

Spring 2018

Introduction to Ecology

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Recommended Citation

Huang, Ching-Yu; Crook-Hill, Janice; Darracq, Andrea; Collantes, Hugo; Wilkison, James; Aganovic, Enes; and Bell, Terri, "Introduction to Ecology" (2018). *Biological Sciences Grants Collections*. 19.
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Ching-Yu Huang, Janice Crook-Hill, Dawn Lubeski,
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and Terri Bell

Introduction to Ecology



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 Grants Round 8

Award Cycle: Round 8

Internal Submission Deadline: Sunday, December 11, 2016

Application Title: 296

Application ID: #001291

Submitter First Name: Ching-Yu

Submitter Last Name: Huang

Submitter Title: Lecturer

Submitter Email Address: ching-yu.huang@ung.edu

Submitter Phone Number: 706-867-2952

Submitter Campus Role: Proposal Investigator (Primary or additional)

Applicant First Name: Ching-Yu

Applicant Last Name: Huang

Co-Applicant Name(s): --

Applicant Email Address: ching-yu.huang@ung.edu

Applicant Phone Number: 706-867-2952

Primary Appointment Title: Lecturer

Institution Name(s): University of North Georgia

Submission Date: Monday, December 12, 2016

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

1. Dr. Ching-Yu Huang, Lecturer, Biology Department-Dahlonega campus, ching-yu.huang@ung.edu

2. Dr. Janice Crook-Hill, Assistant Professor, Biology Department-Dahlonega campus, Janice.crook-hill@ung.edu

3. Ms. Dawn Lubeski, Senior Lecture, Biology Department- Gainesville campus, dawn.lubeski@ung.edu

4. Mr. Hugo Collantes, Lecturer, Biology Department-Oconee campus, Hugo.collantes@ung.edu

5. Mr. James Wilkison, Instructional Designer, Distance Learning & Technology Integration Department-Dahlonega campus, james.wilkison@ung.edu

6. Mr. Enes Aganovic, Coordinator of Technology Integration, Distance Learning & Technology Integration Department-Dahlonega campus, enes.aganovic@ung.edu

7. Ms. Terri Bell, Senior Library Assistant-Copyright Compliance, Libraries-Dahlonega campus, terri.bell@ung.edu

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

*Dr. Nancy Dalman, Department Head of Biology, University of North Georgia;
Nancy.Dalman@ung.edu*

Proposal Title: 296

Course Names, Course Numbers and Semesters Offered:

BIOL 1102 Introduction to Ecology; offered every Fall, Spring and Summer on all four UNG campuses (Dahlonega, Gainesville, Oconee and Cumming)

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

**Number of Course
Sections Affected by
Implementation in
Academic Year: 35**

**Total Number of Students
Affected by Implementation
in Academic Year: 840**

**List the original course
materials for students
(including title, whether
optional or required, & cost
for each item):** 1. Required textbook for Gainesville and Oconee campuses: Campbell Biology: Concepts & Connections by Reece et al.; \$2312. Required textbook for Dahlonega and Cumming campuses Ecology: The economy of nature by Ricklefs and Relyea; \$179

**Requested Amount of
Funding: \$30,000**

Original per Student Cost: \$ 179 per student for Dahlonega and Cumming campuses; \$ 231 per student for Gainesville and Oconee campuses

Post-Proposal Projected \$ 0
Student Cost:

Projected Per Student \$ 179 per student for Dahlonega and
Savings: Cumming campuses (100%); \$ 231 per
student for Gainesville and Oconee
campuses (100%)

Projected Total Annual - Student savings: \$231 per student for total
Student Savings: 648 students from Gainesville and Oconee
campuses - Student savings: \$179 per
student for total 192 students from Cumming
and Dahlonega campuses; Total student
saving estimated \$184,057 per academic
year

Creation and Hosting Platforms Used ("n/a" if none):

Digital lessons with Softchalk interactive activities for students

- OpenStax CNX

- Softchalk Share and Softchalk eBooks (Main Hosting Platform)

All course materials (digital lessons, supplemental materials and instructor's manual; Softchalk eBooks)

- the Nighthawks Open Institutional Repository hosted by University of North Georgia

-the Digital Repository of the Affordable Learning Georgia

Proposal Category: Interactive Course-Authoring Tools and
Software

Final Semester of Fall 2017
Instruction:

Project Goals:

[NOTE: Dr. Huang had formatting issues with the InfoReady application. Please view the Narrative document attached for the full proposal. - Jeff Gallant]

The cost of higher education has continued to rise nationwide since 1971. For 4-year public colleges the cost for tuition and fees increased from \$428 (in current dollars) in 1971-1972 to approximately \$9,139 in 2016-2017 [1]. While tuition and fees have increased 89% (on average), college textbook prices have also increased 82% between 2003 and 2012 [2]. A recent report has shown that over 65% of students choose NOT to purchase textbooks because of their high prices [3]. The average cost of \$1,200 for textbooks and supplies can cause students to incur more debt or work more and longer hours, potentially undermining

their learning in class. We have observed that this additional cost of high-priced textbooks could potentially impede students' learning and performance in the subject matter, particularly for required science core curriculum courses for non-science major students.

How high cost textbook affects science core curriculum courses and non-science major students in North Georgia: The introductory ecology course for *non-science major* students is an important course to cultivate one's scientific literacy, and to develop an appreciation of the natural world as well as a recognition of current global change issues. Every academic year, a total of 35 sections of BIOL 1102 Introduction to Ecology are offered across four campuses (Cumming, Dahlonega, Gainesville, and Oconee campuses) at the University of North Georgia. However, a lack of introductory-level ecology textbooks that are appropriate for non-science majors has limited our ability to fully engage students in the study of ecology. Current ecology textbooks available in the market are either *developed for biology-major advanced-level ecology* or *strongly biased toward environmental science*.

The textbooks that Biology Department at the UNG currently adopt for the BIOL1102 Introduction to Ecology courses are:

- 1) An introductory biology textbook (Campbell Biology: Concepts & Connections by Reece et al.; Price \$231) and cover ONLY 13 ecology-related chapters (**34%** of the Campbell Biology textbook- total 38 chapters).
- 2) A biology-major advanced-level ecology textbook (Ecology: The Economy of Nature by Ricklefs and Relyea; \$179) and ONLY cover selected topics in 17 chapters (**50%** of the ecology textbook content- total 23 chapters).

