

Application Details

Manage Application: Textbook Transformation Grants Round Seven

Award Cycle: Round 7

Internal Submission Deadline: Sunday, September 4, 2016

Application Title: 261

Application ID: #001159

Submitter First Name: Lea

Submitter Last Name: Padgett

Submitter Title: Senior Lecturer

Submitter Email Address: lea.padgett@armstrong.edu

Submitter Phone Number: 912.344.2946

Submitter Campus Role: Proposal Investigator (Primary or additional)

Applicant First Name: Lea

Applicant Last Name: Padgett

Applicant Email Address: lea.padgett@armstrong.edu

Applicant Phone Number: 912.344.2946

Primary Appointment Title: Senior Lecturer, Department of Chemistry and Physics

Institution Name(s): Armstrong State University

Proposal Category: OpenStax Textbooks

Submission Date: Tuesday, September 6, 2016

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

Dr. Catherine MacGowan, Assistant Professor, Department of Chemistry and Physics, Armstrong State University

Catherine.macgowan@armstrong.edu

Dr. Gary Guillet, Assistant Professor, Department of Chemistry and Physics, Armstrong State University

Gary.guillet@armstrong.edu

Dr. Todd Hizer, Assistant Professor, Department of Chemistry and Physics, Armstrong

State University

Todd.hizer@armstrong.edu

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

Dr. Robert T. Smith

Provost and Vice President for Academic Affairs

Professor of Mathematics

Armstrong State University

Final Semester of Instruction: Fall 2017

Proposal Title: 261

Course Names, Course Numbers and Semesters Offered:

CHEM 1211 Principles of Chemistry I

CHEM 1212 Principles of Chemistry II

Each course is offered every Fall, Spring, and Summer semester; Changes from this proposal will go into effect Fall 2017 and continue into Spring 2018

Average Number of Students per Course Section: 30

Number of Course Sections Affected by Implementation in Academic Year: 32

Total Number of Students Affected by Implementation in Academic Year: 960

List the original course materials for students (including title, whether optional or required, & cost for each item): Principles of Chemistry: A Molecular Approach, 3rd Edition by Nivaldo J. Tro (Required)\$244.93 at campus bookstore Mastering Chemistry online access (Required)\$65.95 directly from publisher website

Requested Amount of Funding: \$21,400

Original per Student Cost: \$310.88 if purchased separately; \$280.69 when bundled new from bookstore

Post-Proposal Projected Student Cost: \$65 for two semesters; \$32.50 when prorated by course

Projected Per Student Savings: \$215.69 from new bundled price

Projected Total Annual Student Savings: \$110,000

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

D2L will be used to share materials within the department and with students.

Materials will be made available to others using the Community Resources partnership OpenStax has with OER Commons

Project Goals:

There is wide-reaching debate over the costs of college attendance and the long-term ramifications on each student. One way students reduce their total outlay is by not buying textbooks suggested or required for the course. This fact is especially true for Armstrong State students as many are first generation college students from lower income areas in southeast Georgia. Textbook costs have risen dramatically over the last 30 years, outpacing inflation, home prices, and healthcare cost.¹ Choosing to avoid the cost of books, however, is not a success strategy for most students. Studies have shown a correlation between not purchasing textbooks and increased likelihood of failure or withdrawal from courses.²

Textbooks are marketed not to students, but to faculty, for whom cost is not as determining a factor. There is an increasing availability of low-cost or free materials available to students and faculty, but the adoption of a new textbook carries a large, possibly prohibitive, time commitment from the faculty teaching those courses.^{3,4} Integration of electronic materials into the university's learning management system or an online homework platform is particularly time-consuming. We seek funding to compensate faculty for the time and effort that a switch to free, openly-available course textbook published by Openstax would entail. This includes creating course materials (lecture slides, online homework templates, and clicker questions) of comparable quality to those provided by publishers with the adoption of mainstream, high-cost textbooks. Specific goals to this project are:

Reduce costs to students by adopting a no-cost textbook.

Review course content for currency, relevance, and programmatic needs.

Develop ancillary materials similar to those provided by publishers to support use of the OpenStax textbook by all faculty in the department.

Assess student and faculty satisfaction with the no- or low-cost textbook option and resources produced.

