

## Table of Contents

---

Muse, William - #4006 - 516.....	1
Letter of Support.....	6
Proposal Narrative.....	8

# Application Summary

## Competition Details

---

<b>Competition Title:</b>	Textbook Transformation Grants, Round Sixteen (Spring 2020 - Spring 2021)
<b>Category:</b>	University System of Georgia
<b>Award Cycle:</b>	Round 16
<b>Submission Deadline:</b>	01/13/2020 at 11:59 PM

## Application Information

---

<b>Submitted By:</b>	William Muse
<b>Application ID:</b>	4006
<b>Application Title:</b>	516
<b>Date Submitted:</b>	01/14/2020 at 8:15 AM

## Personal Details

---

<b>Institution Name(s):</b>	Columbus State University
<b>Applicant First Name:</b>	William
<b>Applicant Last Name:</b>	Muse
<b>Applicant Email Address:</b>	muse_william@columbusstate.edu
<b>Applicant Phone Number:</b>	7065078255
<b>Primary Appointment Title:</b>	Professor of Mathematics
<b>Submitter First Name:</b>	William
<b>Submitter Last Name:</b>	Muse
<b>Submitter Email Address:</b>	muse_william@columbusstate.edu
<b>Submitter Phone Number:</b>	7065078255
<b>Submitter Title:</b>	Professor of Mathematics

## Application Details

---

### Proposal Title

516

### Requested Amount of Funding

\$30,000

### Priority Category (if applicable)

Scaling Up OER

**Final Semester:**

Spring 2021

**Course Title(s)**

Elementary Statistics

**Course Number(s)**

STAT 1401

**Team Member 1 Name**

William Muse

**Team Member 1 Email**

muse\_william@columbusstate.edu

**Team Member 2 Name**

Madhusudan Bhandary

**Team Member 2 Email**

bhandary\_madhusudan@columbusstate.edu

**Team Member 3 Name**

Kristin Lilly

**Team Member 3 Email**

seamonlilly\_kristin@columbusstate.edu

**Team Member 4 Name**

Carlos Almada

**Team Member 4 Email**

almada\_carlos@columbusstate.edu

**Additional Team Members (Name and email address for each)****Sponsor Name**

Ben Kamau

**Sponsor Title**

Chair

**Sponsor Department**

Mathematics

**Total Number of Student Section Enrollments Affected by Project in One Academic Year**

741.33

**Average Number of Student Section Enrollments Affected per Summer Semester**

51.33

**Average Number of Student Section Enrollments Affected per Fall Semester**

325.33

### **Average Number of Student Section Enrollments Affected per Spring Semester**

364.67

### **Original Required Commercial Materials (title, author, price, and bookstore or retailer URL showing price)**

For faculty that require a book and a graphing calculator

- Ti 83 Graphing Calculator: \$97.20 on Amazon.com

- Essentials of Statistics, Triola

Ebook: \$44.99 or Paper bound: \$179.99

Total cost for book + calculator: \$142.19 - \$277.19

OR

For faculty that only require an online homework system:

- Pearson Mylab Statistics with Essentials of Statistics, Triola etext along with StatCrunch (instead of a calculator): \$79.99

<https://www.pearson.com/us/higher-education/program/Triola-Essentials-of-Statistics-Plus-My-Lab-Statistics-with-Pearson-e-Text-24-Month-Access-Card-Package-6th-Edition/PGM1985102.html?tab=order>

### **Original Total Cost per Student**

Using book + calculator: \$142.19 - \$277.19 OR Using online homework system: \$79.99

### **Post-Project Cost per Student**

Using book + rental calculator: \$10 OR Using online homework system: \$37.95

### **Post-Project Savings per Student**

Using book + rental calculator: \$132.19-\$267.19 OR Using online homework system: \$42.04

### **Projected Total Annual Student Savings per Academic Year**

Using book + rental calculator: \$97,996 - \$198,075 OR Using online homework system: \$31,166

### **Using OpenStax Textbook?**

Yes

### **Project Goals**

Building on the success of the textbook transformation project undertaken by Dr. Richard Stephens and Dr. Alin Stancu in 2015 through 2016 and the continued use of the materials created by Dr. Stephens in STAT 1401, the department takes the opportunity to scale the project to all sections in STAT 1401 by Fall 2020.

