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Application Summary

Competition Details

Competition Title:	Textbook Transformation Grants, Round Fourteen (2019-2020)
Category:	University System of Georgia
Award Cycle:	Round 14
Submission Deadline:	04/09/2019 at 11:59 PM

Application Information

Submitted By:	Anilkumar Devarapu
Application ID:	3370
Application Title:	454
Date Submitted:	04/09/2019 at 8:23 AM

Personal Details

Institution Name(s):	Albany State University
Applicant First Name:	Zephyrinus
Applicant Last Name:	Okonkwo
Applicant Email Address:	.Okonkwo@asurams.edu
Applicant Phone Number:	2295003575
Primary Appointment Title:	Professor of Mathematics and Interim Dean of College of Arts & Sciences
Submitter First Name:	Anilkumar
Submitter Last Name:	Devarapu
Submitter Email Address:	anilkumar.devarapu@asurams.edu
Submitter Phone Number:	2295002281
Submitter Title:	Associate Professor of Mathematics

Application Details

Proposal Title

454

Final Semester of Project

Spring 2020

Requested Amount of Funding

\$30,000

Type of Grant

Gateways to Completion

Course Title(s)

Quantitative Reasoning

Course Number(s)

MATH 1001

Team Member 1 Name

Zephyrinus C. Okonkwo

Team Member 1 Email

zephyrinus.okonkwo@asurams.edu

Team Member 2 Name

Anilkumar Devarapu

Team Member 2 Email

anilkumar.devarapu@asurams.edu

Team Member 3 Name

Anthony Smith

Team Member 3 Email

anthony.smith@asurams.edu

Team Member 4 Name

Vijay Kunwar

Team Member 4 Email

vijay.kunwar@asurams.edu

Additional Team Members (Name and email address for each)

Laxmi Paudel; laxmi.paudel@asurams.edu

Jeffery Swords; jeffery.swords@asurams.edu

Sponsor Name

Robert S. Owor

Sponsor Title

Professor and Chair

Sponsor Department

Mathematics and Computer Science

Original Required Commercial Materials (title, author, price)

Title: Viewing Life Mathematically;

Authors: Denley, Hall;

Price: \$93.00

Average Number of Students per Course Section Affected by Project in One Academic Year

30

Average Number of Sections Affected by Project in One Academic Year

64

Total Number of Students Affected by Project in One Academic Year

1920

Average Number of Students Affected per Summer Semester

25

Average Number of Students Affected per Fall Semester

1080

Average Number of Students Affected per Spring Semester

840

Original Total Cost per Student

\$93.00

Post-Project Cost per Student

Zero Dollars

Post-Project Savings per Student

\$93.00

Projected Total Annual Student Savings per Academic Year

\$192,510.00

Using OpenStax Textbook?

Yes

Project Goals

1. To eliminate the cost of textbook and other course related materials to students by providing no-cost course materials, software, and free online textbook.
2. To strengthen student engagement in learning of MATH 1001-Quantitative Reasoning, and to enhance student success and achievement in the course.
3. To motivate students' interest in the use of online based technology to solve real-life problems encountered in Quantitative Reasoning
4. To increase enrollment of students' in Quantitative Reasoning through the provision of no-cost textbook and learning materials.
5. To create a standardized online Quantitative Reasoning course by incorporating innovative pedagogy enriched learning resources, and assessments on a scalable instructional delivery platform

Statement of Transformation

Over the past two years, the number of students enrolling in MATH 1001 Quantitative Reasoning course at Albany State University has grown continuously mainly for two reasons. First, due to the consolidation of old Albany State University and Darton State College, MATH 1001 was adopted as a course that could be taken by students to fulfill the math requirement for Area A2. Second, as an alternative math pathway, non-STEM majors can take it to fulfill the math requirement in the core. Most non-STEM freshmen majors are being put in the Quantitative Reasoning course. For example, there were 187 students enrolled in Quantitative Reasoning in fall 2017, which was significantly grown to 551 students enrolled in fall 2018. While only 65 students enrolled in Quantitative Reasoning in spring 2018, 334 students enrolled in the same course in spring 2019. Essentially, a total of 885 students enrolled in Quantitative Reasoning during the 2018-2019 academic year.