References

- Weissmann, J. Why are college textbooks so absurdly expensive? *The Atlantic*. **2013**. Available at: <http://www.theatlantic.com/business/archive/2013/01/why-are-college-textbooks-so-absurdly-expensive/266801>
- Florida Distance Learning Consortium. (2011, September). Florida Student Textbook Survey. Tallahassee, FL. <http://www.openaccesstextbooks.org/projectInfo.html>
- Hilton III, J., Wiley, D. A., and Lutz, N. Examining the Reuse of Open Textbooks. *The International Review of Research in Open and Distance Learning*. **2012**, 13(2), 45-58.
- Everard, A. and St. Pierre, K. A Case for Student Adoption of Open Textbooks. *Journal of the Academy of Business Education*. **2014**, 66-76.

Statement of Transformation:

The Principles of Chemistry I (CHEM 1211) and II (CHEM 1212) sequence is required by a range of disciplines in the Colleges of Science and Technology and Health Professions at Armstrong State University. Approximately 500 new students begin this sequence each year, thus defining the primary stakeholders at Armstrong State. These classes are listed in the Top 100 undergraduate courses as impacting large numbers of students. The students are currently required to purchase a physical textbook as well as an access code to an online homework system from the same publisher, costing \$280.69 when purchased as a bundle. There is a reduced cost for the publisher's online textbook, which can be purchased as an eText with the online homework access code for \$136.30, but with this option the students lose access to the book when their subscriptions expire. For many of these students, the book is a helpful resource they need to retain for future classes or to review for licensing exams, so selling the book back or losing access to it are not favorable options. Many students also delay purchasing the book or the homework access because they do not have the funds available to get all the course materials at the beginning of the semester, resulting in their falling behind and increasing their chances of not successfully completing the course.

Assuming every student purchased a new physical textbook, the cost savings for switching to the free, online OpenStax textbook may reach over \$110,000 each year. For those students that wish to have a hard copy of the textbook,⁵ OpenStax offers a bound version that costs one-fourth the cost of the currently used textbook. We feel that this is a significant advantage of the OpenStax book over other open resources, as there are studies that show not all students can use the electronic textbooks as efficiently as hard copies.⁶ The live web version and the downloadable pdf version of the OpenStax book are free. We still plan to use an online homework system, but would switch to Sapling Learning, which can be used with any book and is often marketed for use with the OpenStax books. The cost for Sapling (\$65) is approximately the same as the current online homework system for the student. The

instructions for this proposal indicate an expectation of \$35 cost of materials to the student; we feel that this online homework fits the spirit of that cost limitation since it will be used for two semesters of coursework, and is thus less than \$35 per class.

In our department, decisions regarding book selection and homework systems are made by the General Chemistry Committee, from which the project applicants are derived. As members of the General Chemistry Committee, the applicants have experience with providing curriculum materials via electronic media, as we have previously moved the CHEM 1211 and CHEM 1212 laboratory materials to an on-line platform (Desire2Learn). Reduction of cost to the students was one significant factor in making this change. The work performed by the applicants will be distributed for use throughout the entire department, so the primary task within this proposal is the preparation of materials for use by all instructors, including temporary faculty. If funded, the project team will review all of the content areas currently taught for currency and relevance to the discipline and the degree programs we serve. The material in the new textbook will be carefully reviewed and an online homework template made available to all instructors. Lecture materials, clicker-type questions, and worked examples will also have to be produced for the chapters, as there are limited materials of these types currently available from OpenStax. We anticipate preparing the first-run of these materials and the course integration with our learning management software during the summer 2017 semester, with revisions occurring over the following two semesters.

Baek, E-O. and Monaghan, J. Journey to Textbook Affordability: An Investigation of Students' Use of eTextbooks at Multiple Campuses. *The International Review of Research in Open and Distance Learning*. **2013**, 14(3), 1-26.

Daniel, D. B. and Woody, W. D. E-textbooks: At what cost? Performance and use of electronic v. print texts. *Computers and Education*. **2013**, 62, 18-23.

Transformation Action Plan:

Alignment of the course objectives and redesign of both course syllabi will be accomplished during spring 2017. Assessment materials will be assembled and/or developed during the spring semester 2017 and submitted for IRB approval.

