

Summer 2018

Physical Science II (ASU)

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Grants Collection

Albany State University



UNIVERSITY SYSTEM
OF GEORGIA

Liqiu Zheng and Arun Saha

Physical Science II





Grants Collection

Affordable Learning Georgia Grants Collections are intended to provide faculty with the frameworks to quickly implement or revise the same materials as a Textbook Transformation Grants team, along with the aims and lessons learned from project teams during the implementation process.

Each collection contains the following materials:

- **Linked Syllabus**
 - The syllabus should provide the framework for both direct implementation of the grant team's selected and created materials and the adaptation/transformation of these materials.
- **Initial Proposal**
 - The initial proposal describes the grant project's aims in detail.
- **Final Report**
 - The final report describes the outcomes of the project and any lessons learned.



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Initial Proposal

**Affordable Learning Georgia Textbook Transformation Grants
Round Nine
For Implementations beginning Summer Semester 2017
Running Through Spring Semester 2018**

Proposal Form and Narrative

- *The proposal form and narrative .docx file is for offline drafting and review. Submitters must use the InfoReady Review online form for proposal submission.*
- **Note: The only way to submit the proposal is through the online form in Georgia Tech’s InfoReady Review at:**
<https://gatech.infoready4.com/#competitionDetail/1757803>
- *If you are copying and pasting into InfoReady Review from this form, first convert the file to **plain text** and copy/paste from the plain text file.*
 - *In Word, go to File > Save As... > and change the file format to “Plain Text (.txt).”*
 - *Copy and paste from the .txt file.*
 - *Be sure to save both copies in case you are asked to resubmit.*
- *Microsoft Word Document formatting pasted into InfoReady Review will render the reviewer copy unreadable. **If you paste Word-formatted tables into InfoReady Review, you may be asked to resubmit your application if time permits.***
- *Italicized text is provided for your assistance; please do not keep the italicized text in your submitted proposal. Proposals that do not follow the instructions may be returned.*

| | |
|-------------------------------|---|
| Submitter Name | Dr. Liqiu Zheng |
| Submitter Title | Assistant Professor of Physics, Department of Chemistry & Forensic Sciences |
| Submitter Email | Liqiu.Zheng@asurams.edu |
| Submitter Phone Number | 2294207052 |
| Submitter Campus Role | Principal Investigator (Primary) |
| Applicant Name | Dr.Liqiu Zheng Dr.Arun K. Saha |

| | | | | | |
|---|---|--|----|---|-----|
| Applicant Email | Liqiu.Zheng@asurams.edu | | | | |
| Applicant Phone Number | 2294207052 | | | | |
| Primary Appointment Title | Assistant professor of physics | | | | |
| Institution Name(s) | Albany State University | | | | |
| Team Members | <p>Dr. Liqiu Zheng, Assistant Professor of Physics, Department of Chemistry & Forensic Sciences, Liqiu.Zheng@asurams.edu;</p> <p>Dr. Arun K. Saha, Associate Professor of Physics/pre-engineering, Department of Chemistry & Forensic Sciences, arun.saha@asurams.edu</p> | | | | |
| Sponsor, Title, Department, Institution | <p>Dr.Seong S.Seo</p> <p>Chair of Department of Chemistry & Forensic Sciences</p> | | | | |
| Proposal Title | Non-Science major students' science learning at zero cost | | | | |
| Course Names, Course Numbers and Semesters Offered | Physical Science II, PHYS1012; Spring 2018 | | | | |
| Final Semester of Instruction | Spring 2018 | | | | |
| Average Number of Students Per Course Section | 25 | Number of Course Sections Affected by Implementation in Academic Year | 14 | Total Number of Students Affected by Implementation in Academic Year | 350 |

| | |
|--|--|
| Average Number of Course Sections Per Semester | Summer 2 sections, Fall 7 sections, and Spring 5 sections. Average number of course 7 sections per semester |
| Award Category (pick one) | <input type="checkbox"/> No-or-Low-Cost-to-Students Learning Materials <input checked="" type="checkbox"/> Specific Core Curriculum Courses |
| Are you planning on using an OpenStax textbook? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| List the original course materials for students (including title, whether optional or required, & cost for each item) | The Physical Universe 16th Edition by Konrad Krauskopf, Arthur Beiser, <i>ISBN-13: 978-0077862619</i> \$238.00 Required |
| Requested Amount of Funding | \$10800.00 |
| Original Per Student Cost | \$238.00 |
| Post-Proposal Projected Per Student Cost | \$0.00 |
| Projected Per Student Savings | \$238.00 |

| | |
|---|--|
| Projected Total Annual Student Savings | the total amount of annual students savings \$238.00*25*7*2=\$83,300.00 |
|---|--|

NARRATIVE

1.1 PROJECT GOALS

List the goals you are trying to achieve with the transformation, including goals for student savings, student success, materials creation, and pedagogical transformation.

The goal is to improve the overall physical science education quality; to boost the passing rate and decrease the withdraw rate for physical science learning; and eventually to enhance the retention rate campus-wide by adopting zero cost and readily accessible electronic teaching/learning textbook (eBook) in GeorgiaView. Without buying a costly textbook, students could perform lots of learning activities at a one-stop learning environment to ensure their science learning outcomes. Free online **OpenStax** textbooks will be adopted as a primary textbook. By taking advantage of GeorgiaView—a well-designed online course platform, various best-illustrated topics of physical science will be selected from different open source textbooks and will be contained in GeorgiaView as important supplemental learning materials. Meanwhile, as one unique science class, virtually all physical science concepts relate to the things in our daily life. In order to better grasp the concepts, YouTube online demonstration will be linked to GeorgiaView to further enhance the learning outcome because it could easily relate physical science concepts to the more familiar things in day to day life. Additionally, problems and exercises for better understanding/applying each and every concept, which are stated in different styles, will be embedded in GorgiaView to better suit the learners from different backgrounds.