The adoption of MATH 1001-Quantitative Reasoning as an alternative math pathway for non-STEM major is enabling increase in the number of students enrolling in the course. Albany State University is expecting about one thousand six-hundred new freshmen to enroll in fall 2019, and more than nine-hundred students are expected to enroll in Quantitative Reasoning. Many of the freshmen will take MATH 1001 course with its co-requisite as well. In addition, Quantitative Reasoning as a gatekeeper course plays a significant role on timely progress of our students. This course deserves to receive substantial amount of focus and attention for two crucial reasons: (i) a lot of our ASU students take this course during their first year, and (ii) their success in this course plays a vital role on overall retention, and hence, on the fulfillment of the ASU mission as an academic institution. As such, Quantitative Reasoning has been chosen as one of the two mathematics courses to be implemented as a part of G2C initiative at ASU. The significance of Quantitative Reasoning course motivated our team to come up with the collaborative effort to develop a no-cost comprehensive material which will have a long-term effect by saving our students a huge amount of money.

The MATH 1001 – Quantitative Reasoning textbook is very expensive. Most students are unable to purchase the textbook, thereby making attaining the course learning outcomes very difficult. Hence, many of our instructors select materials from various sources such as the College Algebra e-book and the Introduction to Statistics e-book for their classes. Lack of access to a standard textbook for the course has reduced student success rate in the course. It has also negatively affected students' ability to engage in productive learning inside and outside the classroom. Hence, students are unable to achieve deep content knowledge of the concepts learned in the course and the applications of such concepts to real life. The development of MATH 1001 Quantitative Reasoning no-cost textbook course will enhance student understanding, engagement, achievement, and interest in the course.

Our team consists of the core faculty members who teach the Quantitative Reasoning course. The team will develop a seventy to ninety-page long organized and comprehensive support/supplemental material; together with OER textbook. This will enhance pedagogy and learning in the course. This way every student taking the course will be able to read the most essential course materials, do the appropriate course assignments, and practice problems. Furthermore, it is most essential that the course have a unified syllabus and textbook for every course section. This will ensure the uniformity and consistency across all sections of Quantitative Reasoning course, which will enhance faculty engagement and overall quality of learning as well.

MATH 1001 requires that instructors demonstrate substantial coverage of topics and concepts while still allowing instructors the flexibility to adapt certain materials and innovative pedagogical techniques to meet course outcomes. Research results indicate that students who take their Math and English courses required in the core during their first year and are also able to pass nine credits in their focus areas have a better chance of graduating in four years than those who do not succeed in the Math and English courses in their first year. ASU data indicates that the Quantitative Reasoning course has a higher pass rate than College Algebra. Consequently, student success in Quantitative Reasoning has a broader ramification on student retention, progression, and degree completion across all majors at Albany State University (ASU).

During our preparation of support course materials, we will consult with our colleagues within our department and other faculty members in other departments, seek their input and recommendations, and adopt their recommendations. We will do this in order to adopt and address more concepts dealing with applications since the majority of Quantitative Reasoning takers are non-STEM majors.

Guided by our experience in the previous successful Affordable Learning Georgia Textbook grants we had garnered, we plan to adopt the best practices in pedagogy, assessment, and learning. Our team will explore and develop seamless learning and assessment materials, including developing and adopting certain problem-solving and simulation software and handheld technology which will enhance student engagement and interest. All instructors teaching the Quantitative Reasoning course will use a common syllabus which will be redesigned through this grant. The Open Education Resource Textbook (OER) we adopt will be used in the syllabus redesign. Instructors will have the freedom to adopt pedagogical methods that most fit their teaching styles as well as the learning styles of their

students. All students will have seamless access to the course materials, including having access on their mobile devices; any time, any day.