Drs. Guillet, Hizer, MacGowan and Padgett (lead instructors) will be trained from the OpenStax publisher and Sapling Learning on best practices with their course materials.

The course content and supplemental curriculum materials for CHEM 1211 and CHEM 1212 will be identified and/or developed (e.g. online homework, lecture materials), during the spring and summer semesters of 2017.

Course materials will be uploaded and incorporated into the University's *Desire-to-Learn (D2L)* website during summer 2017. All course content and supplemental curriculum materials (e.g. clicker questions, power points slides, answer keys and assessment tools) will

be freely accessible for all CHEM 1211 and CHEM 1212 instructors at Armstrong State starting in the fall semester 2017. These materials will also be made freely available to the public in the Community Resources partnership OpenStax has with OER Commons.

Drs. Guillet, Hizer, MacGowan and Padgett will provide training on course content material and the organizational structure to all department faculty assigned to teach CHEM 1211 and CHEM 1212 during fall 2017 and/or spring 2018 in a workshop format in August, prior to the semester start.

Feedback and assessment data on whether or not the grant's objectives were met will be collected throughout the 2017-2018 academic year. Retooling, as necessary, of the organization of the course and/or curriculum materials will take place in spring 2018. Updates will be made available as they are created for use in subsequent semesters.

Quantitative & Qualitative Measures: Assessment of the project will focus around four questions: Do students perform similarly to previous semesters in which materials from mainstream publishers were employed? What are student perceptions of eTexts and open educational resources (OER), and do these perceptions change after use of the OpenStax textbook? Are students satisfied with the quality of the materials available for this class? Are faculty satisfied with the quality and scope of the materials produced from the work done under this proposal? Student performance will be evaluated through mostly quantitative measures. We want to ensure that the textbook and materials produced can be used to effect the same or better learning gains in the students. The chemistry faculty at Armstrong have data on the percentage of students earning D or F grades or withdrawing (W) from CHEM 1211 and CHEM 1212. These historic percentages for courses using a traditional textbook will be compared to classes that use the Openstax textbook. Both courses in the general chemistry curriculum use a standardized final exam written by the American Chemical Society. The average scores on this exam for courses that use the Openstax textbook will be compared to historic data from courses that used a traditional textbook. Similar percentages for DFW percentage and standardized exam scores would indicate that the Openstax textbook is sufficient to meet the needs of our curriculum. Faculty will also be asked for their perceptions of student performance, including engagement during class. Student perceptions of OER materials and eTexts will be evaluated qualitatively through surveys. A short survey will be given at the beginning of the semester, containing questions such as: What advantages do you feel open-source textbooks have compared to traditional textbooks? What concerns do you have about using an open-source textbook? Would you primarily identify yourself as a “highlighter” or a “note-taker” when describing how you use textbooks? For a chemistry course, if offered the choice, would you choose an eText or a hard-copy

textbook and why? The questions will also be presented on an end-of-semester survey along with additional questions investigating student satisfaction with the book and the materials produced by the grant authors. Examples of these additional questions are: How easy was it to find and use topics in the book? How comfortable were you reading the electronic version of the text compared to a hard-copy text? Did you meet the instructor's expectations for reading material in the textbook? If you chose to buy a hard-copy of the OpenStax book or print large amounts of text, why did you make that choice? If your instructor used lecture slides, did you find them to complement the material in the textbook? Were there enough problems for you to practice difficult concepts? Does the accessible-anywhere nature of the book make you more likely to consult it to answer questions? The student survey questions will be developed spring 2017 and submitted for IRB approval prior to use in Fall 2017 and subsequent semesters. As all instructors that teach general chemistry will be impacted by the textbook and online homework system change, we will also assess faculty satisfaction with the OpenStax textbook and the ancillary materials produced by the grant authors. Faculty will be surveyed regarding the consistency, completeness, and ease of further customization of the new ancillary materials. Suggestions for additions and improvements will also be solicited. A survey form will be generated that faculty can use to submit their responses at the end of each chapter. A meeting will be held every month between the grant authors and any interested faculty to review the survey responses and plan on-going improvements for the subsequent semester.

Timeline:

Spring 2017

Kick-off meeting

Investigators will:

Become familiar with the materials available through OpenStax and the associated on-line homework system available through Sapling Learning.

Receive thorough training in utilizing the OpenStax online textbook and Sapling Learning online homework system.

