

Application Details

Manage Application: ALG Textbook Transformation Grant

Award Cycle: Round 4

Internal Submission Deadline: Monday, September 7, 2015

Application Title: 159

Submitter First Name: Zephyrinus

Submitter Last Name: Okonkwo

Submitter Title: Professor

Submitter Email Address: Zephyrinus.Okonkwo@asurams.edu

Submitter Phone Number: 229-430-1833

Submitter Campus Role: Proposal Investigator (Primary or additional)

Applicant First Name: Zephyrinus

Applicant Last Name: Okonkwo

Co-Applicant Name(s): Anilkumar Devarapu

Applicant Email Address: Zephyrinus.Okonkwo@asurams.edu

Applicant Phone Number: 229-430-1833

Primary Appointment Title: Professor of Mathematics

Institution Name(s): Albany State University

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

- 1.Zephyrinus C. Okonkwo, Ph.D., Professor of Mathematics Department of Mathematics and Computer Science zephyrinus.okonkwo@asurams.edu
- 2.Anilkumar Devarapu, Ph.D., Assistant Professor of Mathematics , Department of Mathematics and Computer Science anilkumar.devarapu@asurams.edu

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

Syed Roosta, Ph.D.,

Professor and Chair of the Department of Mathematics and Computer Science

Albany State University

Proposal Title: 159

Course Names, Course Numbers and Semesters Offered:

Basic Statistics,

MATH 2411,

Fall, Spring, and Summer

Final Semester of Instruction: Spring 2016

Average Number of Students per Course Section: 35

Number of Course Sections Affected by Implementation in Academic Year: 8

Total Number of Students Affected by Implementation in Academic Year: 260

List the original course materials for students (including title, whether optional or required, & cost for each item): Title: Elementary Statistics: A Step-by-Step Approach with Formula Card 9th Edition, Author: Bluman, McGraw Hill Publishers, Required.
Buy New : \$254.93; Buy Used: \$191.27
Rent New : \$188.65; Rent Used: \$137.67
TI-84 Plus Graphing Calculator: \$125.00

Proposal Categories: No-Cost-to-Students Learning Materials

Requested Amount of Funding: \$10,800

Original per Student Cost: \$262.67 - \$379.93

Post-Proposal Projected Student Cost: \$ 0.00

Projected Per Student Savings: \$262.67 - \$379.93

Plan for Hosting Materials: D2L

Project Goals:

- To eliminate financial cost of textbook and other course related materials to students by providing no-cost course materials, software, and online free textbook
- Enhance student engagement in the learning of MATH 2411-Basic Statistics, and improve student success in the course.
- Stimulate student interest in the use technology in the solution of real life problems encountered in statistics.
- Increase enrollment of students in the course through the provision of no-cost textbook and course materials.

Statement of Transformation:

For more than fifteen years, most of our students have been finding it difficult to purchase class textbooks due to rising cost of textbooks and learning materials. Our MATH 2411-Basic Statistics text is very expensive and most students are unable to buy and use it. This has reduced student success rate in the classes as well students' ability to have deep content knowledge of the concepts learned in the course and their applications in real life. Textbook cost has reduced the number of students taking the course. Developing this no-cost instructional and assessment materials with free online textbook, will increase student understanding and interest in the course.

We will develop 50 to 70 pages of reading material which will encompass all adequate content learning materials, including study guide, and assessment materials needed for the course. This way every student taking the course will be able to read the whole material and do the appropriate course assessments. The course materials we will develop will be connected with the free textbook.

MATH 2411 requires the coverage of certain topics and concepts while still allowing instructors the flexibility to adapt certain materials to meet the outcomes of certain disciplines and cohorts of students. During our preparation of this course material, we shall consult colleagues within our department and other faculty members teaching statistics courses in other units and departments, seek their inputs and recommendations, and adopt their recommendations. This way these other instructors could adopt this textbook for teaching their students, thereby reducing the costs as well.

We plan to adopt the best practices in pedagogy and learning. Dr. Devarapu and Dr. Okonkwo will adequately explore and develop seamless learning materials, including statistical simulation, which will attract student interests. All faculty members who will use the course material will have the freedom to use pedagogical methods that most fit their teaching styles as well as the learning styles of their students. Students will have seamless access to the

course materials and free online textbook, including having access on their mobile devices any time, any day.

