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Application Summary

Competition Details

Competition Title:	Textbook Transformation Grants, Round Thirteen (Spring 2019-Spring 2020)
Category:	University System of Georgia
Award Cycle:	Round 13
Submission Deadline:	01/14/2019 at 11:59 PM

Application Information

Submitted By:	Lei Li
Appplication ID:	2880
Application Title:	422
Date Submitted:	01/15/2019 at 7:35 AM

Personal Details

Institution Name(s):	Kennesaw State University
Applicant First Name:	Lei
Applicant Last Name:	Li
Applicant Email Address:	Lli13@kennesaw.edu
Applicant Phone Number:	(470)578-3915
Primary Appointment Title:	Professor, assistant department chair
Submitter First Name:	Lei
Submitter Last Name:	Li
Submitter Email Address:	Lli13@kennesaw.edu
Submitter Phone Number:	(470)578-3915
Submitter Title:	Professor, assistant department chair

Application Details

Proposal Title

422

Final Semester of Project

Spring 2020

Requested Amount of Funding

$30,000

Type of Grant

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

Course Title(s)
IT 5413: Software Design and Development IT 5423: Computer Networks and System Administration IT 6773:
Practical Data Analytics IT 7833: IT Strategy, Policy, and Governance IT 7993: IT Capstone

Course Number(s)
IT 5413,IT 5423, IT 6773, IT 7833, IT 7993

Team Member 1 Name
Lei Li

Team Member 1 Email
Lli13@kennesaw.edu

Team Member 2 Name
Richard Halstead-Nussloch

Team Member 2 Email
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Team Member 3 Name
Ying Xie

Team Member 3 Email
yxie2@kennesaw.edu

Team Member 4 Name
Hossain Shahriar

Team Member 4 Email
hshahria@kennesaw.edu

Additional Team Members (Name and email address for each)
 Meng Han, mhan9@kennesaw.edu

Sponsor Name
Jon Preston, Rebecca Rutherfoord

Sponsor Title
Dean, Department chair

Sponsor Department
College of Computing and Software Engineering, Information Technology

Original Required Commercial Materials (title, author, price)

IT 5413 - Starting Out with Python 3rd Edition, Tony Gaddis, ISBN-13: 978-0133582734, Pearson.

IT 5423 - 1). The Architecture of Computer Hardware, Systems Software, and Networking, Author: Irv Englander, 2009, Fourth Edition, ISBN: 978-0471-71542-9; 2). Data Communications and Networking (5th Edition), B.A. Forouzan, McGraw-Hill, 2012, ISBN: 978-0-07-337622-6.

IT 6773 - Hands-on Machine Learning with Scikit-Learn, Keras, and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems 2nd Edition.

IT 7883 - Restricted COBIT materials provided cost-free to KSU through ISACA Academic Advocate Program, but restricted to KSU-only for the individual student's use in the course semester only.

IT 7993 - Information Technology Project Management, 9th Edition, Kathy Schwalbe, ISBN-13: 978-1337101356, Cengage.

Average Number of Students per Course Section Affected by Project in One Academic Year
26

Average Number of Sections Affected by Project in One Academic Year
17.5

Total Number of Students Affected by Project in One Academic Year
450

Average Number of Students Affected per Summer Semester
60

Average Number of Students Affected per Fall Semester
220

Average Number of Students Affected per Spring Semester
190

Original Total Cost per Student
$857.18

Post-Project Cost per Student
$0

Post-Project Savings per Student
$857.18

Projected Total Annual Student Savings per Academic Year
$70,543.41 (please refer to the Enrollment and Cost Saving Prediction Table in Project Goals section on how the total savings is calculated)

Using OpenStax Textbook?
No

Project Goals

The Master of Science in Information Technology (MSIT) program currently is the largest department level graduate program at Kennesaw State University currently with over 280 students in the MSIT and its affiliated graduate certificate programs. Having graduated more than 650 students since 2012, the MSIT program has been a big contributor to the much-needed IT workforce for the State of Georgia. Moreover, the MSIT program is also a great enabler for underrepresented minorities and people who want to change their job fields in the middle of their career. For fall 2018, 65% of MSIT students represent ethnic minorities, 39% are female, and around 40% of the students entered MSIT without background in computing. The high-quality of the curriculum, the flexibility of the offerings and affordability are the main enablers for the success of the MSIT program.

Much thanks to the supports of Affordable Learning Georgia in previous grants, we have transformed 15 out of 29 courses in the MSIT curriculum with no-cost-to-student learning material and the responses from the students are overwhelmingly positive. In this project, we propose to continue our department-wide effort to replace the textbooks used in five more MSIT courses with no-cost-to-student learning materials. We believe the impact of the proposed project will be significant given the scale of the MSIT program.

In summary, the objectives of the proposed project are listed as follows.

- Make the MSIT program more affordable by eliminating the textbooks used in five MSIT courses. By doing so, the MSIT program can better support the career–changing students and further boost female and minority participation.
- Develop free, up-to-date and well-designed learning material for the five proposed MSIT courses.
- Teach the proposed courses using the developed learning material and validate those material offers equal or better learning effectiveness as the textbooks do.
- Develop a sustainability plan to ensure the no-cost learning material will be continuously maintained and used in future course offerings.

