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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:	Scott Pierce
Application ID:	3373
Application Title:	458
Date Submitted:	04/09/2019 at 8:24 AM

Personal Details

Institution Name(s):	Abraham Baldwin Agricultural College
Applicant First Name:	April
Applicant Last Name:	Abbott
Applicant Email Address:	aabbott@abac.edu
Applicant Phone Number:	229-391-5160
Primary Appointment Title:	Mathematics Lab Coordinator/Lecturer
Submitter First Name:	Scott
Submitter Last Name:	Pierce
Submitter Email Address:	scott.pierce@abac.edu
Submitter Phone Number:	229-391-4983
Submitter Title:	Director of Sponsored Programs

Application Details

Proposal Title

458

Final Semester of Project

Summer 2020

Requested Amount of Funding

\$27,712.50

Type of Grant

No-or-Low-Cost-to-Students Learning Materials

Course Title(s)

Quantitative Reasoning

Course Number(s)

MATH 1001

Team Member 1 Name

April Abbott

Team Member 1 Email

aabbott@abac.edu

Team Member 2 Name

Gary Dicks

Team Member 2 Email

gdicks@abac.edu

Team Member 3 Name

Jan Gregus

Team Member 3 Email

jgregus@abac.edu

Team Member 4 Name

Wesley Whitehead

Team Member 4 Email

Wesley.whitehead@abac.edu

Additional Team Members (Name and email address for each)

5. Wanda Coston: elwanda.coston@abac.edu
6. Shelia Mclendon: shelia.mclendon@abac.edu
7. Amanda Urquhart: aurquhart@abac.edu

Sponsor Name

Dr. Jerry Baker

Sponsor Title

Provost and Vice President for Academic Affairs

Sponsor Department

Academic Affairs

Original Required Commercial Materials (title, author, price)

\$165 for Pearson Textbook and Software bundle: Mathematics All Around 6th edition by Pirnot

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

25

Average Number of Sections Affected by Project in One Academic Year

20

Total Number of Students Affected by Project in One Academic Year

500

Average Number of Students Affected per Summer Semester

30

Average Number of Students Affected per Fall Semester

270

Average Number of Students Affected per Spring Semester

200

Original Total Cost per Student

\$165

Post-Project Cost per Student

\$40

Post-Project Savings per Student

\$125

Projected Total Annual Student Savings per Academic Year

\$62,500

Using OpenStax Textbook?

Yes

Project Goals

Abraham Baldwin Agricultural College (ABAC) proposes a large-scale textbook transformation project for Quantitative Reasoning (MATH 1001). The course is taught by several professors at ABAC across four campuses 90 miles apart. We offer ~20 sections of the course each year to 500 students. We anticipate our project will save Georgia students over \$62,000 in one Fiscal year.

The overall goal of this grant is to provide our students significant savings without compromising the quality of instruction or our commitment to an internationalized general education curriculum. Since Quantitative Reasoning is a gateway course normally taken in a student's first or second semester, we will provide our students with less financial stress in their first year. These funds can be re-allocated to other educational needs, allowing them an easier transition to college. In turn, our team hopes to improve our current D/W/F math rates for Quantitative Reasoning as well as our improving our final exams scores/course learning objectives assessment (this will be discussed further below).

Another goal of this project is to standardize the Quantitative Reasoning curriculum offered across ABAC's campuses. The 2017 consolidation between ABAC and Bainbridge College merged two different math departments. Our Bainbridge, Moultrie and Blakeley Campus were asked to switch to Tifton Campus's textbooks, syllabi, and scheduling. This grant will allow members of all campuses to come together to create a course. It will promote discussions, connections, and aid in solidifying ABAC's math faculty into a single, if geographically distinct, department.

Our team hopes to smooth out most of the adjustment bumps during a pilot one Quantitative Reasoning course at the Tifton Campus during the summer of 2019 before changing all team member's courses in the Fall of 2019. If all goes as planned, all future Quantitative Reasoning courses across all campuses will implement the low/no-cost resources.

Statement of Transformation

All of ABAC's students have benefited from the last two grants we've received for math. The last grant allowed us to purchase over 110 used TI-83 calculators for students to check out from the library. They are available to students in all math classes. For this project, the calculators purchased by prior grants will provide our incoming Quantitative Reasoning students even more financial savings, since many can't afford to purchase a graphing calculator.

Currently, the STEM pathway has switched to low or no-cost resources. College Algebra and Trigonometry students only spend \$40 on WebAssign software for course materials. There are plans to review and implement WebWorks software for these two courses, which would reduce the cost for students' materials to zero.

Quantitative Reasoning is the Non-STEM pathway. As currently taught, the course requires students to purchase a MyMathLab access code as well as a textbook. The textbook and software bundle is \$165. Since non-STEM students are only required to take one math course in Area A it seems unreasonable to be charged nearly 4 times as much as STEM students for one course in one area of their checksheet. We want to provide these students with comparable costs as the STEM pathway students.

The number of students in Quantitative Reasoning at the Tifton Campus for Spring 2018 was 48 and Fall 2018 year was 270. However, the Non-Stem pathway is growing. In Fall of 2017 only two Quantitative Reasoning courses were offered. This semester (Fall of 2018) Tifton Campus offered nine Quantitative Reasoning courses and Bainbridge offered two courses. There will be an expected 500 students affected per year with the addition of more courses as USG institutions promote Non-Stem pathways.

Quantitative Reasoning is a gateway course; one of the first our students take. We hope that lowering the cost for students will contribute to their retention, progression, and graduation at ABAC. From a previous implementation of a mini-grant and a large scale grant for STEM pathway students, there is expected to be little to no change to course success rates.

