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Application Summary

Competition Details

Competition Title:	Textbook Transformation Grants, Round Sixteen (Spring 2020 - Spring 2021)
Category:	University System of Georgia
Award Cycle:	Round 16
Submission Deadline:	01/13/2020 at 11:59 PM

Application Information

Submitted By:	Christine Whitlock
Application ID:	3997
Application Title:	517
Date Submitted:	01/14/2020 at 8:15 AM

Personal Details

Institution Name(s):	Georgia Southern University
Applicant First Name:	Christine
Applicant Last Name:	Whitlock
Applicant Email Address:	cwhitlock@georgiasouthern.edu
Applicant Phone Number:	912-478-5682
Primary Appointment Title:	Professor
Submitter First Name:	Christine
Submitter Last Name:	Whitlock
Submitter Email Address:	cwhitlock@georgiasouthern.edu
Submitter Phone Number:	912-478-5682
Submitter Title:	Professor

Application Details

Proposal Title

517

Requested Amount of Funding

\$10,800

Priority Category (if applicable)

Final Semester:

Spring 2021

Course Title(s)

Organic Chemistry I Lab and Organic Chemistry II Lab

Course Number(s)

CHEM 3401L/CHEM 3402L

Team Member 1 Name

Christine Whitlock

Team Member 1 Email

cwhitlock@georgiasouthern.edu

Team Member 2 Name

Shainaz Landge

Team Member 2 Email

slandge@georgiasouthern.edu

Team Member 3 Name

Team Member 3 Email

Team Member 4 Name

Team Member 4 Email

Additional Team Members (Name and email address for each)

Sponsor Name

Dr. Delana A. Gajdosik-Nivens

Sponsor Title

Dean

Sponsor Department

College of Science and Mathematics

Total Number of Student Section Enrollments Affected by Project in One Academic Year

864

Average Number of Student Section Enrollments Affected per Summer Semester

96

Average Number of Student Section Enrollments Affected per Fall Semester

384

Average Number of Student Section Enrollments Affected per Spring Semester

384

Original Required Commercial Materials (title, author, price, and bookstore or retailer URL showing price)

The Organic Chem Lab Survival Manual

Zubrick = \$89.33

<https://gsustore.com/CourseMaterials?lds=2964746>

CHEM 3401L (or 3402L) Lab Manual

In-house = \$29.00

<https://gsustore.com/CourseMaterials?src=2>

Original Total Cost per Student

\$118.33

Post-Project Cost per Student

\$29.00

Post-Project Savings per Student

\$89.33

Projected Total Annual Student Savings per Academic Year

\$42,878 (Assuming the student purchased the book only in Organic Chemistry I and used it for Organic Chemistry II)

Using OpenStax Textbook?

No

Project Goals

Georgia Southern University (GSU) is the largest regional university in southeast Georgia and is serving more than 20,000 students at the Statesboro campus. The overall student body can be hugely impacted by any small positive changes. With 151 degree programs, the university serves more than 26,000 students on three campuses. Among its many accolades, GSU ranks #2 in affordable colleges in Georgia^[1] and #5 nationally for producing African-American graduates in Physical Sciences.^[2] The Department of Chemistry and Biochemistry offers American Chemical Society (ACS) certified degrees in Chemistry and Biochemistry and will soon offer an American Society for Biochemistry and Molecular Biology (ASBMB) certified degree in Biochemistry. With over 400 majors, the department regularly ranks nationally in the top 25 producers of ACS certified BS degrees in Chemistry.

The overburdening cost of textbooks affects student life in general and thus overall student success. It is often seen that students do not purchase the textbook or lab materials, because they cannot afford them and thus miss valuable learning opportunities. Without having necessary materials, the students face class unpreparedness, less engagement, and easier paths towards failures. Having a low- or no-cost option for students will ensure that each student taking these challenging courses has access to the critical learning materials. Having students free access to learning materials will lessen the strain and will definitely enhance student engagement. Lowering the cost of student expenses will not only benefit our low-income students, but also help each Chemistry, Biochemistry, and Biology major required to take these courses. Finally, the consistent study habits and growth mindset of this culture will lead to improved student learning gains.

