

Application Details

Manage Application: Textbook Transformation Grants: Round Ten

Award Cycle: Round 10

Internal Submission Deadline: Friday, September 29, 2017

Application Title: 345

Application ID: 001889

Submitter First Name: Melisa

Submitter Last Name: Widner

Submitter Title: Grants Management Coordinator

Submitter Email Address: melisa.widner@asurams.edu

Submitter Phone Number: 229-420-7040

Submitter Campus Role: Sponsored Programs Office

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

Institution Name(s): Albany State University

Submission Date: Monday, October 2, 2017

Proposal Title: 345

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

Are you using an OpenStax textbook?: Yes

Final Semester of Instruction: Fall 2018

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

Zephyrinus C. Okonkwo, Ph.D.

Professor of Mathematics, Department of Mathematics and Computer Science

zephyrinus.okonkwo@asurams.edu

Anilkumar Devarapu, Ph.D.

Associate Professor of Mathematics, Department of Mathematics and Computer Science

anilkumar.devarapu@asurams.edu

Anthony Smith, MAT

Assistant Professor of Mathematics, Department of Mathematics and Computer Science

anthony.smith@asurams.edu

Vijay Kunwar, Ph.D.

Assistant Professor of Mathematics, Department of Mathematics and Computer Science

vijay.kunwar@asurams.edu

Laxmi Paudel, Ph.D.

Assistant Professor of Mathematics, Department of Mathematics and Computer Science

laxmi.paudel@asurams.edu

Taylor Wars, M.S.

Assistant Professor of Mathematics, Department of Mathematics and Computer Science

taylor.wars@asurams.edu

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

Robert S. Owor, PhD.

Professor and Chair of the Department of Mathematics and Computer Science

Albany State University

robert.owor@asurams.edu

Course Names, Course Numbers and Semesters Offered:

MATH 1111 College Algebra, Spring/Summer/Fall of each Year

List the original course materials for students (including title, whether optional or required, & cost for each item): College Algebra by Larson, 8th/10th Edition, Cengage Learning This book is required at a cost of \$150 per student.

Average Number of Students per Course Section: 30

Number of Course Sections Affected by Implementation in Academic Year: 90

Average Number of Course Sections Per Semester:

There is an average of 80 course selections during the academic year and 10 during the summer term, totaling an average of 90 course selections each year.

Total Number of Students Affected by Implementation in Academic Year: 2700

Requested Amount of Funding: 30800

Original per Student Cost: \$150/student

Post-Proposal Projected Student Cost: \$0/student

Projected Per Student Savings: \$150

Projected Total Annual Student Savings: \$405,000

Project Goals:

1. PROJECT GOALS

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

To improve student engagement in learning of MATH 1111-College Algebra, and enhance student success and achievement in the course.

To motivate student interest in the use of online based technology to solve real-life problems encountered in College Algebra

To increase enrollment of students in College Algebra through the provision of no-cost textbook and learning materials.

To create a standardized online College Algebra course by incorporating innovative pedagogy, enriched learning resources, and assessments which is scalable on an instructional delivery platform.

Statement of Transformation:

1.1 STATEMENT OF TRANSFORMATION

For more than twenty years, most of our students have been finding it difficult to purchase class textbooks due to rising cost of textbooks and learning materials. The MATH 1111 – College Algebra textbook is very expensive and many of our students are unable to purchase the textbook due to the excessive cost. In many sections of the College Algebra course, less than 15% of students or five out of thirty-five in one class are able to buy the textbook, with the remaining 85% of students not having real-time active engagement during most class activities. This has reduced student success rate in the classes as well as students' ability to engage in productive learning outside the classroom. Hence, students are unable to garner deep content knowledge of the concepts learned in the course and the applications of such concepts to real life. Textbook cost has also reduced the number of students taking the course. The development of this no-cost OER textbook will improve student understanding, engagement, achievement, and interest in the course.

