Affordable Learning Georgia Textbook Transformation Grants
Round 2
Summer 2015, Fall 2015, Spring 2016
Proposal Form and Narrative

Transformations-At-Scale for Department-Wide Database Related Courses

Institution Name(s)	Southern Polytechnic State University				
Team Members (Name, Title, Department, Institutions if different, and email address for each)	Dr. Lei Li, Associate Professor, Information Technology Department, lli3@spsu.edu Dr. Rebecca H. Rutherfoord, Professor & Interim Dean of Computing and Software Engineering, brutherf@spsu.edu Dr. Svetlana Peltsverger, Associate Professor & Chair, Information Technology Department, speltsve@spsu.edu Dr. Jack Zheng, Assistant Professor, Information Technology Department, jzheng3@spsu.edu Dr. Zhigang Li, Instructional Designer, Adjunct Professor, Information Technology Department, zli24@spsu.edu Ms. Nancy N. Colyar, Director, Lawrence V. Johnson Library, ncolyar@spsu.edu				
Sponsor, Title, Department, Institution	Dr. Svetlana Peltsverger, Chair of Information Technology Department, speltsve@spsu.edu Dr. Richard Cole, Vice President of Academic Affairs				
Course Names, Course Numbers and Semesters Offered (Summer 2015, Fall 2015, or Spring 2016)	CSE 3153 Database Systems (fall 2015) IT 4153 Advanced Database (spring 2016) IT 4713/6713 Business Intelligence Systems (fall 2015) IT 5433 Databases: Design and Applications (spring 2016)				
Average Number of Students Per Course Section	30	**Number of Course Sections Affected by Implementation in Academic Year 2016**	**11**	**Total Number of Students Affected by Implementation in Academic Year 2016**	330
Award Category (pick one)	☐ No-Cost-to-Students Learning Materials ☐ OpenStax Textbooks ☐ Course Pack Pilots				

	☒ Transformations-at-Scale		
List the original course materials for students (including title, whether optional or required, & cost for each item)	Please see Table 1 for details.	CSE 3153 – $240.40 IT 4153 – $322.96 IT 4713/6713 - $153 IT 5433 – $240.40 *$956.76 per person* ***Total Cost: $110,419.20 based on average enrollment of 458 each year***	
Plan for Hosting Materials	☐ OpenStax CNX ☒ D2L ☐ LibGuides ☐ Other _____		
Projected Per Student Cost	**Original: $956.76** **After: $0**	**Projected Per Student Savings (%)**	100%

Table 1. Detailed information of Courses to be transformed

Course	Textbook Used	List price	Number of section	Average number of students per section	Number of students affected
CSE 3153 Database Systems	Modern Database Management, 11th edition, ISBN: 0132662256, required.	$240.40	8 (3 in springs, 3 in falls, & 2 in summer)	36	288
IT 4153 Advanced Databases	1) Database Administration: The Complete Guide to Practices and Procedures, ISBN: 0201741296, required. 2) Database Systems: Design, Implementation, and Management,11th edition, ISBN:1285196147, required	1). $69.99 2). $252.96 Total: $322.96	1 section	25	25
IT 4713/6713 Business Intelligence Systems	1) Delivering Business Intelligence with Microsoft SQL Server 2012, 3rd edition, ISBN: 0071759387, required. 2) Business Intelligence: A Managerial Perspective on Analytics, 3rd edition, ISBN: 0133051056, required.	1). $50 2) $103 Total: $153.00	1 section	20	20
IT 5433 Databases: Design and Applications	Modern Database Management, 11th edition, required.	$240.40	5 (2 in springs, 2 in falls, and 1 in summer)	25	125

1. PROJECT GOALS

In this project, we take a department-wide effort to transform all learning materials used in four database related courses. All selected courses will adopt no-cost-to-students learning material that offers equivalent or better educational effectiveness. These resources will be used for both in-class and online database students.

1.1 STATEMENT OF TRANSFORMATION

The Transformation

The textbooks used in four proposed database related courses are quite expensive (see Table 1 above). In fact, most textbooks on databases are quite expensive in general. In addition, due to the fast evolving nature of the technology field, the textbooks used in the proposed courses are updated frequently, which negatively impacts their resale value.

The Stakeholders

There are two primary sets of stakeholders for this proposal – the students taking the four database classes (both in-class and online students), and the faculty developing and teaching the database courses. The high costs of textbooks put a big financial burden on students and may become a road block for students' ability to finish their education. Our team of investigators strives to make the higher education more affordable to the students. The database related learning materials are widely available on the World Wide Web today, and some of them have been created by our faculty members. Many of these resources are publicly accessible, free, or with an open license to use. These materials include open and free tutorials, books, videos, labs, test banks, software, and services. For example, major database vendors such as Oracle and Microsoft published abundant tutorials and examples of their products on their websites. Oracle provides VMs with preinstalled Oracle DBMS (current version 12c). Microsoft Azure grants are widely available for faculty who needs free instances of MS SQL server (current version 2014) or Linux/Windows VMs.