The goals for this project are to:

- Provide no/low-cost-to-students learning materials for all sections of STAT 1401 offered in Mathematics Department.
- Develop easy-to-use teaching and learning materials that focus on real-world applications that increase access to quantitative reasoning experiences for students. The choice and creation of such material will be informed by the Student Learning Outcomes.
- Develop multiple modalities of teaching and learning that are supported by use of technology, Learning Management system D2L and Open Educational Resources for all students.

## **Statement of Transformation**

Depending on faculty preference, course material requirements for our Elementary Statistics students generally fall into two categories. The first requires Triola's paper bound Essentials of Statistics textbook and a graphing calculator. The second uses the online homework system Pearson MyLab Statistics with the Essentials of Statistics etext that includes the statistical software package StatCrunch to do calculations. We propose to switch to no/low cost materials while maintaining flexibility to accommodate faculty preferences.

## **Transformation Action Plan**

For the first group, we propose to switch to the zero cost ebook and provide students with the option of renting calculators from the department for \$10 per semester resulting in a total book and calculator cost of at most \$10 per student. For the second group, we propose to switch to a zero cost ebook with a zero or low cost online homework system along with free online calculators, apps, and software to do calculations. Our preliminary evaluation of available low cost online homework systems revealed that the free OpenStax Introductory Statistics book can be paired with WebAssign for only \$37.95 when purchased directly from WebAssign.com. We also intend to look into WebWork <http://webwork.maa.org/> as a no cost online homework possibility.

During Spring and Summer 2020 the team will invest time identifying, reviewing, and selecting no/low cost textbooks, online homework systems, calculators, apps, and software. Followed by preparing the course for the following fall by redesigning instructional activities to incorporate new materials and setting up and becoming familiar with the new homework system, calculators, apps, and software.

## **Quantitative & Qualitative Measures**

Student satisfaction will be measured with survey questions that will either be included with our usual student evaluations or administered separately using a Qualtrics Survey. Student performance, and course-level retention (drop/fail/withdraw rates) will be analyzed and compared to previous cohorts based on data supplied by our department of Institutional research. The team should have no trouble getting IRB approval if necessary. Dr. Muse and Dr. Lilly have recently received IRB approval four times and so are familiar with the process and have been granted access to data from Institutional Research many times.

## **Timeline**

January 31, 2020: Receive notification of project funding, make travel arrangements for Kickoff Meeting, and after receiving 50% of funding, purchase calculators and make them available for rent.

February 24, 2020: Kickoff Meeting

Spring 2020 – Summer 2020: Identify, review, and select no/low cost textbooks, online homework systems, calculators, apps, and software. Redesign instructional activities to incorporate new materials. Set up and become familiar with new homework system, calculators, apps, and software.

Fall 2020: Begin requiring new materials in all sections of STAT 1401. Continue redesign of instructional activities to incorporate new materials. Collect and study data.

Spring 2021: Continue to use new materials with revision as needed. Collect and study data. Submit final report.

## **Budget**

\$5,000 stipend for Dr. Muse  
\$5,000 stipend for Dr. Bhandary  
\$5,000 stipend for Dr. Lilly  
\$5,000 stipend for Dr. Almada  
\$800 travel  
\$9,200 equipment - (about 92) graphing calculators  
Total: \$30,000

### **Sustainability Plan**

The four faculty members Dr. William Muse, Dr. Madhusudan Bhandary, Dr. Kristin Lilly, and Dr. Carlos Almada have been teaching this Statistic course every spring and fall semester. The four professors will continue to teach sections of this course in the department's 3-year schedule cycle. This will provide significant feedback, reflection and assessment.

The success in this project will be shared through Math Connections seminar and Gateway Math team with the aim of recruiting more faculty to expand the project to other course sections including MATH 1001 Quantitative Skills and Reasoning, MATH 1111 College Algebra and MATH 1101 Mathematical Modeling.