Our team will develop about 80 pages of course support/supplemental materials; together with the adopted open resources textbook, will enhance pedagogy and learning in the course.. This way every student taking the course will be able to read the most essential course material and do the appropriate course assessments and practice problems. At the present time, the textbook we are using is 674 pages long, with students required to cover more than 400 pages of the textbook for this single course.

MATH 1111 requires substantial coverage of topics and concepts while still allowing instructors the flexibility to adapt certain materials and innovative pedagogical techniques to meet the outcomes. Student success in College Algebra has wider ramification on student retention, progression, and degree completion across all majors at Albany State University (ASU). During fall 2017, ASU scheduled fifty sections of the College Algebra course and with about one-thousand four-hundred students enrolled in the course. About ninety percent of these students are first time freshmen.

During our preparation of support course materials, we shall consult 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 more concepts dealing with applications since the majority of College Algebra takers are non-STEM majors.

We plan to adopt the best practices in pedagogy, assessment, and learning. Our team will adequately explore and develop seamless learning and assessment materials, including developing and adopting certain problem-solving and simulation software, which will attract students' engagement and interest. All faculty members who will use the textbook will have the

freedom to use 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:

1.2 TRANSFORMATION ACTION PLAN

This project will not require any changes in the syllabus; the course description, goal of the course, course learning outcomes, and specific objectives of the course will remain unchanged. However, there will be an alignment of pedagogy and assessment with the adopted Open Stax textbook. The team members and other faculty members using the course materials developed through this project will have collaboration, including meeting regularly to examine project activities and associated data. Collaboration will lead us to develop measures which will ensure success of the project as well as effectiveness of the project. MATH 1111- College Algebra is presently taught through 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 in D2L. Some assessments, including some tests, will be placed in D2L as deemed necessary and convenient by individual instructors. All College Algebra sections will be enriched by developing and placing additional learning resources on D2L with exportable capabilities, that is, any faculty can “Copy Course” and customize the course within and outside Albany State University. The finished products will be in Word, Latex, and pdf.

Dr. Anilkumar Devarapu, Dr. Vijay Kunwar, Professor Anthony Smith, Professor Taylor Wars, 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 college algebra projects which could enhance 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. He has taught undergraduate and graduate courses in Mathematics for more than twenty-two years. 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: 1.3 QUANTITATIVE AND QUALITATIVE MEASURES

The development of OER provides the instructors and students the opportunity to take complete control of the course. More students will enroll in the course due to the fact that the course is no-cost textbook course. More importantly, the textbook will be available on D2L before the first day of class. This will enable the instructors to give reading assignments and out-of-class activities from the book. Furthermore, more instructors teaching College Algebra will adopt the textbook thereby saving the students enormous amount of money. Instructors are unable to receive appropriate pedagogical and assessment support from textbook publishers. In case one receives such support, editing such materials is not allowed. 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 easy guidance for instructors. Our department will provide hard copies to instructors. The course guide will also be reposed on D2L. We will use both quantitative and qualitative approaches for the assessment of our OER materials. We will collect the data during spring 2018 prior to the launch of OER material. This will be our control group. The data obtained from project implementation semesters/periods will be compared with the data from control group and will be analyzed. The results will be used for continuous project improvement. The team members will teach at least 18 sections of College Algebra in spring 2017, eight sections in summer 2018, and twenty-five sections in fall 2018. We will invite other instructors of College Algebra to use the materials as well during the above mentioned semesters and subsequently. We will collect both qualitative and quantitative data, as outlined below, from all College Algebra sections during spring 2018 (control group) and at least 3 subsequent OER implementation groups.

Quantitative Measures: The following

quantitative data will be collected, compared, and analyzed (control group vs. OER implementation group): Number of students enrolled in the College Algebra 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 (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. 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 survey questionnaires, 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 As stated earlier, the formative assessments is aimed at receiving feedback from participants, which in turn will enable project improvement.