Transformation Action Plan

This project will not require any major changes in the syllabus. The course description, goal of the course, course learning outcomes, and specific objectives of the course will remain unchanged. However, a common revised syllabus will be required. There will be an alignment of pedagogy and assessment with the adopted OER textbook. There will be a renewed emphasis on collaboration of project team members, and other faculty members who teach this course. Team members will meet regularly to examine project activities and progress. Through collaboration the team will develop measures which will ensure success of the project as well as effectiveness of the project activities. MATH 1001 and its co-requisite are presently taught through face-to-face on campus and online options. The support materials developed through this project, as well as all assessment materials and other course materials, will be placed on GeorgiaVIEW, the ASU learning platform. Some assignments, including some tests, will be placed in GeorgiaVIEW as deemed necessary and convenient by individual instructors. All Quantitative Reasoning sections will be enhanced by developing and placing additional learning resources on GeorgiaVIEW with exportable capabilities, that is, any faculty can “Copy Course” and customize the course within and outside Albany State University. The final products will be available in Word, LaTeX, and pdf formats.

Dr. Anilkumar Devarapu, Dr. Vijay Kunwar, Professor Anthony Smith, Professor Jeffery Swords, Dr. Laxmi Paudel, and Dr. Zephyrinus Okonkwo will discuss the outline of the textbook and project implementation plan with other faculty members within the department. Faculty members will be invited to suggest possible Quantitative Reasoning projects to further enhance the overall course quality. Such projects will be included in the learning materials we will develop through this grant.

Dr. Li Feng will serve as the project reviewer. He is a Professor of Mathematics and has taught undergraduate and graduate courses in Mathematics for more than twenty-three years. He will examine the appropriateness and relevance of the content, pedagogy, and adequate alignment of the content of the OER textbook with the course learning outcomes.

Quantitative & Qualitative Measures

Our previous grant experience indicates that the activities and materials outlined in this grant proposal will provide instructors and students with the opportunity to take complete control of the course. The emphasis on non-STEM majors taking Quantitative Reasoning course as their required course in area A2, coupled with the advising center and BOR Momentum Year guidelines will ensure that more students will enroll in the course. This course will be a no-cost textbook course. More importantly, the pdf version of the textbook and syllabus will be available on GeorgiaVIEW at least the week before the classes begin. This will enable the instructors to give reading assignments and out-of-class activities from the course package. Instructors teaching Quantitative Reasoning would be able to adopt the textbook and developed package to save a huge amount of money on behalf of students.

Many instructors were unable to receive appropriate pedagogical and assessment support from textbook publishers. In many cases, students were required to pay more money in order to purchase access codes to do their homework. Moreover, in cases one received such support, editing such materials was not permissible. This project will give us an opportunity to develop a stand-alone OER course material which will provide flexibility in instruction, learning, and assessment. Furthermore, we will also develop the course material guide which will provide an easy guidance for instructors. Our department will provide hardcopies to instructors. The course guide will also be reposed on GeorgiaVIEW.

We will adopt both quantitative and qualitative approaches for data collection, assessment, and analysis. We will collect the data during the summer of 2019 and fall of 2019. We will also use the data collected in spring 2019 for benchmark and comparison purposes. During fall 2019, we will designate some sections of Quantitative Reasoning to be in the Control Group while others will be in the Treatment Group. The subsequent quantitative and qualitative data collected will be analyzed and compared accordingly. The results will be used for continuous project improvement. We plan to have full project implementation in spring 2020.

The team members will teach at least 16 sections of Quantitative Reasoning in fall 2019 in which 10 sections will have co-requisites. We will provide other Quantitative Reasoning instructors with the materials developed through this grant, beginning the spring 2020.

Quantitative Measures: The following quantitative data will be collected, compared, and analyzed (control group vs. ALG implementation group):

- Number of students enrolled in the Quantitative Reasoning course (total and average)
- Number of students impacted
- Number of course sections offered
- Retention rates (both in individual sections and aggregate)
- Early drop-out rates
- Withdrawal rates
- Student success rates in pre-test, mid-term test, final test, and end of each semester.
- Mean GPA of students

Collected data will be organized, compared, and analyzed using graphs, descriptive and inferential statistical tools. Other appropriate significance tests such as z-test, t-test, ANOVA etc. will be done for comparative data analysis.