Transformation Action Plan

On April 25, 2019, ABAC faculty will be notified if they have received the grant. Shortly thereafter, faculty members will invite a Knewton Representative to present software form, function and operation to team members who haven't seen the program, or who need a refresher. The faculty will also discuss setting up a Knewton Bootcamp for Summer and Fall 2019 as well as Spring 2020 where representatives come to our campuses to show our students how to work the software. In May, at least two members of the team will attend the kickoff meeting on May 20th at Middle Georgia State University. Additionally in May, the team will create Knewton Alta online assignments, calendars, and written homework problems. Each team member's responsibility can be found below. Abbott will pilot teach Quantitative Reasoning in the Summer to catch any items that need to be updated or changed and all faculty will implement the low/no-cost materials in the Fall of 2019.

The current Pearson Textbook (Mathematics All Around 6th Edition) for Quantitative Reasoning has 14 chapters. The ABAC Math Department teaches four units comprised of seven of those chapters. The chapters are as follows:

Unit 1: Chapter 1 – Problem Solving

Chapter 2 – Set Theory

Unit 2: Chapter 3 – Logic

Chapter 14 – Descriptive Statistics

Unit 3: Chapter 12 – Counting

Chapter 13 – Probability

Unit 4: Chapter 7 – Algebraic Models

The Pearson course consists of a textbook with descriptions of mathematical principles, examples, section homework questions, chapter summaries, end-of-chapter homework questions, and solutions to the odd-numbered homework. MyMathLab, the software connected to the Pearson book, provides online homework, how-to-solve videos, and examples.

The material covered in the Pearson text is a suitable sequence, meets our needs, and prepares our students well. It is simply too expensive, especially for a course to be taught in a student's first year. We propose to retain the same information contained in the Pearson text, and to present it in the same order, but simply to use lower cost sources.

We intend to use a proven online platform, Knewton Alta. Knewton Alta uses a style of mastery learning where the student's grade reflects their knowledge of outcomes. A study by Knewton showed that students using Alta who had not yet completed an assignment scored an average of 55% on related course assessments, while students who completed their assignment scored an average of 81% (Knewton, 2017). In 2018, a Johns Hopkins study by Wolf, Armstrong, and Ross showed a positive trend with using Knewton Alta, where completing a greater proportion of assignments positively correlated with improved student performance on quizzes and tests. In the study, it was found that students 10% increase in the overall Knewton assignment completion rate was associated with an increase in average student performance of 1.4% (Wolf et al., 2018, p. 28).

Each team member will be responsible for identifying suitable assignments from within Knewton Alta to supplant the primary material. In addition, they will create supplemental materials and written homework assignments to go along with the software and Openstax resources. Team members will be responsible for creating supplemental instructional materials such as class handouts, written homework assignments, and quizzes for each chapter.

A working list of responsibilities are:

Unit 1: Chapter 1 Problem Solving Amanda Urquhart

Chapter 2 Set Theory Wesley Whitehead

Unit 2: Chapter 3 Logic April Abbott

Chapter 4 Descriptive Statistics Shelia Mclendon

Unit 3: Chapter 5 Counting Wanda Coston

Chapter 6 Probability Jan Gregus

Unit 4: Chapter 7 Algebraic Models Gary Dicks

The Quantitative Reasoning course calendar and syllabus will be redesigned by Abbott for the transformation. Any created materials such as handouts or a workbook will be placed on Georgia View and faculty websites for the students to access for free. These materials will also be attached to the status update report and final report for grant.

The ABAC library will be asked to assist in uploading all created materials to Galileo so that others in the USG can have open access. GALILEO is an online library portal to subscription-only information that is not available through free search engines or Web directories and is available to all USG faculty, staff, and students. GALILEO Open Learning Materials are classified under a Creative Commons license. Definitive classification for licenses in GALILEO can be found at the following address <https://creativecommons.org/licenses/>. Documents in Galileo are accessible by course number, course title, discipline, or Creative Commons license. The GALILEO administrator would work with the library to add materials to the collection. Affordable Learning Georgia is focused on OER adoption and an open license for materials is required. The project team will follow through to make sure all requirements are met, in conjunction with the library team.

ABAC faculty members Abbott, Coston, Dicks, Gregus, Mclendon, Urquhart, and Whitehead teach Quantitative Reasoning across all campuses. They are the only ones who do. Ms. Abbott was selected as project lead because she has taught Quantitative Reasoning the longest and is the most familiar with students' support needs. She began instructing the course in the spring of 2012. Gregus and Abbott were the first to teach Quantitative Reasoning Corequisite Support courses and Foundations courses at ABAC, beginning in Spring of 2014. Ms. Abbott teaches 5-6 sections of the course per academic year and is most familiar with the course curriculum. In addition, Abbott led a previous Affordable Learning Grant in 2017 (Grant Number 344). She knows the areas the students struggle, especially learning support students. Given her consistent engagement with the students, the curriculum and given her prior successes with Affordable Learning Georgia, she is in an excellent position to oversee the production all created material and assignments and the administrative aspects of the grant proposed here.

References

Knewton. (2017). Student data insights. Retrieved from <https://www.knewton.com/wp-content/uploads/2018/09/Knewtons-alta-2017-Student-Data-Insights.pdf>

Wolf, A., Armstrong, C., & Ross, S.M. (2018). Study of knewton online courses for undergraduate students: Examining the relationships among usage, assignment completion, and course success. Johns Hopkins School of Education. Retrieved from <https://marketing.knewton.com/wp-content/uploads/2019/01/JHU-alta-efficacy-2018.pdf>

Quantitative & Qualitative Measures

The data from every Quantitative Reasoning course will be analyzed at the end of Summer 2019, Fall 2019, and Spring 2020. These data will be compared to that instructor's Spring 2018, Summer 2018, Fall 2018 baseline average. This data comparison of grant students versus last year's students will include DWF rates of 428 students. This comparison will show us if using a more expensive software and textbook versus cheaper software and free textbook has any effect on student success rates.