Timeline:

1.4 TIMELINE

Dr. Zephyrinus C. Okonkwo will be the manager of the project. He 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.

November 6, 2017: Attend the required Kick-Off meeting

December 5, 2017: Search for open source textbook for College Algebra courses and select the book to be adopted.

December 30, 2017: Revise existing syllabi for College Algebra course and prepare necessary redesigning/modifications.

January 8, 2018: Share and discuss the project plans with mathematics faculty within the department. Introduce open source textbook and syllabi. Collect instructors' feedback.

May 25, 2018: 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 should have been collected.

July 25, 2018: Develop and incorporate projects, necessary software implementations, and more intuitive examples, practice problems, and tests.

August 3, 2018: Introduce and discuss the OER materials developed with fellow mathematics instructors. Collect participants' feedback. Encourage all College Algebra course instructors to adopt the material for fall 2018.

August 10, 2018: Organize workshops on "OER materials for College Algebra and software implementation" for colleagues. Collect participants' feedback.

August 24, 2018: 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.

October 15, 2018: Data collection and analysis of students' performance on midterm term test. Use both descriptive and inferential statistics to compare students' performance: formal textbook versus OER materials. Collect students' feedback about their feeling and usefulness of the new material and analyze the data.

October 20, 2018: Prepare and submit the mid semester report.

November 10, 2018: 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.

December 10, 2018: Data collection and analysis on students' performance on the final test. Use both descriptive and inferential statistics to compare students' performance: formal textbook versus OER materials.

December 17, 2018: Data collection and analysis on students' semester end grades and their mean GPA. Use both descriptive and inferential statistics to compare students' performance: formal textbook versus OER materials.

December 20, 2018: Prepare and submit the final report.

Budget:

1.5 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 Taylor Wars, \$4,600

Dr. Laxmi Paudel, \$4,600

Dr. Li Feng, \$1,600

In addition, travel funds are being requested for two team members to attend the Kickoff Meeting at Middle Georgia State University in Macon, GA.

Travel, \$800

Sustainability Plan:

1.6 SUSTAINABILITY PLAN

1111-College Algebra is offered every semester at Albany State University. Data indicates that during the fall 2017, 50 sections of this course were offered, with about 1,400 enrolled students. 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 D2L. Furthermore, our instructors can download the instructional materials and textbook from D2L or "Copy Course."



MATHEMATICS & COMPUTER SCIENCE

September 29, 2017

Re: Affordable Learning Georgia Textbook Transformation Grant

Dear Sir/Madam:

I am very glad to write this letter in support of our faculty members who are applying for the Affordable Learning Georgia Textbook Grant. The team from Albany State University Department of Math and Computer Science in the College of Science and Technology consists of Zephyrinus Okonkwo, Anilkumar Devarapu, Anthony Smith, Laxmi Paudel and Vijay Kunwar. They wish to develop a no-cost textbook for our students taking the MATH 1111-College Algebra course at Albany State University. 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. 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 a no-cost textbook, the committee will be making available to our students, much needed support which ultimately contributes towards greater student success. Most students who enroll will be able to have the resources they need to succeed in MATH 1111-College Algebra, as they will have access to a free textbook and associated learning materials.

The committee has consulted with other faculty members who teach College Algebra in the Department of Mathematics and Computer Science.

The College of Science and Technology supports this no-cost textbook development objective, 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 several thousand dollars a year once this project is fully implemented.

I strongly support their application and subsequent award of an Affordable Learning Georgia Grant.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Seyed Roosta".

Dr. Seyed Roosta
Professor and Dean



DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

Albany, GA 31705

September 27

Re: Affordable Learning Georgia Textbook Transformation Grant

Date: September 27, 2017

Dear Sir/Madam:

I am most pleased to write this letter in support of six of our faculty members, Zephyrinus Okonkwo, Anilkumar Devarapu, Anthony Smith., Vijay Kunwar, Laxmi Paudel, and Taylor Wars, who have applied for the Affordable Learning Georgia textbook Transformation Grant to develop a no-cost textbook for students taking MATH 1111-Colege Algebra 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 College Algebra being the most expensive of books at the freshman level. Students taking five courses a semester sometimes spend about \$1200 on textbooks each semester. Essentially, the cost of textbooks have continued to hinder student enrollment and success in College Algebra.

