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Application Summary

Competition Details

Competition Title:	Textbook Transformation Grants, Round Twelve (Fall 2018-2019)
Category:	University System of Georgia
Award Cycle:	Round 12
Submission Deadline:	09/13/2018 at 11:59 PM

Application Information

Submitted By:	Anne Gaquere-Parker
Appplication ID:	2591
Application Title:	379
Date Submitted:	09/11/2018 at 8:23 AM

Personal Details

Institution Name(s):	University of West Georgia
Applicant First Name:	Anne
Applicant Last Name:	Gaquere-Parker
Applicant Email Address:	agaquere@westga.edu
Applicant Phone Number:	678-839-6026
Primary Appointment Title:	Professor of Chemistry
Submitter First Name:	Anne
Submitter Last Name:	Gaquere-Parker
Submitter Email Address:	agaquere@westga.edu
Submitter Phone Number:	678 839 6026
Submitter Title:	Professor of Chemistry

Application Details

Proposal Title
379

Final Semester of Project
Fall 2019

Requested Amount of Funding
20,800

Type of Grant

No-or-Low-Cost-to-Students Learning Materials

Course Title(s)
Survey Chemistry I

Course Number(s)
CHEM 1151

Team Member 1 Name
Gaquere-Parker, Anne

Team Member 1 Email
agaquere@westga.edu

Team Member 2 Name
Khan, Farooq

Team Member 2 Email
fkhan@westga.edu

Team Member 3 Name
Stuart, Douglas

Team Member 3 Email
dstuart@westga.edu

Team Member 4 Name
Geisler, Victoria

Team Member 4 Email
vgeisler@westga.edu

Additional Team Members (Name and email address for each)

Sponsor Name
Dr. Denise Overfield

Sponsor Title
Vice President for Sponsored Projects

Sponsor Department
University of West Georgia

Original Required Commercial Materials (title, author, price)
General, Organic and Biological Chemistry, 6th Edition, by Karen Timberlake with Mastering Chemistry access code. Different formats (ebook or hardcover book) are available to students from $158 to $322. The average of $240 is used for the calculations below as it is estimated half the students choose the cheaper version and the other half the more expensive one.

Average Number of Students per Course Section Affected by Project in One Academic Year
20

Average Number of Sections Affected by Project in One Academic Year
11

Total Number of Students Affected by Project in One Academic Year
220

Average Number of Students Affected per Summer Semester
0

Average Number of Students Affected per Fall Semester
140

Average Number of Students Affected per Spring Semester
80

Original Total Cost per Student
$240

Post-Project Cost per Student
39.99 dollars for two year access (online homework)

Post-Project Savings per Student
$200

Projected Total Annual Student Savings per Academic Year
$44,000

Using OpenStax Textbook?
Yes

Project Goals

This project aims at transforming how the content is delivered in all the sections of the first course of a year-long sequence in chemistry designed for pre-allied health majors.

The goals of this project are as follows:

Goal 1: Reduce the cost of course material by 83%;

Goal 2: Ensure that students have access to course materials from the very beginning of the semester, including online graded homework;

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Goal 4: Improve student success (as measured by an increase in scores on the standardized examination written by the American Chemical Society, and a decrease in the DFW rates for the course, increase B versus C grades, and retention in the second course in the sequence);

Goal 5: Improve student attitude towards the need for chemistry in health-related fields

Statement of Transformation

Survey of Chemistry I, CHEM 1151, is the first course of a two-course sequence designed for pre-allied health majors. Every fall semester, nearly 140 students enroll in this course at the University of West Georgia; however, only 50 students continue on to the second course of this sequence. This low progression rate affects in turn the number of qualified applicants for nursing school and the overall number of graduates in this field, worsening the shortage of trained professionals in the nursing field. This broader impact of this project for the community is therefore significant. The DFW rate for this freshman course is about 40%. Several factors contribute to this retention and progression rate. One factor is that students in general lack the mathematical skills needed to successfully complete this course. To remediate this, college algebra has been added as a co-requisite with the intention of enhancing student readiness/preparedness for the course. Pre-allied health majors have the choice between a chemistry or a biology sequence, and the college algebra co-requisite was also implemented to encourage self-selection of students who have stronger mathematical skills into the chemistry track. The results are not as promising as anticipated since this co-requisite change has not had any significant change in the DFW rate. A second factor is that half of the students change their declared major by the end of the first semester in the sequence, and thus do not need to take the second part for this course. Students who switch their majors after having taken CHEM1151 usually only need an easier science course for non-science majors without a laboratory to finish their science core requirements. A third important contributing factor is purely financial: A sizeable fraction of the students simply cannot afford the current textbook. Students enrolled in this class refrain from buying the mandatory textbook until after the second exam (midterm point), at which time it is already too late to be truly successful. To avoid this, the lead instructor now requests the students purchase access to a textbook with bundled online graded homework. Students purchase the package to get access to the homework, while the instructor's true intent is to ensure that students are provided with access to the actual textbook. The issue of financial accessibility remains the same, however, with only 88 students out 120 having purchased access to the text just before the first examination is about to take place (current data). Others who have purchased the textbook package have expressed concerns to the instructor about the expense incurred, probably creating a financial crisis elsewhere in their lives.