Course objectives will be realigned, and the course syllabi for CHEM 1211 and CHEM 1212 will undergo some revision.

May - August 2017

The OpenStax material will be aligned with our objectives and our paradigm.

Ancillary materials to supplement those available through OpenStax will be developed. An on-line homework regimen, based on the Sapling system, will be developed.

These materials will be made available to students through Desire to Learn, to which all Armstrong students have free access.

August 2017

Investigators will provide training on accessing and using the new materials at a workshop held prior to the beginning of fall classes.

January 2018

Feedback from students and faculty will be collected both terms. Effectiveness of the course transformation will be assessed as described in section 1.4. Identified weaknesses will be addressed and improvements/adjustments made beginning in the spring semester.

January – May 2018

Course will be executed again with modifications.

May 2018

Meet and assess two semesters of data from qualitative and quantitative assessments.
Prepare final report.

Budget:

Item	Justification	Amount (\$)
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Release time for Dr.Gary Guillet	Dr. Guillet will need time to develop web content and assessment tools; coordinate lecture and laboratory content with team members; to disseminate and train department faculty members on new course curriculum materials and attend meetings.	5000
Release time for Dr.Todd Hizer	Dr. Hizer will need time to develop web content and assessment tools; coordinate lecture and laboratory content with team members; to disseminate and train department faculty members on new course curriculum materials and attend meetings.	5000
Release time for Dr. Catherine MacGowan	Dr. MacGowan will need time to develop web content and assessment tools; coordinate lecture and laboratory content with team members; to disseminate and train department faculty members on new course curriculum materials and attend meetings.	5000
Release time for Dr. Lea Padgett	Dr. Padgett will need time to develop web content and assessment tools; coordinate lecture and laboratory content with team members; to disseminate and train department faculty members on new course curriculum materials and attend meetings.	5000
Travel for Drs. MacGowan and Padgett	Travel funds for USG grant kick-off training/implementation meeting	800

Materials	American Chemical Society standardized testing materials for comparisons to national/state averages	600
	Grand Total	21,400

Sustainability Plan:

The Department of Chemistry and Physics at Armstrong State University has an established General Chemistry Committee that oversees this sequence. Numerous sections of each course are offered every semester. All course instructors use the same textbook and will have access to all ancillary materials produced, with the ability to further adapt them at any time. The committee will ensure continuity and consistency in the materials available to our department. The produced materials will be uploaded to the Community Resources partnership with OER Commons; significant revisions or continued educational products will be uploaded to this community forum as they are produced. The committee will also continue monitoring and evaluating student-focused outcomes. Revisions will be made as needed to provide a positive learning experience for the students.

August 26, 2016

To Whom It May Concern,

On behalf of Armstrong State University, I am very pleased to be writing this letter of support for the Affordable Learning Georgia Textbook Transformation grant proposal authored by Drs. Leah Padgett, Catherine MacGowan, Gary Guillet and Todd Hizer of Armstrong's Department of Chemistry and Physics. Their proposal, entitled, "Making Chemistry Affordable" intends to develop a no-cost textbook and ancillaries to support students in two courses: CHEM 1211 (Principles of Chemistry I) and CHEM 1212 (Principles of Chemistry II). This project will have a broad impact on our campus and beyond, as Armstrong has a very strong program in Chemistry and since many additional students take these courses in support of other majors, with approximately 500 students taking this course sequence each year. Moreover, this team of faculty is very well positioned to implement the project that they have proposed.

It is important to recognize that commercially published General Chemistry textbooks are generally quite expensive. Further, due to the very high cost, many students feel that they cannot afford to purchase the text and hence, do not do so. Thus, developing such a no-cost alternative to a traditional textbook will have a significant impact on both students' cost for taking CHEM 1211 and 1212, as well as their performance, by making high-quality free materials available to all students.

Armstrong recognizes the importance of engaging our students in the STEM disciplines and the proposed project will further this objective, by utilizing modern technology and multimedia presentations to assist student learning in this challenging area. Further, the Provost's office will support this campus team, working with the Department of Chemistry and Physics, as well as the rest of the campus, to broaden the university's adoption of open source materials wherever appropriate. It is hoped that this team will develop a campus model that will assist other faculty and departments in their efforts to investigate and adapt open source material, leading to broader implementation of the open textbook concept at Armstrong. I am very pleased to recommend this project wholeheartedly.