Students are encouraged to take cost-saving options like used books or renting to save money. However, these costs continue to rise as well. Neither of the abovementioned textbook options is cost-effective or ideal for our *non-science major* students. Because the subject matter (i.e., ecology) is not their career focus, non-science major students often forego required ecology textbooks, despite their concerns and potential impacts on their academic progress. By providing accessible and no cost open educational resources (OER) for the BIOL1102 Introduction to Ecology course to non-science major students, we hope to provide an opportunity for our students to expand their access to knowledge in ecology anytime and anywhere, as well as to facilitate students' engagement in learning beyond the classroom.

The goals of this project are:

1. To provide no cost and high quality course materials for the BIOL1102 Introduction to Ecology courses to non-science majors with adoption of selected chapters from the OpenStax Biology Textbook (<https://openstax.org/details/books/biology>; Please see Table 1 for selected chapters). This department-wide textbook transformation project will impact all the BIOL1102 Introduction to Ecology sessions offered in the four campuses at the University of North

Georgia.

Estimated savings for students from the four campuses at UNG:

- 1) Student savings- Gainesville and Oconee campuses: \$231 per student for total 648 students
- 2) Student savings- Cumming and Dahlonega campuses: \$179 per student for total 192 students

Total student savings estimated to be \$184,057 per academic year

2. To develop and/or incorporate free supplemental materials into learning content, including short ecology-related videos, such as Creative Common licensed Ted Talk videos, online Softchalk self-assessment, interactive activities for students, and interactive classroom activities (such as local/regional/global case studies, hands-on activities, and discussion questions in each learning module) for instructors to promote student engagement. The implementation of these teaching strategies will create an active and interactive learning environment for students via facilitating multi-level (i.e., *student-content*, *student-student* and *student-instructor* levels) interactions.
3. To improve non-science major students' performance (both grades and engagement) and to facilitate students' success in the Introduction to Ecology course by reducing the drop/withdrawal rate (to increase retention rate). We expect that accessible and no cost instructional course materials and supplemental learning resources will encourage students' attendance and participation in class.
4. To promote consistency in instructional materials for non-science major BIOL1102 Introduction to Ecology courses on all the campuses, as well as to ensure comparable learning outcomes and expectations of non-science major students, while achieving the University's learning objectives and learning goals of the BIOL1102 Introduction to Ecology course.

Statement of Transformation:

In this project, a total of 20 ecology topics will be identified for development into individual learning modules (Fig. 1). Each learning module will include: 1. Digital lesson: A customized OpenStax Biology textbook chapter A digital lesson will be developed based on an adopted OpenStax Biology textbook chapter. Supplemental short ecology-related videos and additional developed materials would be added as needed. (See Table 1 for selected OpenStax Biology textbook chapters). 2. Interactive online exercise(s): Softchalk activities for student (self)-assessments As a Softchalk Cloud subscriber, UNG faculty can develop Softchalk interactive activities (such as DragNDrop, crossword puzzles and sorting activities) and publish them as open educational resources (OER) via Softchalk Share. Softchalk Share (<http://softchalk.com/products/share/>) is an online repository with accessible and no cost

learning materials created and shared by educators. Instructors from any institution can easily link and embed these learning activities into their webpages or their learning management systems (LMS). Recently, with the Softchalk eBook feature, digital lessons and interactive activities can be packaged into an interactive eBook. 3. Interactive classroom activities: In-class activities for student engagement One or two in-class activities will be developed for each learning module to help instructors engage students in the classroom and promote an in-depth understanding on specific ecology topics. Interactive classroom activities may include hands-on exercises, case studies (at national, regional or local scales), discussion forums (focusing on directed, or open-ended questions) and visual concept mapping exercises (such as Popplet- a free app for learning). 4. Instructor's manual: The instructor's manual will be developed and prepared for each learning module in order to address learning objectives and learning outcomes for each ecology topic. This manual will also include teaching tips and suggested class plans for newly hired instructors or instructors who are teaching the BIOL1102 Introduction to Ecology course for the first time. Non-science major students are the primary stakeholders for this project. With accessible and no cost OpenStax digital lessons and Softchalk learning activities, we hope to better engage non-science major students in learning ecology, regardless of their financial situations, career focus or personal interests. The interactive classroom activities developed in this project will help instructors to create a student-centered and active learning environment. With the funding from the Affordable Learning Georgia (ALG), we hope to improve students' retention rates and performance for this BIOL1102 Introduction to Ecology course, and cultivate non-science major students as science-literate, informed global citizens. In this project, biology faculty will also have an opportunity to explore several innovative teaching strategies and teaching technologies to rejuvenate their pedagogical methods. Faculty will participate in training workshops to explore these teaching technologies (see below for some examples) and specific ways to implement these technologies into their learning management system (i.e., Desire to Learn, D2L) and in the classroom. Teaching tips and suggested class plans included in the Instructor's manual will facilitate a smooth transition in textbook transformation, as well as to promote the success of this textbook transformation project. I (Dr. Ching-Yu Huang), as the team leader of this project, have adopted several teaching technologies and a "flipped classroom" approach in my BIOL1102 Introduction to Ecology course since 2015. Last year, I hosted a "Conversations in Pedagogy and Research" workshop to introduce and help to train my fellow biology faculty in effective teaching technologies and techniques. In 2016 I was awarded the Innovative Use of Technology Award from the University of North Georgia for my expertise and effective implementation of teaching technologies in the face-to-face and online courses. Please see below for selected teaching technologies and samples: Softchalk lessons and interactive activities [Microevolution:

<https://www.softchalkcloud.com/lesson/serve/WLPrtV3Jq84FCv/html>] Padlet Corkboard discussion forum ["Is virus a living thing?": <https://padlet.com/chingyh/7j6tpdngu98r>] Socrative in-class quizzes and poll tools (<http://www.socrative.com>) Kahoot game-based learning platform for quizzes and pool tools (<https://getkahoot.com>) Many Desire to Learn (D2L) features (such as Dropbox, Survey, Quizzes and Discussions.) Here are a couple of students'

comments on my technology use in the flipped BIOL1102 Introduction to Ecology course: “My favorite of the many [technology] uses is the D2L Softchalk lessons and [D2L] surveys. The modules she provides before class give insight to what we are going to learn in the next lesson. Within the modules she also provides small pop quizzes, crosswords, or drag and drop activities which immediately tests the knowledge we just learned. With this self-check, I am able to learn what I know and what I need to review.”-BIOL1102, Spring 2016 “Throughout my college experience so far, I have yet to come across a professor who uses technology in such a useful and efficient manner.”- BIOL1102, Spring 2016 Most of our Biology faculty at the University of North Georgia teach at least one non-science major introductory course. With the adoption of the OER OpenStax textbook and the introduction of innovative teaching technologies, this project can serve as an exemplary model for other non-science major courses to replace their high-cost, commercial textbooks (such as the BIOL1101 Introductory Biology: From a human perspective and the BIOL1260 Environmental Science). All these three non-science major courses represent the majority of courses offered in our Biology department on an annual basis, and therefore affect the greatest numbers of students of the University of North Georgia.