During the fall of 2017, ASU has fifty sections of College Algebra scheduled with about one-thousand four-hundred students enrolled.

By developing this no-cost textbook College Algebra course for our students, Dr. Zephyrinus Okonkwo, Dr. Anilkumar Devarapu, Professor Anthony Smith., Dr. Vijay Kunwar, Dr. Laxmi Paudel, and Professor Taylor Wars 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

A handwritten signature in blue ink that reads "Robert S. Owor".

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

Affordable Learning Georgia Textbook Transformation Grant

Round 10

Spring 2018, Summer 2018, Fall 2018

Proposal Form and Narrative

Level of Funding Requested: Large-Scale textbook Transformation Project

Institution	Albany State University				
Team Members (Name, Title, Department, Institutions if different, and email addresses of each)	<p>Zephyrinus C. Okonkwo, Ph.D., Professor of Mathematics, Department of Mathematics and Computer Science, zephyrinus.okonkwo@asurams.edu</p> <p>Anilkumar Devarapu, Ph.D., Associate Professor of Mathematics, Department of Mathematics and Computer Science, anilkumar.devarapu@asurams.edu</p> <p>Anthony Smith, MAT, Assistant Professor of Mathematics Department of Mathematics and Computer Science anthony.smith@asurams.edu</p> <p>Vijay Kunwar, Ph.D. Assistant Professor of Mathematics Department of Mathematics and Computer Science vijay.kunwar@asurams.edu</p> <p>Laxmi Paudel, Ph.D., Assistant Professor of Mathematics Department of Mathematics and Computer Science laxmi.paudel@asurams.edu</p> <p>Taylor Wars, M.S., Assistant Professor of Mathematics Department of Mathematics and Computer Science taylor.wars@asurams.edu</p>				
Sponsor, Title, Department, Institution	Robert S. Owor, PhD., Professor and Chair of the Department of Mathematics and Computer Science robert.owor@asurams.edu				
Course Names, Course Numbers, and Semesters Offered (Spring 2018, Summer 2018, Fall 2018)	MATH 1111 College Algebra, Spring/Summer/Fall of each Year				
Average Number of Students per course Section	30 per regular year 30 per Summer	Number of Sections Affected by Implementation in Academic Year 2018	80 per regular year 10 per summer	Total Number of Students Affected by Implementation in Academic Year 2017	2,700
Award Category	<ul style="list-style-type: none"> • No-Cost-to-Students Learning Materials 				
List the original course materials for students (including title, whether optional or required, & cost	College Algebra by Larson, 8 th /10 th Edition, Cengage Learning		BUY NEW: \$150.00 Total Savings: \$405,000		

for each item			
Plan for Hosting Materials	<ul style="list-style-type: none"> • D2L 		
Projected Per Student Cost	ZERO DOLLARS	Projected Per Student Savings (%)	100%

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 improve student engagement in learning of MATH 1111-College Algebra, and enhance student success and achievement in the course.
 3. To motivate student interest in the use of online based technology to solve real-life problems encountered in College Algebra
 4. To increase enrollment of students in College Algebra through the provision of no-cost textbook and learning materials.
 5. To create a standardized online College Algebra course by incorporating innovative pedagogy, enriched learning resources, and assessments which are scalable on an instructional delivery platform.
- 2.