Year 2019 Enrollment & Cost Saving Prediction

Course, Offer Frequency, Sections to be offered, Avg. enrollment per section, Total enrollment, Textbook cost, Total Saving

IT 5413 2 times every year 4 23 92 $129.00 $11,919.60

IT 5423 2 times every year 4 21 84 $178.95 $23,372.16

IT 6773 2 times every year 4 32 126 $55.99 $7,054.74

IT 7833 3 times every two years 1.5 32 47 $215.00 $10,158.75

IT 7993 2 times every year 4 25 101 $178.95 $18,038.16

Total 17.5 450 $857.18 $70,543.41

Note: 1) the projected average enrollment per section is based on three factors: past enrollment in 2018, MSIT permanent course schedule and the assumption of 5% increase in enrollment in 2019. 2) The IT 7993 is new course that is offered for the first time in spring 2019. IT 7993 is designed with no-cost learning material to begin with. The total saving for IT 7993 is the saving if a textbook was used. 3) IT 6773 is a new course that is offered for the first time in Spring 2019. A textbook is used for its first offering. The total saving for IT 6773 is calculated based on the projection that no-cost learning material will be used starting in Fall 2019.

Statement of Transformation

The quality of the MSIT curriculum is one of the main reasons makes the program very successful. Given the dynamic and fast-changing nature of information technology, we need to constantly update our courses or create new courses to stay in the cutting edge of technology and competition. Unfortunately, the traditional textbook model won't work very well for the IT courses: they are not only expensive, but also could become outdated after got published. The instructors of courses have to constantly add new material to their courses in addition to what's covered in the textbook. The no-cost-learning-material model fits much better for the IT courses.

As matter of fact, the Department of Information Technology has been a big proponent of no-cost-learning material since round one of ALG. The faculty of IT department has transformed 30 IT courses at both undergraduate and graduate level with the support of ALG. Several of our ALG awards, e.g., round 2 award #119, round 8 award #302, round 10 award #334, round 11, award #365, are coordinated at the department level. Moreover, the responses for those renovated with no-cost-learning-material courses have been overwhelmingly positive from the students.

The positive responses from the students, our past successes, and the nature of the IT discipline make a perfect storm for us to continue transforming more IT courses using no-cost learning material. This project aims to replace the textbooks used in the five proposed MSIT courses with no-cost-to-students learning materials that offer equal or higher educational effectiveness. One of the proposed courses, IT 7993, is a new addition to MSIT curriculum. The instructor of IT 7993 started with no-cost learning material when develop the course. We believe the proposed transformation is an economical and viable solution to address the challenges imposed by the traditional textbook model.

Firstly, the learning materials for the proposed MSIT courses are widely and readily available on the World Wide Web today and many of these resources are publicly accessible, free, or with an open license to use [1] [2]. These materials include open and free tutorials, books, videos, labs, software, and services. For example, currently IT7833 uses cost-free materials provided by ISACA.org under their academic advocate program. These materials have worked well for the past decade as they focused on one of the original frameworks for IT strategy, policy and governance (ITSP&G) called COBIT; the materials are also restricted to use by the students during the semester they take the course. Since the course's original implementation, many additional frameworks, e.g., ITIL and enterprise architecture, have emerged. To provide a more complete picture of ITSP&G, we want to use the grant to curate a wider range of open and free materials for ITSP&G. This will also allow IT7833 students to carry forward and use their course materials beyond the semester they take IT7833 without the restriction imposed by ISACA.org.

Secondly, Web content can better reflect the latest trends and industrial development than the traditional textbooks as technology is changing rapidly, so is the content of Web resources. We are already using contents from the Web as supplemental materials to the textbook. For example, we have utilized open source resources to redevelop information security courses with the latest open source tools and systems (e.g., [3, 4]). For another example, newest machine learning methods and applications are typically published as open source packages on websites such as GitHub. Some of them are great learning materials and use cases for the course IT6773 Practical Data Analytics. Furthermore, a lot of public data sets in different business domains are searchable using the new data sets search tool that was published by Google (https://toolbox.google.com/datasetsearch), which enables students in IT6773 to have a variety of choices of apply machine learning methods to the domains of their interests.

Thirdly, the materials from the Web are generally more interactive. The interactive content will not only engage the students, but also improve their learning experience. As instructors, one of the key roles we play is to select, organize and deliver from the vast amount of information available from the web and open source resources to fit with the classroom learners background. In particular, developing hands-on labs and assignments with tools and methods so that students are well prepared for the job market and pursuing advanced courses. For example, there are books and manuals (e.g., [5, 6]) available on how to become a system administrator (IT5423), but they may not be applied directly applied to classroom students for effective hands-on learning.

Fourthly, developing and assembling a set of learning materials ourselves allow us to better align the course contents not only with the outcomes of each course but also with the outcomes of MSIT program. For example, IT 7993 is a capstone course in which students work in group to complete a real-world IT project from start to finish. The learning outcomes of IT 7993 cover many areas such as project management, team dynamics, etc. and there is no one textbook covering all outcomes. Using the materials compiled by the instructor actually better serve the students in the class.

Lastly, our project team is well prepared for the proposed transformation. The disadvantages of using Web resources are that they are often disorganized, may contain inaccurate information, may be changed or deleted without notices. However, our team members are not only subject matter experts in the IT fields, but also are proficient educators who on average have more than 10 years of teaching experience. We will select, organize and integrate resources from the Web and transform the information into instructional sound learning materials for the proposed courses. We also created a sustainable plan to periodically review the developed no-cost-to-student learning materials. All courses in the department are reviewed every three years as part of the continuous improvement process. In addition, all of the team members have successfully completed many ALG grants, to name a few, round 2 award #119, round 8

award #302, round 10 award #334, and round 11 award #365.