Sincerely,



Robert T. Smith, Ph.D.
Provost and Vice President for Academic Affairs
Professor of Mathematics

Affordable Learning Georgia Textbook Transformation Grants

Rounds Six, Seven, and Eight

For Implementations beginning Fall Semester 2016

Running Through Fall Semester 2017

Proposal Form and Narrative

Submitter Name	Lea W. Padgett
Submitter Title	Senior Lecturer
Submitter Email	Lea.padgett@armstrong.edu
Submitter Phone Number	912.344.2946
Submitter Campus Role	Proposal Investigator
Applicant Name	Lea Padgett
Applicant Email	Lea.padgett@armstrong.edu
Applicant Phone Number	912.344.2946
Primary Appointment Title	Senior Lecturer, Department of Chemistry and Physics
Institution Name(s)	Armstrong State University

Team Members	<p>Dr. Catherine MacGowan, Assistant Professor, Department of Chemistry and Physics, Armstrong State University Catherine.macgowan@armstrong.edu</p> <p>Dr. Gary Guillet, Assistant Professor, Department of Chemistry and Physics, Armstrong State University Gary.guillet@armstrong.edu</p> <p>Dr. Todd Hizer, Assistant Professor, Department of Chemistry and Physics, Armstrong State University Todd.hizer@armstrong.edu</p>				
Sponsor, Title, Department, Institution	<p>Dr. Robert T. Smith Provost and Vice President for Academic Affairs Professor of Mathematics Armstrong State University</p>				
Proposal Title	<p>Making Chemistry Affordable</p>				
Course Names, Course Numbers and Semesters Offered	<p>CHEM 1211 Principles of Chemistry I CHEM 1212 Principles of Chemistry II Each course is offered every Fall, Spring, and Summer semester; Changes from this proposal will go into effect Fall 2017 and continue into Spring 2018</p>				
Final Semester of Instruction	<p>Fall 2017</p>				
Average Number of Students Per Course Section	<p>30</p>	Number of Course Sections Affected by Implementation in Academic Year	<p>32</p>	Total Number of Students Affected by Implementation in Academic Year	<p>960</p>
Award Category	<p><input type="checkbox"/> No-or-Low-Cost-to-Students Learning Materials <input checked="" type="checkbox"/> OpenStax Textbooks</p>				

(pick one)	<input type="checkbox"/> Interactive Course-Authoring Tools and Software <input type="checkbox"/> Specific Top 100 Undergraduate Courses
List the original course materials for students (including title, whether optional or required, & cost for each item)	Principles of Chemistry: A Molecular Approach, 3rd Edition by Nivaldo J. Tro (Required) \$244.93 at campus bookstore Mastering Chemistry online access (Required) \$65.95 directly from publisher website
Requested Amount of Funding	\$21,400
Original Per Student Cost	\$310.88 if purchased separately; \$280.69 when bundled new from bookstore
Post-Proposal Projected Per Student Cost	\$65 for two semesters; \$32.50 when prorated by course
Projected Per Student Savings	\$215.69 from new bundled price
Projected Total Annual Student Savings	\$110,000
Creation and Hosting Platforms Used	D2L will be used to share materials within the department and with students. Materials will be made available to others using the Community Resources partnership OpenStax has with OER Commons

NARRATIVE

1.1 PROJECT GOALS

There is wide-reaching debate over the costs of college attendance and the long-term ramifications on each student. One way students reduce their total outlay is by not buying textbooks suggested or required for the course. This fact is especially true for Armstrong State students as many are first generation college students from lower income areas in southeast Georgia. Textbook costs have risen dramatically over the last 30 years, outpacing inflation, home prices, and healthcare cost.¹ Choosing to avoid the cost of books, however, is not a success strategy for most students. Studies have shown a correlation between not purchasing textbooks and increased likelihood of failure or withdrawal from courses.²