Qualitative Measures: We will use both formative and summative participant Likert-Type surveys, and open-ended interview questions among participant faculty and students to collect qualitative data. The following qualitative data will be collected, compared, and analyzed (control group vs. OER implementation group):

- Quality of the course materials
- Usefulness of the course materials
- Accessibility of the course materials
- Preference or further recommendation of the course materials
- Instructor Opinion Survey on project activities, collaboration, and impact

As stated earlier, the formative assessments will be aimed at receiving feedback from participants, which in turn will be used for project improvement.

Timeline

May 20, 2019: Attend the required Kick-Off meeting at Middle Georgia State University, Macon, Georgia

June 20, 2019: Search, select, and adopt the best open source textbook for Quantitative Reasoning

July 15, 2019: Revise existing syllabus for Quantitative Reasoning and prepare necessary redesigning/modifications

August 5, 2019: Share and discuss the project plans with mathematics faculty within the department. Introduce open source textbook and syllabus. Collect instructors' feedback.

September 5, 2019: Develop appropriate course materials; concepts, worked out examples, unit/section/benchmark prototype tests will also be included. Review and test all developed components to check if they are accurate, appropriate, and adequate. By this time, the first sets of data from the control group as outlined above should have been collected.

October 5, 2019: Develop and incorporate projects, necessary software implementations, and more intuitive examples, practice problems, and tests.

November 5, 2019 Introduce and discuss the OER materials developed with fellow mathematics instructors. Collect participants' feedback. Encourage all Quantitative Reasoning course instructors to adopt the material for fall spring 2010.

December 10, 2019: Organize workshops on "OER materials for Quantitative Reasoning and software implementation" for colleagues. Collect participants' feedback.

December 18, 2019: Data collection and analysis of students' performance on pre-test. Use both descriptive and inferential statistics to compare students' performance: formal textbook versus OER materials. Presentation of midpoint project report

March 10, 2020: Data collection and analysis of students' performance on midterm term test. Use both descriptive and inferential statistics to examine students' performance. Collect students' feedback about their feeling and usefulness of the new material and analyze the data.

March 20, 2020: Prepare and submit the mid semester report

April 2, 2020: Share and discuss the data analysis on students' performance on pre-test, mid-term test, and students' feedback on new material with the facilities within the department. Collect their feedback.

May 15, 2020: Data collection and analysis on students' performance on the final test. Use both descriptive and inferential statistics to compare students' performance on project.

May 17, 2020: Data collection and analysis on students' semester end grades and their mean GPA. Use both descriptive and inferential statistics to compare students' performance.

May 2020: Prepare and submit the final report.

Budget

Supplemental compensation is being requested for the project services being performed by the following faculty members:

- Dr. Zephyrinus Okonkwo: \$4,600
- Dr. Anilkumar Devarapu: \$4,600
- Dr. Vijay Kunwar: \$4,600
- Professor Anthony Smith: \$4,600
- Professor Jeffery Swords: \$4,600
- Dr. Laxmi Paudel: \$4,600
- Dr. Li Feng: \$1,600
- Travel*: \$800
- TOTAL: \$30,000.00

*Travel funds are being requested for two team members to attend the mandatory Kickoff Meeting at Middle Georgia State University in Macon, GA.

Sustainability Plan

MATH 1001-Quantitative Reasoning is offered every semester at Albany State University. Data indicates that during the fall 2018, 22 sections of this course were offered with about 553 enrolled students. During fall 2019, about 36 sections will be offered. Implementation of this project will accomplish the delineated goals, and yet accomplish the predetermined course outcomes. It will also have a broader impact. The OER textbook will be offered to faculty members in the format they choose. The learning and all support materials will be placed on a link for our faculty members. Students will be availed the opportunity to download the pdf version on GeorgiaVIEW. Furthermore, our instructors can download the instructional materials and textbook from GeorgiaVIEW or "Copy Course."

The course materials developed will be hosted in Albany State University's BrightSpace (D2L) webpage <https://albanystate.view.usg.edu/> , and all the students who enroll in the course will have free access to the materials in the course. We will also make the course materials available at the <http://anil.asurams.edu/ALG>. This will result in broader access of course materials for educators and students across the nation.

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.