In summary, the faculties at IT department have transformed 15 MSIT courses using no-cost-to-student learning material which are very well received by the students. Building on our previous success and lessons learned, we are well positioned to continue transformation efforts and further increase the cost-saving benefits to the students in our program.

References

[1] Li, L., Peltsverger, S. B., Colyar, N. N., Rutherfoord, R., Zheng, G., Li, Z. (2016). Transformation At Scale: The Experience Of Developing No Cost Learning Material For Database-Related Courses. 19th Annual Conference of the Southern Association for Information Systems. aisel.aisnet.org/sais2016/9/

[2] Rutherfoord, R., Peltsverger, S. B., Li, L., Zheng, G., Rutherfoord, J. (2016). Transforming IT Education with No-Cost Learning Materials. SIGITE'16. ACM Special Interest Group for IT Education.

[3] H. Shahriar. (2018), Ethical Hacking for Effective Defense (Modules, Labs, and Lectures), https://oer.galileo.usg.edu/compsci-ancillary/9/

[4] Shahriar, H., Peltsverger, S. (2018). Open Education Resource for Information Security Courses, USG Teaching and Learning Conference. https://sched.co/DvNV

[5] Clark, N. (2018). Linux: Installation, Configuration and Command Line Basics. Amazon.

[6] Linuxtraining.be. (2018). NetSec BVVA, http://linux-training.be/

Transformation Action Plan

Built on our previous experience of developing no-cost-to student learning material, our team of investigators plan to carry out following activities to transform the five proposed MSIT courses.

- Research on existing resources including ALG website for publicly available learning material could be re-used or adapted.
- Research and identify no cost readings for each of the learning modules in each course. The reading list includes both required readings and optional readings. All of these readings will be publicly accessible, free to use, or openly licensed.
- Research and identify no cost materials that can be shared across the courses.
- Develop study guides and lecture notes for students' use to review course content and key learning points.
- Adopt or develop all assignments, exercises and lab materials that are no cost to students to replace the ones in the textbooks.
- Develop test banks to replace the ones in the textbooks if necessary.
- Update the syllabus to include major resources and no cost materials.
- Re-develop the proposed courses in our learning management system, D2L Brightspace.
- The developed course material will be organized based on the template provided by ALG and will be made available to the public for adoption

The responsibilities of each investigator are listed as follows.

- Dr. Lei Li, project Lead, subject matter expert, developer and instructor of record for IT 7993: IT Capstone.
- Dr. Richard Halstead-Nussloch, subject matter expert, developer and instructor of record for IT 7833: IT Strategy, Policy, and Governance.
- Dr. Ying Xie, subject matter expert, developer and instructor of record for IT 6773: Practical Data Analytics.
- Dr. Hossain Shahriar, subject matter expert, developer and instructor of record for IT 5423: Computer Networks and System Administration.
- Dr. Meng Han, subject matter expert, developer and instructor of record for IT 5413: Software Design and Development.

Quantitative & Qualitative Measures

We plan to assess the effectiveness of our transformation efforts in the following ways.

1. Student performance data comparison. The course pass rate, average GPA and Drop/Withdraw/Fail rate are used as measurement of students' performance. We will only use aggregated data in analysis and final report and no IRB approval is needed. The performance data will be collected after the no-cost learning material is implemented for a proposed course, which is referred as current performance data. For each of the measurement, we plan to conduct two levels of analysis.

- Compare the current performance data to a preset goal. For example, 80 % is the aimed passing rate as the courses involved are graduate courses. Letter grade of B or better will be considered as a passing grade.
- Compare the current. performance data to those from past offerings where the textbooks were used. The student performance data from the sections last taught using the textbooks will be used as baseline.

2. Student survey on developed no-cost learning material. We will develop an anonymous web-based survey to collect students' feedback on the no-cost learning material. The survey will need approval from IRB board of Kennesaw State University before it can be distributed to the students. The proposed survey will be totally anonymous and voluntary and introduce minimum risk to the participants. As the result, the survey will qualify for the expedited review based on our previous experience. All proposed courses will use the same survey and the survey will be distributed at the end of implementation semester for a proposed course. The proposed survey consists of a mixture of quantitative and qualitative measures including:

- Student perception and attitude toward no cost materials.
- Quantitative ratings of the no cost materials used in this course.
- Qualitative measures such as open-ended questions for comments and suggestions.

3. Official student course evaluation from the university. The student course evaluation can also provide some insights on the effectiveness of no-cost learning material used in the proposed MSIT course.

Timeline

The major milestones of this proposal are listed as follows.

1. 03/01/2019. Complete gathering of baseline data.
2. 04/01/2019. Complete the development of the web-based student survey and submit it for IRB approval.
3. 05/05/2019. a). Student survey is approved by IRB. b). Complete course level materials redesign (mainly course syllabus) for IT 5413, IT 5423, IT 6773, IT 7833, and IT 799 c). Complete the project progress report.
4. 5/30/2019. a). Complete the module level development including reading, lecture notes, video, exams, labs, and assignments for IT 7833. b). Update the D2L Brightspace course sites are updated using the developed no cost learning material for IT 7833.
5. 07/15/2019. Complete the module level development including reading, lecture notes, video, exams, labs, and assignments for IT 5413, IT 5423, IT 6773, and IT 7993.
6. 07/30/2019. a). Complete course offering for IT 7833 and complete survey collection. b). Update the D2L Brightspace course sites are updated using the developed no cost learning material for IT 5413, IT 5423, IT 6773, and IT 7993. c). Complete project progress report.
7. 12/02/2019. a). Complete the course offering for IT 5413, IT 5423, and IT 6773. b). Complete the survey data collection for IT 5413, IT 5423, and IT 6773.
8. 05/01/2020. a). Complete the course offering for IT 7993. b). Complete the survey data collection for IT 7993.
9. 05/10/2020. Compile and submit project final report.