Proceeds from calculator rental will be used to purchase additional graphing calculators and replacement batteries for calculators.

### **Acknowledgment**

---

#### **Grant Acceptance**

[Acknowledged] I understand and acknowledge that acceptance of Affordable Learning Georgia grant funding constitutes a commitment to comply with the required activities listed in the RFP and that my submitted proposal will serve as the statement of work that must be completed by my project team. I further understand and acknowledge that failure to complete the deliverables in the statement of work may result in termination of the agreement and funding.



To: Affordable Learning Georgia, Textbook Transformation Grants

From: Dr. Ben Kamau, Chair and Associate Professor, Mathematics Department

Re: Departmental Scaling for STAT 1401 Elementary Statistics

Date: December 12, 2019

This is to convey my full support for the Affordable Learning Georgia scaling-up project proposed by Dr. William Muse, Dr. Madhusudan Bhandar, Dr. Carlos Almada and Dr. Kristin Lilly.

Dr. Muse, Dr. Bhandary and Dr. Almada are Professors with extensive teaching experience, while Dr. Lilly joined the Mathematics Department as Assistant Professor of Statistics in 2017. Each has several years of experience teaching STAT 1127 Introductory Statistics; recently renamed STAT 1401 Elementary Statistics. Dr. Muse and Dr. Lilly have employed multiple delivery modes in their courses including face-to-face, hybrid and fully online. They have experimented widely with different Online homework platforms, creating instructional material that employ multiple modalities and utilizing Open Educational Resources. Dr. Lilly is a grant recipient for QEP project in 2017, while Dr. Muse has had several mini-grants to support course design. Dr. Bhandary's has had research grants and brings along an active research agenda in Statistics, which will contribute to inform the project. Dr. Almada is has experimented with at-no-cost material for most of his courses and has devised instructional strategies that are supported by Open educational resources.

The scaling-up project and changes they seek to make will benefit our students financially and academically by reducing the cost of their education and tailoring the learning experience to the audience. This project will allow the instructors to provide interactive relationship among the key components of the course as informed by the Student Learning Outcomes; to all students and with consistency. In availing the positive results of this project department-wide, and in variety of formats, other faculty will be encouraged and enabled to modify easily to other course sections including MATH 1111 College Algebra, MATH 1101 Mathematical Modeling and MATH 1001 Quantitative Skills and reasoning. It is envisaged that the success of this project will provide significant feedback, reflection and assessment.

As chair of the Mathematics Department, I commit to supporting the plans identified by Dr. Muse, Dr. Bhandary, Dr. Almada and Dr. Lilly in their project proposal.

Our three-year course rotation schedule will allow all sections of STAT 1401 to be taught by the four instructors multiple times.

On another positive note, Columbus State University is one of the USG institutions that are piloting the Statistics Pathway offering STAT 1401 in Area A2 beginning fall 2020 and Dr. Muse is coordinating this effort. The success of this project will not only extend savings to students but also immensely contribute to success of the pilot of the Statistics Pathway at Columbus State University. Building on the material and success of the ALG textbook grant awarded to Dr. Richard Stephens and Dr. Alin Stancu of Columbus State University in 2015/2016, I am confident that the scaling-up of STAT 1401 department-wide will influence student success and retention significantly.

Sincerely,

A handwritten signature in black ink, appearing to read 'Kamau Ben', written over a horizontal line.

Kamau Ben, PhD.  
Chair and Associate Professor,  
Department Mathematics,  
Columbus State University,  
4225 University Ave,  
Columbus, GA 31907.  
Tel: 706 507 8460  
Email: [Kamau\\_ben@columbusstate.edu](mailto:Kamau_ben@columbusstate.edu)





Textbook Transformation Grants, Round Sixteen  
(Spring 2020 – Spring 2021)  
Proposal Form and Narrative

Notes

- The proposal form and narrative .docx file is for offline drafting and review. Submitters must use the InfoReady Review online form for proposal submission.
- The only way to submit the official proposal is through the online form in Georgia Tech’s InfoReady Review. The link to the online application is on the [Round 16 RFP Page](#).
- The italic text provided below is meant for clarifications and can be deleted.

