

Affordable Learning Georgia Textbook Transformation Grants

Final Report (Round 2)

Date: December 15, 2015

Grant Number: 125

Institution Name(s): University of North Georgia

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Project Lead: Mr. Michael Goodroe

Course Name(s) and Course Numbers:

Foundations for College Algebra - Math 0989, Intermediate Algebra - Math 0099,
College Algebra - Math 1111, Math 1113 – Pre-Calculus, Math 1450 – Calculus I

Semester Project Began: Fall 2015

Semester of Implementation: Fall 2015

Average Number of Students per Course Section: 19

Number of Course Sections Affected by Implementation: 8

Total Number of Students Affected by Implementation: 152

1. Narrative

- Overall positive outcomes

Accomplishments:

- Transitioned eight classes which formerly used hard-copy textbooks to on-line textbooks and course materials.
- Development of faculty websites which included all course materials, daily uploaded Smartboard notes, copies of quizzes/activities/assignments/exams, handouts, and syllabi.
- Use of UNG IT survey tool to gain student feedback.

Challenges:

- Creating faculty websites so students have a central on-line source to course materials.
- Developing a “content” outline for students to follow the progression of sections using the on-line textbooks
- Finding a “single” on-line textbook which was similar to the hard-copy textbook used on campus.
- No single on-line textbook has the materials needed as required by the university’s course syllabi.
- Requiring students to use more than one source of on-line materials increased their confusion level and overall performance.
- Some students had difficulty “finding” materials on the website.

- Daily updating/maintenance of website is very demanding.
- Practice must be printed out, copied, and handed out during class for additional student practice sets.
- Class activities are graded and students are provided feedback constantly with solutions that are posted online daily.
- Raising students' expectations for a course after they learn that they are not required to buy a textbook for that course.

Transformative impacts on instruction:

- Generally positive acceptance by student.
- Once on-line textbooks were selected and faculty websites were completed, classes ran smoothly.
- No real issues brought to our attention from students by using on-line texts and materials.
- One on-line text, which resides on a college math departmental server, occasionally goes off-line causing access by students difficult.

Transformative impacts on students and their performance

- Mindset transition from hard-copy textbooks to on-line. There is a comfort level perceived by students using hard-copy textbooks.
- Some students expressed difficulty in “finding” various materials on faculty websites.
- General acceptance by most students of on-line materials.

Lessons Learned

- Given what was learned during our Round 1 grant trial, we tried using fewer on-line textbooks per course.
- Provide more “supportive” materials, which expand on the concepts covered in the textbooks.
- Continue to upload daily notes to course website for student reference.
- Conduct more feedback surveys to determine issues students may be having.
- Set student expectations toward learning from on-line recourses.

List of Resources Used in the Textbook Transformation

Math 0989 - Foundations for College Algebra: <http://faculty.ung.edu/mgoodroe/CRN6964.html>

- College of the Sequoias –Pre Algebra <https://www.cos.edu/Faculty/rossr/Pages/Math-360-PreAlgebra.aspx>
- College of the Redwoods - Intermediate Algebra [\(http://www.wtamu.edu/academic/anns/mps/math/mathlab/beg_algebra/](http://www.wtamu.edu/academic/anns/mps/math/mathlab/beg_algebra/)
- West Texas A & M University - Beginning Algebra http://www.wtamu.edu/academic/anns/mps/math/mathlab/int_algebra/index.htm
- West Texas A & M University - Intermediate Algebra <http://msenux.redwoods.edu/IntAlgText/>
- Kuta Software – <http://kutasoftware.com>

Math 0099 - Intermediate Algebra: <http://faculty.ung.edu/mgoodroe/CRN6967.html>

- College of the Sequoias – Intermediate Algebra <https://www.cos.edu/Faculty/jonb/Pages/Math-230-Intermediate-Algebra.aspx>
- West Texas A & M University – Intermediate Algebra http://www.wtamu.edu/academic/anns/mps/math/mathlab/int_algebra/index.htm
- College of the Redwoods – Intermediate Algebra <http://msenux.redwoods.edu/IntAlgText/>
- Kuta Software – <http://kutasoftware.com>

Math 1111 - College Algebra: <http://faculty.ung.edu/bkidane/courses.html>

- Open Resource College Algebra free e-book link:
 - <http://www.stitz-zeager.com/szca07042013.pdf> (Main Text Book: by Stitz and Zeager)
- West Texas A & M University – College Algebra http://www.wtamu.edu/academic/anns/mps/math/mathlab/col_algebra/index.htm (free online resource **under fair use**)
- Larry Green's Applet Page <http://www.ltconline.net/greenl/java/index.html> (licensed under a Creative Commons License)
- Khan academy at: <http://www.khanacademy.org>
- YouTube at: <http://www.youtube.com>
- Kuta Software – <http://kutasoftware.com>
- <http://www.mathwarehouse.com/algebra/>
- <http://www.ltconline.net/greenl/java/index.html>
- <http://flashytrig.com/intro/teacherintro.htm> (Animations)