1.2 STATEMENT OF TRANSFORMATION

- *Describe the transformation.*
- *Identify stakeholders affected by the transformation.*
- *Describe the impact of this transformation on stakeholders and course success.*
- *Describe the transformative impact on the course, program, department, institutions, access institution, and/or multiple courses.*

With varying degree of math-phobia, non-science major undergraduate students choose not to enter into science fields. Any class involved math would be very intimidating to them. The worst thing is that Physical Science requires students to apply math properly

to solve the real world problems. Oftentimes, Physical Science I&II are taken by those non-Science majors when they are mandated to take science class with no other option. Under such circumstances, there are lots of **problems** in Physical Science learning. First of all, the **higher failing rate** (for instance, the failing rate was 35% in 2015 fall) occurs among those passive learners with low confidence because of their math phobia. They do not even read the textbook and complete their homework assignments because they tend not to buy textbooks with the high cost, which worsens the situation. Secondly, **the higher withdraw rate**(for example, the withdraw rate was 20% in 2016 Fall) is resulted from the fast pace college teaching and no other helping/reading materials available for them. They feel behind very soon enough and then drop out of the Physical Science class. Eventually they might drop out of college due to their unsuccessful science experience, which would **harm the overall retention rate** campus wide. Meanwhile, such bad science experience would stop those undecided from choosing science as major.

The **proposed solution** is to provide readily accessible eBook at zero cost through GeorgiaView to improve the course delivery so that 100% students will be prompted to read book and perform learning activities at a one-stop platform.

Key benefits: In addition to save \$238.00 per student per semester, their science learning outcome will be significantly elevated; a larger number of teachers and students will benefit from the developed teaching/ learning materials accessible through online with free of cost; and the more effective pedagogy will be explored to deliver knowledge; the overall physical science education quality will be enhanced; and thus, the higher passing rate and lower dropping out rate will be ensured; the overall retention rate will be boosted. If the approach is tested to be successful, it could be expanded to other science courses so that more and more teachers/students would benefit from it.

1.2 Transformation Action Plan

Action plans must address:

- *The identification, review, selection, and adoption/adaptation/creation of the new course materials.*
- *The course and syllabus instructional design/redesign necessary for the transformation.*
- *The activities expected from each team member and their role(s): subject matter experts, instructional designer, librarian, instructor of record, et al.*
- *The plan for providing open access to the new materials.*

The identification, review, selection, and adoption/adaptation/creation of the new course materials.

For Physical Science (PHYS1012), **OpenStax textbook** will be utilized as a primary textbook because of its free online accessibility. By taking advantage of GeorgiaView—a well-designed online course platform, various best-illustrated topics of physical science will be selected from different open source textbooks and posted in GeorgiaView, in

order to sufficiently clarify each concepts/definitions. As one unique science, nearly all the concepts in physical science relate to things in our daily life. Relating what they learn to the familiar stuffs in their daily life would help them better understand physical science, boosting their science learning confidence. YouTube quick demonstration will be easily adopted and linked to GeorgiaView since it is readily available, which could serve as an amazing teaching/learning resource in connection physical science concepts with things in our day to day life. Existing YouTube resources will be employed. Thanks to the aficionados of physics all over the world, there is a large pool of demonstrations on any single topic, for instance, Newton's first law, which allows us to freely choose the best ones around our lesson content. Those content and links will be embedded in GeorgiaView. At zero cost, YouTube demonstration could facilitate students to better grasp concepts, eventually to enhance the overall learning outcomes. Additionally, a poor attitude/outright hostility to math will translate into reluctance on the part of the students to do homework assignment. Therefore, problems and exercises for further understanding/applying each and every concept, which are stated in different styles (some are heavily math-based, some are simply conceptual), will be embedded in GorgiaView. They will be assigned to students to practice and test. Various type questions in GeorgiaVeiw will accommodate different learners' needs because they are from different non-science fields. Students with solid math background would feel the course challenging enough while the students with math-phobia would not feel behind. In order to complete the homework assignments and earn good grades for tests, students are required to read all assigned reading materials. As far as reading materials are concerned, they have multiple options, either consulting with OpenStax textbooks or the selected best-illustrated topics, to better suit their own learning styles to enhance the learning outcomes. Moreover, GeorgiaView is designed in such a way that allows instructors to track how much time devoted to learning activities for each student and easily pinpoint poorly performing students. Instructor will conduct timely consultancy / intervention before he/she withdraws from the class; as a result, the lower withdraw rate will be ensured.

The course and syllabus instructional design/redesign

The current syllabus will be modified to reflect the instructional redesign. The instruction on attendance policy, how to enroll the course, how to do their homework/tests, the weights of homework, quizzes, exams will be well stated in syllabus.

The activities expected from each team member and their role(s): subject matter experts, instructional designer, librarian, instructor of record, et al.

Dr.Zheng has expertise in GeorgiaView (Used to be D2L) and has employed D2L since 2011. Some class activities have been performed through GeorgiaView, for example, homework assignment submission, test taking, reading materials posting and so on. In order to turn Georgiaview into a full-fledged supplement of free online learning resource, along with the OpenStax, more time and efforts are in need.