This project proposes to utilize the available, free online open end resources (OER) material and replace the costly textbook for the laboratory portion of Organic Chemistry I and II courses. The in-house lab manual will still be required (\$29.00). Along with the lab textbook, our goal through this proposal is to provide supplementary material (in-lab technique videos, pre-lab lecture lightboard videos, and pre-lab notes) tailored to our department needs. Development of the new supplementary material will help to keep laboratory assignments aligned with student learning outcomes (SLO) and everyone involved on track. The materials will include informative technique videos, content background videos, and pertinent notes for every experiment in Organic Chemistry I and II. Students may view them online or print them before the laboratories as they will be shared through the online learning management system (LMS). All developed resources will not only be shared within the department, but also be shared on other GSU campuses as well.

Project Goals:

- 1) Adopt the no-cost OER laboratory textbook, which will dramatically lower the student expense.
- 2) Align the available online open end resources lab textbook with the course objectives.
- 3) Develop supplementary materials (in-lab technique videos, pre-lab lecture lightboard videos, and pre-lab notes) which will provide additional resources tailored to our departmental needs.
- 4) Assess the newly developed materials to measure their effectiveness in student satisfaction, faculty satisfaction, student performance, and student retention.

The primary pedagogical transformation expected with this change is the introduction of a free online laboratory textbook and newly-prepared ancillary materials. All faculty members teaching organic chemistry will have the freedom of incorporating the material as they see fit in their courses.

[1] "2018 Most Affordable Colleges in Georgia." (2018). Retrieved from <https://www.collegeaffordabilityguide.org/schools/georgia/>

[2] "Top 100 Degree Producers," (2017). Retrieved from <https://diverseeducation.com/top100/>.

Statement of Transformation

Organic Chemistry I (CHEM 3401) and Organic Chemistry II (CHEM 3402) introduce the fundamental concepts of organic chemistry: the structure and bonding of carbon-containing compounds, nomenclature of organic compounds, stereochemistry, spectroscopic techniques and organic mechanisms utilizing various functional groups. It is a two-course sequence that is required for the Chemistry, Biology, and Biochemistry majors, among others. A minimum grade of C is required in CHEM 3401 to progress to the Organic Chemistry II course and subsequent courses. The lecture and the lab sections of all chemistry courses are linked and are normally taught by the same instructor. This allows the alignment of the content and reinforced lecture content in the laboratory.

Traditionally, students are required to purchase a comprehensive textbook (\$170) combined with online homework system (\$30) for the lecture portion of the course. A previous Affordable Learning Georgia (Textbook Transformation Grants Round Fourteen – Proposal # 461) grant allowed us to transform the lecture portion of the textbook and made it available to be on our department LMS free of charge. Similarly, the lab portion (CHEM 3401L) requires students to purchase the survival lab textbook (\$89.33) along with the in-house lab manual (\$29.00).

The current lab textbook (The Organic Chem Lab Survival Manual: A Student's Guide to Techniques 10th Edition) helps the students primarily to understand all the lab techniques/methods and is aligned with the prelab questions in the lab manual. The textbook also provides the theory and the practical information (schematic diagrams and figures) needed to successfully perform the lab. The alignment of the lab manual and the prelab questions to the lab textbook must be carried out in the months of June and July for the lab manual to be sent for printing and to be implemented in the fall semester.

We propose to reduce the required cost for lab course materials from \$118.33 to \$29 per student by taking advantage of the free online lab textbook available on the OER websites. We also propose to customize the supplementary materials (detailed prelab notes, organic chemistry techniques/instrument training videos, prelab lecture light board videos) developed by the lead team members and simultaneously edited by the rest of the organic chemistry faculty members.

The prelab notes, organic chemistry techniques/instrument training videos, prelab lecture light board videos will be supplementary material formatted to help students follow along the fast-paced lab course. They will have a detailed outline of the lab textbook material used from the available OER materials in line with the lab course. These editable materials will be shared with all of the instructors who will be responsible to share or utilize according to their needs on the provided departmental LMS.

The Statesboro campus of our department includes seven organic chemistry faculty members who work together as a committee to make any decisions regarding changes or new implementation.

Student impact: With complete and free availability to the lab textbook and supplementary material, the students will take advantage of the available resources and thus be able to achieve higher student learning gains.