The data analysis will also include evaluating Learning Outcome Success. Learning outcomes are assigned by the USG, and the ABAC math department evaluates those outcomes via the final exam. All ABAC faculty give the same final. There are six USG learning outcomes that are assessed on the final. They are:

- **Outcome 1:** Students will have developed number sense sufficiently to be able to put numbers, expressed in a variety of ways (such as decimal, fraction, percentage, and scientific notation), into perspective.
- **Outcome 2:** Students shall acquire skills that will enable them to construct logical arguments based on rules of inference and to develop strategies for solving quantitative problems.
- **Outcome 3:** Students will understand and appropriately use the meaning of central tendency, variation, the significance of different distributions, and statistical inference.
- **Outcome 4:** Students will understand the difference between causation and correlation and be able to interpret statistics presented graphically.
- **Outcome 5:** Students shall acquire skills in counting possible outcomes to calculate probability of an event, the odds, probability involving independent event, and conditional probability.
- **Outcome 6:** Students will understand and appropriately use a variety of mathematical models reflecting real-world phenomena. Specifically, a student will be able to distinguish among linear, quadratic and exponential growth models (functions).

Each outcome is assessed by three questions on the final for a total of 24 questions per exam. The 24 questions were selected by the faculty as items that match the outcome. The assessment is analyzed in Excel by averaging the number of assessment questions the student got correct, and those averages are compared between faculty members.

The faculty will survey the students to obtain qualitative data about their satisfaction and opinions. A Likert type survey with four free response questions has already been created by Dr. EunKyung You and Ms. April Abbott. This survey was used by students to rate their opinions on the free textbook and low-cost software for College Algebra, Trigonometry, and Statistics. This survey can be found below. A new version of the survey will be created for Quantitative Reasoning. The software references will be changed from 'WebAssign' to 'Alta'. Question 19 will be removed as only Quantitative Reasoning students will receive this survey, and Question 20 will be adjusted to state the team members' names. Qualtrics will be used to administer the survey. Qualitative data will be taken from open-response questions, along with quotations. The team will gain approval from ABAC's IRB Committee during May 2019, before the redesigned course is taught.

Affordable Learning Math Survey

(Previously developed for College Algebra, Trigonometry and Statistics)

For each of the questions below, select the response that best characterizes how you feel about the statement, where: 1 = Strongly Disagree, 2 = Somewhat Disagree, 3 = Neither Agree Nor Disagree, 4 = Somewhat Agree, and 5 = Strongly Agree.

Q1 The e-book gives me good explanations to understand the lesson on my own.

- Strongly disagree (1)
- Somewhat disagree (2)
- Neither agree nor disagree (3)
- Somewhat agree (4)
- Strongly agree (5)

Q2 The e-book provides enough examples for me to understand the material.

- Strongly disagree (1)
- Somewhat disagree (2)
- Neither agree nor disagree (3)

- Somewhat agree (4)

- Strongly agree (5)

Q3 I used the e-book regularly during the semester.

- Strongly disagree (1)

- Somewhat disagree (2)

- Neither agree nor disagree (3)

- Somewhat agree (4)

- Strongly agree (5)

Q4 I have used my e-book to prepare for exams.

- Strongly disagree (1)

- Somewhat disagree (2)

- Neither agree nor disagree (3)

- Somewhat agree (4)

- Strongly agree (5)

Q5 The e-book was easy to read and used mathematical terminology comparative to my instructor's terminology.

- Strongly disagree (1)

- Somewhat disagree (2)

- Neither agree nor disagree (3)

- Somewhat agree (4)

- Strongly agree (5)

Q6 The e-book was easy to access and read on my phone.

- Strongly disagree (1)

- Somewhat disagree (2)

- Neither agree nor disagree (3)

- Somewhat agree (4)

- Strongly agree (5)

Q7 The e-book was easy to access and read on my computer.

- Strongly disagree (1)

- Somewhat disagree (2)

- Neither agree nor disagree (3)

- Somewhat agree (4)

- Strongly agree (5)

Q8 What is your opinion of the free textbook? Do you have any suggestions?

Q9 It was easy to create and sign into a Web-Assign account.

- Strongly disagree (1)

- Somewhat disagree (2)

- Neither agree nor disagree (3)

- Somewhat agree (4)

- Strongly agree (5)

Q10 It was easy to purchase Web-Assign.

- Strongly disagree (1)

- Somewhat disagree (2)

- Neither agree nor disagree (3)

- Somewhat agree (4)

- Strongly agree (5)

Q11 It was easy to navigate and answer questions in Web-Assign.

- Strongly disagree (1)

- Somewhat disagree (2)

- Neither agree nor disagree (3)

- Somewhat agree (4)

- Strongly agree (5)

Q12 Web-Assign helped me understand what I learned in class.

- Strongly disagree (1)
- Somewhat disagree (2)
- Neither agree nor disagree (3)
- Somewhat agree (4)
- Strongly agree (5)

Q13 Web-Assign provided enough problems to prepare for in class quizzes and tests.

- Strongly disagree (1)
- Somewhat disagree (2)
- Neither agree nor disagree (3)
- Somewhat agree (4)
- Strongly agree (5)

Q14 The Web-Assign provided helpful examples to solve problems.

- Strongly disagree (1)
- Somewhat disagree (2)
- Neither agree nor disagree (3)
- Somewhat agree (4)
- Strongly agree (5)

Q15 Knowing that other students paid \$130 for MyMathLab in other math courses, I am content with Web-Assign's \$35 price.