Budget

The budget information for this project is listed as follows.

1. Individual Expense

   - Dr. Lei Li, project Lead, developer and instructor of record for IT 7993, $5000 for professional development.
   - Dr. Richard Halstead-Nussloch, developer and instructor of record for IT 7833, $5000 for summer salary.
   - Dr. Ying Xie, developer and instructor of record for IT 6773, $5000 for professional development.
   - Dr. Hossain Shahriar, developer and instructor of record for IT 5423, $5000 for professional development
   - Dr. Meng Han, developer and instructor of record for IT 5413, $5000 for professional development.
   - Subtotal: $25,000.
2. Travel Expense: $2500. $800 is reserved for two team members attend the Kickoff Meeting at Middle Georgia State University in Macon, GA. $1700 is budgeted for attending another conference.

3. Equipment (computers and tablets): $2500

4. Total Budget requested: $30,000

Sustainability Plan

The IT department at Kennesaw State University implements a course architect system for all courses. A faculty who is assigned to a course as the course architect, is responsible for the content of the course and teaches the course regularly. All of our investigators are a course architect for the proposed courses. Our team member will develop the no-cost-to-student learning material for the proposed courses and teach the courses for the first time using the new material. As a course architect, our team member will also make sure a course is continuously taught using developed no-cost learning material in the future semesters even the course might have a different instructor.

Moreover, the developed course content is not only available at learning management system, but also archived at department server. It is also our department policy that there are at least two faculty who regularly teach a course. This further ensures the developed learning material will be continuously used and updated even there is a personnel turnover.

The IT department also have well established course continual improvement plan. Each course is assessed each semester after being taught, and a course will be formally evaluated and updated every three years or earlier if the need arises. A course architect is in charge of those assessment efforts. Thus, we are committed to continuously update the no-cost learning material in the proposed courses based on research, assessment results and feedback from students and alumni. As shown in their support letters, our transformation efforts also have strong supports from our department chair and the dean of our colleges which further ensure the sustainability of our transformation efforts.

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.
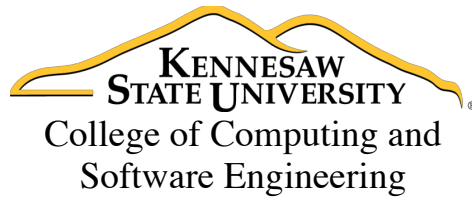
January 8, 2019

Dear Affordable Learning Georgia (ALG) Grant Reviewers,

It is my pleasure to write this letter in support of the proposal titled "Developing a more affordable Masters of Science in Information Technology (MSIT) Program Using No-Cost-to-Student Learning Material" submitted by Drs. Li, Halstead-Nussloch, Xie, Shahriar, and Han from our Information Technology (IT) Department at Kennesaw State University.

In this project, the primary investigators will work as a team to replace existing, costly textbooks in five graduate information technology related courses with no-cost-to-students learning materials. Their efforts will significantly lower the cost of education for students, saving over $70k per year at KSU alone and impacting 450 students per year. Additionally, this will generate a positive impact on the retention, progression, and graduation for the College of Computing and Software Engineering, specifically helping us maintain excellence and throughput for the largest graduate program at KSU, the MSIT program. Additionally, given the rapid change of the IT field, having digital materials available to students will improve the ability to keep them updated with the latest advances in the field of information technology.

The proposers have past experience with a successful ALG projects, thus the quality and success of this project is highly likely. The investigators in this project are also designated course architects who are responsible for the development and the maintenance of the to-be-transformed courses.

In conclusion, I wholeheartedly support this effort to improve access to our MSIT program. This proposal has the full support of the College of Computing and Software Engineering.

Sincerely,

Dr. Jon A. Preston
Dean and Professor
College of Computing and Software Engineering
Kennesaw State University
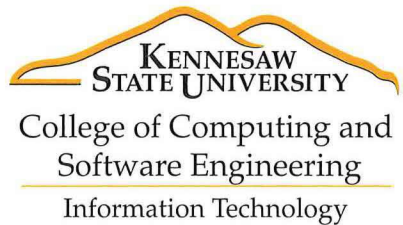
January 10, 2019

ALG Grant Committee University System of GA
Dear Colleagues:

This letter is in support of the Proposal "Developing a more affordable Masters Science in Information Technology (MSIT) Program Using No-Cost-to-Student Learning Material " submitted from Kennesaw State University, Information Technology department faculty. As Department Chair for Information Technology, I clearly see the need for bringing down costs for our students. The ALG grants assist faculty to prepare no-cost courses that allow students to take courses without the monetary burden of expensive textbooks.

Several faculty in the Information Technology Department at Kennesaw State University have successfully carried out an ALG rounds #1, #2, #5, #8, #10, #11 and #12. The savings already realized from the previous ALG grant encouraged our faculty to develop this new ALG grant proposal to help our students save even more money.