Many of the textbooks become outdated at the moment they are published, while digital delivery of the learning materials makes it easier to keep the content up-to-date. Developing and assembling a set of learning materials for all database-related courses at the same time is a unique approach. It will not only allow us to target the outcomes of each course, but also target the outcomes of the Information Technology program.

Compared to traditional textbooks, the Web resources have many benefits: 1) the Web resources are generally free to use; 2) they are constantly being updated and always reflect the latest trends and industrial development; 3) the materials from the Web are also more dynamic and interactive. The pitfalls of Web resources are that they are often disorganized and may contain inaccurate information. However, our team of investigators are not only subject matter experts in the database field, but also are proficient educators who on average have more than 10 years teaching experience. We will select, organize and integrate resources from the Web and transform the

information into instructionally sound learning materials for the proposed courses. We strongly believe that the new learning materials will offer equivalent or better learning effectiveness compared to the original textbooks. Digital delivery also allows us to add interactive elements into the learning materials. The interactive content will not only engage the students, but also improve their learning experience. It will also help to enhance the learning outcomes and learning satisfaction.

The Impact

The impact of our transformation efforts will be profound. By our estimates, 400 to 500 students will benefit from the no-cost learning material each year. Because of the cost savings from not having to buy textbooks, students may be able to take a few more courses each year and graduate sooner. Having a series of database courses adapting no-cost-to-students material not only offers better and more consistent learning experience to students, but also makes our renowned IT program more affordable. As a result, our IT program could recruit more students and produce more qualified IT professionals that Georgia needs. Our experience gained in this transformation project could be useful to other programs or departments who want to lower the cost of the education to their students. In summary, we believe the proposed project will have a positive impact in students' retention, progression, and graduation at program, department and institution level.

1.2 TRANSFORMATION ACTION PLAN

With a coordinated effort, the department investigators plan the following activities to transform all database related courses to completely use no-cost learning materials:

- Research and identify no cost content 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 the no cost material 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.
- Adopt open source or no-cost-to-students database software for students to gain hands-on experience.
- Update the syllabus to include major resources and no cost materials.
- Update the D2L accompanying sections for online students to match the resources for the in-class students.

There will be one course architect for each course who will be the main person to develop the course. The responsibilities of each PI is described in table 2.

Table 2. PI responsibilities

Primary Investigator	Course	Responsibilities
Dr. Lei Li	IT 5433	Coordinate project activities; subject matter expert and developer; instructor of record
Dr. Rebecca Rutherfoord	CSE 3153	Subject Matter Expert and developer; instructor of record
Dr. Svetlana Peltsverger	IT 4153	Subject Matter Expert and developer; instructor of record
Dr. Jack Zheng	IT 4713/6713	Subject Matter Expert and developer; instructor of record
Dr. Zhigang Li		Provide Instructional Design and Hosting Support.
Ms. Nancy N. Colyar		Provide support in searching learning material, and handling license and copyright issues of no-cost material.

All course design with the no-cost materials will be provided through USG LMS D2L Brightspace for our students and on CourseSites for the public.

1.3 QUANTITATIVE AND QUALITATIVE MEASURES

The investigators plan to assess the effectiveness of our proposal in two ways: 1) qualitatively, we will design a survey and gather inputs from the students after they used the no-cost learning material; 2) quantitatively, we will compare students' performance data gathered from sections using traditional textbooks and sections using no-cost learning material.

The investigators will establish baseline data on student pass rates for the five courses over the last two years – 2013 and 2014. This data will be used as a baseline for comparison of student performance in courses with alternative no cost material. The detailed assessment plan is shown in table 3.
For each of the measurement, the investigators are going to conduct two levels of analysis:

1. Comparing them to the preset goals. Generally, 75% is the aimed passing rate in undergraduate courses and 80% in graduate courses.
2. Comparing them to those from past offerings where costly textbooks were used. The investigators will obtain the data from the sections taught in the past 2 years.

Table 3. Assessment Plan

Source	Description
Student performance measures	This data is from the overall class performance based on the grading of student works. Metrics include: • Class average, grades distribution, pass rate for each grading item. • Overall letter grades distribution, pass rate, withdraw rate, and fail rate. • Percentage of students meeting or exceeding learning outcomes
Specific survey on no-cost learning materials.	The survey will be distributed at the end of the semester to collect student feedback. It 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 comments and suggestions
Student evaluation of the instructor	Formal student evaluation of the instructor can also provide information about teaching effectiveness using no cost materials. This evaluation is based on standardized forms for every course.

1.4 TIMELINE

The major milestones of the proposal are illustrated in table 4.