Dr.Saha has experience in GeorgiaView as well and took the lead to conduct Affordable Learning Georgia Transformation on Introductory Physics in the past.

The plan for providing open access to the new materials.

First of all, the syllabus, which serves as a comprehensive guidance for all changes, will be redesigned and planned out carefully, and then posted on GeorgiaView. Secondly, OpenStax will be adopted and linked to GeorgiaView as a primary textbook. Based on the experiences of instructors, best-illustrated topics will be collected from various open source textbooks and posted to GeorgiaView over times. Next, topic-related Youtube demonstration will be linked to GeorgiaView for each chapter to fortify the learning outcomes. Meantime, numerous problems and exercises, which are stated in different styles, will be selected for students to practice and apply what they learn. All the problems and exercises will be posted on GeorgiaView right after each chapter.

1.3 QUANTITATIVE AND QUALITATIVE MEASURES

- *The quantitative and qualitative measures of impact on student success and experience. The quantitative and qualitative data collected will be utilized in your final report as well as within ALG program communications.*
- *It is important to identify how the data is to be analyzed for each data source. In specific, the action plan must address the project's quantitative impact on student success (items such as Learning Objective success, Drop, Fail, Withdraw (DFW) delta rate, and any other critical factors) to measure impact on student experience.*
- *Qualitative measures can include student feedback through surveys, interviews, focus groups, or other means.*

Project's **quantitative** impact on student success will be measured at the end of semester (middle of April 2018) by comparing failing and withdraw rate over the last 5 years period. **Qualitative** measurement will be performed by obtaining student feedback through two surveys – one in middle of February and the other in middle of April 2018 by asking questionnaires on confidence in math-based science learning, affordability, accessibility and satisfaction on text book, how long / how often they read book, motivation for homework, expectation in course and so on.

Benefited Student numbers - Just for the proposed course Physical Science II (PHYS1012) 125 students will be benefited with annual savings of $\$238 \times 125 = \$29,750.00$. But this transformation action can easily be extended to Physics Science I (PHYS 1011) ($7 \times 25 = 175$ students) with annual savings of $\$41,650.00$. There are two sections of Physical science in summer ($2 \times 25 = 50$) with annual savings of $\$11,900.00$. Projected annual savings will be $\$29,750.00 + \$41,650.00 + \$11,900.00 = \$83,300.00$. If the approach is expanded to the other courses, more savings will be easily attained.

1.4 TIMELINE

This is a timeline of milestone dates for your transformation project through the end of the first semester the transformed course(s) is/are offered to students. Your interim reports will utilize this timeline to indicate if the project is on schedule.

When submitting this timeline in InfoReady Review, be sure to use the Paste from Word button in order to correctly paste a table from Word. Otherwise, the document will be unreadable to reviewers.

| | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| OpenStax eBook adoption & Course setting for Spring 2018 (Zheng) | x | | | | | | | | |
| Syllabus Redesign (Zheng, Saha) | x | x | | | | | | | |
| Instruction Redesign (Zheng, Saha) | x | x | x | | | | | | |
| Chapter Summary (Saha) | x | x | x | x | | | | | |
| Course Release (Zheng, Saha) | | | | x | x | x | x | | |
| Data Collection for evaluation purposes (Zheng, Saha) | | | | | x | | x | | |
| Evaluation of course effectiveness (Zheng, Saha) | | | | | | x | | x | |
| Final report (Zheng, Saha) | | | | | | | | x | x |

1.5 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 courses or sections with under 500 students enrolled on average per academic year total.

*\$10,800 maximum award
\$5,000 maximum per team member
\$800 for travel and expenses*

Large-Scale Transformation: Textbook transformation projects within one or more courses or sections or department-wide adoptions with 500 or more students enrolled on average per academic year total.

\$30,000 maximum award
 \$5,000 maximum per team member
 \$800 for travel and expenses

*Funding is **not a direct stipend** to the team members, but rather goes **to the institution to cover the team member's time** (salary/release time/overload/replacement coverage), project expenses including related department needs, and travel expenses (up to \$800 is specifically designated for at least two team members to attend the required in-person kickoff meeting).*

The proposing team must coordinate as necessary with their departments and institutional sponsors to determine how to handle the distribution, including amounts, release time/overload/salary/replacement as well as semester(s). This provides the maximum flexibility to the institution and the team in terms of how many people and what types of skills are needed, amount of compensation vs. replacement of teaching load, and timing in terms of semesters of preparatory work vs. semesters of adoption.

| Item | Justification | Amount |
|--|--|-----------|
| One course release for Dr. Liqiu Zheng | Dr. Zheng will adopt OpenStax eBook with home assignment administered by GeorgiaView, create necessary settings & post necessary materials in GeorgiaView. | \$4500.00 |
| One course release for Dr. Arun Saha | Dr. Saha will compose chapter/topic summary for each chapter/topic suitable for GeorgiaView. | \$4500.00 |
| 2 iPads for Zheng & Saha | For portability of activities | \$800.00 |
| Travel for Zheng, Saha | To share experience in SACS AAPT meeting | \$1000.00 |
| | Total | \$10800 |

1.6 SUSTAINABILITY PLAN

What is your plan for offering the course in the future, including maintenance and updating of course materials?