Department and College impact: The guarantee that all students have required materials will positively impact the learning culture of our department. The materials generated by this grant will ensure all organic chemistry faculty members make a smooth transition to online lab resources in a systematic fashion. All organic chemistry faculty members are part of the organic chemistry departmental committee in the Statesboro campus and hence will be involved and aware of each step or change of the implementation process.

University Impact: Inclusive and inexpensive access to the course materials for all of the students taking Organic Chemistry I and II is expected to increase student success, which will be clearly seen at the university level in terms of retention, progression and graduation (RPG) rates.

Transformation Action Plan

Implementation of this project will equally involve both the PIs at the Statesboro campus. The roles and efforts of the leads are mentioned below:

Project leads (Drs. Christine Whitlock and Shainaz Landge) will be responsible for identifying, aligning, preparing, adapting, and assessing the new supplementary lab materials for the Organic Chemistry I (Dr. Landge) and Organic Chemistry II (Dr. Whitlock) lab courses. They will be the lead contacts for the remaining organic chemistry faculty members, the COSM library liaison and students. They will align the lab course with open end resource materials and with the prelab used in the in-house lab manual. They will be responsible for developing new lab materials (in-lab technique videos, pre-lab lecture lightboard videos, and pre-lab notes) for the CHEM 3401L and CHEM 3402L courses and assessment instruments.

Project lead Dr. Shainaz Landge is also the laboratory coordinator for the organic chemistry division at the Statesboro campus. Hence any consistent incorporation and transformation in the organic chemistry laboratory course will help the entire department and will enhance the lab course material.

The **COSM library liaison** (Dawn Rech) will assist in training, identifying and finally distributing the newly created resource material as libguide modules on the college website.

Currently, two online Organic Chemistry lab textbooks are available at no cost as well as two additional open-end resources can help students to have a smooth lab transition and experience.

- The first Laboratory textbook has basic lab techniques used in the organic chemistry laboratory from University of Minnesota and has an open end creative commons license attached to it.

<https://open.umn.edu/opentextbooks/textbooks/369>

- The second open end resource also targets the methods used in organic chemistry lab.

http://do.chem.uni.wroc.pl/system/files/Organic%20chemistry%20-%20laboratory%20methods_201617_0.pdf

· Additional notes which can be helpful for the organic chemistry labs can be found in the following supplementary material as well coming from Drs. Laurie S. Starkey and Alexander Sandtorv,

<https://www.cpp.edu/~lsstarkey/ochemlab/>

<https://pdxscholar.library.pdx.edu/cgi/viewcontent.cgi?article=1021&context=pdxopen>

· All the above materials align with our departmental student learning outcomes.

Quantitative & Qualitative Measures

All Organic Chemistry courses taught at the Statesboro campus during the Fall 2020, Spring 2021, and Summer 2021 semesters will participate in this transformation as well as in the assessment study. After implementation of the lab course materials, the assessment study will target the students as well as the Organic Chemistry instructors. The team leaders, Dr. Christine Whitlock (Chair) and Shainaz Landge (member), are part of the departmental assessment committee as well. They will develop the assessment tools and collect the data focusing on student satisfaction, performance, course level retention, and faculty satisfaction. They also have conducted a similar assessment study for their previously funded ALG grant for the lecture portion of the course.

Student satisfaction: An available or adapted student satisfaction survey similar to our study using open end resources (Understanding Students' Satisfaction with OERs as Course Materials) will be utilized to assess student perception of the access, quality, and usefulness of the newly created required lab course materials.

The students will be asked to compare the transformation between the previously used hardbound organic chemistry lab textbook to the available online free material.

Preliminary questions which will address topic such as:

- 1) Was this a smooth and systematic transformation?
- 2) Was the study material useful in terms of adoption, utilization, access, financial needs etc.?
- 3) What additional required materials will be useful for the future incoming students?
- 4) What needs to be creatively changed in the required, generated materials?
- 5) Do students prefer the free virtual laboratory textbook and supplementary materials over a purchased hard copy?

Faculty satisfaction: The level of overall faculty satisfaction will be measured with a survey similar or adapted to one developed at the University of Wyoming and University of Mississippi. All faculty members teaching Organic Chemistry will be questioned about student-, instructor-, and institution-related factors. Questions will be adapted to compare the consistency and implementation of the newly-added material with the previous course material.

