Affordable Learning Georgia Affordable Materials Grants  
Transformation Grants Final Report

*(or Textbook Transformation Grants, if R17 or earlier)*

Once you have completed this template, to submit your Final Report, go to the [Final Report submission](https://survey.zohopublic.com/zs/xTCCvG) form.

The final report submission form allows you to submit the following:

* This completed narrative document (required)
* Syllabus or syllabi (required)

*If multiple files, compress into one .zip folder*

* Qualitative/Quantitative Measures data files (optional, as needed)

*If multiple files, compress into one .zip folder*

* Photo of your team or a class of your students for future ALG promotions (optional)
* Invoice for the second half of the grant’s award amount (optional)

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: 12/17/2025**

**Grant Round: 26**

**Grant Number: 728**

**Institution Name(s): Georgia Gwinnett College**

**Project Lead: Qing Shao**

**Team Members (Name, Title, Department, Institutions if different, and email address for each): Zengjun Chen, Physics,** [**zchen1@ggc.edu**](mailto:zchen1@ggc.edu)**; Lijun Pang, Physics, lpang@ggc.edu; Sherita Moses, Physics,** [**smoses2@ggc.edu**](mailto:smoses2@ggc.edu)**; Tae Lee, Physics,** [**taeslee@ggc.edu**](mailto:taeslee@ggc.edu)**; Paul Camp, Physics,** [**pcamp@ggc.edu**](mailto:pcamp@ggc.edu)**; Indrajit Sen, Physics, isen@ggc.edu.**

**Course Name(s) and Course Numbers: Physical Science, PSCI 1102**

**Semester Project Began: Fall 2024**

**Final Semester of Implementation: Fall 2025**

**Total Number of Students Affected During Project: 69**

# Narrative

* 1. *Describe the key outcomes, whether positive, negative, or interesting, of your project. Include:*
* *Summary of your transformation experience, including challenges and accomplishments*
* *Transformative impacts on your instruction*
* *Transformative impacts on your students and their performance*
  1. *Describe lessons learned, including any things you would do differently next time.*
  2. *Describe any materials you created or revised/remixed that will be shared with the public. Include the* [*open license your materials will be shared under*](https://creativecommons.org/share-your-work/)*—for most materials, this will be an Attribution 4.0 License (CC BY) as required in the Grants Request for Proposals.*

**In the proposal, the project’s goals were set as follows:**

**Goal for Student Savings: To adopt OpenStax Astronomy 2e in GGC’s Physical Science II course (PSCI1102) at no cost**

**Goal for Student Success: To assess the impact of open-access materials on students’ overall academic performance and student retention in the PSCI 1102 course**

**Goal for Materials Creation: To tailor-make open-access class materials including lecture videos, class activities, and projects**

**Goal for Pedagogical Transformation: To create auxiliary materials to support the active learning environment, such as Flipped Classroom and inquiry-based learning**

**After a year, we have achieved the following key outcomes.**

1. **The team completely adopted free OpenStax Astronomy 2e textbook in PSCI1102 with the theme solar system at Georgia Gwinnett College (GGC). We implemented in 1 section in summer 2025 and 2 sections in Fall 2025.**
2. **The team recorded a total of 15 lecture videos for the course that cover the following topics: science and the Universe, history of astronomy, orbits and gravity, earth, moon and sky, radiation and spectra, astronomical instruments, Other Worlds: An Introduction to the Solar system, Earth as a Planet, Cratered Worlds, Earthlike Planets: Venus and Mars, The Giant Planets, Rings, Moons and Pluto, Comets and Asteroids: Debris of the Solar System, Cosmic Samples and the Origin of the Solar System, and Life in the Universe. (The list of lecture video links is attached)**
3. **The team provided end-semester surveys to students for their opinions of the adoption and created materials. (Survey report is attached)**
4. **Provided a comprehensive package of course materials including PowerPoint slides, lecture videos, Projects and activities for future PSCI1102 courses at GGC or other USG (University System of Georgia) institutions. Other colleagues can directly use the materials created in their courses. (All materials except videos, due to the large size, are attached)**
5. **Students pay $0 for the textbook, videos, and other materials. This will greatly reduce the financial burden on many students. (Shown in the survey report)**
6. **Most students taking the course favor the adoption of OpenStax. (Shown in the survey report)**
7. **Students’ performance in the course is not sacrificed due to the adoption. The pre- and post-test comparison is attached to justify the statement.**