The redesigned course Physical Science II (PHYS 1012) will be offered every academic year. The syllabus and materials will be available and hosted in GeorgiaView(D2L), which will be easily accessible to those who are taking physical science. Meantime, a copy of the related syllabus and teaching materials will be stored in the institutional repository of Albany State University, which will be maintained by the library of ASU. As a result, materials will be available everywhere to everyone who has an interest, due to the fact that OpenStax, those carefully selected topics from open sources, and Youtube, all of them are under an open license. Instructions for course adoption and settings through

GeorgiaView will be saved by the department so that any instructor can move forward with the course without difficulty. GeorgiaView portion of the course will be updated on a regular basis as necessary and instructions for latest science or technological developments will be obtained by instructors and added to GeorgiaView by IT department, if necessary. All instructional materials will be well-organized/ stored on GeorgiaView, which leads to a seamless transition from semester to semester, from one instructor to another instructor.

1.7 REFERENCES & ATTACHMENTS

A letter of support has been be provided below.

Syllabus

PHSC 1012K - Physical Science II
Spring 2018

Instructor: Dr. Arun Saha
Office: BCBB 206

Voice: 2294304816
e-mail: arun.saha@asurams.edu

Class Period: TR(9:00-10:15am), F(9:00 – 10:50am)

Office Hours MW [8:30-10am & 2:30-3:30pm], T[1:05-3pm], R[2-3pm], F[11-1pm]

Objectives:

Students are expected to:

1. Develop deep understanding and hands-on experience of scientific processes
2. Possess competence in basic concepts related to physical science that covers motions, sounds, thermal, electricity, magnetism and nuclear.
3. Develop matured reasoning skill
4. Use technology-assisted learning for life time learning

Best illustrated chapters. Please refer to the Opens tax textbooks:

<https://open.umn.edu/opentextbooks/BookDetail.aspx?bookId=22>

<https://ocw.mit.edu/courses/chemistry/5-12-organic-chemistry-i-spring-2005/>

<https://openstax.org/details/chemistry>

<https://cnx.org/contents/RTmuIxzM@8.3:uXg0kUa-@4/Introduction>

Contents:

1. Atoms and periodic properties

Different fields of study contributed to the development of a model of the atom.

Please refer to:

<https://www.youtube.com/watch?v=Gy9HR65DpYQ>

<https://www.youtube.com/watch?v=q--2WP8wXtk>

<https://www.youtube.com/watch?v=ywqg9PorTAW>

https://www.youtube.com/watch?v=IFKnq9QM6_A

<https://www.youtube.com/watch?v=fLSfgNxoVGk>

2. Chemical bonds

Electron structure will explain how and why atoms join together in certain numbers.

<https://www.youtube.com/watch?v=7DjsD7Hcd9U>

<https://www.youtube.com/watch?v=VSc491HLzDc>

<https://www.youtube.com/watch?v=OTgpN62ou24>

<https://www.youtube.com/watch?v=M9khs87xQ8>

<https://www.youtube.com/watch?v=KjoQHqgzda8>

<https://www.youtube.com/watch?v=OTgpN62ou24>

3. chemical reactions

Chemical symbols, formulas, and equations can be used to concisely represent elements, compounds, and what happens in a chemical reaction

<https://www.youtube.com/watch?v=aMU1RaRulSo>

<https://www.youtube.com/watch?v=5rtJdjas-mY>

<https://www.youtube.com/watch?v=IZ1tKxsqV74>

<https://www.youtube.com/watch?v=yA3TZJ2em6g>

<https://www.youtube.com/watch?v=jy6F0Lbvjm8>

4. water and solutions

Water and solutions of water have unique properties

<https://www.youtube.com/watch?v=AN4KifV12DA>

<https://www.youtube.com/watch?v=9h2f1Bjr0p4>

<https://www.youtube.com/watch?v=iWOnCH8m5ug>

<https://www.youtube.com/watch?v=AOqH5ktwoDE>

<https://www.youtube.com/watch?v=XC1RxloV0Mo>

5. Organic compounds

The nature of the carbon atom allows for a great variety of organic variety of organic compounds, many of which play vital roles in living.

<https://www.youtube.com/watch?v=MmWZ8vGz9zQ>

<https://www.youtube.com/watch?v=zUN2nIVHiyU>

<https://www.youtube.com/watch?v=cMTRB1K6Scg>

<https://www.youtube.com/watch?v=gP8H7xj97pA>

<https://www.youtube.com/watch?v=0WAV47hsCpY>

<https://www.youtube.com/watch?v=OOcFFJ-s0p4>

<https://www.youtube.com/watch?v=7fv8GETEOu8>

<https://www.youtube.com/watch?v=IC57cJzM8OA>

6. the universe

The night sky is filled with billions of stars, and the Sun is an ordinary star with an average brightness.

<https://www.youtube.com/watch?v=mO3Q4bRQZ3k>

<https://www.youtube.com/watch?v=lkEvS4QUFeY>

<https://www.youtube.com/watch?v=XSVjaklLf24>

<https://www.youtube.com/watch?v=Qd6nLM2QIWw>

<https://www.youtube.com/watch?v=jpMyjPJ9HfG>

7.the solar system

The solar system is composed of the Sun and orbiting planets, dwarf planets, and small solar system bodies.

