1. Leveraging Technology to Strengthen Academic Quality Proposal

*Institution:* The University of North Carolina at Greensboro (UNCG)

*Unit:* The Division of Continual Learning (DCL) in collaboration with the Faculty Teaching Learning Commons (FTLC) and selected campus academic departments

*Campus Contact:* Dr. James Eddy, Interim Dean, Division of Continual Learning, jmeddy@uncg.edu  
*Courses Developer:* Nora Reynolds, Executive Director, Division of Continual Learning, norareynolds@uncg.edu

2. Courses Proposed for Redesign

Recently, there has been a movement in higher education to explore the option of the flipped classroom—a pedagogical model in which lecture and homework elements of a course are reversed—as a way to enhance student-learning outcomes. The flipped classroom can be any form of blended learning that uses technology to leverage learning outside the classroom so teachers and students can spend more time interacting and applying lessons learned during the face-to-face classroom experience. Our proposed pilot employs a flipped classroom model that replaces all but one weekly in-class meeting with online content and activities. The one remaining class meeting time is spent with students actively participating in the widely used collaborative learning model called Team Based Learning (TBL). (See TBL description in Section 3.)

The proposed UNCG pilot will include one section each of the following six general education courses, for a total of 550 students, from the RFP’s Appendix A Grade Distribution of Lower Division Courses. If the pilot is successful DCL will increase sections and face-to-face offerings for AY 14/15.

<table>
<thead>
<tr>
<th>Course (1 Section Each)</th>
<th>% DFIW</th>
<th># Enrolled AY 2011-12</th>
<th>Projected Spring 2014 Enrollments in Proposed Pilot</th>
<th>AY 14/15 Projected Enrollments</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 105: Major Concepts of Biology</td>
<td>46.3</td>
<td>1,118</td>
<td>100</td>
<td>400</td>
</tr>
<tr>
<td>PSY 121: General Psychology</td>
<td>27.5</td>
<td>1,575</td>
<td>100</td>
<td>400</td>
</tr>
<tr>
<td>GEO 103: Introduction to Earth Science</td>
<td>29.8</td>
<td>1,310</td>
<td>100</td>
<td>400</td>
</tr>
<tr>
<td>PSC 100: American Politics</td>
<td>29.1</td>
<td>398</td>
<td>75</td>
<td>300</td>
</tr>
<tr>
<td>PHI 121: Contemporary Moral Problems</td>
<td>26.8</td>
<td>619</td>
<td>75</td>
<td>300</td>
</tr>
<tr>
<td>ECO 201: Principles of Microeconomics</td>
<td>41.0</td>
<td>939</td>
<td>100</td>
<td>400</td>
</tr>
</tbody>
</table>

Each of the courses selected for inclusion in the proposed pilot meets the following requirements:

- Courses have high DFIW Rates
- Course is currently being offered as a comprehensive web-based course
- Online course contains all content, interactive practice activities, frequent assessments, and automated feedback, as appropriate

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• Course collects student performance data that is easily accessible by the instructor to inform individualized, personalized instruction
• Course is designed to scale to large number of students
• An experienced online instructor is available to participate in the pilot
• Instructors and staff are committed to developing the content required for successful implementation of TBL as a complement to the online course instruction

**Why This Model Was Chosen For The Pilot**

UNCG is facing two significant challenges—enhancing student learning outcomes with fewer resources and increasing student credit hour production to meet university goals and projections.

UNCG is privileged to have a number of expert online general education instructors who are experienced with integrating technology-based instructional elements into their courses. The faculty has worked with DCL to create a substantial catalog of highly interactive online general education courses. The Team Based Learning (TBL) framework was chosen to complement the online course materials because it has had widespread use as an effective model for facilitating small group discussion in large class environments.

The proposed model takes advantage of two proven pedagogies—UNCG online courses and TBL. It is scalable and replicable.

DCL hypothesize our flipped classroom with TBL model will contribute to the university learning outcome goals and increased student credit hour production at a reduced cost.

**Student outcomes expected:**
- Increased engagement and time on task
- Frequent online assessments and activities keep students on track
- Students better prepared to participate in class discussions
- Higher attendance in class
- Deeper student understanding of relevant issues related to course content
- A more positive attitude about the value of general education requirements

**Institutional outcomes expected:**
- Lower DFW rates
- Reduced cost per credit hour as larger class sections and new teaching models become possible
3. Course Redesign Model: The Replacement Model

The proposed pilot is representative of the Replacement Model as described by the National Center for Academic Transformation. Students will asynchronously access all course content and much of the course assessment from the online course. They will meet with the instructor and classmates one time each week where they will participate in the structured team based learning activity designed to complement and extend what they have learned in the online course. Instructors will engage with students in both the online and face-to-face environments.