Transformation Action Plan:

This project will require some changes in syllabus. However, there will be no change in goal of the course, course learning outcomes, and specific objectives of the course. There will be pedagogical changes which will be adopted across the course. MATH 2411- Basic Statistics is presently taught in class only. It has minimum online content. The course materials which will be developed through this project as well as all assessment materials will be placed in D2L. Furthermore, some assessments, including some tests will be placed in D2L as deemed necessary and convenient by individual instructors. We will integrate the Open-Source RStudio server in the course and students will be able to do their homework and exams using it. This gives instructors the flexibility to choose how best to teach their course. The finished products will be in Word, Latex, and pdf.

Dr. Zephyrinus Okonkwo and Dr. Devarapu will discuss the outline of the development of this course material with faculty within the department as well as faculty members teaching Statistics for Business, and Statistics for Social Sciences. These instructors will be invited to suggest possible statistical projects appropriate in their disciplines. Such projects will be developed and incorporated as part of the textbook.

Dr. Robert Owor will serve as the external reviewer. Although he holds a PhD in Computer Science and Software Engineering, he has very deep understanding of Statistics and its applications. He has taught MATH 2411 in the past. He will examine the appropriateness and relevance of the content, pedagogy, and adequate alignment of the content of the textbook with the course learning outcomes.

Quantitative & Qualitative Measures: We will examine the effectiveness of no-cost textbook and learning materials on student learning using quantitative and qualitative methods. Using the R software, we shall perform statistical data analysis of the student performance in the course using the no-cost textbook verses the performance of those using the formal textbook. Since all students in the non-cost textbook classes will have free online textbooks and other course materials available to them, we predict that in-depth learning will take place and students in the no-cost textbook will outperform those who use the formal textbook. Three qualitative measures will be used. First, there will be discussion sessions with students using the no-cost textbook and their input adequately recorded and analyzed. A Likert-type will also be administered to the students, and results analyzed. Furthermore, instructors teaching the course using the no-cost textbooks will interviewed, and their experiences and input recorded. Those faculty members will be invited to present additional input in writing. These results and feedback will subsequently be used for project improvement.

Timeline:

10/12/15: Attend required ALG training

10/31/15 : Search open source textbook and course materials

11/30/15: Prepare syllabus redesign

12/15/15: Set up online R studio server

1/12/16: Classes begin and the team introduces open source course material and syllabus

2/18/16: Quantitative data collection-Test one comparison: Formal Textbook vs. no-cost material

3/10/16: Quantitative data collection-Test two comparison: Formal Textbook vs. no-cost material

3/4/16: Qualitative data collection-Discussion forum comparison and participant survey

3/11/16: Midterm grades due

3/15/16: Submission of mid-semester report

4/8/16: Quantitative data collection-Test three comparison: Formal Textbook vs. no-cost material

4/28/16: Quantitative data collection-Test four comparison: Formal Textbook vs. no-cost material

5/4/16: Qualitative data collection-Discussion forum comparison and participant survey

5/13/16: Final grades due

5/31/16: Submission of final report

Budget:

Dr. Okonkwo--\$5000 for the selection and preparation of the no-cost course materials, redesign of syllabus, and collection and analysis of associated data.

Dr. Devarapu--\$5000 for the selection and preparation of the no-cost course materials, collection and analysis of associated data, and the setting up of the Open-Source RStudio Server.

\$800- for overall project expenses, including travel to attend a required ALG grant kickoff meeting.

Sustainability Plan:

MATH 2411 is offered every semester at Albany State University. The course material will be offered to faculty members in the format they choose. The textbook and all support material will be placed on a link <http://anil.asurams.edu> for our faculty members. Students will have the opportunity to download the pdf version on D2L. Furthermore, our instructors can download the whole instructional materials and textbook from D2L as well as from <http://anil.asurams.edu>.

From: Dr. Seyed Roosta, Professor of Computer Science
Chair, Department of Mathematics and Computer Science
Re: Grant Application for Statistics Learning Materials
Date: September 3, 2015

I am very glad to write this letter in support of two faculty members, Dr. Zephyrinus Okonkwo and DR. Anilkumar Devarapu, who have applied for an Affordable Learning Georgia grant to develop a no-cost textbook for students taking statistics courses at Albany State University. For many years, the cost of textbooks have continued to rise, and today the cost of a mathematics, statistics, or computer science textbook is more than fifty percent above what it was six years ago. Yet textbook cost continues to rise. Since coming on board at Albany State University, I have negotiated textbook cost reduction with several publishers, yet the costs continue to rise unhindered. By developing no-cost textbook for our students, Dr. Okonkwo and Dr. Devarapu will be making available to our students a much needed help, and more students will be able to enroll in MATH-2411-Basic Statistics.

Drs. Okonkwo and Devarapu will consult with other faculty members who teach statistics related courses within and outside of the Department of Mathematics and Computer Science.