<https://www.youtube.com/watch?v=Qd6nLM2QIWw>

<https://www.youtube.com/watch?v=jpMyjPJ9HfG>

<https://www.youtube.com/watch?v=95NCtnMRuBs>

<https://www.youtube.com/watch?v=B-b4XvuQo1Y>

<https://www.youtube.com/watch?v=TKM0P3XIMNA>

<https://www.youtube.com/watch?v=0ytyMKa8aps>

8.earth in space

The way the Earth moves in space is used to define time and describe location on the surface, and causes other recurrent phenomena such as seasons.

<https://www.youtube.com/watch?v=n4IhCSMkADc>

<https://www.youtube.com/watch?v=EPy1lLgNtoQ>

<https://www.youtube.com/watch?v=Un5SEJ8MyPc>

<https://www.youtube.com/watch?v=mve7hRaoH8U>

<https://www.youtube.com/watch?v=6v2L2UGZJAM>

For any missed work, if you have a right excuse, you need contact the instructor right after you get back and bring the written document with you. All those missed work must be made up in the following two weeks (the two week right after the date on which you are absent, just in case you are sick for more than one week). After these particular 2-week, even if you have a legitimate reason, you would lose the chance to make up for your missed work!

| Chapter | Topics | Problems set |
|---------|-------------------------------|--------------|
| 1 | Atoms and periodic properties | |
| 2 | Chemical bonds | . |
| 3 | Chemical reactions | . |
| 4 | Water and solutions | . |
| 5 | Organic chemistry | . |
| 6 | Nuclear reactions | . |
| 14 | The Universe | . |
| 15 | The Solar System | . |
| 16 | The Earth in Space | . |

Grading System:

| <u>Grade Distribution</u> | | <u>Letter Grades</u> | |
|---------------------------|------|----------------------|------------|
| | | A | 90 & up |
| Tests | 40 % | B | 80-89 |
| HW | 15% | C | 70-79 |
| Lab | 20% | D | 60-69 |
| Final | 20% | F | 59 & below |
| attendance | 5% | | |
| Total | 100% | | |

Policy:

A. Attendance

- Class attendance is compulsory.
You can have up to 4 excused or non-excused absences for the entire semester according to the university policy, unless you have extreme circumstances.

For each extra absence (excused or unexcused) after the permitted number, student will suffer a deduction of 2% of total overall points. For example, for a 3 credit hour course:

For 4 absences, deduction is 0%

For 5 absences, deduction is 1%

For 6 absences, deduction is 2%

For 7 absences, deduction is 3%

For 8 absences, deduction is 4%

For 9 absences, deduction is 5% (equivalent to one letter grade down)

- Punctuation.

Late: 5-15 minutes late to class is considered as late.

Absence: 15 minutes and more late to class.

Three late's count as one absence.

You forfeit your right to take a test, quiz, lab, or other in-class assignment if you're more than 15 minutes late.

B. Classroom behaviors

0. **Turn off Cell Phone or on vibrate if you expect an emergency call.**

1. You must own your own scientific calculator, no sharing of calculator is allowed.

2. Use your own calculator, **No sharing** of calculator during test or quiz session is allowed. You are not allowed to use calculator on the cellphone, which is considered as a potential cheating device.

3. No child is allowed in the classroom

4. **No eating or drinking is allowed in the Lab.**

5. No chatting during lecture, else you will be asked to leave the classroom.
6. No communication whatsoever is tolerated during a test or quiz. You will be disqualified from taking the test or quiz if you are caught doing so. Disqualification means you get an instant "0" for the test or quiz.

8. **Do ask questions in class.**

C. Work & Grades related policy

1. It is recommended that you do your work in pencil such that you can make correction easily. Always keep your pencils sharp.
2. You are expected to spend minimal 2 hours for every lecture hour spent in class. Check the instructor's website to update your homework assignments
3. Some of the lab sessions will be used for problem solving sessions.
4. Grade-drop policy.
One lowest grade of the tests will be dropped from the computation of "final" grade average. The dropping policy will not be applied to the mid-term grade.
5. No late assignments will be accepted. Each assignment must be handed-in in the first 10 minute of a class unless otherwise announced. If you forget your homework, you will have to bear the consequence of your action. Be prepared before you come to class.
6. Make-up Policy. Because of the grade dropping policy, no make-up quiz, homework, and lab assignments will be given unless you have extraordinarily serious events such as a hospital stay of two weeks. The student must coordinate with the instructor, at the discretion of the instructor about the makeup. You may make up a missed test if you have legitimate excuses such as sickness, with proof of evidence. You must make up any test, quiz, or assignment missed within one week after returning to campus. An automatically zero will be applied if an assignment is not made-up on time.
7. The consequence of caught cheating is an automatic "F" and your action will be reported to the university authority. **Communication in any forms during a test will be considered as cheating.**
8. You are encouraged to discuss and share ideas with your classmates; however, **Plagiarism will not be tolerated.** Works that shows the same mistake at the same manners such as identical number of steps to solve a problem with identical symbols, signs, and punctuation marks, and identical styles and formats will be considered as plagiarism. If so, you will receive "0" credit. Submitting printed copy of Web pages as your own work is also considered as plagiarism. You may only submit them as references or attachment only.
9. Depends on the average background of students of the year, we may or may not cover chapters listed above in one semester. And the order of coverage may be different from the sequence listed in homework section above. The listed sequence is for your reference only. Please pay attention to announcement of changes or visit the course site as often as possible to keep yourself update.

