EUE Proposal
FY2019

Project ID#

19-27

Project Title

Bringing Your Students Up To Speed: Teaching the System Development Lifecycle Using an Agile Methodology

Project Director	ID Number	Telephone	Email
Connie S. Barber	800570336	3093	cobarbe@siue.edu

Department	Campus Box	School College
CMIS	1106	School of Business

Course or Program

CMIS 270

Project Co-Director	ID	Department	Email

Student Impact:	170/year

Multiple Submission Priority:	

Summary:
Students studying computer management and information systems at SIUE take a variety of courses that teach them about the functionalities of information systems. CMIS 270, their first course in the major, provides the content they need to learn the process for designing those systems and functionalities. Unfortunately, due to the nature of that content and the limitation of the semester, we are currently only able to thoroughly cover the traditional method of design known as the systems development lifecycle (SDLC). This is a weakness of the course because 80% of system design projects are conducted using an agile design methodology…a derivative of the traditional method. We spend 1-2 course periods on agile methodologies at the end of the semester, once students have learned the SDLC. It is possible, however, to apply techniques from agile methodologies pedagogically, allowing the students to learn the method through experiencing it during the management of the course, their homework and team project assignments. This proposal presents a course restructuration project for the CMIS 270 course that will utilize the agile methodology known as SCRUM to teach the system development lifecycle.
Approximately 170 students per academic year would be impacted by this structural change to the CMIS 270 course. Upon finishing CMIS 270, most CMIS students begin to look for internships. What would set them apart when applying for those internships would be to actually have

experience with the aspects of agile methodologies. This EUE grant would support the first phase of this course restructuration. The next phase is to transition the new course structure to a High Impact Community Engagement Practice (HICEP) in which I partner with system design professionals in local businesses to transform the homework and team projects in the course into co-curricular activities. This will allow students and faculty to help external clients (not-for-profits, businesses, government entities, etc.) with system design problems they are facing.

Project Budget

Salary	Wages	Travel	Equip.	Comm	CServ	Auto	Tele	Awards	Total
9000	0	0	0	23.9	0	0	0	0	9023.9

Cost-Sharing

Salary	Wages	Travel	Equip.	Comm	CServ	Auto	Tele	Awards	Total
0	0	0	0	0	0	0	0	0	0

Project Narrative

Current Situation:

Within the information systems' design and development community, 80% of system design projects are completed using an agile design methodology. As such, it is important that undergraduate students in the SIUE CMIS program learn about these types of design methodologies. All students majoring in CMIS at the undergraduate level are required to take a Systems Analysis and Design course (CMIS 270). Unfortunately, the course is not currently structured to allow for immersion in an agile methodology during the semester. The catch is that in order to truly gain an understanding of agile methods, students must first learn the traditional method of system design known as the systems development lifecycle. Upon finishing CMIS 270, most CMIS students begin to look for internships. What would set them apart when applying for those internships would be to actually have experience with the aspects of agile methodologies. To address this gap between the learning and internships I propose using agile methodology techniques to teach students about the systems development lifecycle. This would allow for the necessary content to be taught, but would also give students the opportunity to work through different aspects of the agile methodology. Approximately 170 students per academic year would be impacted by this structural change to the CMIS 270 course. This EUE grant would support the first phase of this course restructuration. The next phase is to transition the new course structure to a High Impact Community Engagement Practice (HICEP) in which I partner with system design professionals in local businesses to transform the homework and team projects in the course into co-curricular activities. This will allow students and faculty to help external clients (not-for-profits, businesses, government entities, etc.) with system design problems they are facing. Additionally, when the textbook comes up for renewal, I will need to identify a new textbook that will fit the revised course structure.

Proposed Project:

This project proposes a complete course redesign for the CMIS 270 – Systems Analysis and Design course. Currently the course is taught using traditional methods of lectures supported by PowerPoints and in-class activities. I would like to take a more innovative approach to teaching the course through the implementation of aspects of an agile system development methodology as an engagement and learning tool. Specifically I want to adopt principles of the SCRUM design framework. The SCRUM framework has been adapted to project management (Cervone, 2011) which has been used to the classroom setting with outcomes that demonstrated students viewing themselves as stronger collaborators (Pope-Ruark, Eichel, Talbott, & Thornton, 2011). So, there is precedence for the use of an agile method to teach students and to help them use the methodology to manage their team project.