I strongly support this proposal. This is a very sustainable proposal as we have a large Information Technology degree program. Many of our master's students take courses online as well as in-class. Creating the no-cost format for the five MSIT courses will allow students for many years to realize savings from not buying textbooks for these courses.

This is a very solid proposal. All faculty participating in the previous ALG grants completed their courses and offered them successfully. I believe that this new ALG proposal will have the same student satisfaction and success that the previous ALG grants did. This new proposal will have an even larger monetary impact on our students than the previous grants. Thank you for your consideration of this proposal.

Sincerely,

Rebecca H. Rutherfoord, Ed.D.
Interim Assistant Dean of the College of Computing & Software Engineering,
Department Chair for Information Technology, Professor of Information Technology
brutherf@kennesaw.edu

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 13 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)	Kennesaw State University
Applicant Name	Lei Li
Applicant Email	Lli13@kennesaw.edu
Applicant Phone #	(470)578-3915
Applicant Position/Title	Professor, assistant department chair
Submitter Name	Lei Li
Submitter Email	Lli13@kennesaw.edu
Submitter Phone #	(470)578-3915
Submitter Position	Professor, assistant department chair

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	Lei Li	Lli13@kennesaw.edu
Team Member 2	Richard Halstead-Nussloch	rhalstea@kennesaw.edu
Team Member 3	Ying Xie	yxie2@kennesaw.edu
Team Member 4	Hossain Shahriar	hshahria@kennesaw.edu
Team Member 5	Meng Han	mhan9@kennesaw.edu
Team Member 6		
Team Member 7		
Team Member 8		

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.

Dr. Rebecca Rutherfoord, Department of Information Technology, Kennesaw State University

Project Information and Impact Data

Title of Grant Project	Developing a more affordable Masters Science in Information Technology (MSIT) Program Using No-Cost-to-Student Learning Material
Type of Grant	No-or-Low-Cost-to-Students Learning Materials
Requested Amount of Funding	$30,000
Course Names and Course Numbers	IT 5413: Software Design and Development IT 5423: Computer Networks and System Administration IT 6773: Practical Data Analytics IT 7833: IT Strategy, Policy, and Governance IT 7993: IT Capstone
Final Semester of Project	Spring 2020
Average Number of Students Per Course Section Affected by Project	26
Average Number of Sections Affected by Project in One Academic Year	17.5
Total Number of Students Affected by Project in One Academic Year	450
Average Number of Students Affected per Summer Semester	60
Average Number of Students Affected per Fall Semester	220
Average Number of Students Affected per Spring Semester	190
Title/Author of Original Required Materials	IT 5413 - Starting Out with Python 3rd Edition, Tony Gaddis, ISBN-13: 978-0133582734, Pearson. IT 5423 - 1). The Architecture of Computer Hardware, Systems Software, and Networking, Author: Irv Englander, 2009, Fourth Edition, ISBN: 978-0471-71542-9; 2). Data Communications and Networking (5th Edition), B.A. Forouzan,

	McGraw-Hill, 2012, ISBN: 978-0-07-337622-6. IT 6773 - Hands-on Machine Learning with Scikit-Learn, Keras, and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems 2nd Edition. IT 7883 - Restricted COBIT materials provided cost-free to KSU through ISACA Academic Advocate Program, but restricted to KSU-only for the individual student's use in the course semester only. IT 7993 - Information Technology Project Management, 9th Edition, Kathy Schwalbe, ISBN-13: 978-1337101356, Cengage.
Original Total Cost Per Student	$857.18
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Post-Project Savings Per Student	$857.18
Projected Total Annual Student Savings Per Academic Year	$70,543.41 (please refer to the Enrollment and Cost Saving Prediction Table in Project Goals section on how the total savings is calculated)
Using OpenStax Textbook?	*No*

Narrative Section

1. Project Goals

Goals for a Textbook Transformation Grant project go beyond just cost savings. Include goals for student savings, student success, materials creation, and pedagogical transformation here.

The Master of Science in Information Technology (MSIT) program currently is the largest department level graduate program at Kennesaw State University currently with over 280 students in the MSIT and its affiliated graduate certificate programs. Having graduated more than 650 students since 2012, the MSIT program has been a big contributor to the much-needed IT workforce for the State of Georgia. Moreover, the MSIT program is also a great enabler for underrepresented minorities and people who want to change their job fields in the middle of their career. For fall 2018, 65% of MSIT students represent ethnic minorities, 39% are female, and around 40% of the students entered MSIT without background in computing. The high-quality of the curriculum, the flexibility of the offerings and affordability are the main enablers for the success of the MSIT program.

Much thanks to the supports of Affordable Learning Georgia in previous grants, we have transformed 15 out of 29 courses in the MSIT curriculum with no-cost-to-student learning material and the responses from the students are overwhelmingly positive. In this project, we

propose to continue our department-wide effort to replace the textbooks used in five more MSIT courses with no-cost-to-student learning materials. We believe the impact of the proposed project will be significant given the scale of the MSIT program.

In summary, the objectives of the proposed project are listed as follows.

- Make the MSIT program more affordable by eliminating the textbooks used in five MSIT courses. By doing so, the MSIT program can better support the career–changing students and further boost female and minority participation.
- Develop free, up-to-date and well-designed learning material for the five proposed MSIT courses.
- Teach the proposed courses using the developed learning material and validate those material offers equal or better learning effectiveness as the textbooks do.
- Develop a sustainability plan to ensure the no-cost learning material will be continuously maintained and used in future course offerings.