2.1. **STATEMENT OF TRANSFORMATION**

3. For more than twenty years, most of our students have been finding it difficult to purchase class textbooks due to rising cost of textbooks and learning materials. The MATH 1111 – College Algebra textbook is very expensive and many of our students are unable to purchase the textbook due to the excessive cost. In many sections of the College Algebra course, less than 15% of students or five out of thirty-five in one class are able to buy the textbook, with the remaining 85% of students not having real-time active engagement during most class activities. This has reduced student success rate in the classes as well as students' ability to engage in productive learning outside the classroom. Hence, students are unable to garner deep content knowledge of the concepts learned in the course and the applications of such concepts to real life. Textbook cost has also reduced the number of students taking the course. The development of this no-cost OER textbook will improve student understanding, engagement, achievement, and interest in the course.
4. Our team will develop about 80 pages of course support/supplemental materials; together with the adopted open resources textbook, will enhance pedagogy and learning in the course.. This way every student taking the course will be able to read the most essential course material and do the appropriate course assessments and practice problems. At the present time, the textbook we are using is

674 pages long, with students required to cover more than 400 pages of the textbook for this single course.

5. MATH 1111 requires substantial coverage of topics and concepts while still allowing instructors the flexibility to adapt certain materials and innovative pedagogical techniques to meet the outcomes. Student success in College Algebra has wider ramifications on student retention, progression, and degree completion across all majors at Albany State University (ASU). During fall 2017, ASU scheduled fifty sections of the College Algebra course and with about one-thousand four-hundred students enrolled in the course. About ninety percent of these students are first-time freshmen.
6. During our preparation of support course materials, we shall consult 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 more concepts dealing with applications since the majority of College Algebra takers are non-STEM majors.
7. We plan to adopt the best practices in pedagogy, assessment, and learning. Our team will adequately explore and develop seamless learning and assessment materials, including developing and adopting certain problem-solving and simulation software, which will attract students' engagement and interest. All faculty members who will use the textbook will have the freedom to use 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.

8.

9. **1.2 TRANSFORMATION ACTION PLAN**

10. This project will not require any changes in the syllabus; the course description, goal of the course, course learning outcomes, and specific objectives of the course will remain unchanged. However, there will be an alignment of pedagogy and assessment with the adopted Open Stax textbook. The team members and other faculty members using the course materials developed through this project will have collaboration, including meeting regularly to examine project activities and associated data. Collaboration will lead us to develop measures which will ensure success of the project as well as effectiveness of the project. MATH 1111- College Algebra is presently taught through 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 in D2L. Some assessments, including some tests, will be placed in D2L as deemed necessary and convenient by individual instructors. All College Algebra sections will be enriched by developing and placing additional learning resources on D2L with exportable capabilities, that is, any faculty can “Copy Course” and customize the course within and outside Albany State University. The finished products will be in Word, Latex, and pdf.

11. Dr. Anilkumar Devarapu, Dr. Vijay Kunwar, Professor Anthony Smith, Professor Taylor Wars, 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 college algebra projects which could enhance course quality. Such projects will be included in the learning materials we will develop through this grant.
12. Dr. Li Feng will serve as the project reviewer. He is a Professor of Mathematics. He has taught undergraduate and graduate courses in Mathematics for more than twenty-two years. 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.

13.

14. 1.3 QUANTITATIVE AND QUALITATIVE MEASURES

15. The development of OER provides the instructors and students the opportunity to take complete control of the course. More students will enroll in the course due to the fact that the course is no-cost textbook course. More importantly, the textbook will be available on D2L before the first day of class. This will enable the instructors to give reading assignments and out-of-class activities from the book. Furthermore, more instructors teaching College Algebra will adopt the textbook thereby saving the students enormous amount of money.
16. Several instructors are unable to receive appropriate pedagogical and assessment support from textbook publishers. In case one receives such support, editing such materials is not allowed. 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 easy guidance for instructors. Our department will provide hardcopies to instructors. The course guide will also be reposed on D2L.