- Strongly disagree (1)
- Somewhat disagree (2)
- Neither agree nor disagree (3)
- Somewhat agree (4)
- Strongly agree (5)

Q16 What is your opinion of the low-cost online resource Web-Assign? Do you have any suggestions?

Q17 Do you feel that the no/low cost resources affected your grade? Explain how.

Q18 Do you have other comments/suggestions for future courses that use the same no/low cost resources?

Q19 What math class are you currently in?

- College Algebra - MATH 1111 (1)
- Trigonometry - MATH 1112 (2)
- Statistics - MATH 2000 (3)

Q20 Who is your current instructor?

- Ms. Abbott (1)
- Mr. Dicks (2)
- Dr. Gregus (3)
- Dr. Pantha (4)
- Ms. Partlow (5)
- Ms. Pearman (6)
- Ms. Urquhart (7)
- Dr. You (8)

Timeline

April 25, 2019: Notification Date. Faculty will be notified if they have received the grant and start work immediately.
RESPONSIBLE: Board of Regents

May 2019

- Faculty members will invite a Knewton Representative to present for any team members who haven't seen the program or who need a refresher. We will also discuss setting up a Knewton Bootcamp for Summer and Fall 2019 as well as Spring 2020 where representatives come to our campus to show our students how to work the software.
RESPONSIBLE: Faculty team

- Faculty members will create Knewton Alta online assignments. Faculty will also work on updating an existing workbook created for Foundations of Quantitative Reasoning. Calendars will be created for the new layout of the course, and written homework problems will be selected from various texts and the workbook. Each team member will be responsible for their chapter as previously mentioned. RESPONSIBLE: Faculty team members Dicks, Gregus, Coston, Whitehead, McClendon and Urquhart

- May 20, 2019: Kickoff Meeting, Middle Georgia State University Hatcher Conference Center. At least two members will attend this meeting, if not all 8 team members. RESPONSIBLE: Board of Regents; team attends

Summer 2019: Pilot test Quantitative Reasoning course to catch any items that need to be updated or changed.
RESPONSIBLE: Abbott

July 2019: Status report submitted. RESPONSIBLE: Abbott

Fall 2019: The full team will implement in Fall of 2019. RESPONSIBLE: All

December 2019: Status report submitted. RESPONSIBLE: Abbott

Spring 2020: All Quantitative Reasoning courses will be implementing low/no-costs resources including the courses taught by adjunct faculty members. RESPONSIBLE: All

May 2020: Data will be analyzed. The Math Departments of both campuses will meet and discuss continuing with the piloted material and software. A status report will be submitted. RESPONSIBLE: Abbott

July 2020: The Final Status Report will be submitted at the end of the month. RESPONSIBLE: Abbott

Budget

- Salary and Benefits
 - o April Abbott: \$4,000
 - o Gary Dicks: \$3,500
 - o Jan Gregus: \$3,500
 - o Wanda Coston: \$3,500
 - o Wesley Whitehead: \$3,500
 - o Sheila Mclendon: \$3,500
 - o Amanda Urquhart: \$3,500
- Travel/Overall Project Expenses: \$800
- Benefits (7.65% FICA): \$1,912.50
- Overall Request: \$27,712.50

During the design phase, each team member will be paid \$1500 dollars during the month of May 2019, equating to approximately two weeks' effort, to create the online assignments, classroom handouts, and selecting homework assignments. Each team member will teach Quantitative Reasoning in the Fall of 2019 and Spring of 2020. In addition to their base salary, they will receive an additional \$1,000 per course per semester to collect project data, collate, and to assist Ms. Abbott with reporting requirements. The total compensation requested for each faculty team member is \$3,500.

Ms. Abbott will serve as the project lead. She will be piloting the class in Summer of 2019 and will teach the course in the Fall of 2019 and Spring of 2020. Thus, she will teach the course three times and requests \$3,500 for this effort in piloting new materials and collecting/analyzing data, all of which are above and beyond her normal teaching duties. During the Fall of 2019 and Spring of 2020, she will also facilitate grant activities amongst the administrative units to generate invoices, payments and purchase orders, will convene team meetings, lead team discussions and will serve as the principal point of contact for the Board of Regents. In addition, she will analyze end of semester data, then draft and submitting the final report. Miss Abbott requests an additional \$500 dollars above the other team members' compensation, for a total of \$4,000.

Sustainability Plan

The faculty plan to continue offering no/low cost Quantitative Reasoning courses beyond Spring 2020, provided there are no negative consequences on DFW rates or student learning. The department will review the matter during the summer of 2020 to decide on sustained implementation. All project materials developed will be made available to the public via Galileo so that other Institutions might benefit from ABAC's efforts.

We will continue to improve Knewton Alta assignments every semester to better suit the needs of the students. We will review and implement new OpenStax editions or an Openstax Quantitative Reasoning Textbook. If needed, we will create and provide our students with supplemental material that we find lacking.

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.

April 4, 2019

Members of the Review Committee:

I write to endorse the Affordable Learning Georgia Textbook Transformation Grant put forth by ABAC for your consideration. I serve as the Provost and Vice President for Academic Affairs at Abraham Baldwin Agricultural College, located in Tifton GA. We are a State University with Fall 2019 enrollment of 4,291. We offer transfer associate degrees in core disciplines, along with an Associate's in Fine Arts/Music and a Career RN Degree in Nursing. We offer bachelor degrees in eight disciplines. In the fiscal year 2018, we conferred 231 associate degrees, 126 Career Associate Degrees in Nursing and 257 bachelor degrees. Most of our bachelor degree programs are only a few years old, but they now comprise nearly half of our degrees conferred.