Transformation Action Plan:

1. Development and Review of the learning modules

Each of four Faculty members (Dr. Huang, Dr. Crook-Hill, Ms. Lubeski and Mr. Collantes) has at least 5-year of teaching experience in the BIOL1102 Introduction to Ecology course. We will meet several times to discuss learning objectives, learning outcomes and overall goals for each learning module. Four faculty members will work closely to review and develop a total of 20 learning modules based on the adopted OpenStax Biology textbook chapters (Please see Table 1 for ecological topics and selected OpenStax chapters for this course). Each learning module will be reviewed by the other three faculty members, and revised based on comments, feedback and discussion from the internal peer-reviewing process before publication.

2. Instructional design and technology integration

Mr. James Wilkison and Mr. Enes Aganovic from the Distance Education and Technology Integration (DETI) at the University of North Georgia will:

provide consultation and suggestions on instructional design and technology integration, host OpenStax CNX, Softchalk and D2L training workshops for Biology faculty
prepare step-by-step tutorial videos or instructions for *instructors* on how to access and adopt the BIOL1102 Introduction to Ecology course materials and instructor resources (such as OpenStax CNX, Softchalk Cloud and Softchalk Share, Padlet and D2L tools)
develop step-by-step tutorial videos for *students* on how to access to OpenStax lessons, online Softchalk interactive activities and the Softchalk eBook, as well as how to use these learning technologies (such as OpenStax, Softchalk Share, Padlet and D2L tools)

3. Library support and consultation in copyright compliance and the OER publication

Copyright Specialist Ms. Terri Bell will provide consultation in copyright compliance for course content and supplemental materials. The open access course materials and instructor resources of the BIOL1102 Introduction to Ecology course will be published on the Nighthawks Open Institutional Repository hosted by the University of North Georgia, as well as the Digital Repository of Affordable Learning Georgia.

Please see the **Budget** table for detailed responsibilities for each personnel.

Quantitative & Qualitative Measures: Quantitative and qualitative data collection for this project will begin in Spring 2017 and the results collected from Spring, Summer and Fall 2017 will be analyzed and used to evaluate the success of this textbook transformation project.

Quantitative data: All the quantitative data from the pre- and post-transformation courses of the same instructor will be analyzed by the paired t-test to avoid the confounding effects from different teaching styles and individual instructional method.

1. The Drop/Fail/Withdrawal rate (DFW rates) and student attendance and participation (%) We expect that the DFW rates would significantly decrease with an improved student attendance after the implementation of accessible and no-cost BIOL1102 Introduction to Ecology course materials and learning resources. Student's participation will be tracked by using D2L's User Progress tool and Completion Tracking feature to evaluate their frequency in viewing specific course materials and their contributions to Discussions, Dropboxes, or other online assignments.
2. Students' first exam scores This is to evaluate whether the adoption of accessible and no cost learning materials and resources can improve students' learning and performance at the beginning of the semester. Because students can obtain all required course materials at the first day of the class, we expect to see better student performance on their first exam, regardless their financial limitations or delayed financial aid support (due to late class registration or late financial aid application).
3. Students' final cumulative exam score and class pass rate (%) We expect that the final exam scores and class pass rate (%) would be significantly improved after the implementation of no cost learning materials and resources for the BIOL1102 Introduction to Ecology courses.

Qualitative data: All qualitative data will be collected via online survey developed by the Qualtrics web-based survey software. The survey results will be analyzed and compared between the pre-transformation classes (Spring semester, 2017) and post-transformation classes (Summer and Fall

semesters, 2017). The pre- and post-transformation results will be compared within the same instructor (to avoid the confounding effects from different teaching styles and individual instructional method) as well as by all instructors participated in this project to evaluate overall impacts of this textbook transformation project to non-science major students.

1. An online student survey for pre-transformation coursesA short survey will be developed and given to students from pre-transformation courses (Spring 2017) during the first month of the semester to collect information for their commercial textbook purchasing. The survey questions will address textbook ownerships (new, used, renting or no textbook is purchased), textbook edition purchased, whether students consider that textbook costs would affect their overall learning progress, and other textbook-cost related questions.
2. An online student survey for both pre- and post-transformation coursesStudents will be asked to evaluate their frequency of textbook usage, their “internet skills” to retrieve information from digital lessons and to partake in online interactive activities adopted by the courses (such as Softchalk, Padlet, and D2L features; Post-transformation courses only), and their opinions and comparisons on accessibility, readability and quality of the OER Introduction to Ecology course materials and commercial textbooks (Post-transformation courses only).
3. An online instructor surveyAn online survey will be developed to request critiques, comments and suggestions from instructors who participate in this project on the developed learning modules and supplemented teaching technology and resources. The survey results can be used to improve and/or re-design the learning modules in the future.All the data will be compiled, summarized and presented in the project report.

Timeline:

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|-----------------|--|
| <i>Timeline</i> | <i>Stages for the transformation project</i> |
|-----------------|--|

| | |
|------------------|--|
| January 12, 2017 | *Faculty members <i>begin</i> to draft learning objectives and learning outcomes for the BIOL1102 <u>Introduction to Ecology</u> course |
| January 30, 2017 | * Team members attend ALG Kick-off meeting |
| January 30, 2017 | *Faculty members <i>review</i> and <i>finalize</i> learning objectives and learning outcomes for the BIOL1102 <u>Introduction to Ecology</u> course |
| February 1, 2017 | <p>*Faculty members begin to review and customize the adopted OpenStax chapters. Additional course materials will be developed and added as needed. Faculty member, while reviewing and customizing the OpenStax digital lessons, will also develop interactive classroom activities.</p> <p>*Faculty members provide Copyright Specialist with <i>initial</i> Table of Content (Toc) for all supplemental content (content outside of OpenStax chapters)</p> <p>*Technology Integration coordinator host a Keltura training workshop for faculty members.</p> <p>*Instructional designer to host an OpenStax CNX training workshop for faculty members.</p> |
| March 15, 2017 | *Faculty members provide Copyright Specialist (Ms. Terri Bell) with <i>final</i> ToC for all supplemental content (content outside of OpenStax chapters) |
| April 1, 2017 | <p>*Faculty members submit the customized digital lessons for internal peer-review process.</p> <p>*Copyright Specialist to perform Initial Compliance Citations Review of Faculty members' layout of all content for accurate in-text copyright and license citation, as well as accurate ToC and Bibliography citations.</p> |