PROVOST & VICE PRESIDENT
FOR ACADEMIC AFFAIRS

April 4, 2019

Re: Affordable Learning Georgia Textbook Transformation Grant

Dear Sir/Madam:

I am most pleased to write this letter in support of six of our faculty members, Zephyrinus Okonkwo, Anilkumar Devarapu, Jeffery Swords, Anthony Smith, Vijay Kunwar, and Laxmi Paudel, who have applied for the Affordable Learning Georgia Textbook Transformation Grant to develop a no-cost textbook for students taking MATH 1001-Quantitative Reasoning at Albany State University. As you are aware, the cost of textbooks have continued to rise, and mathematics books are the most expensive textbooks used by our students, with students taking five courses per semester sometimes spend about \$1200 on textbooks each semester. Essentially, the cost of textbooks have continued to hinder student achievement and deeper understanding of concepts taught in Quantitative Reasoning.

MATH 1001-Quantitative Reasoning is a G2C course, and the activities of this grant, including the enhancements which will be made through this grant, could lead to increased student achievement in the course.

A total of 885 students enrolled in Quantitative Reasoning during the 2018-2019 academic year. The adoption of MATH 1001-Quantitative Reasoning as an alternative math pathway for non-STEM major is enabling increase in the number of students enrolling in the course. Albany State University is expecting about one thousand six-hundred freshmen to enroll in fall 2019, and more than nine-hundred students are expected to enroll in Quantitative Reasoning. Many of the freshmen will take MATH 1001 course with its co-requisite as well.

By developing this no-cost textbook Quantitative Reasoning course for our students, Dr. Zephyrinus Okonkwo, Dr. Anilkumar Devarapu, Professor Anthony Smith., Dr. Vijay Kunwar, Dr. Laxmi Paudel, and Professor Jeffery Swords will be doing an enviable job for our students and university. The course, which will be developed through this project, will save a lot of money for many of our students, and could lead to enhanced student achievement in the course.

I support this grant proposal and I recommend very strongly the funding of this proposal.

Yours sincerely,

Raj Parikh, Ph.D., CFA, CMA, CFM
Interim Provost/VPAA



DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

Albany, GA 31705

April 4, 2019

Re: Affordable Learning Georgia Textbook Transformation Grant

Dear Sir/Madam:

I am very glad to write this letter in support of our faculty members under the leadership of Dr. Okonkwo, who have applied for an Affordable Learning Georgia Textbook Transformation Grant to develop a no-cost textbook for our students taking MATH 1001-Quantitative Reasoning course at Albany State University. For many years, many students who took Quantitative Reasoning were unable to purchase the textbook required for the course due to the cost of the textbook. 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 ten years ago. Yet textbook cost continues to rise unabated. Since coming on board at Albany State University, I have negotiated textbook cost reduction with several publishers, yet the cost continuous to rise unhindered. By developing no-cost textbook course our students, Dr. Okonkwo and his team will be making available to our students a much needed help, and more students will be able to enroll in MATH-1001-Quantitative Reasoning, as they will have access to a free textbook and associated learning materials.

MATH 1001-Quantitative Reasoning is a G2C course, and the activities of this grant, including the enhancements which will be made through this grant, could lead to increased student achievement in the course.

Dr. Okonkwo and his team will consult with other faculty members who teach Quantitative Reasoning in 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 other departments. Essentially, students at Albany State University could save up-to one hundred and ninety-two thousand, two-hundred and fifty dollars a year once this project is fully implemented.

I am very glad that Dr. Okonkwo and his team are developing this no-cost textbook for Quantitative Reasoning, 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 to assure its success.

Yours sincerely

Robert Steven Owor

Robert S. Owor, Ph.D.
Professor and Chair



Textbook Transformation Grants, Round Fourteen (Summer 2019 – Summer 2020)

Proposal Form and Narrative

Applicant, Team, and Sponsor Information

The **applicant** is the proposed Project Lead for the grant project. The **submitter** is the person submitting the application (which may be a Grants Officer or Administrator). The submitter will often be the applicant – if so, leave the submitter fields blank.