Textbooks are marketed not to students, but to faculty, for whom cost is not as determining a factor. There is an increasing availability of low-cost or free materials available to students and faculty, but the adoption of a new textbook carries a large, possibly prohibitive, time commitment from the faculty teaching those courses.^{3,4} Integration of electronic materials into the university's learning management system or an online homework platform is particularly time-consuming. We seek funding to compensate faculty for the time and effort that a switch to free, openly-available course textbook published by Openstax would entail. This includes creating course materials (lecture slides, online homework templates, and clicker questions) of comparable quality to those provided by publishers with the adoption of mainstream, high-cost textbooks. Specific goals to this project are:

1. Reduce costs to students by adopting a no-cost textbook.
2. Review course content for currency, relevance, and programmatic needs.
3. Develop ancillary materials similar to those provided by publishers to support use of the OpenStax textbook by all faculty in the department.
4. Assess student and faculty satisfaction with the no- or low-cost textbook option and resources produced.

1.2 STATEMENT OF TRANSFORMATION

The Principles of Chemistry I (CHEM 1211) and II (CHEM 1212) sequence is required by a range of disciplines in the Colleges of Science and Technology and Health Professions at Armstrong State University. Approximately 500 new students begin this sequence each year, thus defining the primary stakeholders at Armstrong State. These classes are listed in the Top 100 undergraduate courses as impacting large numbers of students. The students are currently required to purchase a physical textbook as well as an access code to an online homework system from the same publisher, costing \$280.69 when purchased as a bundle. There is a reduced cost for the publisher's online textbook, which can be purchased as an eText with the online homework access code for \$136.30, but with this option the students lose access to the book when their subscriptions expire. For many of these students, the book is a helpful resource they need to retain for future classes or to review for licensing exams, so selling the book back or losing access to it are not favorable options. Many students also delay purchasing the book or the homework access because they do not have the funds available to get all the course materials at the beginning of the semester, resulting in their falling behind and increasing their chances of not successfully completing the course.

Assuming every student purchased a new physical textbook, the cost savings for switching to the free, online OpenStax textbook may reach over \$110,000 each year. For those students that wish to have a hard copy of the textbook,⁵ OpenStax offers a bound version that costs one-fourth the cost of the currently used textbook. We feel that this is a significant advantage of the OpenStax book over other open resources, as there are studies that show not all students can use the electronic textbooks as efficiently as hard copies.⁶ The live web version and the downloadable pdf version of the OpenStax book are free. We still plan to use an online homework system, but would switch to Sapling Learning, which can be used with any book and is often marketed for use with the OpenStax books. The cost for Sapling (\$65) is approximately the same as the current online homework system for the student. The instructions for this proposal indicate an expectation of \$35 cost of materials to the student; we feel that this online homework fits the spirit of that cost limitation since it will be used for two semesters of coursework, and is thus less than \$35 per class.

In our department, decisions regarding book selection and homework systems are made by the General Chemistry Committee, from which the project applicants are derived. As members of the General Chemistry Committee, the applicants have experience with providing curriculum materials via electronic media, as we have previously moved the CHEM 1211 and CHEM 1212 laboratory materials to an on-line platform (Desire2Learn). Reduction of cost to the students was one significant factor

in making this change. The work performed by the applicants will be distributed for use throughout the entire department, so the primary task within this proposal is the preparation of materials for use by all instructors, including temporary faculty. If funded, the project team will review all of the content areas currently taught for currency and relevance to the discipline and the degree programs we serve. The material in the new textbook will be carefully reviewed and an online homework template made available to all instructors. Lecture materials, clicker-type questions, and worked examples will also have to be produced for the chapters, as there are limited materials of these types currently available from OpenStax. We anticipate preparing the first-run of these materials and the course integration with our learning management software during the summer 2017 semester, with revisions occurring over the following two semesters.