Applicant, Team, and Sponsor Information

Institution(s)	Columbus State University
Applicant Name	William Brian Muse
Applicant Email	muse_william@columbusstate.edu
Applicant Phone #	(706)507-8255
Applicant Position/Title	Professor and Associate Chair of Mathematics
Submitter Name	
Submitter Email	
Submitter Phone #	
Submitter Position	

	Name	Email Address
Team Member 1	William Muse	muse_william@columbusstate.edu
Team Member 2	Madhusudan Bhandary	bhandary_madhusudan@columbusstate.edu
Team Member 3	Kristin Lilly	seamonlilly_kristin@columbusstate.edu
Team Member 4	Carlos Almada	almada_carlos@columbusstate.edu

Please provide the sponsor’s name, title, department, and institution. The sponsor is the provider of your Letter of Support.

- |   |
|---|
| <ol style="list-style-type: none"> <li>1) Ben Kamau, Chair, Department of Mathematics, Columbus State University</li> <li>2) Annice Yarber-Allen, Dean, Colleges of Letters &amp; Science, Columbus State University</li> <li>3) Deborah Bordelon, Provost and Executive Vice President, Columbus State University</li> </ol> |
|---|

Project Information and Impact Data

<b>Priority Category / Categories</b>	“Scaling Up OER”
<b>Requested Amount of Funding</b>	\$30,000
<b>Course Names and Course Numbers</b>	Elementary Statistics STAT 1401
<b>Final Semester of Project</b>	Spring 2021
<b>Total Number of Student Section Enrollments Affected by Project in</b>	741.33

<b>One Academic Year</b>	
<b>Average Number of Student Section Enrollments Affected per Summer Semester</b>	51.33
<b>Average Number of Student Section Enrollments Affected per Fall Semester</b>	325.33
<b>Average Number of Student Section Enrollments Affected per Spring Semester</b>	364.67
<b>Original Required Commercial Materials</b>	<p>For faculty that require a book and a graphing calculator</p> <ul style="list-style-type: none"> <li>• Ti 83 Graphing Calculator: \$97.20 on Amazon.com</li> <li>• Essentials of Statistics, Triola Ebook: \$44.99 or Paper bound: \$179.99</li> </ul> <p>Total cost for book + calculator: \$142.19 - \$277.19 OR For faculty that only require an online homework system:</p> <ul style="list-style-type: none"> <li>• Pearson Mylab Statistics with Essentials of Statistics, Triola etext along with StatCrunch (instead of a calculator): \$79.99</li> </ul> <p><a href="https://www.pearson.com/us/higher-education/program/Triola-Essentials-of-Statistics-Plus-My-Lab-Statistics-with-Pearson-e-Text-24-Month-Access-Card-Package-6th-Edition/PGM1985102.html?tab=order">https://www.pearson.com/us/higher-education/program/Triola-Essentials-of-Statistics-Plus-My-Lab-Statistics-with-Pearson-e-Text-24-Month-Access-Card-Package-6th-Edition/PGM1985102.html?tab=order</a></p>
<b>Average Price of Original Required Materials Per Student Section Enrollment</b>	Using book + calculator: \$142.19 - \$277.19 OR Using online homework system: \$79.99
<b>Average Post-Project Cost Per Student Section Enrollment</b>	Using book + rental calculator: \$10 OR Using online homework system: \$37.95
<b>Average Post-Project Savings Per Student Section Enrollment</b>	Using book + rental calculator: \$132.19-\$267.19 OR Using online homework system: \$42.04
<b>Projected Total Annual Student Savings Per Academic Year</b>	Using book + rental calculator: \$97,996 - \$198,075 OR Using online homework system: \$31,166
<b>Using OpenStax Textbook?</b>	Yes

## Narrative Section

### 1. Project Goals

Building on the success of the textbook transformation project undertaken by Dr. Richard Stephens and Dr. Alin Stancu in 2015 through 2016 and the continued use of the materials created by Dr. Stephens in STAT 1401, the department takes the opportunity to scale the project to all sections in STAT 1401 by Fall 2020.