| | |
|-------------------|---|
| May 15, 2017 | <ul style="list-style-type: none"> *Internal peer-review process completed. Faculty members revise digital lessons based on comments and feedback received from peer-review process. *Instructional designer to host a Softchalk training workshop for faculty members. *Faculty members to develop Softchalk interactive activities and prepare Instructor's Manual. |
| June 1, 2017 | <ul style="list-style-type: none"> *Finalize digital lessons and Softchalk interactive activities. * Perform Final Compliance Citations Review of all PI's layout of all content for accurate in-text copyright and license citation, as well as accurate ToC and Bibliography citations *Faculty members, if teaching in summer, conduct a pilot course in summer |
| June - July, 2017 | <ul style="list-style-type: none"> *Instructional designer to host a D2L training workshop for faculty members and instructors who will teach the BIOL1102 <u>Introduction to Ecology</u> course *Technology Integration coordinator host a Kaltura training workshop for instructors who will teach the BIOL1102 <u>Introduction to Ecology</u> course *Instructional designer and Technology Integration coordinator to prepare step-by-step tutorials and instructions of OpenStax, Softchalk and D2L tools for instructors and students. *Faculty members finalize Instructor's Manual. |
| August 1, 2017 | <ul style="list-style-type: none"> * Complete class data collection and analysis for pilot courses (if any) * Review and modify the learning modules if needed |
| August 15, 2017 | <ul style="list-style-type: none"> * Implementation of the OER BIOL1102 <u>Introduction to Ecology</u> for Fall semester, 2017 * All Copyright and CC license work completed. |

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|-------------------|---|
| December 23, 2017 | <ul style="list-style-type: none"> * Complete class data collection and analysis for Fall courses * Submit the final project report to ALG * Review and modify the learning modules as need for 2018 |
| January, 2018 | <ul style="list-style-type: none"> * The OER BIOL1102 <u>Introduction to Ecology</u> published on UNG Nighthawks Open Institutional Repository and the ALG Digital Repository. |

Budget:

The budget is proposed as follows:

| <i>Names</i> | <i>Responsibilities</i> | <i>Budget</i> |
|--|--|---------------|
| Dr. Ching-Yu Huang Lecturer Biology department (Dahlongega) | <u>Supplemental compensation</u> for -Developing course materials (include OpenStax digital lessons, Softchalk interactive exercise, interactive classroom activities, and instructor's manual) - Project data collection - Data analysis and report preparation <i>Monthly \$625.00 for 8 months (Jan-August)</i> | \$5,000 |
| Dr. Janice Crook-Hill Assistant Professor Biology Department (Dahlongega & Cumming) | <u>Supplemental compensation</u> for -Developing course materials (include OpexStax digital lessons, Softchalk interactive exercise, interactive classroom activities, and instructor's manual) - Project data collection <i>Monthly \$625.00 for 8 months (Jan-August)</i> | \$5,000 |

| | | |
|---|---|---------|
| Ms. Dawn Lubeski Lecturer Biology department (Gainesville) | <u>Supplemental compensation</u> for -Developing course materials (include OpenStax digital lessons, Softchalk interactive exercise, interactive classroom activities, and instructor's manual) - Project data collection <i>Monthly \$625.00 for 8 months (Jan-August)</i> | \$5,000 |
| Mr. Hugo Collantes Lecturer Biology department (Oconee) | <u>Supplemental compensation</u> for -Developing course materials (include OpenStax digital lessons, Softchalk interactive exercise, interactive classroom activities, and instructor's manual) - Project data collection <i>Monthly \$625.00 for 8 months (Jan-August)</i> | \$5,000 |
| Mr. James Wilkison Instructional Designer | <u>Supplemental compensation</u> for - Assist Biology instructors for instructional design - Host OpexStax CNX, Softchalk and D2L training workshops for faculty - Develop step-by-step instructions for faculty (such as OpenStax, Softchalk Share, D2L tools, etc.) <i>Monthly \$312.50 for 8 months (Jan-August)</i> | \$2,500 |

| | | |
|---|--|-----------------|
| Mr. Enes Aganovic Coordinator of Technology Integration | <u>Supplemental compensation</u> for - Assist Biology instructors for technology integration - Host Kaltura (D2L-My media) training workshops for faculty - Develop step-by-step tutorial videos on D2L features, Softchalk activities, Padlet board, etc. for students <i>Monthly \$312.50 for 8 months (Jan-August)</i> | \$2,500 |
| Ms. Terri Bell Copyright Specialist Senior Librarian | <u>Supplemental compensation</u> for - assign final OER licensing - perform copyright compliance review, license compatibility review and citations review on all proposed content. <i>Monthly \$500.00 for 8 months (Jan-August)</i> | \$4,000 |
| Ching-Yu Huang and Dawn Lubeski (faculty members) | Travel and other expenses for the ALG Kick-off meeting in January | \$800 |
| Travel for other team member(s) (Terri Bell, Janice Crook-Hill and Hugo Collantes) | Travel and other expenses for the ALG Kick-off meeting in January (Our team is really excited about this project, and we all want to attend the Kick-off meeting. We hope that we all can get to go by sharing a total \$1,000 budget for travel and other expense.) | \$200 |
| Total budget | | \$30,000 |

Sustainability Plan:

We anticipate the implementation of the accessible and no cost course materials for the BIOL1102 Introduction to Ecology course will promote non-science major students' learning and performance in this course. We expect to receive positive feedbacks from students.

Instructors who participate in this textbook transformation project will receive an Instructor Feedback Form at the beginning of the implementation. They will be asked to fill out the Feedback Forms to provide their suggestions on improvement of each individual learning module. Instructor Feedback Forms will be collected at the end of each semester.

Faculty members will meet in January and August every year to review and update course content and supplemental materials. We will revise and/or redesign the course based on feedback and suggestions received from Instructor Feedback Forms and survey results from students and instructors. A regular maintenance (once a year as needed) on the OER course contents and supplemental materials is vital to ensure the most up-to-date and high quality course offering for the BIOL1102 Introduction to Ecology course.