Project Components: Online Courses, TBL Sessions, Evaluation

Online Courses

The online course materials are accessible to students through Blackboard. Most of the courses were designed by teams of faculty with the intention of being taught by faculty from across the department. These courses are all successfully offered as an option for regular UNCG undergraduate students and UNCG distance degree completion students who need to fulfill general education requirements.

All of the online courses incorporate numerous multimedia and interactive elements such as video, case studies, branching logic trees, games, communication tools, and alternative assessments with immediate feedback. Faculty and instructional design teams relied on the Wiggins’ and McTighe’s backward design principles and the learning and motivation theoretical models described below to develop online courses that would engage learners and enhance learning outcomes.

Learning and Motivation Theories that Influence UNCG Online Course Design

Evidence from research suggests that limited working memory and low motivation significantly contribute to student learning difficulties. DCI believes that both factor into the low performance rate of UNCG students in the general education courses selected for this pilot project. Our course development teams rely on this evidence as the basis for our decision to pair the Cognitive Load Theory (CLT) and the Multimedia Learning Theory, a cognitive constructivist theory (Mayer, 2003), as the learning theories that influence online course design. These theories assume individuals have a limited working memory and learning cannot happen when the working memory is overloaded. Prior knowledge is the factor determining how much information can be held in working memory. Cognitive load theory posits that the burden placed on working memory can be reduced in one of two ways—increasing its capacity or reducing cognitive load.

Working memory has two components, a visuo-spatial sketchpad and a phonological loop that initially process visual and verbal information independently. Two largely independent working memory processing systems mean that information overload that might overwhelm one of the systems can be managed when divided across two of these systems. Therefore, using more than one presentation modality can increase the capacity of working memory (Mayer, 2003). (See diagram above.) The reliance on these theoretical models results in courses designed to maximize
students' learning through efficient use of working memory capacity as impacted by the management of cognitive load (Sweller, 2008).

**Motivation Theory**
Improving working memory through cognitive load reduction must be supplemented with attention to the student's desire to learn and his/her effort levels. Because many UNCG students struggle with low motivation in general education courses, DCL will draw from Self-Determination Theory (SDT) principles (Ryan and Deci, 2000) to enhance positive learning outcomes in the proposed flipped classroom pilot. The SDT theory is extensively cited in studies on the autonomy and motivation of students, including those with learning disabilities (Grolnick and Ryan, 1990). SDT argues that an individual's experience of autonomy, competence, and relatedness determine the most volitional and high quality forms of motivation and engagement for activities, including enhanced performance and persistence. Students in the proposed pilot will experience autonomy and competence as they progress through the online course materials and activities and relatedness as they collaborate with peers in the TBL activities.

**Team Based Learning (TBL) Framework**
The online coursework will be complemented by a classroom experience where students work in teams to solve relevant, significant, and interesting problems related to the course content they are studying. Problems require students to use course concepts to solve them. TBL instructors use the same backward design methodology used in course design to develop the problems for the classroom activities.

TBL uses a specific sequence of individual work, group work, and immediate feedback to create a framework where students increasingly hold each other accountable for coming to class prepared and ready to contribute to discussion. The TBL model has been used successfully in universities for more than twenty years and is adaptable to many disciplines. A single instructor can successfully facilitate groups of 150 or more students.

Significant features of the TBL framework are:

- Small group learning in large class environments
- Permanent teams, readiness assurance, application activities, and peer evaluation
- Functionality in large theatre-style classrooms with fixed seats
- High levels of student attendance, preparation, participation, and critical thinking
- More motivated students


**Project Evaluation**
Pilot assessment and evaluation is critical to this project. DCL will work with UNCG assessment and evaluation experts from the Educational Research Methodologies department to develop and implement the evaluation design. A process evaluation of the pilot implementation will be conducted to examine the delivery of the pilot, the quality of its implementation, and the experience of the participants. The project evaluation design will focus on determining the feasibility of the model and teachers' and students' experience with the online course/TBL model. Project evaluation will also include comparison of student grade performance and course DWIF rates in traditional classroom and online only classroom sections of the courses. Data will be obtained through various methods to inform the pilot’s feasibility and usability.
and allow for improvements for future expanded implementation, where measurement of content understanding and attitude will be the primary focus of the intervention.