17. We will use both quantitative and qualitative approaches for the assessment of our OER materials. We will collect the data during spring 2018 prior to the launch of OER material. This will be our control group. The data obtained from project implementation semesters/periods will be compared with the data from control group and will be analyzed. The results will be used for continuous project improvement.
18. The team members will teach at least 18 sections of College Algebra in spring 2017, eight sections in summer 2018, and twenty-five sections in fall 2018. We will invite other instructors of College Algebra to use the materials as well during the above mentioned semesters and subsequently. We will collect both qualitative and quantitative data, as outlined below, from all College Algebra sections during spring 2018 (control group) and at least 3 subsequent OER implementation groups.
19. **Quantitative Measures:** The following quantitative data will be collected, compared, and analyzed (control group vs. OER implementation group):
- Number of students enrolled in the College Algebra 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 (pre-test, mid-term test, final test, and end of each semester.
 - Mean GPA of students
20. Collected data will be organized, compared, and analyzed using graphs, descriptive and inferential statistical tools. Appropriate significance tests such as z-test, t-test, ANOVA etc. will be done for comparative data analysis.
21. **Qualitative Measures:** We will use both formative and summative survey questionnaires, 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
22. As stated earlier, the formative assessments is aimed at receiving feedback from participants, which in turn will enable project improvement.
- 23.

24.1.4 TIMELINE

25. Dr. Zephyrinus C. Okonkwo will be the manager of the project. He 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.

26. **November 6, 2017:** Attend the required Kick-Off meeting

27.

28. **December 5, 2017:** Search for open source textbook for College Algebra courses and select the book to be adopted.

29.

30. **December 30, 2017:** Revise existing syllabi for College Algebra course and prepare necessary redesigning/modifications.

31.

32. **January 8, 2018:** Share and discuss the project plans with mathematics faculty within the department. Introduce open source textbook and syllabi. Collect instructors' feedback.

33.

34. **May 25, 2018:** 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 should have been collected.

35.

36. **July 25, 2018:** Develop and incorporate projects, necessary software implementations, and more intuitive examples, practice problems, and tests.

37.

38. **August 3, 2018:** Introduce and discuss the OER materials developed with fellow mathematics instructors. Collect participants' feedback. Encourage all College Algebra course instructors to adopt the material for fall 2018.
- 39.
40. **August 10, 2018:** Organize workshops on "OER materials for College Algebra and software implementation" for colleagues. Collect participants' feedback.
- 41.
42. **August 24, 2018:** 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.
- 43.
44. **October 15, 2018:** Data collection and analysis of students' performance on midterm term test. Use both descriptive and inferential statistics to compare students' performance: formal textbook versus OER materials. Collect students' feedback about their feeling and usefulness of the new material and analyze the data.
- 45.
46. **October 20, 2018:** Prepare and submit the mid semester report.
- 47.
48. **November 10, 2018:** 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.
- 49.
50. **December 10, 2018:** Data collection and analysis on students' performance on the final test. Use both descriptive and inferential statistics to compare students' performance: formal textbook versus OER materials.
- 51.
52. **December 17, 2018:** Data collection and analysis on students' semester end grades and their mean GPA. Use both descriptive and inferential statistics to compare students' performance: formal textbook versus OER materials.
- 53.
54. **December 20, 2018:** Prepare and submit the final report.
- 55.
56. **1.5 BUDGET**

57. 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 Taylor Wars, \$4,600
- Dr. Laxmi Paudel, \$4,600
- Dr. Li Feng, \$1,600

58. In addition, travel funds are being requested for two team members to attend the Kickoff Meeting at Middle Georgia State University in Macon, GA.

- Travel, \$800

59. 1.6 SUSTAINABILITY PLAN

60. MATH 1111-College Algebra is offered every semester at Albany State University. Data indicates that during the fall 2017, 50 sections of this course were offered, with about 1,400 enrolled students. 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 D2L. Furthermore, our instructors can download the instructional materials and textbook from D2L or “Copy Course.”

61.

62. 1.7 REFERENCES AND ATTACHMENTS

63. 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. Seyed Roosta, Dean, College of Sciences and Technology, Albany State University

64.