REFERENCES & ATTACHMENTS

[1] College Board. 2016. Tuition and fees and room and board over time: Table 2: Average Tuition and Fees and Room and Board (Enrollment-Weighted) in Current Dollars and in 2016 Dollars, 1971-72 to 2016-17. Retrieved from <https://trends.collegeboard.org/college-pricing/figures-tables/tuition-fees-room-and-board-over-time>

[2] United States Government Accountability Office. 2013. College Textbooks: Students have greater access to Textbook information. Retrieved from <http://www.gao.gov/assets/660/655066.pdf>

[3] U.S. PIRG Education Fund and the Student PIRGs. 2014. Fixing the Broken Textbook Market. Retrieved from <http://www.studentpirgs.org/reports/sp/fixing-broken-textbook-market>

Table 1. The selected ecology topics and the corresponding OpenStax Biology textbook chapters that will be adopted and modified for the development of a total 20 learning modules in this project.

| Learning Modules | Topics | OpenStax Biology Textbook Chapters | Team members |
|--|--|--|-------------------|
| I. Introduction and Scientific literacy | | | |
| 1 | <ul style="list-style-type: none"> - The Science of life - The scientific method - Science literacy | <ul style="list-style-type: none"> - Unit 1: Chap. 1 The study of life | Ching-Yu Huang |
| II. Evolutionary process | | | |
| 2 | <ul style="list-style-type: none"> - Microevolution - Population genetics - Hardy-Weinberg equilibrium | <ul style="list-style-type: none"> - Unit 4: Ch. 19 The evolution of population | Ching-Yu Huang |
| 3-4 | <ul style="list-style-type: none"> - Evolution by natural selection - Non-adaptive evolution (mutation, genetic drift and gene flow) - Speciation | <ul style="list-style-type: none"> - Unit 4: Ch. 18 Evolution and Origin of the species | Janice Crook-Hill |
| 5 | <ul style="list-style-type: none"> - Macroevolution - Phylogenetic trees | <ul style="list-style-type: none"> - Unit 4: Ch. 20 Phylogenies and the history of life | Dawn Lubeski |
| III. Biological diversity | | | |
| 6-8 | <ul style="list-style-type: none"> - Diversity of virus and prokaryotes - Diversity of protists - Diversity of fungi | <ul style="list-style-type: none"> Unit 5: Ch. 21 Virus Ch. 22 Prokaryotes: Bacteria and Archaea Ch. 23 Protist Ch. 24 Fungi | Hugo Collantes |
| 9 | <ul style="list-style-type: none"> - Diversity and reproduction of Seedless and seed plants | <ul style="list-style-type: none"> - Unit 5: Ch. 25 Seedless plant Ch. 26 Seed plant Ch. 32 Plant reproduction | Dawn Lubeski |
| 10 | <ul style="list-style-type: none"> - Diversity and reproduction of invertebrates | <ul style="list-style-type: none"> - Unit 5: Ch. 27 Introduction to animal diversity Ch. 28 Invertebrates Ch. 33 The animal body: Basic form and function Ch. 43 Animal | Hugo Collantes |

| | | | |
|--|--|--|----------------------------------|
| | | Reproduction and development | |
| 11 | - Diversity and reproduction of vertebrates | - Unit 5: Ch. 29 Vertebrates Ch. 33 The animal body: Basic form and function Ch. 43 Animal Reproduction and development | Hugo Collantes |
| IV. Ecology | | | |
| 12 | - Ecology and Biosphere | - Unit 6: Ch. 44 Ecology and Biosphere | Hugo Collantes |
| 13 | Population Ecology - Population growth models - Life table - Survivorship curve & r vs. K strategist | - Unit 6: Ch. 45 Population and community ecology | Dawn Lubeski |
| 14 | Community Ecology - Food web - Competition, predation, parasitism, symbiosis and mutualism | - Unit 6: Ch. 45 Population and community ecology | Janice Crook-Hill |
| 15-18 | Ecosystem Ecology - Energy flow - Carbon cycle and global warming - Nitrogen cycle and air pollutions - Phosphorus cycle and environmental issue | - Unit 6: Ch. 46 Ecosystem | Ching-Yu Huang |
| V. Conservation and biodiversity | | | |
| 19 | - Conservation biology - Biodiversity loss | - Unit 6: Ch. 47 Conservation biology and biodiversity | Janice Crook-Hill |
| VI. Behavioral ecology and adaptation | | | |
| 20 | - Behavioral ecology | N/A | Dawn Lubeski & Janice Crook-Hill |

7 December, 2016

Dear ALG Review Board,

I am writing this letter to support the University of North Georgia biology department's *Affordable Learning Georgia Textbook Transformation Grant* proposal. UNG formed 3.5 years ago through the consolidation of North Georgia College & State University and Gainesville State College. The new institution now serves over 18,000 students, from 132 Georgia counties and 98 different countries, spread across five distinct campuses. Unlike many USG institutions, enrollment at UNG has continually risen over the past several years; retention and 6 year graduation rates are among the highest in the state.

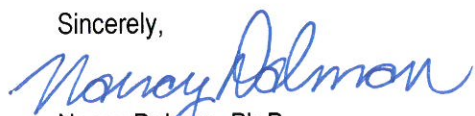
Dr. Huang and her colleagues teach our Introduction to Ecology (BIOL 1102) course at the three university campuses where this course is offered. This course is one of several core science courses taken by non – science majors. The impact of the proposed changes will be impressive. I am particularly pleased that the group plans to develop learning modules because one challenge that all recently consolidated institutions face is course consistency across campuses, particularly when the merged institutions had different mandates, as was the case for UNG. The collaborative efforts of this group will not only benefit BIOL 1102, but will serve as a model for instructors of other courses in creating course uniformity across campuses.

Dr. Huang is an extremely innovative instructor, who has pioneered the use of the “flipped classroom” in several biology courses at UNG and continues to incorporate technology – based and highly engaging pedagogy in her classes. In fact, her efforts were recently recognized when she won the university – wide “Innovative Use of Technology Award”. Based on student performance, which Ching – Yu has assessed relative to student performance in traditionally formatted classes, student analytical thinking showed substantive gains. Small sample sizes precluded any sort of statistical analysis. Further, and perhaps more impressive, student course evaluations were mostly positive. Dr. Huang has been using proven quantitative and qualitative measures (adapted from national and state SoTL workshops Dr. Huang has attended), and these same measures can readily be applied to the currently proposed project.