4. Professional Development and Support for Faculty

DCL and FTLC staff will work with faculty participants, researchers, and technology consultants who are participating in this pilot. In Fall 2013, a TBL consultant will come to UNCG to conduct a two-day workshop with all participants. This hands-on workshop will introduce faculty to the TBL model. The consultant will assist the faculty and staff to apply the model to their courses including providing advice for adapting online materials, if needed, to accommodate the readiness assurance phase of TBL. Pilot participants will continue the work begun in the workshop through the Fall semester in preparation for the targeted pilot launch in the Spring 2014 semester.

Each online course will be assigned a DCL instructional technology consultant (ITC) to help with problems, upload new course content, and make revisions. DCL personnel will troubleshoot technical problems that sometimes occur in courses, assist with software and hardware, and help with databases.

Data collection and analysis that tracks student performance across a range of criteria (number of days since last student access, assignments missed, grade, etc.) will be provided to instructors on a weekly basis.

5. Budget

Since the proposed pilot includes multiple courses and instructors UNCG is applying for Tier II funding for this project. The projected budget below reflects direct costs for the proposed pilot. The majority of the funding will be used to support faculty and departments participating in the pilot. Faculty will each receive a $1,500 stipend for attendance at the workshop and planning sessions; academic departments will receive funds during the Spring 2014 semester to allow them to buy out the faculty teaching salary at adjunct rate. A trained TBL consultant will conduct a two-day workshop for faculty and staff participating in the program—consulting fees and workshop materials are included in the budget request. Remaining funds will offset the cost of instructional and technical support.

<table>
<thead>
<tr>
<th>ORGANIZATION</th>
<th>PROPOSED BUDGET</th>
</tr>
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<tbody>
<tr>
<td>University of NC at Greensboro</td>
<td></td>
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<tr>
<td>Campus contact</td>
<td></td>
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<tr>
<td>Dr. James Eddy, Interim Dean, Division of Continual Learning</td>
<td></td>
</tr>
</tbody>
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A. FACULTY

<table>
<thead>
<tr>
<th>Faculty Name</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Malcolm Schug-Biology</td>
<td>1,500</td>
</tr>
<tr>
<td>Dr. Robert Guttenag-Psychology</td>
<td>1,500</td>
</tr>
<tr>
<td>Dr. Jay Lennartson-Geography</td>
<td>1,500</td>
</tr>
<tr>
<td>Ms. Leigh Sink-Political Science</td>
<td>1,500</td>
</tr>
<tr>
<td>Mr. Wade Maki-Philosophy</td>
<td>1,500</td>
</tr>
<tr>
<td>Dr. Jeffrey Sarbaum-Economics</td>
<td>1,500</td>
</tr>
</tbody>
</table>

TOTAL FACULTY: $9,000
B. OTHER PERSONNEL
1. Assessment Expert 1,500
2. Adjunct Instructors (1 course buyout at adjunct rate) 26,000
3. Technical and Instructional Support Services 9,500
   TOTAL SALARIES AND WAGES 46,000
C. FRINGE BENEFITS (20%) 9,200
   TOTAL SALARIES, WAGES AND FRINGE BENEFITS 55,200
D. OTHER DIRECT COSTS
1. MATERIALS AND SUPPLIES 300
3. CONSULTANT SERVICES 4,500
   E. TOTAL OTHER DIRECT COSTS 4,800
H. TOTAL COST $60,000

6. Timeline

The following milestones will be accomplished no later than the dates below.

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Date</th>
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<tbody>
<tr>
<td>Initial Meeting of Participants</td>
<td>September 10, 2013</td>
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<tr>
<td>TBL Workshop</td>
<td>October 31, 2013</td>
</tr>
<tr>
<td>Modification of online course content, if required</td>
<td>October 31, 2013</td>
</tr>
<tr>
<td>TBL Activities Developed</td>
<td>December 13, 2013</td>
</tr>
<tr>
<td>Courses Offered</td>
<td>January 13, 2014</td>
</tr>
<tr>
<td>Evaluation Report</td>
<td>June 1, 2014</td>
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7. Signoff and Endorsements

Dr. David H. Perrin
Provost and Executive Vice Chancellor

Dr. James Eddy
Interim Dean
Division of Continual Learning

July 9, 2013
References