Student performance: The overall student performance will be measured periodically throughout the semester. Organic Chemistry I and II (CHEM 3401L and 3402L) lab grades will be compared to the previous year's grades. The DFW percentage rates and withdrawals will be also be compared with previous semesters to check the effectiveness of the change on student performance.

Course-level retention: After implementation and assessment of the materials in Fall 2020, necessary changes will be made and adapted in spring 2021. Spring semester will also be used to measure the students' long-term retention both in the courses and in their majors.

Proper attention will be given to the above generated qualitative and quantitative assessment tools to check their reliability, incorporation during the semester, and alignment to the material.

Institutional Review Board (IRB) approval will be sought in the summer of 2020 before implementing the materials in the lab course and gathering the data from the student. The students will be asked to sign the consent form before collecting any data.

Timeline

April 2020

- Free, online materials available on the OER websites such as OpenStax, Merlot, virtual laboratory technique textbooks will be reviewed.

May 2020

- Course objectives, learning outcomes, and existing lab assignments will be reviewed for CHEM 3401L and CHEM 3402L.
- Findings will be shared with all the organic chemistry faculty members.

June 2020

- The developed lab textbook materials will be aligned with prelab questions in the lab manual.
- All lab assignments will be updated for both courses by the project leads.
- Supplementary materials (in-lab technique videos, pre-lab lightboard videos, pre-lab notes) will be generated by the project leads.

July 2020

- Edited lab manual with the updated prelabs will be sent for printing for the upcoming AY 2020-2021.
- All newly developed lab course materials will be made available to faculty members through the Folio online learning platform (LMS) and/or electronic files.

Fall 2020

- New materials will be implemented in all lab sections (CHEM 3401L and 3402L; 8 sections) and evaluated. They will be simultaneously reviewed, edited, and incorporated.

December 2020

- Feedback for online laboratory textbook from the students and faculty will be collected and discussed with the organic chemistry faculty members.

Spring/Summer 2021

- All newly-edited materials will be implemented and further assessed.
- The final report will be prepared and shared with the Textbook Transformation Grants committee.

Spring/Fall 2021

- Results will be collected and disseminated in USG and STEM Learning and Teaching conferences and/or a regional Chemistry conference plus peer-reviewed publications. The supplementary material will be linked as modules on the college LMS website.

Budget

Dr. Christine Whitlock, \$5000

Dr. Whitlock will spend time during the summer to coordinate team members, develop new materials (in-lab technique videos, pre-lab lecture lightboard videos, and pre-lab notes), align lab assignments for CHEM 3402L, create assessment tools, and disseminate new materials to colleagues.

Dr. Shainaz Landge, \$5000

Dr. Landge will spend time during the summer to develop new materials (in-lab technique videos, pre-lab lecture lightboard videos, and pre-lab notes), align lab assignments for CHEM 3401L, create assessment tools, and disseminate new materials to colleagues.

Travel, \$800

Funds will be used for travel to attend a USG or STEM or Scholarship of Teaching and Learning conference.

Sustainability Plan

All Organic Chemistry courses at the Statesboro campus use the same textbook (now online on our LMS), online homework system, lab text book, and lab manual. The selection of all these materials is determined by the committee which consists of all faculty members who teach Organic Chemistry. Thus, maintaining the continuity and/or updating of the course material is ensured throughout the Organic Chemistry sequence for years to come. The project leaders will guarantee that the lab material is up-to-date to current standards and applicable in future semesters. The PIs will also be responsible for uploading the new materials on the Common LMS college website hence providing sustainable solutions. Our previous award has made the lecture material free of charge to students. This grant award will be a step forward in bringing the lab materials to the students at minimal price. After successful implementation of this project, the data collected will be disseminated at various local, regional and national conferences focused on teaching and learning (USG, STEM, SoTL), and chemical education (American Chemical Society) conferences. The PIs also plan to disseminate the results in the peer-reviewed journals such as Journal of Chemical Education or International Journal of Scholarship of Teaching and Learning (IJSoTL).

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.