Final Report

Affordable Learning Georgia Textbook Transformation Grants

Final Report

To submit your Final Report, go to the Final Report submission page on the ALG website:

http://affordablelearninggeorgia.org/site/final_report_submission

Final report submission requires four files:

- This completed narrative document
- Syllabus or syllabi
 - (if multiple files, compress into one .zip folder)
- Qualitative/Quantitative Measures data files
 - (if multiple files, compress into one .zip folder)
- Photo of your team or a class of your students w/ at least one team member, minimum resolution 800x600px
 - (nearly all smartphones take photos larger than this size by default)

Follow the instructions on the webpage for uploading your documents. Based on receipt of this report, ALG will process the final payment for your grant. ALG will follow up in the future with post-project grantee surveys and may also request your participation in a publication, presentation, or other event.

General Information

Date:06.01.2018

Grant Round:10

Grant Number:337

Institution Name(s): Albany State university

Project Lead: Liqiu Zheng

1. Team Members Dr. Liqiu Zheng, Associate Professor of Physics, Department of Natural & Forensic Sciences, Albany State University. Email – liqiu.zheng@asurams.edu
2. Dr. Arun K Saha, Associate Professor of Physics, Department of Natural & Forensic Sciences, Albany State University. Email – arun.saha@asurams.edu

Course Name(s) and Course Numbers: Physical Science II/Phys1012

Semester Project Began: Fall 2017

Semester of Implementation: Spring 2018

Total Number of Students Affected During Project: 23

1. Narrative

The goal was to improve the overall physical science education quality; to boost the passing rate and decrease the withdraw rate for physical science learning; and eventually to enhance the retention rate campus-wide by adopting low cost and readily accessible electronic teaching/learning textbook (eBook) in GeorgiaView and university repository. Without buying a costly textbook, students performed lots of learning activities at a one-stop learning environment to ensure their science learning outcomes. Various best-illustrated topics of physical science course were excerpted from different textbooks and placed in GeorgiaView and university repository. Meanwhile, as one unique science class, virtually all physical science concepts relate to the things in our daily life. In order to better grasp them, YouTube online demonstration were linked to GeorgiaView and university repository to further enhance the learning outcome because it would accommodate different learning needs like Visual and Auditory learners. Additionally, problems and exercises to facilitate understanding/applying each and every concept, which were stated in different styles, were embedded in the learning materials to suit the learners from different backgrounds. All of developed materials are posted/stored in the following URL for open access to everyone -<http://hdl.handle.net/10675.1/620195>

A. Describe the key outcomes, whether positive, negative, or interesting, of your project.

Include:

- Summary of your transformation experience, including challenges and accomplishments
 1. Students had more multiple resources to boost their learning with zero cost
 2. The teaching materials cover a wide range of physical science to cater for students with different backgrounds.
 3. Students enjoyed the exposure to various reading materials and exercises materials.
 4. The implementation time frame is too short-only one semester. The longer time implementing it, the more students would get impacted.
- Transformative impacts on your instruction
This allows for the flexibility, more effective of teaching.
- Transformative impacts on your students and their performance
Students demonstrate more passionate for learning science.

B. Describe lessons learned, including any things you would do differently next time.

2. Quotes

- Provide three quotes from students evaluating their experience with the no-cost learning materials.
 - a) Blanding, Lezilee D

"I really appreciated the free material offered to us, I feel as if it was helpful b/c sometimes students in college don't have jobs and school checks don't come until months after school had already began. Having the course material offered to us online w/ free access 24/7 was very convenient"

b) Cole Sutton

"New material was helpful and should be used in future"

Meanwhile, the following survey questions were asked for the participating students to measure the effectiveness of the course material developed.

Date: April 24, 2018
Survey Questionnaires & Responses
Free Text Book
Course Name: Physical Science II (PHSC 1012)
Spring 2018

The following questions are related to Text Book material developed for you which is at FREE of cost.

1. How do you like the content of this book?
(a) Liked very much **61.5%** (b) Liked somewhat (c) Did not like **38.5%**
2. Do you think that this FREE book will help you secure a better grade?
(a) YES **92.3%** (b) NO **7.7%**
3. How accessible is the FREE material?
(a) Very much accessible **69.2%** (b) Somewhat accessible **15.4%** (c) Not accessible at all **15.4%**
4. Do you think that for this FREE Text Book, you will be able to focus more on your study rather than spending more time in outside employment to earn money for Text Book?
(a) YES **100%** (b) NO **0%**
5. Next semester, ASU will offer two sections of this course. One section will adopt regular hard cover Text Book (which you are using now) and other section will adopt the FREE Text Book. Which section will you recommend your friend to get enrolled in?

(a) Section adopting FREE Text Book **92.3%** (b) Section adopting hard-cover printed Text Book **7.7%**

3. Quantitative and Qualitative Measures

3a. Uniform Measurements Questions

The following are uniform questions asked to all grant teams. Please answer these to the best of your knowledge.

Student Opinion of Materials

Was the overall student opinion about the materials used in the course positive, neutral, or negative?

Total number of students affected in this project: 23

- Positive: 78.5 % of 13 number of respondents
- Neutral: % of number of respondents
- Negative: 21.5 % of 13 number of respondents

The following 10 survey questions are asked to the students to get student opinion about the current Text Book.

Date: April 24, 2018
Survey Questionnaires & Responses
Free Text Book
Course Name: Physical Science II (PHSC 1012)
Spring 2018

Question from 1-10 is related to your current costly Text Book with hard cover.