The SCRUM framework of system design operates in what is called a 'sprint'. These typically last two weeks. Structurally, the first day is spent planning the two-week sprint. The next eight and a half days are spent completing assigned tasks. The last half of the final day of the sprint is spent demonstrating the deliverables and conducting a retrospective to understand what is working and not working so the process itself can be improved as needed. SCRUM is based on empiricism, which "asserts that knowledge comes from experience and making decisions based on what is known" (Schwaber & Sutherland, 2017, p. 4). As such, the activities of the SCRUM framework includes The Daily Scrum in which each member of the team answers three questions: "(1) What did I do yesterday that helped the Development Team meet the Sprint Goal? (2) What will I do today to help the Development Team meet the Sprint Goal? (3) Do I see any impediment that prevents me or the Development Team from meeting the Sprint Goal?" (Schwaber & Sutherland, 2017, p. 12). This helps the team members hold each other accountable and continue forward momentum on the project.

Practically the implementation of a SCRUM framework to guide the course structure, would allow the students to address the requirements of the course in two-week chunks, rather than looking at the semester as a whole. While they learn about the SDLC through completion of their homework assignments and the team project, they will learn about SCRUM through execution of the framework to manage their homework and projects. So, for the students this becomes a dual learning opportunity, with SCRUM being learned experientially through its execution. This is a huge improvement in opportunity for students to learn about an agile methodology. In the present course structure and schedule only one or two class periods in a semester are spent on agile methodologies and the content is delivered via PowerPoint slides and the textbook. Executing the SCRUM framework in the course will give them hands-on experience with an agile methodology and better equip students as they prepare for internships, future CMIS courses, and employment on system design teams.

The restructuring of the CMIS 270 course will involve six major activities. These, along with a timeline of completion are outlined in Table 1.

Activity Name	**Activity Deliverable**	**Start Date**	**End Date**
Course schedule	A plan for the semester that divides learning into two-week increments	July 1, 2017	July 3, 2017
Course sessions	A plan for each individual course session that starts with The Daily Scrum	July 5, 2017	July 8, 2017
Team project	Refined and restructured project into pieces that can be flexibly moved between sprints	July 9, 2017	July 14, 2017
Homework	Refined and restructured homework assignments that can be flexibly moved between sprints	July 15, 2017	July 20, 2017
SCRUM assessment	Develop exam questions and student questionnaires to assess learning of SCRUM framework	July 21, 2017	July 26, 2017
SDLC assessment	Update current exam questions and develop student questionnaires to assess learning of SDLC	July 27, 2017	July 31, 2017

Table 1. Structural Activities to bring SCRUM to Life in CMIS 270

Evaluation and Dissemination:

There are four aspects of this project that must be assessed. Two of those are learning aspects and include the students' knowledge of the SDLC and SCRUM. These will be assessed incrementally throughout the semester through the use of exams. Additionally, the students' knowledge of SCRUM will be assessed through peer evaluations completed throughout the semester. This is valuable to understand students' knowledge and execution of the SCRUM framework as the basis of SCRUM is the team. The other two aspects of the project that must be assessed are students' perspective on the SCRUM framework and if they perceive value in using the framework to learn about both the SDLC and SCRUM. These assessments will be conducted using questionnaires within Qualtrics. Project effectiveness will be measured quantitatively through exam results and peer evaluations. It will be measured qualitatively through open-ended questions on the questionnaires.

Once the semester is over and the assessments evaluated, I will disseminate the results of the project in two arenas. First I will write up the experience and my findings for submission to International Conference on Information Systems. This is the top conference in the information systems field. Acceptance to the conference will provide great exposure for the research, the EUE program, and SIUE. Also, I will present the experience and my findings at a faculty development brown bag on the SIUE campus.

Budget and Budget Justification

As shown in Table 2, the budget request for this project is straightforward with a total request of $9,023.90. The main resource for this project is my time. That is reflected on the salary line as a request for summer salary of $9,000. In addition to my time, two books regarding agile project management would be helpful. They are: *Agile Project Management: A Complete Beginner's Guide To Agile Project Management* for $14.95 and *Agile Project Management:*

QuickStart Guide for $8.95. These resources would allow me to design, develop, and implement a successful restructuring of the CMIS 270 course.

Budget Item	**Total**
Salary	$9,000.00
Commodities	$23.90
Total	**$9,023.90**

Table 2. Budget for CMIS 270 Restructuration Project

References:

Cervone, H. F. (2011). Understanding agile project management methods using Scrum. *OCLC Systems & Services: International Digital Library Perspectives*, *27*(1), 18–22.

Pope-Ruark, R., Eichel, M., Talbott, S., & Thornton, K. (2011). Let' s scrum: How Scrum Methodology Encourages Students to View Themselves as Collaborators. *Teaching and Learning Together in Higher Education*, (3), 1–17.