Finally, the biology department will provide financial support to allow Dr. Huang and colleagues the opportunity to present their findings at a teaching and learning conference and will also underwrite the cost of any materials needed to conduct analyses of learning outcomes. I believe this to be a viable program, one that we hope to pilot in this, the smallest of our core science courses, and ultimately expand it to our larger, higher enrollment, core science classes. In this way, we will provide cost – savings to over 90% of all UNG students since almost every student at the university takes at least one biology core science class.

Thank you very much for your consideration of this proposal and please do not hesitate to contact me at (706)867-2832 if you have any questions.

Sincerely,



Nancy Dalman, Ph.D.
Professor and Department Head of Biology

December 8, 2016

Mr. Jeff Gallant
Program Manager
Affordable Learning Georgia
Board of Regents Academic Affairs
2500 Daniells Bridge Road, Building 300
Athens, GA 30606

Re: Affordable Learning Georgia Textbook Transportation Grant Proposal
Proposal Title: No-Cost Replacement of the High Cost Required Ecology Textbook for Non-
Science Major *Introduction to Ecology* course
Principal Investigator (PI): Ching-Yu Huang, Ph.D., Department of Biology

Dear Mr. Gallant:

Please consider this to be an official letter of commitment for the above referenced project. If awarded, the University of North Georgia (UNG) will be supportive of Dr. Huang's efforts to achieve the goals of this project and UNG agrees to provide the services defined in Dr. Huang's scope of work on a reasonable best effort basis. The estimated budget is \$30,000 for the one-year project performance period.

Agreements required in conjunction with this project should reflect The Board of Regents of the University System of Georgia by and on behalf of the University of North Georgia as the contracting party. The award and any administrative correspondence should be sent to the address below:

Mr. Brandon Arbuthnot
Assistant Director for Post-Award Services, Grants and Contracts Administration
University of North Georgia
82 College Circle
Dahlonega, GA 30597-0001
Phone: [\(706\) 867-3280](tel:(706)867-3280) Email: brandon.arbuthnot@ung.edu

If additional information is needed, please contact me at the UNG Grants and Contracts Administration Office at (706) 867-2139 or charles.wood@ung.edu. Thank you for your assistance.

Sincerely,



Charles P. Wood, Associate Director
Grants and Contracts Administration

Syllabus

BIOL1102 Course Outline Document

Tentative Course Schedule:

| Weeks | | Topics | Pre-lecture reading assignments (Check D2L for updated lists of assignments) |
|-------|------------------|---|---|
| 1 | Aug. 21- 25 | <i>No classes on Aug. 21</i> 1. Syllabus (Bring the syllabus) 2. Introduction to Ecology | - BIOL 1102 Syllabus - Module 1a https://softchalkcloud.com/lesson/serve/HnEXZ5xbIhCzR8/html |
| 2 | Aug. 28- Sept. 1 | 1. Scientific method and Scientific literacy and skills (Bring your laptop or iPad to class) 2. Evolution and natural selection | - Module 1b https://softchalkcloud.com/lesson/serve/HnEXZ5xbIhCzR8/html - Module 2 https://softchalkcloud.com/lesson/serve/XmJtFEvgoW6PZ9/html |
| 3 | Sept. 4- 8 | <i>No classes on Sept. 4 (Labor day)</i> Evolution of populations | - Module 3 https://softchalkcloud.com/lesson/serve/YJjQMDGwcozBVd/html |
| 4 | Sept. 11-15 | 1. Evolution of populations (Cont'd) 2. Speciation | - Module 3 - Module 4 https://softchalkcloud.com/lesson/serve/qCMVkJWE5y9QSG/html |
| 5 | Sept. 18-22 | TEST #1 (Modules 1-4) Phylogeny & Tree of life | - Module 5 https://softchalkcloud.com/lesson/serve/EgWG9ODSRI4Qk2/html |
| 6 | Sept. 25-29 | Phylogeny & Tree of life Ecology and Biosphere | - Module 5 - Module 6 https://softchalkcloud.com/lesson/serve/afjsylZUIOCzgh/html |
| 7 | Oct. 2-6 | Population Ecology <i>No Classes on Oct. 6</i> | - Module 7 https://softchalkcloud.com/lesson/serve/WQdevqoShPNwYz/html |
| 8 | Oct. 9-13 | ¶ October 13: last day to withdraw with a "W"! Population Ecology | - Module 7 |
| 9 | Oct. 16-20 | TEST #2 (Modules 5-7) Community Ecology (competition) | - Module 8 https://softchalkcloud.com/lesson/serve/GP4CJtiwNYoEdS/html |

| | | | |
|----|-----------------|--|---|
| 10 | Oct. 23-27 | No classes on Oct. 23 Community Ecology | - Module 8 |
| 11 | Oct. 30-Nov. 3 | 1. Community Ecology 2. Ecosystem Ecology (Energy flow) | - Module 8 - Module 9 https://softchalkcloud.com/lesson/serve/fgiECZKDInj8wr/html |
| 12 | Nov. 6-10 | TEST #3 (Modules 8-9) Ecosystem Ecology (Carbon cycle) | - Module 10 https://softchalkcloud.com/lesson/serve/pyLavbVHiwW5I9/html |
| 13 | Nov. 13-17 | Ecosystem Ecology (Nitrogen cycle) | - Module 11 https://softchalkcloud.com/lesson/serve/pMaLzmlWkZ0Pe5/html |
| 14 | Nov. 20- 24 | Thanksgiving Break- NO CLASSES | |
| 15 | Nov. 27- Dec. 1 | 1. Ecosystem Ecology (Nitrogen cycle) 2. Biodiversity & Conservation | - Module 11 - Module 12 |
| 16 | Dec. 4-8 | Biodiversity & Conservation TEST #4 (Modules 10-12) Study session | - Module 12 https://softchalkcloud.com/lesson/serve/pztnKkPxGefyXI/html |
| 17 | Dec. 13 | Final exam (cumulative): 8:00 a.m. - 10:00 p.m., Dec. 13 (Wednesday) | |

Please note that we are still working on the latest revision of the e-textbook. These learning modules will also be published as a Softchalk e-book. We have provided a link for downloading the learning module 1

(https://ebooks.softchalkcloud.com/books/2158#cfi_eyJpZlZlZi6lmlkLWNvdmVvLXBhZ2UiLCJjb250ZW50Q0ZlIjoilZQvMi8yIn0=)

If students download Softchalk eReader (free), they can download the modules and access the learning modules offline.