One reason for our success is the attention we give our students. We strive to provide students with the assistance they need, a supportive learning environment, highly qualified faculty and customer-focused staff. We would like to be in a position to lower their overall cost of attendance, giving them the opportunity to devote more of their resources to other educational necessities in our changing times, such as experiential learning opportunities, internships, and off-site research projects. The textbook grant April Abbott has proposed supports exactly this kind of effort. With the Affordable Learning Grant proposal, ABAC students would be able to save a considerable amount on their textbook expenses.

As the Provost and VPAA, I will see to it that the grant funds will be received and allocated in accordance with the project's budget plan. Furthermore, I agree to help April Abbott sustain the grant's efforts after the period of support has ended. If the project goes according to plan, we will continue to use the materials developed in future coursework here at ABAC. I support this project and believe it is an important statewide initiative. As such, I will encourage our faculty to share the materials we develop with our state educational partners, and with fellow faculty members at other institutions.

Thank you in advance for your consideration of our proposal.

Best Regards,



Jerry Baker, Ph.D.
Provost & Vice President for Academic Affairs
Abraham Baldwin Agricultural College
jbaker@abac.edu
229-391-4782



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

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 14 RFP Page](#).
- The italic text we provide is meant for clarifications and can be deleted.

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)	Abraham Baldwin Agricultural College
Applicant Name	April Abbott
Applicant Email	aabbott@abac.edu
Applicant Phone #	229-391-5160
Applicant Position/Title	Mathematics Lab Coordinator/Lecturer
Submitter Name	Scott Pierce
Submitter Email	scott.pierce@abac.edu
Submitter Phone #	229-391-4983
Submitter Position	Director of Sponsored Projects

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	April Abbott	aabbott@abac.edu
Team Member 2	Gary Dicks	gdicks@abac.edu
Team Member 3	Jan Gregus	jgregus@abac.edu
Team Member 4	Wesley Whitehead	Wesley.whitehead@abac.edu
Team Member 5	Wanda Coston	elwanda.coston@abac.edu
Team Member 6	Shelia Mclendon	shelia.mclendon@abac.edu
Team Member 7	Amanda Urquhart	aurquhart@abac.edu
Team Member 8		

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

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

Dr. Jerry Baker, Provost ABAC

Project Information and Impact Data

Title of Grant Project	ABAC Affordable Learning Grant for Quantitative Reasoning
Type of Grant	Large Scale Transformation
Requested Amount of Funding	\$27,712.50
Course Names and Course Numbers	Quantitative Reasoning, MATH 1001
Final Semester of Project	Summer 2020
Average Number of Students Per Course Section Affected by Project	25
Average Number of Sections Affected by Project in One Academic Year	20 sections
Total Number of Students Affected by Project in One Academic Year	$20 * 25 = 500$
Average Number of Students Affected per Summer Semester	30
Average Number of Students Affected per Fall Semester	270
Average Number of Students Affected per Spring Semester	200
Title/Author of Original Required Materials	Homework Platform: Knewton Alta MATH 1001 Workbook: ABAC Faculty adapting from a MATH 0987 workbook created by April Abbott Text: Selected by Knewton https://www.knewton.com//wp-content/uploads/2018/09/Alta-Quantitative-Reasoning-1.pdf
Original Total Cost Per Student	\$165 for Pearson Textbook and Software bundle: Mathematics All Around 6 th edition by Pirnot
Post-Project Cost Per Student	\$40
Post-Project Savings Per Student	\$125
Projected Total Annual Student Savings Per Academic Year	$125 * 500 = \$62,500$

Using OpenStax Textbook?	Yes, but sections compiled from various books because there is not a Quantitative Reasoning textbook. The Openstax sections will be taken from Statistics and Pre-Algebra.
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Narrative Section

1. Project Goals

Abraham Baldwin Agricultural College (ABAC) proposes a large-scale textbook transformation project for Quantitative Reasoning (MATH 1001). The course is taught by several professors at ABAC across four campuses 90 miles apart. We offer ~20 sections of the course each year to 500 students. We anticipate our project will save Georgia students over \$62,000 in one Fiscal year.

The overall goal of this grant is to provide our students significant savings without compromising the quality of instruction or our commitment to an internationalized general education curriculum. Since Quantitative Reasoning is a gateway course normally taken in a student's first or second semester, we will provide our students with less financial stress in their first year. These funds can be re-allocated to other educational needs, allowing them an easier transition to college. In turn, our team hopes to improve our current D/W/F math rates for Quantitative Reasoning as well as our improving our final exams scores/course learning objectives assessment (this will be discussed further below).

Another goal of this project is to standardize the Quantitative Reasoning curriculum offered across ABAC's campuses. The 2017 consolidation between ABAC and Bainbridge College merged two different math departments. Our Bainbridge, Moultrie and Blakeley Campus were asked to switch to Tifton Campus's textbooks, syllabi, and scheduling. This grant will allow members of all campuses to come together to create a course. It will promote discussions, connections, and aid in solidifying ABAC's math faculty into a single, if geographically distinct, department.

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2. Statement of Transformation

All of ABAC's students have benefited from the last two grants we've received for math. The last grant allowed us to purchase over 110 used TI-83 calculators for students to check out from the library. They are available to students in all math classes. For this project, the calculators purchased by prior grants will provide our incoming Quantitative Reasoning students even more financial savings, since many can't afford to purchase a graphing calculator.

Currently, the STEM pathway has switched to low or no-cost resources. College Algebra and Trigonometry students only spend \$40 on WebAssign software for course materials. There are plans to review and implement WebWorks software for these two courses, which would reduce the cost for students' materials to zero.

Quantitative Reasoning is the Non-STEM pathway. As currently taught, the course requires students to purchase a MyMathLab access code as well as a textbook. The textbook and software bundle is \$165. Since non-STEM students are only required to take one math course in Area A it seems unreasonable to be charged nearly 4 times as much as STEM students for one course in one area of their checksheet. We want to provide these students with comparable costs as the STEM pathway students.