1.3 TRANSFORMATION ACTION PLAN

- Alignment of the course objectives and redesign of both course syllabi will be accomplished during spring 2017. Assessment materials will be assembled and/or developed during the spring semester 2017 and submitted for IRB approval.
- Drs. Guillet, Hizer, MacGowan and Padgett (lead instructors) will be trained from the OpenStax publisher and Sapling Learning on best practices with their course materials.
- The course content and supplemental curriculum materials for CHEM 1211 and CHEM 1212 will be identified and/or developed (e.g. online homework, lecture materials), during the spring and summer semesters of 2017.
- Course materials will be uploaded and incorporated into the University's *Desire-to-Learn (D2L)* website during summer 2017. All course content and supplemental curriculum materials (e.g. clicker questions, power points slides, answer keys and assessment tools) will be freely accessible for all CHEM 1211 and CHEM 1212 instructors at Armstrong State starting in the fall semester 2017. These materials will also be made freely available to the public in the Community Resources partnership OpenStax has with OER Commons.
- Drs. Guillet, Hizer, MacGowan and Padgett will provide training on course content material and the organizational structure to all department faculty assigned to teach CHEM 1211 and CHEM 1212 during fall 2017 and/or spring 2018 in a workshop format in August, prior to the semester start.
- Feedback and assessment data on whether or not the grant's objectives were met will be collected throughout the 2017-2018 academic year. Retooling, as necessary, of the organization of the course and/or curriculum materials will take place in spring 2018. Updates will be made available as they are created for use in subsequent semesters.

1.4 QUANTITATIVE AND QUALITATIVE MEASURES

Assessment of the project will focus around four questions:

1. Do students perform similarly to previous semesters in which materials from mainstream publishers were employed?
2. What are student perceptions of eTexts and open educational resources (OER), and do these perceptions change after use of the OpenStax textbook?
3. Are students satisfied with the quality of the materials available for this class?
4. Are faculty satisfied with the quality and scope of the materials produced from the work done under this proposal?

Student performance will be evaluated through mostly quantitative measures. We want to ensure that the textbook and materials produced can be used to effect the same or better learning gains in the students. The chemistry faculty at Armstrong have data on the percentage of students earning D or F grades or withdrawing (W) from CHEM 1211 and CHEM 1212. These historic percentages for courses using a traditional textbook will be compared to classes that use the Openstax textbook. Both courses in the general chemistry curriculum use a standardized final exam written by the American Chemical Society. The average scores on this exam for courses that use the Openstax textbook will be compared to historic data from courses that used a traditional textbook. Similar percentages for DFW percentage and standardized exam scores would indicate that the Openstax textbook is sufficient to meet the needs of our curriculum. Faculty will also be asked for their perceptions of student performance, including engagement during class.

Student perceptions of OER materials and eTexts will be evaluated qualitatively through surveys. A short survey will be given at the beginning of the semester, containing questions such as:

1. What advantages do you feel open-source textbooks have compared to traditional textbooks?
2. What concerns do you have about using an open-source textbook?
3. Would you primarily identify yourself as a “highlighter” or a “note-taker” when describing how you use textbooks?
4. For a chemistry course, if offered the choice, would you choose an eText or a hard-copy textbook and why?

The questions will also be presented on an end-of-semester survey along with additional questions investigating student satisfaction with the book and the materials produced by the grant authors. Examples of these additional questions are:

1. How easy was it to find and use topics in the book?
2. How comfortable were you reading the electronic version of the text compared to a hard-copy text?
3. Did you meet the instructor’s expectations for reading material in the textbook?
4. If you chose to buy a hard-copy of the OpenStax book or print large amounts of text, why did you make that choice?

5. If your instructor used lecture slides, did you find them to complement the material in the textbook?
6. Were there enough problems for you to practice difficult concepts?
7. Does the accessible-anywhere nature of the book make you more likely to consult it to answer questions?

The student survey questions will be developed spring 2017 and submitted for IRB approval prior to use in Fall 2017 and subsequent semesters.

As all instructors that teach general chemistry will be impacted by the textbook and online homework system change, we will also assess faculty satisfaction with the OpenStax textbook and the ancillary materials produced by the grant authors. Faculty will be surveyed regarding the consistency, completeness, and ease of further customization of the new ancillary materials. Suggestions for additions and improvements will also be solicited. A survey form will be generated that faculty can use to submit their responses at the end of each chapter. A meeting will be held every month between the grant authors and any interested faculty to review the survey responses and plan on-going improvements for the subsequent semester.

1.5 TIMELINE

Spring 2017

- Kick-off meeting
- Investigators will:
 - o Become familiar with the materials available through OpenStax and the associated on-line homework system available through Sapling Learning.
 - o Receive thorough training in utilizing the OpenStax online textbook and Sapling Learning online homework system.
- Course objectives will be realigned, and the course syllabi for CHEM 1211 and CHEM 1212 will undergo some revision.