Table 4. Major Milestone

Milestone dates for fall 2015 implementation	Milestone dates for spring 2016 implementation	Milestone
5/01/2015		• Complete baseline gathering of statistics
6/30/2015	10/30/2015	• Complete course modules redesign to use the no cost materials. These include all reading, lecture notes, video clips, exercises, labs, and assignments. The changes are reflected in the learning modeling study guides.
7/31/2015	11/30/2015	• Complete course level materials redesign. This includes quizzes, tests, and syllabus.
10/31/2015	3/31/2016	Develop a survey of using the no cost materials to replace textbook.
12/8/2015	5/8/2016	• Complete the course offering. • Complete the survey data collection. • Complete student evaluation.
12/15/2015	5/15/2016	• Complete assessment data collection and analysis. • Deliver the status report. • Compile final report.

1.5 BUDGET

The funding mainly compensates our team of investigator's work and activity beyond normal teaching load or other job responsibilities in order to successfully complete the project. The role each PI is illustrated in table 2. For each proposed course, course architects approximately will spend at least 80 hours in developing the no-cost learning material and instructor of records, will spend 20 hours in course assessment. Instructional support and librarian would devote at least about 50 hours in assisting course architects. Thus, we request the budget of this project as follows.

Investigators compensation: $5,000 * 6 = $30,000

Travel: $800

Total Budget: $30,800

Only open source software or free software will be used in this project thus there is no additional spending on software or equipment purchasing.

1.6 SUSTAINABILITY PLAN

The IT department implemented a course architect system for all courses. A course architect updates course content based on research, publications and feedback from students and alumni. Each of co-PI is a course architecture for corresponding courses (please see table 2). A course architect develops and maintains the course materials and teaching plans. He/she also teaches the course at least once a year to make sure all resources are valid and make necessary changes. This makes sure all no-cost materials and resources are highly sustainable in the future offerings of this course.

1.7 REFERENCES & ATTACHMENTS

Two letters of support from the VPAA and the chair of Information Technology Department of SPSU are attached.

PROPOSAL SUBMISSION: ALL PROPOSAL DOCUMENTS, REFERENCES, AND ATTACHMENTS MUST BE SUBMITTED IN A SINGLE EMAIL TO ALG@GATECH.EDU.

DEADLINE FOR CATEGORY 4: 5:00 PM, DECEMBER 8, 2014

SOUTHERN POLYTECHNIC STATE UNIVERSITY
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December 5, 2014

Dear Affordable Learning Georgia (ALG) Grant Reviewers,

It is my pleasure to write this letter in support of the proposal, "Transformations-At-Scale for Department-Wide Database Related Courses", submitted by Dr. Li, Dr. Rutherfoord, Dr. Peltsverger, Dr. Zheng, Dr. Li, and Ms. Colyar from our Information Technology (IT) Department at Southern Polytechnic State University (SPSU)/Kennesaw State University.

In this project, the primary investigators will work as a team to replace existing costly textbooks in four database related courses with no-cost-to-students learning materials. Their efforts will significantly lower the cost of education for students and generate immediate and positive impact on the retention, progression, and graduation for the College of Computing & Software Engineering.

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. The developed no-cost-to-students material will be distributed using the course management system, GeorgiaView Desire2Learn. Thus, I believe the effort of this project will be sustainable over the long term.

In conclusion, I wholeheartedly support the efforts of Drs. Li, Rutherfoord, Peltsverger, Zheng, and Li, and Ms. Colyar as they seek this funding. This proposal has the full support of the Office of the Vice President for Academic Affairs.

Sincerely,

C. Richard Cole, AIA, NCARB
Vice President for Academic Affairs

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Dear ALG Grant Review Committee Members:

As the Chair of the Department of Information Technology at Southern Polytechnic State University (SPSU) I strongly support project "Transformations-At-Scale for Department-Wide Database Related Courses", submitted by Dr Li, Dr. Rutherfoord, Dr. Peltsverger, Dr. Zheng, Dr. Li and Ms. Colyar.

The project will have a significant and immediate positive financial effect on 500-600 students, and will make our IT program more affordable. As a result, more students will be able to enroll in the program and Georgia will have more qualified IT professionals. This project aligned with USG's Strategic Imperative 1 to provide high quality and affordable education to Georgians

The primary investigators will disseminate the no-cost materials through USG LMS D2L/Brightspace for SPSU students, and on Course Sites for the public.

To ensure the sustainability of the project over the long term, each course has assigned course architect who is responsible for design, development and maintenance of no-cost-to-students learning materials.

Developing and assembling a set of learning materials for all database-related courses at the same time is a unique approach. It will not only allow IT department to target the outcomes of each course, but also target the outcomes of the Information Technology program.

In closing, I encourage the ALG grant representatives to fund this project. The potential impact on students will be significant and sustainable over the long term.

Sincerely,

Svetlana Peltsverger 12/8/2014

Svetlana Peltsverger, PhD, CISSP
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