The number of students in Quantitative Reasoning at the Tifton Campus for Spring 2018 was 48 and Fall 2018 year was 270. However, the Non-Stem pathway is growing. In Fall of 2017 only two Quantitative Reasoning courses were offered. This semester (Fall of 2018) Tifton Campus offered nine Quantitative Reasoning courses and Bainbridge offered two courses. There will be an expected 500 students affected per year with the addition of more courses as USG institutions promote Non-Stem pathways.

Quantitative Reasoning is a gateway course; one of the first our students take. We hope that lowering the cost for students will contribute to their retention, progression, and graduation at ABAC. From a previous implementation of a mini-grant and a large scale grant for STEM pathway students, there is expected to be little to no change to course success rates.

3. Transformation Action Plan

On April 25, 2019, ABAC faculty will be notified if they have received the grant. Shortly thereafter, faculty members will invite a Knewton Representative to present software form, function and operation to team members who haven't seen the program, or who need a refresher. The faculty will also discuss setting up a Knewton Bootcamp for Summer and Fall 2019 as well as Spring 2020 where representatives come to our campuses to show our students how to work the software. In May, at least two members of the team will attend the kickoff meeting on May 20th at Middle Georgia State University. Additionally in May, the team will create Knewton Alta online assignments, calendars, and written homework problems. Each team member's responsibility can be found below. Abbott will pilot teach Quantitative Reasoning in the Summer to catch any items that need to be updated or changed and all faculty will implement the low/no-cost materials in the Fall of 2019.

The current Pearson Textbook (Mathematics All Around 6th Edition) for Quantitative Reasoning has 14 chapters. The ABAC Math Department teaches four units comprised of seven of those chapters. The chapters are as follows:

- Unit 1: Chapter 1 – Problem Solving
- Chapter 2 – Set Theory
- Unit 2: Chapter 3 – Logic
- Chapter 14 – Descriptive Statistics
- Unit 3: Chapter 12 – Counting
- Chapter 13 – Probability
- Unit 4: Chapter 7 – Algebraic Models

The Pearson course consists of a textbook with descriptions of mathematical principles, examples, section homework questions, chapter summaries, end-of-chapter homework questions, and solutions to the odd-numbered homework. MyMathLab, the software connected to the Pearson book, provides online homework, how-to-solve videos, and examples.

The material covered in the Pearson text is a suitable sequence, meets our needs, and prepares our students well. It is simply too expensive, especially for a course to be taught in a student's first year. We propose to retain the same information contained in the Pearson text, and to present it in the same order, but simply to use lower cost sources.

We intend to use a proven online platform, Knewton Alta. Knewton Alta uses a style of mastery learning where the student's grade reflects their knowledge of outcomes. A study by Knewton showed that students using Alta who had not yet completed an assignment scored an average of 55% on related course assessments, while students who completed their assignment scored an average of 81% (Knewton, 2017). In 2018, a Johns Hopkins study by Wolf, Armstrong, and Ross showed a positive trend with using Knewton Alta, where completing a greater proportion of assignments positively correlated with improved student performance on quizzes and tests. In the study, it was found that students 10% increase in the overall Knewton assignment completion rate was associated with an increase in average student performance of 1.4% (Wolf et al., 2018, p. 28).

Each team member will be responsible for identifying suitable assignments from within Knewton Alta to supplant the primary material. In addition, they will create supplemental materials and written homework assignments to go along with the software and Openstax resources. Team members will be responsible for creating supplemental instructional materials such as class handouts, written homework assignments, and quizzes for each chapter.

A working list of responsibilities are:

Unit 1: Chapter 1	Problem Solving	Amanda Urquhart
Chapter 2	Set Theory	Wesley Whitehead
Unit 2: Chapter 3	Logic	April Abbott
Chapter 4	Descriptive Statistics	Shelia Mclendon
Unit 3: Chapter 5	Counting	Wanda Coston
Chapter 6	Probability	Jan Gregus
Unit 4: Chapter 7	Algebraic Models	Gary Dicks

The Quantitative Reasoning course calendar and syllabus will be redesigned by Abbott for the transformation. Any created materials such as handouts or a workbook will be placed on Georgia View and faculty websites for the students to access for free. These materials will also be attached to the status update report and final report for grant. The ABAC library will be asked to assist in uploading all created materials to Galileo so that others in the USG can have open access. GALILEO is an online library portal to subscription-only information that is not available through free search engines or Web directories and is available to all USG faculty, staff, and students. GALILEO Open Learning Materials are classified under a Creative Commons license. Definitive classification for licenses in GALILEO can be found at the following address <https://creativecommons.org/licenses/>. Documents in Galileo are accessible by course number, course title, discipline, or Creative Commons license. The GALILEO administrator would work with the library to add materials to the collection. Affordable Learning Georgia is focused on OER adoption and an open license for materials is required. The project team will follow through to make sure all requirements are met, in conjunction with the library team.

ABAC faculty members Abbott, Coston, Dicks, Gregus, Mclendon, Urquhart, and Whitehead teach Quantitative Reasoning across all campuses. They are the only ones who do. Ms. Abbott was selected as project lead because she has taught Quantitative Reasoning the longest and is the most familiar with students' support needs. She began instructing the course in the spring of 2012. Gregus and Abbott were the first to teach Quantitative Reasoning Corequisite Support courses and Foundations courses at ABAC, beginning in Spring of 2014. Ms. Abbott teaches 5-6 sections of the course per academic year and is most familiar with the course curriculum. In addition, Abbott led a previous Affordable Learning Grant in 2017 (Grant Number 344). She knows the areas the students struggle, especially learning support students. Given her consistent engagement with the students, the curriculum and given her prior successes with Affordable Learning Georgia, she is in an excellent position to oversee the production all created material and assignments and the administrative aspects of the grant proposed here.