Institution(s)	Albany State University
Applicant Name	Dr. Zephyrinus Okonkwo
Applicant Email	Zephyrinus.Okonkwo@asurams.edu
Applicant Phone #	229-500-3575
Applicant Position/Title	Dean, College of Arts & Sciences; Professor of Mathematics
Submitter Name	Anilkumar Devarapu
Submitter Email	Anilkumar.Devarapu@asurams.edu
Submitter Phone #	229-500-2281
Submitter Position	Associate Professor of Mathematics

Please provide the first/last names and email addresses of all team members within the proposed project. Include the applicant (Project Lead) in this list. Do not include prefixes or suffixes such as Ms., Dr., Ph.D., etc.

	Name	Email Address
Team Member 1	Zephyrinus Okonkwo	Zephyrinus.Okonkwo@asurams.edu
Team Member 2	Anilkumar Devarapu	Anilkumar.Devarapu@asurams.edu
Team Member 3	Anthony Smith	anthony.smith@asurams.edu
Team Member 4	Vijay Kunwar	vijay.kunwar@asurams.edu
Team Member 5	Laxmi Paudel	laxmi.paudel@asurams.edu
Team Member 6	Jeffery Swords	jeffery.swords@asurams.edu

If you have any more team members to add, please enter their names and email addresses in the text box below.

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

Robert S. Owor, PhD., Professor and Chair of the Department of Mathematics and Computer Science

Project Information and Impact Data

Title of Grant Project	<i>ASU's Quantitative Reasoning</i>
Type of Grant	<i>"Gateways to Completion."</i>
Requested Amount of Funding	\$30,000.00
Course Names and Course Numbers	Quantitative Reasoning; MATH 1001
Final Semester of Project	<i>Spring 2020</i>
Average Number of Students Per Course Section Affected by Project	30 per section in Fall & Spring; 25 in Summer
Average Number of Sections Affected by Project in One Academic Year	70
Total Number of Students Affected by Project in One Academic Year	2070
Average Number of Students Affected per Summer Semester	150
Average Number of Students Affected per Fall Semester	1080
Average Number of Students Affected per Spring Semester	840
Title/Author of Original Required Materials	<i>Enter information for each required textbook, homework platform, or other required materials for the course before the grant project.</i>
Original Total Cost Per Student	\$93.00
Post-Project Cost Per Student	ZERO DOLLARS
Post-Project Savings Per Student	<i>This is typically the original cost minus the post-project cost.</i>
Projected Total Annual Student Savings Per Academic Year	<i>This is the total number of students per academic year multiplied by the post-project per student savings estimate.</i>
Using OpenStax Textbook?	Yes

Narrative Section

1. Project Goals

1. To eliminate the cost of textbook and other course related materials to students by providing no-cost course materials, software, and free online textbook.

2. To strengthen student engagement in learning of MATH 1001-Quantitative Reasoning, and to enhance student success and achievement in the course.
3. To motivate students' interest in the use of online based technology to solve real-life problems encountered in Quantitative Reasoning.
4. To increase enrollment of students in Quantitative Reasoning through the provision of no-cost textbook and learning materials.
5. To create a standardized online Quantitative Reasoning course by incorporating innovative pedagogy enriched learning resources, and assessments on a scalable instructional delivery platform.

2. Statement of Transformation

Over the past two years, the number of students enrolling in MATH 1001 Quantitative Reasoning course at Albany State University has grown continuously mainly for two reasons. First, due to the consolidation of old Albany State University and Darton State College, MATH 1001 was adopted as a course that could be taken by students to fulfill the math requirement for Area A2. Second, as an alternative math pathway, non-STEM majors can take it to fulfill the math requirement in the core. Most non-STEM freshmen majors are being put in the Quantitative Reasoning course. For example, there were 187 students enrolled in Quantitative Reasoning in fall 2017, which was significantly grown to 551 students enrolled in fall 2018. While only 65 students enrolled in Quantitative Reasoning in spring 2018, 334 students enrolled in the same course in spring 2019. Essentially, a total of 885 students enrolled in Quantitative Reasoning during the 2018-2019 academic year.

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course and the applications of such concepts to real life. The development of MATH 1001 Quantitative Reasoning no-cost textbook course will enhance student understanding, engagement, achievement, and interest in the course.