Math 1113 – Pre-Calculus: <http://faculty.ung.edu/bkidane/courses.html>

- Open Resource Pre-Calculus free e-book link:
 - <http://www.stitz-zeager.com/szct07042013.pdf> (Main Text Book: by Stitz and Zeager)
- Trigonometry Open resource book by Michael Corral (Secondary Text)
- West Texas A & M University – College Algebra http://www.wtamu.edu/academic/anns/mps/math/mathlab/col_algebra/index.htm
- Larry Green's Applet Page <http://www.ltconline.net/greenl/java/index.html> (licensed under a Creative Commons License)
- Khan academy at: <http://www.khanacademy.org>
- YouTube at: <http://www.youtube.com>
- Kuta Software – <http://kutasoftware.com>
- <http://www.mathwarehouse.com/algebra/>
- <http://www.ltconline.net/greenl/java/index.html>
- <http://en.wikibooks.org/wiki/Trigonometry>
- <http://flashytrig.com/intro/teacherintro.htm> (Animations)
- <http://www.sosmath.com/trig/trig.html>

Math 1450 – Calculus I: [http://faculty.ung.edu/jallagan/Current courses.html](http://faculty.ung.edu/jallagan/Current%20courses.html)

- Open Resource Calculus free e-book link:
<http://faculty.ung.edu/jallagan/Courses%20materials/Math%201450%20Calculus%201/Syllabus%20and%20ebook/TextBook%20Active%20Calculus.pdf>
- Supplemental material:
 - <http://faculty.ung.edu/jallagan/Courses%20materials/Math%201450%20Calculus%201/Syllabus%20and%20ebook/problems%20and%20solutions%20for%20calculus%201.pdf>
 - <https://en.wikibooks.org/wiki/Calculus> (Calculus Wiki-book)
 - <http://tutorial.math.lamar.edu> (Paul's Online Math Notes)
 - <http://archives.math.utk.edu/visual.calculus/> (Tutorial)
 - <http://www2.latech.edu/~schroder/animations.htm> (Animations)
 - <https://www.math.ucdavis.edu/~kouba/ProblemsList.html> (Tutorial)

2. Selected Student Feedbacks

- My experience using online materials this semester has been great. I like using the online textbook because it is at no cost and it really helped me out for having to buy all the other books for my other classes. The online text material gave really good examples and clear instructions on how to do the math that I was taking. The only thing that I disliked was there was one time where I could not access the book because of a technical difficulty; however, this did not last long. I would actually prefer an online text book for math class because it helps me pay attention better. I would not prefer an online one for a class such as literature, because if I were to have to read something like a story, I would rather have a textbook.
- This semester, instead of using a textbook, I was allowed to use online resources provided by the teacher. With this, I believe I have learned as much (and possibly more) from the Internet than I could have with a book.

However, because it is online, the only downside was that I had to have a computer to access the websites. But, because technology is available at my house and at the library, it was rarely a problem going to the online textbook.

Additionally, since we are allowed to use an online textbook, I saved an amazing amount of money. For some classes, an expensive textbook is required, but the students rarely use it. I do not believe that is anyone's fault, but it is very nice to not have to pay money for a textbook.

In conclusion, I believe having an online textbook is as efficient and possibly more than buying a textbook.

- Personally, I enjoyed having an online textbook and assignments. It took financial pressure off of me by not having to buy another book and it was very easily accessible. It was hard at times to use the online book to copy problems and such. I find it easier to do with a paper-back book. Overall, I would rather have an online textbook over a paperback.

3. Quantitative and Qualitative Measures

A. Pass, Fail, and Withdrawal (PFW) Expected Outcomes (*This expectation is projected mainly based on students' performances prior to Grant implementations*)

- Percent pass greater than or equal to:
 - Beginning (Foundations) & Intermediate Algebra 50 %
 - College algebra 60%
 - Pre-Calculus 60%
 - Calculus 1 54%
- Percent fail less than or equal to:
 - Beginning (Foundations) & Intermediate Algebra 35%
 - College Algebra 25%
 - Pre-Calculus 19%
 - Calculus 1 18%
- Percent withdrawn strictly less than:
 - Beginning (Foundations) & Intermediate Algebra 15 %
 - College Algebra 15%
 - Pre-Calculus 21%
 - Calculus 1 28%

In the spring of 2015, compared to the projected Pass Fail and Withdrawal excepted outcomes:

- The percentage of pass in:
 - Foundations and Intermediate Algebra shows a drop of 19%.
 - College Algebra shows a drop of about 2%.
 - Pre-Calculus is about the same
 - Calculus 1 shows a drop of about 7%
- The percentage of fail in:
 - Foundations and Intermediate Algebra shows an increase of 11%.
 - College Algebra shows a decrease of about 8%.
 - Pre-Calculus shows a decrease of about 2%
 - Calculus 1 shows a decrease of about 11%
- The percentage of withdrawal in:
 - Foundations and Intermediate Algebra shows an increase of 8%.
 - College Algebra shows an increase of 10%.
 - Pre-Calculus shows an increase of about 1%
 - Calculus 1 shows an increase of about 20%

B. Students Overall Performance

Rubrics (**number** and **percentage** of students) for the **Pass/Fail and Withdrawal (PFW)** for Foundations and Intermediate Algebra, College Algebra, Precalculus and calculus

| Course Text Book | Semester Year | Total No. Stud./class Registered | Pass in % | Fail a grade of D or less in % | Withdraw in % |
|---|-------------------------------------|---|----------------------|---|--------------------------|
| Beginning & Intermediate Algebra | Fall 2013 | 109 | 64.2% | 31.2% | 4.6% |
| | Spring 2014 | 63 | 41.3% | 46.0% | 12.7% |
| | Spring 2015 (Free OER) | 51 | 41.2% | 39.2% | 19.6% |
| Foundations & Intermediate Algebra | Fall 2015 (Free OER) | 75 | 30.7% | 46.7% | 22.7% |
| College Algebra | Spring 2014 | 31 | 67.7% | 12.9% | 19.4% |
| | Fall 2014 | 62 | 64.5% | 27.4% | 8.1% |
| | Spring 2015 (Free OER) | 58 | 51.7% | 29.3% | 19.0% |
| | Fall 2015 (Free OER) | 56 | 58.9% | 16.1% | 25% |
| | Spring 2014 | 62 | 58.1% | 16.1% | 25.8% |
| | Fall 2014 | 64 | 59.4% | 31.2% | 9.4% |
| | Spring 2015 | 64 | 59.4% | 9.3% | 31.3% |
| | Fall 2015 (Free OER) | 23 | 60.9% | 17.4% | 21.7% |
| Calculus I | Spring 2014 | 31 | 71% | 12.9% | 16.1% |
| | Fall 2014 | 31 | 42% | 16.1% | 41.9% |
| | Spring 2015 | 30 | 50% | 23.3% | 26.7% |
| | Fall 2015 (Free OER Combined) | 54 | 46.3% | 5.6% | 48.1% |

C. Student survey feedback using <https://forms.ung.edu/view.php?id=183960>

The main objective of the survey was to get some idea about:

- Student’s mathematics textbook expenses
- How students meet their financial expenses
- Student’s preference about books; hard copy (which always comes with a price tag) versus web based e-books which could come free of charge

Fall 2015 survey feedbacks collected from Foundations and Intermediate Algebra, College Algebra, Precalculus and calculus

Total number of students participated in the survey is **79**

Shown below are some results of the survey in **percent**:

| Question | Yes | No |
|---|-----|-----|
| ▪ Do you receive financial aid, which covers the cost of textbooks? | 51% | 48% |

| Question | Hard Copy Textbook | On-line Textbook |
|--|--------------------|------------------|
| ▪ Given the choice between using a required "hard" copy textbook which has a cost or using an "on-line" textbook which is free, I would prefer using | 21.5% | 77.22% |

| Question | Strongly Disagree | Disagree | Neither Disagree Nor Agree | Agree | Strongly Agree |
|---|-------------------|----------|----------------------------|--------|----------------|
| ▪ I would prefer using online course materials at no cost to me which would include the course textbook, practice sets, further infestations, etc. even though the sources may be contained on different websites on the Internet | 3.8% | 5.06% | 11.39% | 31.1% | 48.1% |
| ▪ I do not anticipate technical or access problems using online course materials. | 3.8% | 8.86% | 27.85% | 35.44% | 24.05% |

4. Sustainability Plan

- We will continue to offer Foundations, College Algebra, Pre-Calculus, and Calculus I courses currently taught by professors Allagan, Kidane , and Goodroe through the next academic year. We will also continue to update course materials and continually review on-line textbook options as appropriate.

5. Future Plans.

- We will consider creating on-line homework exercises using D2L(Desire to learn)
- In order to expand our ALG grant efforts, we note that our colleagues want the use of “Webassign” or “MyMathLab” for automatic grading of problem sets. Thus, there needs to be investigations done to determine the connection between on-line textbooks and publishers’ propriety math support tools.

6. Description of Photograph

From Left to Right: **John Williams, Michael Goodroe, Julian Allagan, and Berhanu Kidane**