Final Report

Affordable Learning Georgia Textbook Transformation Grants

Final Report

Date: December 22, 2017

Grant Number: 296

Institution Name(s): University of North Georgia

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

1. Dr. Ching-Yu Huang, Lecturer, Biology Department-Dahlonega campus, ching-yu.huang@ung.edu

2. Dr. Janice Crook-Hill, Assistant Professor, Biology Department-Dahlonega campus, Janice.crook-hill@ung.edu

3. Dr. Andrea Darracq, Assistant Professor, Biology Department, Murray State University, adarracq@murraystate.edu

4. Mr. Hugo Collantes, Lecturer, Biology Department-Oconee campus, Hugo.collantes@ung.edu

5. Mr. James Wilkison, Instructional Designer, Distance Learning & Technology Integration Department-Dahlonega campus, james.wilkison@ung.edu

6. Mr. Enes Aganovic, Coordinator of Technology Integration, Distance Learning & Technology Integration Department-Dahlonega campus, enes.aganovic@ung.edu

7. Ms. Terri Bell, Senior Library Assistant-Copyright Compliance, Libraries-Dahlonega campus, terri.bell@ung.edu

Project Lead: Dr. Ching-Yu Huang

Course Name(s) and Course Numbers: BIOL 1102

Semester Project Began: Spring 2017

Semester(s) of Implementation: Fall 2017

Average Number of Students Per Course Section: 16-24

Number of Course Sections Affected by Implementation: 13

Total Number of Students Affected by Implementation: 263

1. Narrative

This project is to provide no cost and high quality course materials for the BIOL1102 Introduction to Ecology course to non-science majors with adoption of selected chapters from the OpenStax Biology Textbook (<https://openstax.org/details/books/biology>) for University of North Georgia. In the summer, 2017, a total of 20 learning modules were developed based on the adopted OpenStax Biology textbook chapters with supplemental ecology videos and additional materials. Each learning module was peer-reviewed and revised based on comments and feedback from the internal peer-reviewing process and discussions among the project team members. Instructor's manual (including teaching tips, suggested class plans and in-class activities) is currently under development. Faculty members who participated in the fall implementation, 2017, will submit their feedback and experiences to the project leader for further improvement and revision of the e-textbook before publication in the spring 2018. The learning modules will not only be released on the Softchalk Share (an online, accessible repository that is free for all educators), as well as packaged into an interactive eBook on the Nighthawks Open Institutional Repository hosted by the University of North Georgia, as well as the Digital Repository of Affordable Learning Georgia for free download in the spring 2018. The BIOL1102 Instructor's Manual will be only available to teachers and educators upon request.

Transformative impacts

This department-wide textbook transformation project was implemented in 13 BIOL1102 Introduction to Ecology sections offered at the University of North Georgia in the fall, 2017. A total of **7 faculty members** (across 3 campuses: Dahlonega, Gainesville, and Oconee) participated this implementation phase. It impacted **a total of 263** students at the University of North Georgia.

Student saving on textbook:

\$ 179 per student for 3 sections on Dahlonega campus;

Textbook Saving: \$179 x 66 students (in 3 sections) = \$ 11,814

\$ 231 per student for 10 sections on Gainesville and Oconee campuses

Textbook Saving: \$231 x 197 students (in 10 sections) = \$ 45,507

Total saving on textbook: **\$57,321** this fall semester for our UNG BIOL1102 students.

Student performance

We collected students' performance (i.e., withdrawn/drop rate, passing rate and exam scores; please see below) from pre- and post-implementation by different instructors. We observed varied results on students' exam scores, class passing rates, drop/withdrawn rates when comparing results of pre-implementation to those of post-implementation. This could be partially explained by the small sample size (n=4). This e-textbook incorporates free supplemental materials into learning content, including short ecology-related videos, such as Creative Common licensed Ted Talk videos, online Softchalk self-assessment, interactive activities for students to promote student engagement. This might affect instructor's teaching strategies and teaching style when adopting the e-textbook. Course sections by the instructors who took advantage of interactive exercises (either used as pre-lecture exercise or graded assignments) did show better exam score and higher passing rates. This was also reflected on students' positive comments from the post-implementation survey (see attached file for survey results). Student adaptability to new technology could also play a factor in their performance. Students who quickly adapt to new technology expressed their preference on digital lessons and online content and could perform

better when adopting this e-book. However, several students did indicate technical issues at the beginning of the semester (which were resolved later).

Based on the survey reports, all the students who participated in the survey expressed positive feedback and experiences from using this free, accessible e-textbook.

The learning modules, which incorporated short ecology-related videos, additional real-life examples, and interactive activities, were designed to promote student engagement. Among the survey responses, numerous students expressed the features they liked the most for this e-textbook are the embedded questions, crossword puzzles, videos and photographs in the learning modules. Students felt these questions and exercises helping them understand the materials better. Such interactive Softchalk eBook promoted student engagement and learning.

Lessons learned and challenges

In this project, faculty members participated in a training workshop to learn Softchalk e-textbook and specific ways to implement these learning modules into the Learning Management System (D2L). A D2L webpage was created for instructors to share their teaching tips and suggested class plans (which will be included in the Instructor's manual when published) in order to facilitate a smooth transition in textbook transformation, as well as to promote the success of this textbook transformation project. However, we did feel that it required more time and several training workshops for faculty members to be fully familiar with and comfortable to navigate the Softchalk learning modules and the D2L. We also encountered some issues with Softchalk software issues. In the past, students could still access the course contents, even after they reached their limited attempts for embedded, graded exercises. This summer, Softchalk change this feature to completely block students' access to course materials after students reach their allowed attempts. Fortunately, students reflected this issue to the instructors immediately, and we would be able to make adjustment accordingly.

2. Quotes

Students' experience and feedback

"It was nice having a text book, or essentially an entire class on my back without adding anymore weight than my computer. The availability and access was spectacular and I would prefer to have all of my classes like this one." Student from Dahlonge campus

"I enjoyed having a textbook that was easy to access and free especially since the course was not one of my major classes." Student from Dahlonge campus

"This book was great! It really helped me understand the material." Student from Dahlonge campus

"Overall I enjoyed using the ebook. It saved me money, it saved my back from carrying around a heavy cumbersome textbook, and it helped me to study for the tests faster because the modules were shorter than the usual chapters in a textbook." Student from Oconee campus

"I loved using this e-book. It allowed me to save money, and get a more concentrated influx of ecological

information.” Student from Oconee campus

“Relatively easy to use, includes most of the necessary course material, and it's free. Who could ask for anything more?” student from Gainesville campus

“I do like using paper books more because I am not around a computer all of the time, but I liked the navigation of the e-textbook.” Student from Gainesville campus

For more students’ experience and feedback, please see attached survey results.