1. Did you have the text book on First Day of semester?
(a) YES **7.7%** (b) NO **92.3%**
2. For your PHSC 1012 course, did you buy the Text Book?
(a) YES **15.4%** (b) NO **84.6%**
3. When did you buy?
(a) Beginning of semester **7.7%** (b) After midterm **15.4%** (c) Not yet **76.9%**

4. Did you wait for refund check to buy this Physics text book?
(a) YES **23%** (b) NO **77%**

5. Do you think that the cost of your text book for PHSC 1012 was affordable?
(a) YES **23%** (b) NO **77%**

6. How do you rate your affordability in buying this text book?
(a) Very much affordable **23%** (b) Somewhat affordable **54%** (c) Not affordable **23%**

7. How did you like the content of the book?
(a) Liked very much **15.4%** (b) Liked somewhat **76.9%** (c) Did not like **7.7%**

8. How did you like the presentation of the content?
(a) Liked very much **46.1%** (b) Liked somewhat **46.2%** (c) Did not like **7.7%**

9. Were the interactive video links in the text book helpful for you?
(a) Very much helpful **23%** (b) Somewhat helpful **38.5%** (c) Not helpful **38.5%**

10. Do you think that, due to the high cost of your text book, you had to engage in outside employment for longer period of time and found less time for study??
(a) YES **46.2%** (b) NO **53.8%**

Student Learning Outcomes and Grades

Was the overall comparative impact on student performance in terms of learning outcomes and grades in the semester(s) of implementation over previous semesters positive, neutral, or negative?

Student outcomes should be described in detail in Section 3b.

Choose One:

- Positive: Higher performance outcomes measured over previous semester(s)
- Neutral: Same performance outcomes over previous semester(s)
- Negative: Lower performance outcomes over previous semester(s)

Student Drop/Fail/Withdraw (DFW) Rates

Was the overall comparative impact on Drop/Fail/Withdraw (DFW) rates in the semester(s) of implementation over previous semesters positive, neutral, or negative?

Drop/Fail/Withdraw Rate:

Depending on what you and your institution can measure, this may also be known as a drop/failure rate or a withdraw/failure rate.

17.4 % of students, out of a total 23 students affected, dropped/failed/withdrew from the course in the final semester of implementation.

Choose One:

- Positive: This is a lower percentage of students with D/F/W than previous semester(s)
- Neutral: This is the same percentage of students with D/F/W than previous semester(s)
- Negative: This is a higher percentage of students with D/F/W than previous semester(s)

3b. Measures Narrative

In this section, summarize the supporting impact data that you are submitting, including all quantitative and qualitative measures of impact on student success and experience. Include all measures as described in your proposal, along with any measures developed after the proposal submission.

[When submitting your final report, as noted above, you will also need to provide the separate file (or .zip with multiple files) of supporting data on the impact of your Textbook Transformation, such as surveys, analyzed data collected, etc.]

- *Include measures such as:*
 - *Drop, fail, withdraw (DFW) delta rates*
 - *Course retention and completion rates*
 - *Average GPA*
 - *Pre-and post-transformation DFW comparison*
 - *Student success in learning objectives*
 - *Surveys, interviews, and other qualitative measures*
- *Indicate any co-factors that might have influenced the outcomes.*

We focused on GPA and DFW comparison to measure the effectiveness of this project. For the fairness, we provided data taken only from one instructor Dr. Arun Saha's (Co-PI) grade distribution form since the PI was not assigned physical science II in spring 2018. The result shows that DFW rate slightly increased when compared with that of two previous semesters as shown in Figure 1. But there is no any significant change in average GPA of the class as shown in Fig.2