December 18, 2019

Affordable Learning Georgia
Textbook Transformation Grant Review Committee

Dear Review Committee,

I am pleased to provide my highest support for Affordable Learning Georgia Textbook Transformation grant proposal submitted by Drs. Christine Whitlock and Shainaz Landge of the Department of Chemistry and Biochemistry at Georgia Southern. Their proposal, for open-source, faculty-editable laboratory manuals, will reduce the cost of the organic chemistry laboratory sequence (CHEM 3401L/3402L) for 768 students by approximately \$90 per student. The organic chemistry sequence is used by chemistry, biochemistry, biology, pre-medical and pre-pharmacy students as well as some students in other majors across the university. The materials will be in compliance with all American Chemical Society and Department of Chemistry and Biochemistry learning outcomes for organic chemistry.

The grant requests funding to support the creation of the laboratory manual and ancillary materials, to be completed in the summer of 2020. Once created the materials will be easy to revise and maintain so that they will be a sustainable resource for several academic cycles. The department and the project directors are experienced with ALG grants—material development, online textbook implementation challenges and the assessment of student learning with online resources-- via previous funding provided to general chemistry faculty at the Armstrong campus and both Dr. Whitlock and Landge at the Statesboro campus. Thus, I have confidence that the team has both the experience and the commitment to projects such as this and they will deliver on their stated goals.

The College of Science and Mathematics recognizes the importance of engaging our students in the STEM disciplines and assuring that STEM success is attainable for a diverse student body. Our office will provide additional support as needed for this important work. I am pleased to wholeheartedly support this project.

Thank you for your consideration,

A handwritten signature in black ink, appearing to read "Delana A. Gajdosik-Nivens".

Delana A. Gajdosik-Nivens
Dean
College of Science and Mathematics

COLLEGE OF SCIENCE AND MATHEMATICS
Statesboro Campus: ENGINEERING BUILDING SUITE 2141 • P.O. BOX 8044 • STATESBORO, GA 30460 • 912-478-5111
Armstrong and Liberty Campus: SCIENCE CENTER SUITE 1505 • 11935 ABERCORN STREET • SAVANNAH, GA 31419 • 912-344-3330
cosm@georgiasouthern.edu



Textbook Transformation Grants, Round Sixteen (Spring 2020 – Spring 2021)

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. The link to the online application is on the [Round 16 RFP Page](#).
- The italic text provided below 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)	Georgia Southern University
Applicant Name	Christine Whitlock
Applicant Email	cwhitlock@georgiasouthern.edu
Applicant Phone #	912-478-5682
Applicant Position/Title	Professor of Chemistry & Biochemistry
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	Christine Whitlock	cwhitlock@georgiasouthern.edu
Team Member 2	Shainaz Landge	slandge@georgiasouthern.edu

Team Member 3		
Team Member 4		
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.

NA

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

<p>Dr. Delana A. Gajdosik-Nivens Dean, College of Science and Mathematics Professor of Chemistry & Biochemistry Georgia Southern University</p>

Project Information and Impact Data

Priority Category / Categories	Low - Cost and Sustainable Solution for the Organic Chemistry Laboratory
Requested Amount of Funding	\$10,800
Course Names and Course Numbers	Organic Chemistry I (CHEM 3401L)-Lab Organic Chemistry II (CHEM 3402L)-Lab
Final Semester of Project	Spring 2021
Total Number of Student	CHEM 3401L = 432

Section Enrollments Affected by Project in One Academic Year	CHEM 3402L = 336
Average Number of Student Section Enrollments Affected per Summer Semester	96 students (CHEM 3401L and CHEM 3402L sections)
Average Number of Student Section Enrollments Affected per Fall Semester	384 students
Average Number of Student Section Enrollments Affected per Spring Semester	384 students
Original Required Commercial Materials	<p>The Organic Chem Lab Survival Manual</p> <p>Zubrick = \$89.33</p> <p>https://gsustore.com/CourseMaterials?Ids=2964746</p> <p>CHEM 3401L (or 3402L) Lab Manual</p> <p>In-house = \$29.00</p> <p>https://gsustore.com/CourseMaterials?src=2</p>
Average Price of Original Required Materials Per Student Section Enrollment	\$118.33
Average Post-Project Cost Per Student Section Enrollment	\$29.00
Average Post-Project Savings Per Student Section Enrollment	\$89.33
Projected Total Annual Student Savings Per Academic Year	\$42,878 (Assuming the student purchased the book only in Organic Chemistry I and used it for Organic Chemistry II)