Schwaber, K., & Sutherland, J. (2017). *The Definitive Guide to Scrum: The Rules of the Game*. *The Scrum Guide*.

Connie S. Barber, PhD, Assistant Professor
Department of Computer Management & Information Systems (618) 650-3093
School of Business cobarbe@siue.edu
Southern Illinois University Edwardsville

EDUCATION

Ph.D.	**The University of North Carolina at Greensboro** (Information Systems)	**2014**
Cert.	**The University of Illinois at Chicago** Public Health Informatics Certification (In collaboration with the American Medical Informatics Association and the CDC)	**2009**
M.S.	**The University of Arkansas at Little Rock** (Management Information Systems)	**2008**
B.S.	**Kaplan College** (Information Technology Management)	**2004**
A.A.S.	**Kaplan College** (Computer Information Systems)	**2002**

PUBLICATIONS – including only activities related to curriculum development

Conference Proceedings

Barber, C.S., and Smutzer, K. *Leveling for Success: Gamification in IS Education*. In *Americas Conference on Information Systems*, pp. 1–10.

ACADEMIC PRESENTATIONS

Barber, C.S., and Smutzer, K. *Leveling for Success: Gamification in IS Education*. (2017, August 10-12) Presented in the *Americas Conference on Information Systems*. Boston, MA.

Barber, C.S. *Gamification in IS Education: Leveling for Success*. (2016, November 4). Presented in the *Focus on Teaching and Technology Conference*. St. Louis, MO.

UNIVERSITY TEACHING – only courses related to the context of the submitted project

Southern Illinois University Edwardsville

Undergraduate Level *(face-to-face environment)*

2017- Systems Analysis and Design (CMIS 270)

Graduate Level *(face-to-face environment)*

2016- Systems Analysis and Design (CMIS 570)

Course Content Development

2015- *CMIS 342:* Developed and implemented a gamification portion of the course through the use of 3D Game Lab in both face-to-face and online environments. Version 1 was chapter based and included the creation of 104 quests that aligned with the course textbook. The goal of which was to encourage students to engage with the textbook regularly throughout the semester. Version 2 is scenario based and walks students through the content via the quests. Multiple instructors have used the system across several sections/semesters of the course.

GRANT AWARD

2017-2018 *STEM Center Faculty Fellowship*

Project Title: When your students are quest-masters: Gamifying Information Systems Course Content

Project Description: The project involves the use of gamified learning management systems (GLMS) as a method to innovate student engagement in the CMIS curriculum. The course for which this is proposed previously used the textbook, paper-based exams, and PowerPoint slides as intersection points for students and course materials. While it is possible to present the course content in this pedagogical style, it is challenging to motivate students to be engaged. The GLMS is a unique delivery method for this content, which is focused on the systems analysis and design process for creating information systems, and may positively impact student motivation to engage with the material. The is implement in both an online and a face-to-face section of the course simultaneously.

Required Deliverables: Acceptance of this fellowship included an agreement to produce two deliverables. (1) I will submit a grant proposal to an external agency, and (2) I will disseminate my finds to the SIUE community and the larger information systems community. I also expect to publish my findings in a high quality academic journal.

TO: Excellence in Undergraduate Education

FROM: Anne Powell, Chair, CMIS department

RE: Connie Barber, EUE proposal

I fully support the EUE initiative to revise the CMIS270 Systems Analysis and Design course content as proposed by Dr. Connie Barber. Agile methodologies continue to grow in importance in industry. A method to integrate both the traditional methodologies (which a student needs to understand first) with the agile methodologies is a valuable learning technique to incorporate into the curriculum.

SOUTHERN ILLINOIS UNIVERSITY
EDWARDSVILLE
SCHOOL OF BUSINESS

Memorandum

To: Excellence in Undergraduate Education Review Committee

From: Tim Schoenecker, Interim Dean

Date: January 29, 2018

Subject: Support for Barber Proposal

Dr. Connie Barber, assistant professor of Computer Management & Information Systems, is submitting a proposal to enhance instruction in CMIS 270 (Systems Analysis & Design). Her proposal centers around applying agile methodologies to systems development. This will provide students in the CMIS 270 course with practice using a methodology that is gaining widespread acceptance in the information technology sector and should provide them with a "leg up" during the job search process.

Dr. Barber has proven to be a dedicated teacher and researcher during her tenure at SIUE. She is currently involved with the STEM Center as a research associate; no other business school faculty member has that designation. Her work with the STEM Center is really in the area of pedagogical research. If she is awarded an EUE grant, I am highly confident that Dr. Barber will take advantage of that support and develop a final product that will lead to an improved educational experience for the many students that enroll in CMIS 270 each year.