References

- Knewton. (2017). Student data insights. Retrieved from <https://www.knewton.com/wp-content/uploads/2018/09/Knewtons-alta-2017-Student-Data-Insights.pdf>
- Wolf, A., Armstrong, C., & Ross, S.M. (2018). Study of knewton online courses for undergraduate students: Examining the relationships among usage, assignment completion, and course success. Johns Hopkins School of Education. Retrieved from <https://marketing.knewton.com/wp-content/uploads/2019/01/JHU-alta-efficacy-2018.pdf>

4. Quantitative and Qualitative Measures

The data from every Quantitative Reasoning course will be analyzed at the end of Summer 2019, Fall 2019, and Spring 2020. These data will be compared to that instructor's Spring 2018, Summer 2018, Fall 2018 baseline average. This data comparison of grant students versus last year's students will include DWF rates of 428 students. This comparison will show us if using a more expensive software and textbook versus cheaper software and free textbook has any effect on student success rates.

The data analysis will also include evaluating Learning Outcome Success. Learning outcomes are assigned by the USG, and the ABAC math department evaluates those outcomes via the final exam. All ABAC faculty give the same final. There are six USG learning outcomes that are assessed on the final. They are:

- **Outcome 1:** Students will have developed number sense sufficiently to be able to put numbers, expressed in a variety of ways (such as decimal, fraction, percentage, and scientific notation), into perspective.
- **Outcome 2:** Students shall acquire skills that will enable them to construct logical arguments based on rules of inference and to develop strategies for solving quantitative problems.
- **Outcome 3:** Students will understand and appropriately use the meaning of central tendency, variation, the significance of different distributions, and statistical inference.
- **Outcome 4:** Students will understand the difference between causation and correlation and be able to interpret statistics presented graphically.
- **Outcome 5:** Students shall acquire skills in counting possible outcomes to calculate probability of an event, the odds, probability involving independent event, and conditional probability.
- **Outcome 6:** Students will understand and appropriately use a variety of mathematical models reflecting real-world phenomena. Specifically, a student will be able to distinguish among linear, quadratic and exponential growth models (functions).

Each outcome is assessed by three questions on the final for a total of 24 questions per exam. The 24 questions were selected by the faculty as items that match the outcome. The assessment is analyzed in Excel by averaging the number of assessment questions the student got correct, and those averages are compared between faculty members.

The faculty will survey the students to obtain qualitative data about their satisfaction and opinions. A Likert type survey with four free response questions has already been created by Dr. Eunkyung You and Ms. April Abbott. This survey was used by students to rate their opinions on the free textbook and low-cost software for College Algebra, Trigonometry, and Statistics. This survey can be found below. A new version of the survey will be created for Quantitative Reasoning. The software references will be changed from 'WebAssign' to 'Alta'. Question 19 will be removed as only Quantitative Reasoning students will receive this survey, and Question 20 will be adjusted to state the team members' names. Qualtrics will be used to administer the survey. Qualitative data will be taken from open-response questions, along with quotations. The

team will gain approval from ABAC's IRB Committee during May 2019, before the redesigned course is taught.

Affordable Learning Math Survey

(Previously developed for College Algebra, Trigonometry and Statistics)

For each of the questions below, select the response that best characterizes how you feel about the statement, where: 1 = Strongly Disagree, 2 = Somewhat Disagree, 3 = Neither Agree Nor Disagree, 4 = Somewhat Agree, and 5 = Strongly Agree.

Q1 The e-book gives me good explanations to understand the lesson on my own.

- Strongly disagree (1)
- Somewhat disagree (2)
- Neither agree nor disagree (3)
- Somewhat agree (4)
- Strongly agree (5)

Q2 The e-book provides enough examples for me to understand the material.

- Strongly disagree (1)
- Somewhat disagree (2)
- Neither agree nor disagree (3)
- Somewhat agree (4)
- Strongly agree (5)

Q3 I used the e-book regularly during the semester.

- Strongly disagree (1)
- Somewhat disagree (2)
- Neither agree nor disagree (3)
- Somewhat agree (4)
- Strongly agree (5)

Q4 I have used my e-book to prepare for exams.

- Strongly disagree (1)
- Somewhat disagree (2)
- Neither agree nor disagree (3)
- Somewhat agree (4)
- Strongly agree (5)

Q5 The e-book was easy to read and used mathematical terminology comparative to my instructor's terminology.

- Strongly disagree (1)
- Somewhat disagree (2)
- Neither agree nor disagree (3)
- Somewhat agree (4)
- Strongly agree (5)

Q6 The e-book was easy to access and read on my phone.

- Strongly disagree (1)
- Somewhat disagree (2)
- Neither agree nor disagree (3)
- Somewhat agree (4)
- Strongly agree (5)

Q7 The e-book was easy to access and read on my computer.

- Strongly disagree (1)
- Somewhat disagree (2)
- Neither agree nor disagree (3)
- Somewhat agree (4)
- Strongly agree (5)

Q8 What is your opinion of the free textbook? Do you have any suggestions?

Q9 It was easy to create and sign into a Web-Assign account.

- Strongly disagree (1)
- Somewhat disagree (2)
- Neither agree nor disagree (3)
- Somewhat agree (4)
- Strongly agree (5)

Q10 It was easy to purchase Web-Assign.

- Strongly disagree (1)
- Somewhat disagree (2)
- Neither agree nor disagree (3)
- Somewhat agree (4)
- Strongly agree (5)

Q11 It was easy to navigate and answer questions in Web-Assign.

- Strongly disagree (1)

- Somewhat disagree (2)
- Neither agree nor disagree (3)
- Somewhat agree (4)
- Strongly agree (5)

Q12 Web-Assign helped me understand what I learned in class.