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3. Transformation Action Plan

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collaboration of project team members, and other faculty members who teach this course. Team members will meet regularly to examine project activities and progress. Through collaboration the team will develop measures which will ensure success of the project as well as effectiveness of the project activities. MATH 1001 and its co-requisite are presently taught through face-to-face on campus and online options. The support materials developed through this project, as well as all assessment materials and other course materials, will be placed on GeorgiaVIEW, the ASU learning platform. Some assignments, including some tests, will be placed in GeorgiaVIEW as deemed necessary and convenient by individual instructors. All Quantitative Reasoning sections will be enhanced by developing and placing additional learning resources on GeorgiaVIEW with exportable capabilities, that is, any faculty can “Copy Course” and customize the course within and outside Albany State University. The final products will be available in Word, LaTeX, and pdf formats.

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Dr. Li Feng will serve as the project reviewer. He is a Professor of Mathematics and has taught undergraduate and graduate courses in Mathematics for more than twenty-three years. He will examine the appropriateness and relevance of the content, pedagogy, and adequate alignment of the content of the OER textbook with the course learning outcomes.

4. Quantitative and Qualitative Measures

Our previous grant experience indicates that the activities and materials outlined in this grant proposal will provide instructors and students with the opportunity to take complete control of the course. The emphasis on non-STEM majors taking Quantitative Reasoning course as their required course in area A2, coupled with the advising center and BOR Momentum Year guidelines will ensure that more students will enroll in the course. This course will be a no-cost textbook course. More importantly, the pdf version of the textbook and syllabus will be available on GeorgiaVIEW at least the week before the classes begin. This will enable the instructors to give reading assignments and out-of-class activities from the course package. Instructors teaching Quantitative Reasoning will be able to adopt the textbook and developed package to save a huge amount of money on behalf of students.

Many instructors were unable to receive appropriate pedagogical and assessment support from textbook publishers. In many cases, students were required to pay more money in order to purchase access codes to do their homework. Moreover, in cases one received such support, editing such materials was not permissible. This project will give us an opportunity to develop a stand-alone OER course material which will provide flexibility in instruction, learning, and assessment. Furthermore, we will also develop the course material guide which will provide an easy guidance for instructors. Our department will provide hardcopies to instructors. The course guide will also be reposed on GeorgiaVIEW.

We will adopt both quantitative and qualitative approaches for data collection, assessment, and analysis. We will collect the data during the summer of 2019 and fall of 2019. We will also use

the data collected in spring 2019 for benchmark and comparison purposes. During fall 2019, we will designate some sections of Quantitative Reasoning to be in the Control Group while others will be in the Treatment Group. The subsequent quantitative and qualitative data collected will be analyzed and compared accordingly. The results will be used for continuous project improvement. We plan to have full project implementation in spring 2020.

The team members will teach at least 16 sections of Quantitative Reasoning in fall 2019 in which 10 sections will have co-requisites. We will provide other Quantitative Reasoning instructors with the materials developed through this grant, beginning the spring 2020.

Quantitative Measures: The following quantitative data will be collected, compared, and analyzed (control group vs. ALG implementation group):

- Number of students enrolled in the Quantitative Reasoning course (total and average)
- Number of students impacted
- Number of course sections offered
- Retention rates (both in individual sections and aggregate)
- Early drop-out rates
- Withdrawal rates
- Student success rates in pre-test, mid-term test, final test, and end of each semester.
- Mean GPA of students

Collected data will be organized, compared, and analyzed using graphs, descriptive and inferential statistical tools. Other appropriate significance tests such as z-test, t-test, ANOVA etc. will be done for comparative data analysis.

Qualitative Measures: We will use both formative and summative participant Likert-Type surveys, and open-ended interview questions among participant faculty and students to collect qualitative data. The following qualitative data will be collected, compared, and analyzed (control group vs. OER implementation group):

- Quality of the course materials
- Usefulness of the course materials
- Accessibility of the course materials
- Preference or further recommendation of the course materials
- Instructor Opinion Survey on project activities, collaboration, and impact

As stated earlier, the formative assessments will be aimed at receiving feedback from participants, which in turn will be used for project improvement.