Year 2019 Enrollment & Cost Saving Prediction

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IT 7993	2 times every year	4	25	101	$178.95	$18,038.16
Total		17.5		450	$857.18	$70,543.41

Note: 1) the projected average enrollment per section is based on three factors: past enrollment in 2018, MSIT permanent course schedule and the assumption of 5% increase in enrollment in 2019. 2) The IT 7993 is new course that is offered for the first time in spring 2019. IT 7993 is designed with no-cost learning material to begin with. The total saving for IT 7993 is the saving if a textbook was used. 3) IT 6773 is a new course that is offered for the first time in Spring 2019. A textbook is used for its first offering. The total saving for IT 6773 is calculated based on the projection that no-cost learning material will be used starting in Fall 2019.

2. Statement of Transformation
Textbook Transformation Grants are awarded to teams focused on creating impactful changes. This section allows teams to describe why the project should be awarded. Include the following:

- *A description of the current state of the course, department, and/or institution if relevant.*
- *An overall description of the project and how it will impact the course, department, and institution as described previously. Include references to scholarly literature to support the claims of your impact if possible.*

The quality of the MSIT curriculum is one of the main reasons makes the program very successful. Given the dynamic and fast-changing nature of information technology, we need to constantly update our courses or create new courses to stay in the cutting edge of technology and competition. Unfortunately, the traditional textbook model won't work very well for the IT courses: they are not only expensive, but also could become outdated after got published. The instructors of courses have to constantly add new material to their courses in addition to what's covered in the textbook. The no-cost-learning-material model fits much better for the IT courses.

As matter of fact, the Department of Information Technology has been a big proponent of no-cost-learning material since round one of ALG. The faculty of IT department has transformed 30 IT courses at both undergraduate and graduate level with the support of ALG. Several of our ALG awards, e.g., round 2 award #119, round 8 award #302, round 10 award #334, round 11, award #365, are coordinated at the department level. Moreover, the responses for those renovated with no-cost-learning-material courses have been overwhelmingly positive from the students.

The positive responses from the students, our past successes, and the nature of the IT discipline make a perfect storm for us to continue transforming more IT courses using no-cost learning material. This project aims to replace the textbooks used in the five proposed MSIT courses with no-cost-to-students learning materials that offer equal or higher educational effectiveness. One of the proposed courses, IT 7993, is a new addition to MSIT curriculum. The instructor of IT 7993 started with no-cost learning material when develop the course. We believe the proposed transformation is an economical and viable solution to address the challenges imposed by the traditional textbook model.

Firstly, the learning materials for the proposed MSIT courses are widely and readily available on the World Wide Web today and many of these resources are publicly accessible, free, or with an open license to use [1] [2]. These materials include open and free tutorials, books, videos, labs, software, and services. For example, currently IT7833 uses cost-free materials provided by ISACA.org under their academic advocate program. These materials have worked well for the past decade as they focused on one of the original frameworks for IT strategy, policy and governance (ITSP&G) called COBIT; the materials are also restricted to use by the students during the semester they take the course. Since the course's original implementation, many additional frameworks, e.g., ITIL and enterprise architecture, have emerged. To provide a more complete picture of ITSP&G, we want to use the grant to curate a wider range of open and free

materials for ITSP&G. This will also allow IT7833 students to carry forward and use their course materials beyond the semester they take IT7833 without the restriction imposed by ISACA.org.

Secondly, Web content can better reflect the latest trends and industrial development than the traditional textbooks as technology is changing rapidly, so is the content of Web resources. We are already using contents from the Web as supplemental materials to the textbook. For example, we have utilized open source resources to redevelop information security courses with the latest open source tools and systems (e.g., [3, 4]). For another example, newest machine learning methods and applications are typically published as open source packages on websites such as GitHub. Some of them are great learning materials and use cases for the course IT6773 Practical Data Analytics. Furthermore, a lot of public data sets in different business domains are searchable using the new data sets search tool that was published by Google (https://toolbox.google.com/datasetsearch), which enables students in IT6773 to have a variety of choices of apply machine learning methods to the domains of their interests.

Thirdly, the materials from the Web are generally more interactive. The interactive content will not only engage the students, but also improve their learning experience. As instructors, one of the key roles we play is to select, organize and deliver from the vast amount of information available from the web and open source resources to fit with the classroom learners background. In particular, developing hands-on labs and assignments with tools and methods so that students are well prepared for the job market and pursuing advanced courses. For example, there are books and manuals (e.g., [5, 6]) available on how to become a system administrator (IT5423), but they may not be applied directly applied to classroom students for effective hands-on learning.

Fourthly, developing and assembling a set of learning materials ourselves allow us to better align the course contents not only with the outcomes of each course but also with the outcomes of MSIT program. For example, IT 7993 is a capstone course in which students work in group to complete a real-world IT project from start to finish. The learning outcomes of IT 7993 cover many areas such as project management, team dynamics, etc. and there is no one textbook covering all outcomes. Using the materials compiled by the instructor actually better serve the students in the class.

Lastly, our project team is well prepared for the proposed transformation. The disadvantages of using Web resources are that they are often disorganized, may contain inaccurate information, may be changed or deleted without notices. However, our team members are not only subject matter experts in the IT fields, but also are proficient educators who on average have more than 10 years of teaching experience. We will select, organize and integrate resources from the Web and transform the information into instructional sound learning materials for the proposed courses. We also created a sustainable plan to periodically review the developed no-cost-to-student learning materials. All courses in the department are reviewed every three years as part of the continuous improvement process. In addition, all of the team members have successfully completed many ALG grants, to name a few, round 2 award #119, round 8 award #302, round 10 award #334, and round 11 award #365.