- Strongly disagree (1)
- Somewhat disagree (2)
- Neither agree nor disagree (3)
- Somewhat agree (4)
- Strongly agree (5)

Q13 Web-Assign provided enough problems to prepare for in class quizzes and tests.

- Strongly disagree (1)
- Somewhat disagree (2)
- Neither agree nor disagree (3)
- Somewhat agree (4)
- Strongly agree (5)

Q14 The Web-Assign provided helpful examples to solve problems.

- Strongly disagree (1)
- Somewhat disagree (2)
- Neither agree nor disagree (3)
- Somewhat agree (4)
- Strongly agree (5)

Q15 Knowing that other students paid \$130 for MyMathLab in other math courses, I am content with Web-Assign's \$35 price.

- Strongly disagree (1)
- Somewhat disagree (2)
- Neither agree nor disagree (3)
- Somewhat agree (4)
- Strongly agree (5)

Q16 What is your opinion of the low-cost online resource Web-Assign? Do you have any suggestions?

Q17 Do you feel that the no/low cost resources affected your grade? Explain how.

Q18 Do you have other comments/suggestions for future courses that use the same no/low cost resources?

Q19 What math class are you currently in?

- College Algebra - MATH 1111 (1)
- Trigonometry - MATH 1112 (2)
- Statistics - MATH 2000 (3)

Q20 Who is your current instructor?

- Ms. Abbott (1)
- Mr. Dicks (2)
- Dr. Gregus (3)
- Dr. Pantha (4)
- Ms. Partlow (5)
- Ms. Pearman (6)
- Ms. Urquhart (7)
- Dr. You (8)

5. Timeline

April 25, 2019: Notification Date. Faculty will be notified if they have received the grant and start work immediately. RESPONSIBLE: Board of Regents

May 2019

- Faculty members will invite a Knewton Representative to present for any team members who haven't seen the program or who need a refresher. We will also discuss setting up a Knewton Bootcamp for Summer and Fall 2019 as well as Spring 2020 where representatives come to our campus to show our students how to work the software. RESPONSIBLE: Faculty team
- Faculty members will create Knewton Alta online assignments. Faculty will also work on updating an existing workbook created for Foundations of Quantitative Reasoning. Calendars will be created for the new layout of the course, and written homework problems will be selected from various texts and the workbook. Each team member will be responsible for their chapter as previously mentioned. RESPONSIBLE: Faculty team members Dicks, Gregus, Coston, Whitehead, McClendon and Urquhart
- May 20, 2019: Kickoff Meeting, Middle Georgia State University Hatcher Conference Center. At least two members will attend this meeting, if not all 8 team members. RESPONSIBLE: Board of Regents; team attends

Summer 2019: Pilot test Quantitative Reasoning course to catch any items that need to be updated or changed. RESPONSIBLE: Abbott

July 2019: Status report submitted. RESPONSIBLE: Abbott

Fall 2019: The full team will implement in Fall of 2019. RESPONSIBLE: All

December 2019: Status report submitted. RESPONSIBLE: Abbott

Spring 2020: All Quantitative Reasoning courses will be implementing low/no-costs resources including the courses taught by adjunct faculty members. RESPONSIBLE: All

May 2020: Data will be analyzed. The Math Departments of both campuses will meet and discuss continuing with the piloted material and software. A status report will be submitted.
RESPONSIBLE: Abbott

July 2020: The Final Status Report will be submitted at the end of the month.
RESPONSIBLE: Abbott

6. Budget

- Salary and Benefits
 - o April Abbott: \$4,000
 - o Gary Dicks: \$3,500
 - o Jan Gregus: \$3,500
 - o Wanda Coston: \$3,500
 - o Wesley Whitehead: \$3,500
 - o Sheila Mclendon: \$3,500
 - o Amanda Urquhart: \$3,500
- Travel/Overall Project Expenses: \$800
- Benefits (7.65% FICA): \$1,912.50
- Overall Request: \$27,712.50

During the design phase, each team member will be paid \$1500 dollars during the month of May 2019, equating to approximately two weeks' effort, to create the online assignments, classroom handouts, and selecting homework assignments. Each team member will teach Quantitative Reasoning in the Fall of 2019 and Spring of 2020. In addition to their base salary, they will receive an additional \$1,000 per course per semester to collect project data, collate, and to assist Ms. Abbott with reporting requirements. The total compensation requested for each faculty team member is \$3,500.

Ms. Abbott will serve as the project lead. She will be piloting the class in Summer of 2019 and will teach the course in the Fall of 2019 and Spring of 2020. Thus, she will teach the course three times and requests \$3,500 for this effort in piloting new materials and collecting/analyzing data, all of which are above and beyond her normal teaching duties. During the Fall of 2019 and Spring of 2020, she will also facilitate grant activities amongst the administrative units to generate invoices, payments and purchase orders, will convene team meetings, lead team discussions and will serve as the principal point of contact for the Board of Regents. In addition, she will analyze end of semester data, then draft and submitting the final report. Miss Abbott requests an additional \$500 dollars above the other team members' compensation, for a total of \$4,000.

7. Sustainability Plan

The faculty plan to continue offering no/low cost Quantitative Reasoning courses beyond Spring 2020, provided there are no negative consequences on DFW rates or student learning. The department will review the matter during the summer of 2020 to decide on sustained implementation. All project materials developed will be made available to the public via Galileo so that other Institutions might benefit from ABAC's efforts.

We will continue to improve Knewton Alta assignments every semester to better suit the needs of the students. We will review and implement new OpenStax editions or an Openstax Quantitative Reasoning Textbook. If needed, we will create and provide our students with supplemental material that we find lacking.