May - August 2017

- The OpenStax material will be aligned with our objectives and our paradigm.
- Ancillary materials to supplement those available through OpenStax will be developed. An on-line homework regimen, based on the Sapling system, will be developed.
- These materials will be made available to students through Desire to Learn, to which all Armstrong students have free access.

August 2017

- Investigators will provide training on accessing and using the new materials at a workshop held prior to the beginning of fall classes.

January 2018

- Feedback from students and faculty will be collected both terms. Effectiveness of the course transformation will be assessed as described in section 1.4. Identified weaknesses will be addressed and improvements/adjustments made beginning in the spring semester.

January – May 2018

- Course will be executed again with modifications.

May 2018

- Meet and assess two semesters of data from qualitative and quantitative assessments.
- Prepare final report.

1.6 BUDGET

Include Personnel & Projected Expenses as appropriate for the category.

Proposals must involve teams of at least teams of 2 or more of any of the following: faculty, faculty librarians, instructional designers, subject matter experts, editors, graphic designers, or others as needed. It is required to include the \$800 for overall project expenses and travel in this section.

Two levels of funding are available based on the scale of the project proposed:

Standard-Scale Transformation: Textbook transformation projects within one or more

1.6 Budget: Multiple Sections/Course/Department-Wide Implementation

Item	Justification	Amount (\$)
Release time for Dr. Gary Guillet	Dr. Guillet will need time to develop web content and assessment tools; coordinate lecture and laboratory content with team members and to disseminate and train department faculty members on new course curriculum materials.	5000
Release time for Dr. Todd Hizer	Dr. Hizer will need time to develop web content and assessment tools; coordinate lecture and laboratory content with team members and to disseminate and train department faculty members on new course curriculum materials.	5000
Release time for Dr. Catherine MacGowan	Dr. MacGowan will need time to develop web content and assessment tools; coordinate lecture and laboratory content with team members; to disseminate and train department faculty members on new course curriculum materials and attend meetings.	5000
Release time for Dr. Lea Padgett	Dr. Padgett will need time to develop web content and assessment tools; coordinate lecture and laboratory content with team members; to disseminate and train department faculty members	5000

	on new course curriculum materials and attend meetings.	
Travel for Drs. MacGowan and Padgett	Travel funds for USG grant kick-off training/implementation meeting	800
Materials:	American Chemical Society standardized testing materials for comparisons to national/state averages	600
	GRAND TOTAL	\$21,400

1.7 SUSTAINABILITY PLAN

The Department of Chemistry and Physics at Armstrong State University has an established General Chemistry Committee that oversees this sequence. Numerous sections of each course are offered every semester. All course instructors use the same textbook and will have access to all ancillary materials produced, with the ability to further adapt them at any time. The committee will ensure continuity and consistency in the materials available to our department. The produced materials will be uploaded to the Community Resources partnership with OER Commons; significant revisions or continued educational products will be uploaded to this community forum as they are produced. The committee will also continue monitoring and evaluating student-focused outcomes. Revisions will be made as needed to provide a positive learning experience for the students.

1.8 REFERENCES & ATTACHMENTS

- 1) Weissmann, J. Why are college textbooks so absurdly expensive? *The Atlantic*. **2013**. Available at:
<http://www.theatlantic.com/business/archive/2013/01/why-are-college-textbooks-so-absurdly-expensive/266801>
- 2) Florida Distance Learning Consortium. (2011, September). Florida Student Textbook Survey. Tallahassee, FL.
<http://www.openaccesstextbooks.org/projectInfo.html>
- 3) Hilton III, J., Wiley, D. A., and Lutz, N. Examining the Reuse of Open Textbooks. *The International Review of Research in Open and Distance Learning*. **2012**, 13(2), 45-58.
- 4) Everard, A. and St. Pierre, K. A Case for Student Adoption of Open Textbooks. *Journal of the Academy of Business Education*. **2014**, 66-76.
- 5) Baek, E-O. and Monaghan, J. Journey to Textbook Affordability: An Investigation of Students' Use of eTextbooks at Multiple Campuses. *The International Review of Research in Open and Distance Learning*. **2013**, 14(3), 1-26.
- 6) Daniel, D. B. and Woody, W. D. E-textbooks: At what cost? Performance and use of electronic v. print texts. *Computers and Education*. **2013**, 62, 18-23.