Therefore, we propose to replace the textbook used for Survey of Chemistry I with an open access textbook so that all students can get access to the text from day one of the semester. The current OpenStax textbook provides a good platform that will be enhanced in several ways. First, several solved problems and case studies with a health-related context will be added. In addition, self-assessments questions will be designed to help with the students' numerical problem-solving skills. Students will still have to complete a graded homework through a different publisher that has agreed to lower the cost down to $39.99 for two year access. This access includes both chemistry courses in the sequence, thus preparing for a possible transformation of the second course in the sequence in a future course development project.

Transformation Action Plan

The team is composed of four faculty members, who hold PhDs in chemistry, and who teach, besides upper level chemistry courses, diverse courses within the freshman chemistry curriculum, namely, Introductory Chemistry for non-science majors, Survey of Chemistry for pre-allied health majors and Principles of Chemistry for science majors. The team has a combined teaching experience of about 80 years, in addition to having created and redesigned online chemistry courses for the University System of Georgia under the umbrella of eCore. They are all subject matter experts and have experience as instructional designers. Furthermore, Drs. Gaquere-Parker, Khan and Stuart are Quality Matters certified peer reviewers, and Drs. Geisler and Gaquere-Parker respectively are the instructors of record for all sections of CHEM1151 and CHEM1152 on our campus (please note that the visiting faculty member who teaches those courses at our satellite campus (about 40 students total a year) and who could not be part of this project has agreed to use the materials created under this project).

Under the leadership of Dr. Gaquere-Parker, the instructor of record for CHEM1151, who will be involved in all activities, the team will share the responsibilities as follows:

1. Composing chemistry content to enhance the current text in Openstax (Drs. D. Stuart and F. Khan)
2. Adding examples and case studies anchored in allied health disciplines, making the course content relevant to the student population (Drs. V. Geisler and A. Gaquere-Parker)
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New chapter 10: Nuclear Chemistry

Edited from OpenStax from chapter 20: Nuclear Chemistry

Quantitative & Qualitative Measures

The implementation of appropriate assessment tools is an important step in the iterative process of course improvement and re-design to optimize overall student success and satisfaction. Quantitative (e.g. DWF rates), and semi-quantitative (e.g. Likert scale attitudinal surveys) tools are preferred, but must be carefully and thoughtfully designed and interpreted to be of maximum value. The directly accessible quantitative data would include: a) Course DFW rates, b) student scores on the final exam written by the American Chemical Society (ACS), c) course C rates, and d) the percentage of students directly continuing to Survey of Chemistry II (CHEM 1152) the following semester. Semi-quantitative data on student satisfaction will be obtained via a conventional rating instrument with a 1-5 scale, as well as section comprising “free response” to targeted questions to be given at both the start of the semester, and again at the end.

These assessments will provide us a vast quantity of useful data. Decreasing DFW rates are, in and of themselves, an important goal, but will tell us more broadly whether or not this particular intervention has been effective. The student scores on the ACS exam will provide additional quantitative data on student learning gains. The ACS exam has the added advantages of being objective, externally generated, and the same as pre-treatment courses. A large extant data set from previous semesters makes this quite amenable to statistical analyses. Knowledge of the rate of immediate progression to the next course (CHEM 1152) will demonstrate that students feel prepared and successful with their experience in CHEM 1151. The course C rates are easy to obtain, and we hypothesize that a decrease percentage of C grades will result in a concomitant increase in the percentage of B grades. This is important, as students can pass the course with a C, but may feel obligated to retake the class in order to get a B or higher so as to stay competitive for entrance into nursing school. This perception of “competitive fitness,” and preparedness will be among items assayed in the attitudinal survey given at the start and finish of the course. This tool will also be used to assay attitude and confidence towards chemistry, and the need for chemical knowledge in the health fields.

The use of student data is a key component in this project, and it is important that proper protocol be followed when dealing with sensitive information subject to FERPA. The team is familiar with the IRB process, and an IRB exemption dossier will be submitted for review if this project be funded.