The Department of Mathematics and Computer Science will support this no-cost textbook development, and we will also help disseminate the textbook. It is our goal to share this textbook with faculty members in the College of Business as well as faculty members in the College of Arts and Humanities who are teaching statistics and application courses. Essentially, students at Albany State University could save up to nine-hundred thousand dollars a year.

I am very glad that Dr. Okonkwo and Dr. Devarapu are developing this no-cost textbook for statistics, and I strongly support their application and subsequent award of an Affordable Learning Georgia grant. The department will provide necessary resources to facilitate their activities. We will monitor the implementation process and if successful will recommend use of the same materials and teaching strategy in all sections of Basis Statistics.

Sincerely Yours,



Seyed Roosta, Ph.D.

Re: Grant Application for Statistics Learning Materials

Date: September 3, 2015

Dear Sir/Madam

I am most pleased to write this letter in support of two of my colleagues, Zephyrinus Okonkwo and Anilkumar Devarapu, who have applied for an Affordable Learning Georgia grant to develop a no-cost textbook for students taking statistics courses at Albany State University. As you are aware, the cost of textbooks have continued to rise, and mathematics and statistics textbooks seem to be the most expensive textbooks used by our students. A student taking five mathematics and statistics courses a semester could spend \$1500 on textbooks alone. Essentially, the cost of textbooks have continued to hinder student enrollment in certain courses including statistics.

By developing this no-cost textbook for our students, Drs. Okonkwo and Devarapu will be doing an enviable job for our students and university. The books will save a lot of money for our students, and many students can then afford to enroll in MATH 2411-Basic Statistics.

Drs. Okonkwo and Devarapu's no-cost textbook development plan is also more encompassing. They will receive input from other statistics instructors including those of us who teach statistics and its applications outside the Department of Mathematics and Computer Science. I plan to give them my input as well.

This no-cost textbook will also save the College of Business students a lot of money. As the main Statistics for Business instructor, my colleagues and I will adopt this textbook as well, thereby increasing the number of students using the textbook by 220 every year.

I am very excited that Drs. Okonkwo and Devarapu are developing this no-cost textbook for statistics, and I strongly support their application for an Affordable Learning Georgia grant.

I can be reached for further information at 229-430-4723.



Amaechi N. Nwaokoro, Ph.D.

Professor of Economics.



Sign in to RStudio

Username:

Password:

Stay signed in

Sign In



File Edit Code View Plots Session Build Debug Tools Help

Go to file/function

statewide.csv x

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1 State,VR,MR,M,W,H,P,S
2 AK,761,9,41.8,75.2,86.6,9.1,14.3
3 AL,780,11.6,67.4,73.5,66.9,17.4,11.5
4 AR,593,10.2,44.7,82.9,66.3,20,10.7
5 AZ,715,8.6,84.7,88.6,78.7,15.4,12.1
6 CA,1078,13.1,96.7,79.3,76.2,18.2,12.5
7 CO,567,5.8,81.8,92.5,84.4,9.9,12.1
8 CT,456,6.3,95.7,89,79.2,8.5,10.1
9 DE,686,5,82.7,79.4,77.5,10.2,11.4
10 FL,1206,8.9,93,83.5,74.4,17.8,10.6
11 GA,723,11.4,67.7,70.8,70.9,13.5,13
12 HI,261,3.8,74.7,40.9,80.1,8,9.1
13 IA,326,2.3,43.8,96.6,80.1,10.3,9
14 ID,282,2.9,30,96.7,79.7,13.1,9.5
15 IL,960,11.4,84,81,76.2,13.6,11.5
16 IN,489,7.5,71.6,90.6,75.6,12.2,10.8
17 KS,496,6.4,54.6,90.9,81.3,13.1,9.9
18 KY,463,6.6,48.5,91.8,64.6,20.4,10.6
19 LA,1062,20.3,75,66.7,68.3,26.4,14.9
20 MA,805.3.9.96.2.91.1.80.10.7.10.9
```

1:1

Text File

Console ~/ ↻

```
> mean(Arnelle$M)
[1] 67.3902
> median(Arnelle$M)
[1] 69.8
> fivenum(Arnelle$M)
[1] 24.00 49.55 69.80 83.95 100.00
> var(Arnelle$M)
[1] 482.1157
> sd(Arnelle$M)
[1] 21.95713
> range(Arnelle$M)
[1] 24 100
> boxplot(Arnelle$M, horizontal = T, col = "pink")
> boxplot(Arnelle$M, horizontal = T)
> hist(Arnelle$M, col = "blue")
> |
```