Using OpenStax Textbook?	<p><i>No. Open End resources link are shown below:</i></p> <p>1) https://open.umn.edu/opentextbooks/textbooks/369</p> <p>2) http://do.chem.uni.wroc.pl/system/files/Organic%20chemistry%20-%20laboratory%20methods_201617_0.pdf</p> <p>3) https://www.cpp.edu/~lsstarkey/ochemlab/</p> <p>4) https://pdxscholar.library.pdx.edu/cgi/viewcontent.cgi?article=1021&context=pdxopen</p>
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Narrative Section

1. Project Goals

Georgia Southern University (GSU) is the largest regional university in southeast Georgia and is serving more than 20,000 students at the Statesboro campus. The overall student body can be hugely impacted by any small positive changes. With 141 degree programs, the university serves more than 26,000 students on three campuses. Among its many accolades, GSU ranks #2 in affordable colleges in Georgia¹ and #5 nationally for producing African-American graduates in Physical Sciences.² The Department of Chemistry and Biochemistry offers American Chemical Society (ACS) certified degrees in Chemistry and Biochemistry and will soon offer an American Society for Biochemistry and Molecular Biology (ASBMB) certified degree in Biochemistry. With over 400 majors, the department regularly ranks nationally in the top 25 producers of ACS certified BS degrees in Chemistry.

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2. Statement of Transformation

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- **Project lead Dr. Shainaz Landge** is also the laboratory coordinator for the organic chemistry division at the Statesboro campus. Hence any consistent incorporation and transformation in the organic chemistry laboratory course will help the entire department and will enhance the lab course material.
- The **COSM library liaison** (Dawn Rech) will assist in training, identifying and finally distributing the newly created resource material as libguide modules on the college website.
- Currently, two online Organic Chemistry lab textbooks are available at no cost as well as two additional open-end resources can help students to have a smooth lab transition and experience.
 - The [first Laboratory textbook](#) has basic lab techniques used in the organic chemistry laboratory from University of Minnesota and has an open end creative commons license attached to it.
<https://open.umn.edu/opentextbooks/textbooks/369>
 - The second open end resource also targets the methods used in organic chemistry lab.
http://do.chem.uni.wroc.pl/system/files/Organic%20chemistry%20-%20laboratory%20methods_201617_0.pdf
- Additional notes which can be helpful for the organic chemistry labs can be found in the following supplementary material as well coming from Drs. Laurie S. Starkey and Alexander Sandtorv,
<https://www.cpp.edu/~lsstarkey/ochemlab/>
<https://pdxscholar.library.pdx.edu/cgi/viewcontent.cgi?article=1021&context=pdxopen>
- All the above materials align with our departmental student learning outcomes.

4. Quantitative and Qualitative Measures

All Organic Chemistry courses taught at the Statesboro campus during the Fall 2020, Spring 2021, and Summer 2021 semesters will participate in this transformation as well as in the assessment study. After implementation of the lab course materials, the assessment study will target the students as well as the Organic Chemistry instructors. The team leaders, **Dr. Christine**

Whitlock (Chair) and Shainaz Landge (**member**), are part of the departmental assessment committee as well. They will develop the assessment tools and collect the data focusing on student satisfaction, performance, course level retention, and faculty satisfaction. They also have conducted the similar assessment study for their previously funded ALG grant for the lecture portion of the course.

Student satisfaction: An available or adapted student satisfaction survey similar to our study using open end resources (Understanding Students' Satisfaction with OERs as Course Materials) will be utilized to assess student perception of the access, quality, and usefulness of the newly created required lab course materials.

The students will be asked to compare the transformation between the previously used hardbound organic chemistry lab textbook to the available online free material.

Preliminary questions which will address topic such as:

- 1) Was this a smooth and systematic transformation?
- 2) Was the study material useful in terms of adoption, utilization, access, financial needs etc.?
- 3) What additional required materials will be useful for the future incoming students?
- 4) What needs to be creatively changed in the required, generated materials?
- 5) Do students prefer the free virtual laboratory textbook and supplementary materials over a purchased hard copy?

Faculty satisfaction: The level of overall faculty satisfaction will be measured with a survey similar or adapted to one developed at the University of Wyoming and University of Mississippi. All faculty members teaching Organic Chemistry will be questioned about student-, instructor-, and institution-related factors. Questions will be adapted to compare the consistency and implementation of the newly-added material with the previous course material.