3. Quantitative and Qualitative Measures

3a. Overall Measurements

Student Opinion of Materials

The overall student opinions about the materials used in the course were very positive. Most students recognized that this no-cost e-textbook did save their money and commented on the easiness of navigating the online learning modules. Several students did comment on how the course materials were well written and closely related to instructor’s teaching materials. Most of students commented that they would definitely recommend this e-textbook to students who are interested in taking BIOL1102.

Total number of students affected in this project: 263

- Positive: 100 % of 44 number of respondents from Dahlonge campus
- Positive: 100 % of 20 number of respondents from Oconee campus
- Positive: 100 % of 43 number of respondents from Gainesville campus

Student Learning Outcomes and Grades

Please note that student learning outcome and grades were arranged by instructors.

Dahlonge campus:

Instructor: Ching-Yu Huang

| | Spring 2017 Pre-implementation | Fall 2017 Implementation |
|---------------------|-----------------------------------|-----------------------------|
| Class size | 30 | 44 |
| Drop/withdrawn | 6.7% | 4.5% |
| Class passing rate | 85% | 100% |
| First exam | 77.0 | 78.3 |
| Final exam | 75.7 | 73.7 |
| Overall final grade | 79.9 | 85.4 |

Instructor: Janice Crook-Hill

| | Fall 2015 Pre-implementation | Fall 2017 Implementation |
|--------------------|---------------------------------|-----------------------------|
| Class size | 22 | 21 |
| Drop/withdrawn | 0% | 0% |
| Class passing rate | 96% | 95% |
| First exam | 90.7 | 81.1 |
| Final exam | 88.7 | 70.2 |

Gainesville campus:

Instructor: Dawn Lubeski

| | Spring 2017 Pre-implementation | Fall 2017 Implementation |
|---------------------|-----------------------------------|-----------------------------|
| Class size | 42 | 47 |
| Drop/withdrawn | 21.4% | 12.8% |
| Class passing rate | 100% | 98% |
| First exam | 74.2 | 75.4 |
| Final exam | 78.3 | 80.9 |
| Overall final grade | 79.9 | 77.7 |
| D/F/W rate | 29% | 32% |

Oconee campus:

Instructor: Hugo Collantes

| | Spring 2017 Pre-implementation | Fall 2017 Implementation |
|--------------------|-----------------------------------|-----------------------------|
| Class size | 26 | 33 |
| Drop/withdrawn | 26.9% | 36.3% |
| Class passing rate | 94.7% | 90.5% |
| First exam | 64.6 | 59.4 |
| Final exam | 68.4 | 73.1 |

Student performance outcomes (final exam, overall final grade and passing rate) :

- 2 Positive: Higher performance outcomes measured over previous semester(s) (Instructors: Huang and Collantes)
- 1 Neutral: Same performance outcomes over previous semester(s) (instructor: Lubeski)
- 1 Negative: Lower performance outcomes over previous semester(s) (instructor: Crook-Hill)

Student Drop/Fail/Withdraw (DFW) Rates

Drop/Fail/Withdraw Rate:

14.5 % of students, out of a total 145 students affected, dropped/failed/withdrew from the course in the final semester of implementation, as compared to

15.8% of students, out of a total _120_ students affected, dropped/failed/withdrew from the course before the implementation

Choose One:

- X 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

We collected students' performance (i.e., withdrawn/drop rate, passing rate and exam scores; please see below) from pre- and post-implementation by different instructors. We observed varied results on students' exam scores, class passing rates, drop/withdrawn rates when comparing results of pre-implementation to those of post-implementation. This could be partially explained by the small sample size (n=4). This e-textbook incorporates free supplemental materials into learning content, including short ecology-related videos, such as Creative Common licensed Ted Talk videos, online Softchalk self-assessment, interactive activities for students to promote student engagement. This might affect instructor's teaching strategies and teaching style when adopting the e-textbook. Course sections by the instructors who took advantage of interactive exercises (either used as pre-lecture exercise or graded assignments) did show better exam score and higher passing rates. This was also reflected on students' positive comments from the post-implementation survey (see attached file for survey results). Student adaptability to new technology could also play a factor in their performance. Students who quickly adapt to new technology expressed their preference on digital lessons and online content and could perform better when adopting this e-book. However, several students did indicate technical issues at the beginning of the semester (which were resolved later).

Based on the survey reports, all the students who participated in the survey expressed positive feedback and experiences from using this free, accessible e-textbook.

The learning modules, which incorporated short ecology-related videos, additional real-life examples, and interactive activities, were designed to promote student engagement. Among the survey responses, numerous students expressed the features they liked the most for this e-textbook are the embedded questions, crossword puzzles, videos and photographs in the learning modules. Students felt these questions and exercises helping them understand the materials better. Such interactive Softchalk eBook promoted student engagement and learning.

4. Sustainability Plan

As a Softchalk Cloud subscriber, UNG faculty can develop and make changes to Softchalk interactive activities (such as DragNDrop, crossword puzzles and sorting activities) and publish them as open educational resources (OER) via Softchalk Share. All the project team members have access to the original learning modules regardless the usage and importation of D2L. In the spring 2018, team members will meet and complete the latest revision based on feedback from students and

instructors. After publication, project team members from all campuses will help make adjustment or changes every semester. As mentioned earlier, a D2L webpage was set up for communication and coordination between team members or participated instructors for this project. Team members and instructors will constantly update or make change to original learning modules after the discussion on the D2L discussion forum (at least twice a year).

5. Future Plans

After implementing this project, we felt we learned a lot about open educational resources and how it would benefit to students' learning. Particularly, the integration of course materials into Softchalk digital lesson not only make course content available and accessible to students any time and anywhere, it also promotes students' learning outside of classroom (Survey results showed that students accessed course materials at least 4-5 times a week.). Satisfactions and positive feedback from the students and instructors about this OER motivate all our instructors to try out more OERs for teaching materials in the future.

After we thoroughly analyze data from student's survey results and instructor's feedback, we are planning to present our project results at the University System of Georgia, Teaching and Learning conference in Athens, Georgia, April 4-6, 2018. A proposal, titled "*Using open educational resource to enhance engagement and interaction in ecological science*" has been submitted to the conference. We are also interested in publishing our project data on the OER-related journals.

6. Description of Photograph

Picture: Mr. Hugo Collantes (left; instructor on Oconee campus) and Dr. Ching-Yu Huang (right; team lead)

Note: Sorry that I didn't know we have to include one picture with team for the final report. I will get a picture with most of our team project members next time we meet.