**All team members agree that students have responded positively to the adoption of OpenStax. This is not only due to the cost savings but also because the materials provided offer a learning experience comparable to traditional resources. Many students have expressed appreciation for the accessibility of lectures and lab videos, which they can view at their convenience, especially helpful during exam preparation. Since implementing the new materials, we’ve observed a decline in both course withdrawals and failures. As shown in the table below, the failure rate has dropped by 2%, and the withdrawal rate has decreased by 5%.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Fall 2024 and Spring 2025** | | **Summer 2025 and Fall 2025** | |
| Number of students | Percentage | Number of students | Percentage |
| Students Enrolled | 96 |  | 52 |  |
| F/D/FN/WF | 10 | 10% | 4 | 8% |
| W | 5 | 5% | 0 | 0% |

**From the instructors' perspective, developing the new materials has introduced us to various new tools, including video editing software. This project has also helped standardize the teaching materials across all sections of PSCI1102 with the theme Solar Astronomy, ensuring that students experience a consistent learning environment regardless of the section they are enrolled in.**

**In the meantime, the team is also aware of some issues that could be resolved to improve the future students’ learning experience:**

**1) We should develop a mechanism to ensure students watch the videos before each class session, such as requiring reflections after watching lecture videos and encourage them to rewatch them to enhance their understanding and overall learning experience.**

**2) We need to collect more data to make a thorough comparison with the commercial materials.**

**Upon the completion of the project, the following materials will be shared on the D2L platform and other platforms, if necessary:**

* **15 Lecture videos.**
* **15 Lecture presentations.**
* **1 project requirement.**
* **12 class activities.**

# Quotes

*Provide three quotes from students evaluating their experience with the no-cost learning materials.*

*“***I liked the course a lot. The professor was knowledgeable and made it engaging with videos and supplemental material.”**

**“This course was easy but also had a good level of difficulty. I learned a lot and I was given the tools to help me accomplish my goals.”**

**“a great course, and the textbook was free.”**

# Quantitative and Qualitative Measures

## 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: \_\_\_69\_\_\_\_

* Positive: \_\_58\_\_\_\_\_ % of \_\_\_45\_\_\_\_\_ number of respondents
* Neutral: \_\_36\_\_\_ % of \_\_\_45\_\_\_\_\_ number of respondents
* Negative: \_\_\_6\_\_\_ % of \_\_\_45\_\_\_\_\_ number of respondents

**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:

* \_X\_\_ 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?**

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

\_\_\_\_8\_\_\_% of students, out of a total \_\_\_52\_\_\_\_ students affected, dropped/failed/withdrew from the course in the final semester of implementation.

Choose One:

* \_\_x\_ 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)

## 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.*

**The quantitative measures have been carried out through tests during the period of the project. The end-semester survey was done in the last semester. The results are attached (ALG data.xlsx and survey report.pdf). We will need more student survey data in the future semesters.**

# 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.*

**The Department of Physics and Pre-Engineering at GGC will continue to use the newly developed course materials in future sections of PSCI 1102 (theme Solar System). All resources—including PowerPoint slides, videos, and assessments—are stored on the D2L system or MS Teams. The team will regularly update the slides, incorporate new topics into the lecture videos, and gather ongoing student feedback to further enhance the course.**

# Future Affordable Materials 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.*

**The most significant impact this course design experience has had on me is having a high quality free online textbook being updated regularly to keep up with the new discovery and development in Astronomy and the realization that an instructor can create a fully customized course tailored to both their teaching style and the students’ backgrounds. This approach not only reduces costs for students but also enhances their overall learning experience. Unlike commercial textbooks, which often impose constraints on topics and homework content, a custom-designed course offers greater flexibility.**

**In the future, I plan to use selected OpenStax in physics, physical science and other courses because of its flexibility and adaptability to an instructor’s preferences. However, I also remain open to exploring other similar resources or even developing new materials from the ground up when needed.**

# Future Scholarship Plans

*Describe any planned or actual papers, presentations, publications, or other professional activities that you expect to produce that reflect your work on this project.*

**The team will thoroughly analyze the data collected over the past few semesters to identify any correlations between student learning outcomes and the materials we developed. The findings will be shared in meetings or presented at conferences. Moving forward, we will make incremental improvements informed by ongoing observations to drive meaningful results.**

# Description of Photograph (optional)

*This is where a team can list the names of the people shown in this separately uploaded photograph, along with their roles, if applicable.*