In summary, the faculties at IT department have transformed 15 MSIT courses using no-cost-to-student learning material which are very well received by the students. Building on our previous success and lessons learned, we are well positioned to continue transformation efforts and further increase the cost-saving benefits to the students in our program.

References
[1] Li, L., Peltsverger, S. B., Colyar, N. N., Rutherfoord, R., Zheng, G., Li, Z. (2016). Transformation At Scale: The Experience Of Developing No Cost Learning Material For Database-Related Courses. 19th Annual Conference of the Southern Association for Information Systems. aisel.aisnet.org/sais2016/9/
[2] Rutherfoord, R., Peltsverger, S. B., Li, L., Zheng, G., Rutherfoord, J. (2016). Transforming IT Education with No-Cost Learning Materials. *SIGITE'16*. ACM Special Interest Group for IT Education.
[3] H. Shahriar. (2018), Ethical Hacking for Effective Defense (Modules, Labs, and Lectures), https://oer.galileo.usg.edu/compsci-ancillary/9/
[4] Shahriar, H., Peltsverger, S. (2018). Open Education Resource for Information Security Courses, USG Teaching and Learning Conference. https://sched.co/DvNV
[5] Clark, N. (2018). Linux: Installation, Configuration and Command Line Basics. Amazon.
[6] Linuxtraining.be. (2018). NetSec BVVA, http://linux-training.be/

3. Transformation Action Plan

Textbook Transformation Grant projects can be work-intensive and require project management in order to be successful. This section allows teams to describe how the team will fulfill the goals of the project. Include the following:

- *The activities expected from each team member and their role(s): subject matter experts, instructional designer, librarian, instructor of record, et al.*
  - *The identification, review, selection, and adoption/adaptation/creation of the new course materials.*
  - *A fully prepared application should include a preliminary evaluation of currently existing OER or no/low-cost materials for adoption or modification, or a preliminary plan to create new materials.*
- *Any redesign work necessary for the transformation.*
  - *This includes instructional design, curriculum alignment, accessibility, etc.*
- *The plan for providing open access to the new materials.*
  - *GALILEO Open Learning Materials will host any newly created materials. Please indicate if you are using other platforms in addition to the repository.*

Built on our previous experience of developing no-cost-to student learning material, our team of investigators plan to carry out following activities to transform the five proposed MSIT courses.

- Research on existing resources including ALG website for publicly available learning material could be re-used or adapted.

- Research and identify no cost readings for each of the learning modules in each course. The reading list includes both required readings and optional readings. All of these readings will be publicly accessible, free to use, or openly licensed.
- Research and identify no cost materials that can be shared across the courses.
- Develop study guides and lecture notes for students' use to review course content and key learning points.
- Adopt or develop all assignments, exercises and lab materials that are no cost to students to replace the ones in the textbooks.
- Develop test banks to replace the ones in the textbooks if necessary.
- Update the syllabus to include major resources and no cost materials.
- Re-develop the proposed courses in our learning management system, D2L Brightspace.
- The developed course material will be organized based on the template provided by ALG and will be made available to the public for adoption

The responsibilities of each investigator are listed as follows.

- Dr. Lei Li, project Lead, subject matter expert, developer and instructor of record for IT 7993: IT Capstone.
- Dr. Richard Halstead-Nussloch, subject matter expert, developer and instructor of record for IT 7833: IT Strategy, Policy, and Governance.
- Dr. Ying Xie, subject matter expert, developer and instructor of record for IT 6773: Practical Data Analytics.
- Dr. Hossain Shahriar, subject matter expert, developer and instructor of record for IT 5423: Computer Networks and System Administration.
- Dr. Meng Han, subject matter expert, developer and instructor of record for IT 5413: Software Design and Development.

4. Quantitative and Qualitative Measures

All Textbook Transformation Grant projects must measure student satisfaction, student performance, and course-level retention (drop/fail/withdraw rates), but teams and institutions will do this in varied ways. Outstanding applications will include measures beyond the minimum to gain meaningful insights into the impact of the project. Include the following:

- *Each quantitative or qualitative measure to be used, along with a description of the methods and/or tools used to gather and analyze data.*
- *If the team needs IRB (Institutional Review Board) approval, please indicate this here. Each institution's IRB functions differently and teams will need to know how their institution's IRB evaluates and approves of institutional research.*

We plan to assess the effectiveness of our transformation efforts in the following ways.

1. *Student performance data comparison*. The course pass rate, average GPA and Drop/Withdraw/Fail rate are used as measurement of students' performance. We will only use aggregated data in analysis and final report and no IRB approval is needed. The performance data will be collected after the no-cost learning material is implemented for a proposed course, which is referred as current performance data. For each of the measurement, we plan to conduct two levels of analysis.

   - Compare the current performance data to a preset goal. For example, 80 % is the aimed passing rate as the courses involved are graduate courses. Letter grade of B or better will be considered as a passing grade.

   - Compare the current. performance data to those from past offerings where the textbooks were used. The student performance data from the sections last taught using the textbooks will be used as baseline.