The goals for this project are to:

- Provide no/low-cost-to-students learning materials for all sections of STAT 1401 offered in Mathematics Department.
- Develop easy-to-use teaching and learning materials that focus on real-world applications that increase access to quantitative reasoning experiences for students. The choice and creation of such material will be informed by the Student Learning Outcomes.
- Develop multiple modalities of teaching and learning that are supported by use of technology, Learning Management system D2L and Open Educational Resources for all students.

### 2. Statement of Transformation

Depending on faculty preference, course material requirements for our Elementary Statistics students generally fall into two categories. The first requires Triola's paper bound Essentials of Statistics textbook and a graphing calculator. The second uses the online homework system Pearson MyLab Statistics with the Essentials of Statistics etext that includes the statistical software package StatCrunch to do calculations. We propose to switch to no/low cost materials while maintaining flexibility to accommodate faculty preferences.

### 3. Transformation Action Plan

For the first group, we propose to switch to the zero cost ebook and provide students with the option of renting calculators from the department for \$10 per semester resulting in a total book and calculator cost of at most \$10 per student. For the second group, we propose to switch to a zero cost ebook with a zero or low cost online homework system along with free online calculators, apps, and software to do calculations. Our preliminary evaluation of available low cost online homework systems revealed that the free OpenStax Introductory Statistics book can be paired with WebAssign for only \$37.95 when purchased directly from WebAssign.com. We also intend to look into WebWork <http://webwork.maa.org/> as a no cost online homework possibility.

During Spring and Summer 2020 the team will invest time identifying, reviewing, and selecting no/low cost textbooks, online homework systems, calculators, apps, and software. Followed by preparing the course for the following fall by redesigning instructional activities to incorporate

new materials and setting up and becoming familiar with the new homework system, calculators, apps, and software.

#### 4. Quantitative and Qualitative Measures

Student satisfaction will be measured with survey questions that will either be included with our usual student evaluations or administered separately using a Qualtrics Survey. Student performance, and course-level retention (drop/fail/withdraw rates) will be analyzed and compared to previous cohorts based on data supplied by our department of Institutional research. The team should have no trouble getting IRB approval if necessary. Dr. Muse and Dr. Lilly have recently received IRB approval four times and so are familiar with the process and have been granted access to data from Institutional Research many times.

## 5. Timeline

January 31, 2020: Receive notification of project funding, make travel arrangements for Kickoff Meeting, and after receiving 50% of funding, purchase calculators and make them available for rent.

February 24, 2020: Kickoff Meeting

Spring 2020 – Summer 2020: Identify, review, and select no/low cost textbooks, online homework systems, calculators, apps, and software. Redesign instructional activities to incorporate new materials. Set up and become familiar with new homework system, calculators, apps, and software.

Fall 2020: Begin requiring new materials in all sections of STAT 1401. Continue redesign of instructional activities to incorporate new materials. Collect and study data.

Spring 2021: Continue to use new materials with revision as needed. Collect and study data. Submit final report.

## 6. Budget

\$5,000 stipend for Dr. Muse  
\$5,000 stipend for Dr. Bhandary  
\$5,000 stipend for Dr. Lilly  
\$5,000 stipend for Dr. Almada  
\$800 travel  
\$9,200 equipment - (about 92) graphing calculators  
Total: \$30,000

## 7. Sustainability Plan

The four faculty members Dr. William Muse, Dr. Madhusudan Bhandary, Dr. Kristin Lilly, and Dr. Carlos Almada have been teaching this Statistic course every spring and fall semester. The four professors will continue to teach sections of this course in the department's 3-year schedule cycle. This will provide significant feedback, reflection and assessment.

The success in this project will be shared through Math Connections seminar and Gateway Math team with the aim of recruiting more faculty to expand the project to other course sections including MATH 1001 Quantitative Skills and Reasoning, MATH 1111 College Algebra and MATH 1101 Mathematical Modeling.

Proceeds from calculator rental will be used to purchase additional graphing calculators and replacement batteries for calculators.