Timeline

- October 2018: Contact OpenStax
- October 29, 2018: Travel to kick-off meeting
- January-May 2019: Creation of content, solved problems and selection of videos to be embedded in the course
- Fall 2019: Implementation in all sections of CHEM1151 and formative assessment
- December 2019: Final evaluation and report submission

Budget

- $800: Travel for two faculty members to kick-off meeting
- $20,000: Each of the four team members will receive $5,000 for creating the course materials

Sustainability Plan

The primary author of this proposal, Dr. Gaquere-Parker, has been the lead instructor for the course under consideration for over a decade and is slated to teach this course regularly in future as well. Therefore, she will be responsible to update the course materials as needed after the grant period has ended. In addition, it is anticipated that the following course in the sequence, CHEM1152, will also be transformed to become a low-cost open access course. As a matter of fact, the instructor of record for all sections of CHEM1152, Dr. Geisler, is a co-PI on this project. To the best of our knowledge, this would be the first example of an open access year-long chemistry sequence in the University System of Georgia.

During the past decade, members of the team have worked together on many different projects including the submission of several external grants, namely, NSF-TUES (funded), NSF-WIDER: (funded), NSF-AISL (not funded), NSF-MRI (two different projects, not funded), USG-BOR STEM Initiative (funded as two 3-year grants)). These collaborations have led to several presentations at statewide conferences and the publication of two peer-reviewed articles as a group, in addition to the publication of individual articles stemming from the collaborative projects. From this strong record of dissemination, it is anticipated that the results of this work will be presented at STEM and STEM education conferences, including the Innovations in Pedagogy conference held annually on the University of West Georgia campus in May, as well as the Annual Pedagogy Conference in Athens.

Acknowledgment

Grant Acceptance

[Acknowledged] I understand and acknowledge that acceptance of Affordable Learning Georgia grant funding constitutes a commitment to comply with the required activities listed in the RFP and that my submitted proposal will serve as the statement of work that must be completed by my project team. I further understand and acknowledge that failure to complete the deliverables in the statement of work may result in termination of the agreement and funding.

UNIVERSITY of West Georgia.

Office of Research and Sponsored Projects
Carrollton, Georgia 30118

September 6, 2018

Jeff Gallant
Program Manager, Affordable Learning Georgia
Library Services, Board of Regents of the University System of Georgia

Dear Mr. Gallant and the ALG Textbook Transformation Grant Committee:

Please accept this letter of enthusiastic support for the ALG proposal by Professor Anne Gaquere. This proposal is for the development of materials for Survey of Chemistry, (CHEM1151), the first of a sequence of courses designed for pre-nursing majors. As you know, students in majors like this one face steep textbook costs.

Professor Gaquere has the full support and endorsement of her department chair and college dean. With this level of support and with the quality of this project, we are confident that this project is worthy of funding, and we look forward to providing support for it.

Sincerely,

Denise Overfield, Ph.D.
Associate Vice President for Research and Dean of the Graduate School

Textbook Transformation Grants, Round Twelve (Fall 2018-2019)

Proposal Form and Narrative

Notes

· The proposal form and narrative .docx file is for offline drafting and review. Submitters must use the InfoReady Review online form for proposal submission.
· The only way to submit the official proposal is through the online form in Georgia Tech's InfoReady Review at: [link to application form]
· The italic text we provide is meant for clarifications and can be deleted.

Applicant, Team, and Sponsor Information

The **applicant** is the proposed Project Lead for the grant project. The **submitter** is the person submitting the application (which may be a Grants Officer or Administrator). The submitter will often be the applicant – if so, leave the submitter fields blank.

Institution(s)	University of West Georgia
Applicant Name	Anne Gaquere-Parker
Applicant Email	agaquere@westga.edu
Applicant Phone #	678-839-6026
Applicant Position/Title	Professor of Chemistry
Submitter Name	
Submitter Email	
Submitter Phone #	
Submitter Position	

Please provide the first/last names and email addresses of all team members within the proposed project. Include the applicant (Project Lead) in this list. Do not include prefixes or suffixes such as Ms., Dr., Ph.D., etc.

	Name	Email Address
Team Member 1	Gaquere-Parker, Anne	agaquere@westga.edu

Team Member 2	Khan, Farooq	fkhan@westga.edu
Team Member 3	Stuart, Douglas	dstuart@westga.edu
Team Member 4	Geisler, Victoria	vgeisler@westga.edu
Team Member 5		
Team Member 6		
Team Member 7		
Team Member 8		

If you have any more team members to add, please enter their names and email addresses in the text box below.

Please provide the sponsor's name, title, department, and institution. The sponsor is the provider of your Letter of Support.

Dr. Denise Overfield
Vice President for Sponsored Projects
University of West Georgia

Project Information and Impact Data

Title of Grant Project	Transforming Survey of Chemistry I at the University of West Georgia
Type of Grant	No-or-Low-Cost-to-Students Learning Materials
Requested Amount of Funding	$20,800
Course Names and Course Numbers	Survey Chemistry I, CHEM 1151
Final Semester of Project	Fall 2019

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Using OpenStax Textbook?	Yes

Narrative Section

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Note: Letter of Support