Student performance: The overall student performance will be measured periodically throughout the semester. Organic Chemistry I and II (CHEM 3401L and 3402L) lab grades will be compared to the previous year's grades. The DFW percentage rates and withdrawals will be also be compared with previous semesters to check the effectiveness of the change on student performance.

Course-level retention: After implementation and assessment of the materials in Fall 2020, necessary changes will be made and adapted in spring 2021. Spring semester will also be used to measure the students' long-term retention both in the courses and in their majors.

Proper attention will be given to the above generated qualitative and quantitative assessment tools to check their reliability, incorporation during the semester, and alignment to the material.

Institutional Review Board (IRB) approval will be sought in the summer of 2020 before implementing the materials in the lab course and gathering the data from the student. The students will be asked to sign the consent form before collecting any data.

5. Timeline

April 2020

- Free, online materials available on the OER websites such as OpenStax, Merlot, virtual laboratory technique textbooks will be reviewed.

May 2020

- Course objectives, learning outcomes, and existing lab assignments will be reviewed for CHEM 3401L and CHEM 3402L.
- Findings will be shared with all the organic chemistry faculty members.

June 2020

- The developed lab textbook materials will be aligned with prelab questions in the lab manual.
- All lab assignments will be updated for both courses by the project leads.
- Supplementary materials (in-lab technique videos, pre-lab lightboard videos, pre-lab notes) will be generated by the project leads.

July 2020

- Edited lab manual with the updated prelabs will be sent for printing for the upcoming AY 2020-2021.
- All newly developed lab course materials will be made available to faculty members through the Folio online learning platform (LMS) and/or electronic files.

Fall 2020

- New materials will be implemented in all lab sections (CHEM 3401L and 3402L; 8 sections) and evaluated. They will be simultaneously reviewed, edited, and incorporated.

December 2020

- Feedback for online laboratory textbook from the students and faculty will be collected and discussed with the organic chemistry faculty members.

Spring/Summer 2021

- All newly-edited materials will be implemented and further assessed.
- The final report will be prepared and shared with the Textbook Transformation Grants committee.

Spring/Fall 2021

- Results will be collected and disseminated in USG/STEM Learning and Teaching conferences, and/or at a regional Chemistry conference and peer-reviewed publications. The supplementary material will be linked as modules on the college LMS website.

6. Budget

Dr. Christine Whitlock, \$5000

Dr. Whitlock will spend time during the summer to coordinate team members, develop new materials (in-lab technique videos, pre-lab lecture lightboard videos, and pre-lab notes), align lab assignments for CHEM 3402L, create assessment tools, and disseminate new materials to colleagues.

Dr. Shainaz Landge, \$5000

Dr. Landge will spend time during the summer to coordinate team members, develop new materials (in-lab technique videos, pre-lab lecture lightboard videos, and pre-lab notes), align lab assignments for CHEM 3401L, create assessment tools, and disseminate new materials to colleagues.

Travel, \$800

Funds will be used for travel to attend a USG or STEM or Scholarship of Teaching and Learning conference.

7. Sustainability Plan

All Organic Chemistry courses at the Statesboro campus use the same textbook (now online on our LMS), online homework system, lab text book and lab manual. The selection of all these materials is determined by the committee which consists of the faculty members who teach organic chemistry. Thus, maintaining the continuity and/or updating of the course material is ensured throughout the Organic Chemistry sequence for years to come. The project leaders will guarantee that the lab material is up-to-date to current standards and applicable in future semesters. The PIs will also be responsible for uploading the new materials on the common LMS college website hence providing sustainable solutions. Our previous award (proposal # 461) has brought the lecture material free of charge to students. This grant award will be a step forward in bringing the lab materials to the students at minimal price. After successful implementation of this project, the data collected will be disseminated at various local, regional and national conferences focused on teaching and learning (USG, STEM, SoTL), and chemical education (American Chemical Society) conferences. The PIs also plan to disseminate the results in the peer-reviewed journals such as Journal of Chemical Education or International Journal of Scholarship of Teaching and Learning (IJSOTL).

Note: Letter of Support



Affordable Learning Georgia
Textbook Transformation Grant Review Committee

Dear Review Committee,

I am pleased to provide my highest support for

Thank you for your consideration,

A handwritten signature in black ink, appearing to read "Delana Arri", written over a white rectangular background.

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