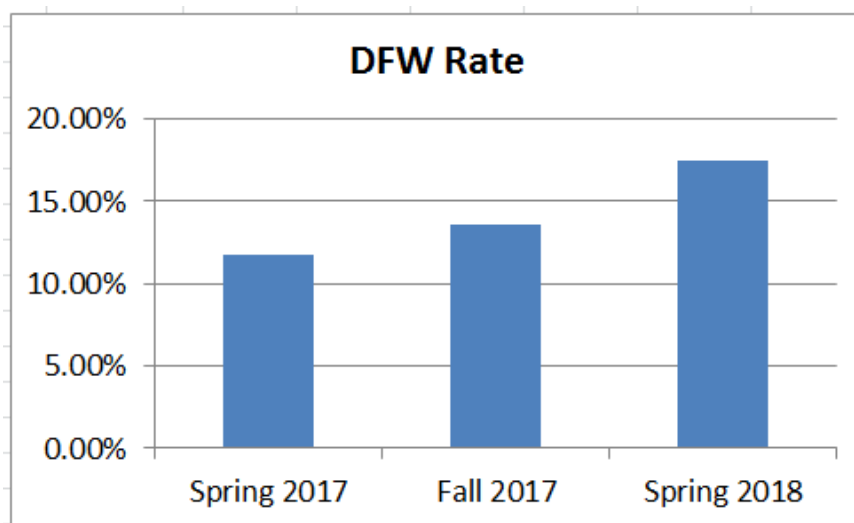


Figure 1. DFW rate of Physical Science II course for 3 consecutive semesters

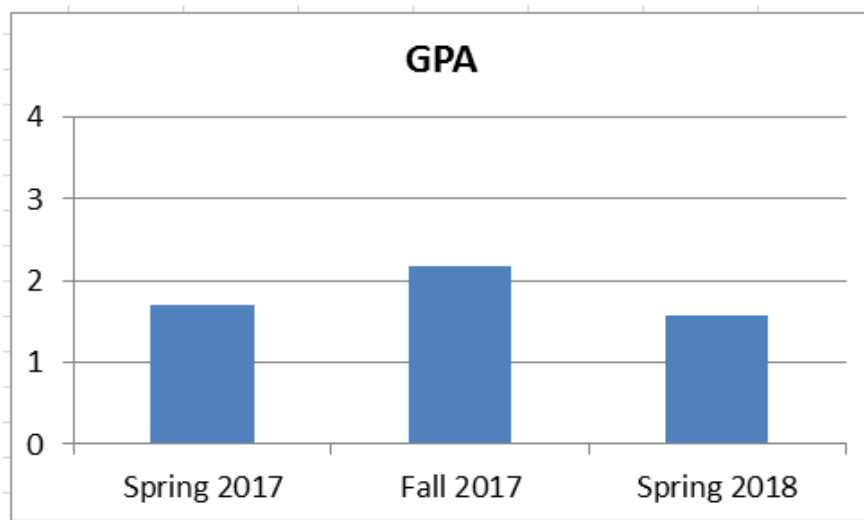
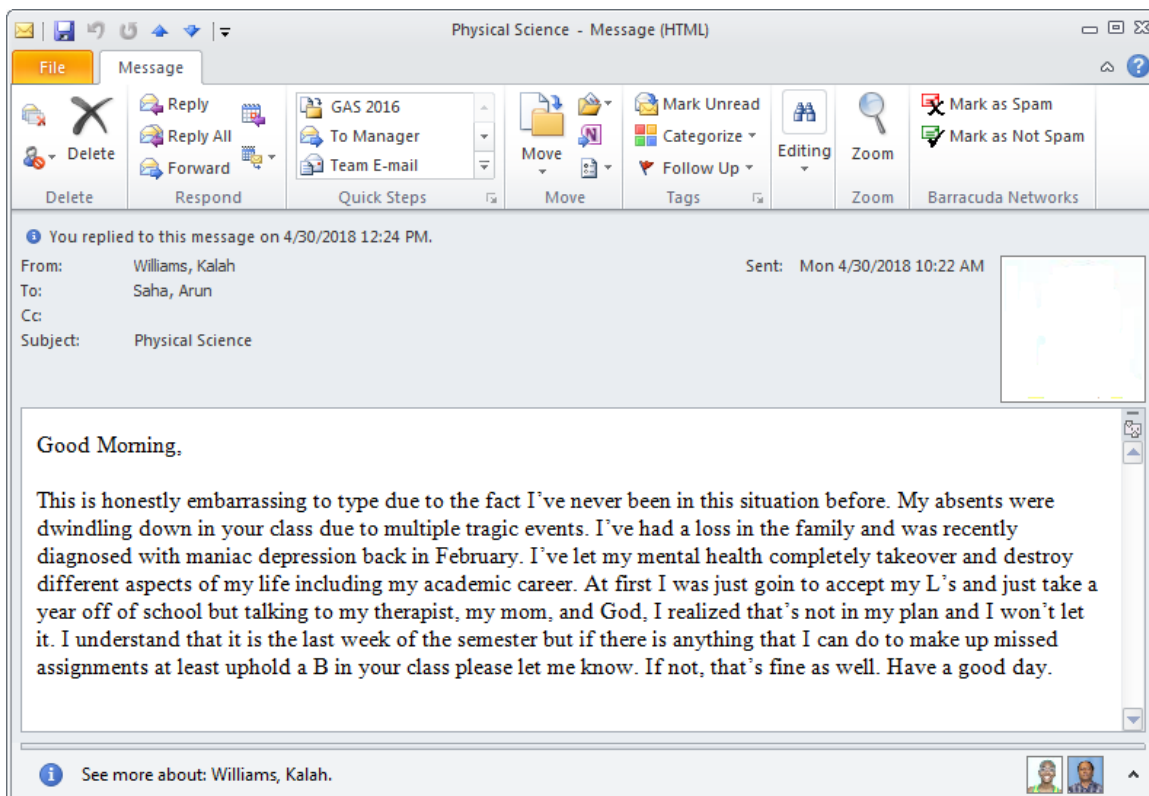


Figure 2. Average GPA of Physical Science II Course in three consecutive semesters

Factors Affecting Outcomes

Recently, we observe that the number of students NOT coming to class is increasing day by day. First couple of days they come to school and then contact instructor at the end of semester to inform their situations which prevented them from attending the school. It does not matter to those students whether Text Book is free or not. A screen shot of one student's such email is provided below -



4. Sustainability Plan

- *Describe how your project team or department will offer the materials in the course(s) in the future, including the maintenance and updating of course materials.*

Physical Science courses are offered from the College of Science and Technology and in this college all instructors teaching Physical Science course are advised by Department Chair to use same course materials. As the developed material is posted in GeorgiaView, so it can easily be copied or transferred to any instructor's portal.

5. Future Plans

- *Describe any impacts or influences this project has had on your thinking about or selection of learning materials in this and other courses that you will teach in the future.*
- *Describe any planned or actual papers, presentations, publications, or other professional activities that you expect to produce that reflect your work on this project.*

We plan to present our project outcome in AAPT (Association of American Physics Teachers) or Georgia Academy of Science Annual meeting in 2019.

6. Description of Photograph

- *On the Final Report Submission page, you will be submitting a photo. In this document, list the names of the people shown in this separately uploaded photograph, along with their roles.*



First row #1 from right: Dr. Liqiu Zheng – PI

First row #3 from right – Dr. Arun Saha – Co-PI