**Affordable Learning Georgia Textbook Transformation Grants**

**Final Report for Mini-Grants**

# General Information

Date: December 19, 2019

Grant Round: 13

Grant Number: M64

Institution Name(s): University of Georgia

Team Members:

Wenjian (Vince) Du (Wenjian.Du@uga.edu) Faculty

Sara Blankenship (Sara.Blankenship@uga.edu) Faculty

Ana West (ana.west@uga.edu)

Rupa Gokal (rugokal@uga.edu)

Joel Caughran (caughran@uga.edu)

Project Lead: Suzanne Ellenberger (Suzanne.ellenberger@uga.edu)

Course Name(s) and Course Numbers: Freshman Chemistry I (CHEM 1211)

Final Semester of Project: December 2019

***If applicable to your project:***

Average Number of Students Per Course Section: 280

Number of Course Sections Affected by Implementation of Revised Resources: approximately five to seven in the fall and spring semesters and one in the summer term.

Total Number of Students Affected by Implementation of Revised Resources: approximately 1000-1200 per spring and fall semesters and 150 in the summer term

# 1. Project Narrative

At UGA the freshman chemistry courses, CHEM 1211 and 1212, serve a large number of students, typically 1000-1200 in the fall and spring semesters and approximately 150 in the summer terms. These courses recently adopted use of the OER OpenStax “Atoms First” textbook which has involved reorganizing the content and order of presentation of the topics. An additional significant change is that key topics are introduced multiple times in early chapters on a basic level and are then covered in depth in a later chapter in either CHEM 1211 or 1212. The purpose of this is to help students see the interconnectedness of the material to both chemistry and other disciplines rather than viewing the content as individual or discrete subjects.

Part of this course redesign included the use of peer learning assistants (PLA’s) either in class, in an additional weekly one-hour study group, or an additional weekly one-hour recitation section. Early data has shown that students who utilize PLA’s in CHEM 1211 earn a greater number of A and B grades compared to CHEM 1211 students in non-PLA sections (approximately 62% versus 48%). During the CHEM1211 PLA sessions, students utilize additional resources such as worksheets and case studies. The purpose of this proposal is to develop these ancillary materials to better meet the needs of the students to assist in deeper learning and understanding of the content.

#  2. Materials Description

Peer Learning Assistants (PLA’s) were utilized in CHEM 1211, Freshman Chemistry I in the spring and fall 2018 semesters in only one section and in all sections in the Spring 2019 semester with promising initial results. During this time, worksheets and case studies were created to be used during these mandatory PLA sessions. Although the PLA project was not funded for the fall 2019 semester, the general chemistry team continued developing worksheets and other ancillary materials that were used during office hours and as study aides by the CHEM 1211 students.

Numerous recent changes have been made to the Freshman Chemistry sequence at UGA which include use of PLA’s, adoption of an OER textbook, rearranging the content and editing the textbook, using paper exams at a common time rather than computer-based exams, utilization of newly created ancillary materials to augment deeper student learning and employing weekly meetings of the general chemistry faculty to discuss progress in the classes. These changes have resulted in an increase in the student success of these classes with a notable decrease in the withdrawal rates. While the D, F and W rates are significantly lower than they have been in the past, the level of rigor has not been compromised.

**CHEM 1211 Grade Distribution by Semester**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **CHEM 1211** | **F 2016** | **Sp 2017** | **F 2017** | **Sp 2018** | **F 2018** | **Sp 2019** | **F 2019** |
| A-C | 65.5% | 66.4% | 69.7% | 71.9% | 73.8% | 83.0% | 86.7% |
| D&F | 6.5% | 11.7% | 5.3% | 8.2% | 6.2% | 4.9% | 6.4% |
| W | 27.9% | 21.9% | 24.9% | 19.9% | 19.9% | 11.9% | 6.9% |

The newly created activities are attached to the email message.

# 3. Materials Links

# 4. Future Plans

 In moving forward, the general chemistry team plans to continue creating additional case studies, worksheets and study aids to deepen the CHEM 1211 student’s understanding of general chemistry concepts. These plans also include creating targeted materials to be used by tutors in the Division of Academic Enhancement.