5. Timeline

Dr. Zephyrinus C. Okonkwo, Dr. Anilkumar Devarapu, and Dr. Vijay Kunwar will manage the project. They will oversee that the timelines and deadlines are met. Dr. Anilkumar Devarapu will be in-charge of all data collection. Data Analysis will be done by the team.

May 20, 2019: Attend the required Kick-Off meeting at Middle Georgia State University, Macon, Georgia

June 20, 2019: Search, select, and adopt the best open source textbook for Quantitative Reasoning

July 15, 2019: Revise existing syllabus for Quantitative Reasoning and prepare necessary redesigning/modifications

August 5, 2019: Share and discuss the project plans with mathematics faculty within the department. Introduce open source textbook and syllabus. Collect instructors' feedback.

September 5, 2019: Develop appropriate course materials; concepts, worked out examples, unit/section/benchmark prototype tests will also be included. Review and test all developed components to check if they are accurate, appropriate, and adequate. By this time, the first sets of data from the control group as outlined above should have been collected.

October 5, 2019: Develop and incorporate projects, necessary software implementations, and more intuitive examples, practice problems, and tests.

November 5, 2019 Introduce and discuss the OER materials developed with fellow mathematics instructors. Collect participants' feedback. Encourage all Quantitative Reasoning course instructors to adopt the material for fall spring 2010.

December 10, 2019: Organize workshops on "OER materials for Quantitative Reasoning and software implementation" for colleagues. Collect participants' feedback.

December 18, 2019: Data collection and analysis of students' performance on pre-test. Use both descriptive and inferential statistics to compare students' performance: formal textbook versus OER materials. Presentation of midpoint project report

March 10, 2020: Data collection and analysis of students' performance on midterm term test. Use both descriptive and inferential statistics to examine students' performance. Collect students' feedback about their feeling and usefulness of the new material and analyze the data.

March 20, 2020: Prepare and submit the mid semester report.

April 2, 2020: Share and discuss the data analysis on students' performance on pre-test, mid-term test, and students' feedback on new material with the faculties within the department. Collect their feedback.

May 15, 2020: Data collection and analysis on students' performance on the final test. Use both descriptive and inferential statistics to compare students' performance on project.

May 17, 2020: Data collection and analysis on students' semester end grades and their mean GPA. Use both descriptive and inferential statistics to compare students' performance.

May 2020: Prepare and submit the final report.

6. Budget

Supplemental compensation is being requested for the project services being performed by the following faculty members:

- Dr. Zephyrinus Okonkwo: \$4,600
- Dr. Anilkumar Devarapu: \$4,600
- Dr. Vijay Kunwar: \$4,600
- Professor Anthony Smith: \$4,600
- Professor Jeffery Swords: \$4,600
- Dr. Laxmi Paudel: \$4,600
- Dr. Li Feng: \$1,600
- Travel*: \$800

TOTAL: \$30,000.00

*Travel funds are being requested for two team members to attend the mandatory Kickoff Meeting at Middle Georgia State University in Macon, GA.

7. Sustainability Plan

MATH 1001-Quantitative Reasoning is offered every semester at Albany State University. Data indicates that during the fall 2018, 22 sections of this course were offered with about 553 enrolled students. During fall 2019, about 36 sections will be offered. Implementation of this project will accomplish the delineated goals, and yet accomplish the predetermined course outcomes. It will also have a broader impact. The OER textbook will be offered to faculty members in the format they choose. The learning and all support materials will be placed on a link for our faculty members. Students will be availed the opportunity to download the pdf

version on GeorgiaVIEW. Furthermore, our instructors can download the instructional materials and textbook from GeorgiaVIEW or “Copy Course.”

The course materials developed will be hosted in Albany State University's BrightSpace(D2L) webpage <https://albanystate.view.usg.edu/>, and all the students who enroll in the course will have free access to the materials in the course. We will also make the course materials available at the <http://anil.asurams.edu/ALG> .This will result in broader access of course materials for educators and students across the nation.

Note: Letter of Support

The following individuals have agreed to provide letters of support for our application:

1. Dr. Robert S. Owor, Chairperson, Department of Mathematics and Computer Science
Albany State University
2. Dr. Rajeev Parikh, Provost and Vice President for Academic Affairs, Albany State
University