2. *Student survey on developed no-cost learning material*. We will develop an anonymous web-based survey to collect students' feedback on the no-cost learning material. The survey will need approval from IRB board of Kennesaw State University before it can be distributed to the students. The proposed survey will be totally anonymous and voluntary and introduce minimum risk to the participants. As the result, the survey will qualify for the expediated review based on our previous experience. All proposed courses will use the same survey and the survey will be distributed at the end of implementation semester for a proposed course. The proposed survey consists of a mixture of quantitative and qualitative measures including:

   - Student perception and attitude toward no cost materials.

   - Quantitative ratings of the no cost materials used in this course.

   - Qualitative measures such as open-ended questions for comments and suggestions.

3. *Official student course evaluation from the university*. The student course evaluation can also provide some insights on the effectiveness of no-cost learning material used in the proposed MSIT course.

5. Timeline

This section allows teams to describe how the project will progress from its inception to the final report (submitted at the end of the final semester of the project). Please provide a list of major milestones for the project here, aligning it with the Transformation Action Plan and your selected Final Semester of the project. Do not put this in the form of a table, as it will create issues within InfoReady Review for the official application – a bullet-point list is acceptable.

The major milestones of this proposal are listed as follows.

1. *03/01/2019*. Complete gathering of baseline data.
2. *04/01/2019*. Complete the development of the web-based student survey and submit it for IRB approval.

3. *05/05/2019.* a). Student survey is approved by IRB. b). Complete course level materials redesign (mainly course syllabus) for IT 5413, IT 5423, IT 6773, IT 7833, and IT 7993. c). Complete the project progress report.
4. *5/30/2019.* a). Complete the module level development including reading, lecture notes, video, exams, labs, and assignments for IT 7833. b). Update the D2L Brightspace course sites are updated using the developed no cost learning material for IT 7833.
5. *07/15/2019.* Complete the module level development including reading, lecture notes, video, exams, labs, and assignments for IT 5413, IT 5423, IT 6773, and IT 7993.
6. *07/30/2019.* a). Complete course offering for IT 7833 and complete survey collection. b). Update the D2L Brightspace course sites are updated using the developed no cost learning material for IT 5413, IT 5423, IT 6773, and IT 7993. c). Complete project progress report.
7. *12/02/2019.* a). Complete the course offering for IT 5413, IT 5423, and IT 6773. b). Complete the survey data collection for IT 5413, IT 5423, and IT 6773.
8. *05/01/2020.* a). Complete the course offering for IT 7993. b). Complete the survey data collection for IT 7993.
9. 05/10/2020. Compile and submit project final report.

6. Budget

Include overall personnel & projected expenses. Be sure to include the $800 in travel funding, which is required for all Textbook Transformation Grants. Do not put this in the form of a table, as it will create issues within InfoReady Review for the official application – a bullet-point list is acceptable. Please keep all funding guidelines from the corresponding RFP in mind.

The budget information for this project is listed as follows.

1. Individual Expense

- Dr. Lei Li, project Lead, developer and instructor of record for IT 7993, $5000 for professional development.
- Dr. Richard Halstead-Nussloch, developer and instructor of record for IT 7833, $5000 for summer salary.
- Dr. Ying Xie, developer and instructor of record for IT 6773, $5000 for professional development.
- Dr. Hossain Shahriar, developer and instructor of record for IT 5423, $5000 for professional development
- Dr. Meng Han, developer and instructor of record for IT 5413, $5000 for professional development.
- Subtotal: $25,000.

2. Travel Expense: $2500. $800 is reserved for two team members attend the Kickoff Meeting at Middle Georgia State University in Macon, GA. $1700 is budgeted for attending another conference.

3. Equipment (computers and tablets): $2500

4. Total Budget requested: $30,000

7. Sustainability Plan

Textbook Transformation Grants should have a lasting impact on the course for years to come. In order for this to happen, a Sustainability Plan needs to be in place after the end of the project. Please include here your plans for offering the course in the future, including:

- *The maintenance and updating of course materials*
- *Any possible expansion of the project to more course sections in the future*
- *Future plans for sharing this work with others through presentations, articles, or other scholarly activities*

The IT department at Kennesaw State University implements a course architect system for all courses. A faculty who is assigned to a course as the course architect, is responsible for the content of the course and teaches the course regularly. All of our investigators are a course architect for the proposed courses. Our team member will develop the no-cost-to-student learning material for the proposed courses and teach the courses for the first time using the new material. As a course architect, our team member will also make sure a course is continuously taught using developed no-cost learning material in the future semesters even the course might have a different instructor.

Moreover, the developed course content is not only available at learning management system, but also archived at department server. It is also our department policy that there are at least two faculty who regularly teach a course. This further ensures the developed learning material will be continuously used and updated even there is a personnel turnover.

The IT department also have well established course continual improvement plan. Each course is assessed each semester after being taught, and a course will be formally evaluated and updated every three years or earlier if the need arises. A course architect is in charge of those assessment efforts. Thus, we are committed to continuously update the no-cost learning material in the proposed courses based on research, assessment results and feedback from students and alumni. As shown in their support letters, our transformation efforts also have strong supports from our department chair and the dean of our colleges which further ensure the sustainability of our transformation efforts.

Note: Letter of Support

A letter of support must be provided from the sponsoring area (unit, office, department, school, library, campus office of the Vice President for Academic Affairs, etc.) that will be responsible for receipt and distribution of funding. Letters must reference sustainability. In the case of multi-institutional affiliations, all participants' institutions/departments must provide a letter of support.