The **National Center** for **Academic Transformation**

Experts in improving learning and reducing cost in higher education.

The Learning MarketSpace, April 2006

A quarterly electronic newsletter of the National Center for Academic Transformation highlighting ongoing examples of redesigned learning environments using technology and examining issues related to their development and implementation.

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1. THE CAT VIEWPOINT

Offering perspectives on issues and developments at the nexus of higher education and information technology

Freshmen Don't Do Optional

In their 1987 Seven Principles for Good Practice in Undergraduate Education, Arthur W. Chickering and Zelda F. Gamson note, "Time plus energy equals learning. There is no substitute for time on task. Learning to use one's time well is critical for students and professionals alike. Students need help in learning effective time management. Allocating realistic amounts of time means effective learning for students and effective teaching for faculty."

Wouldn't it be great if all students wanted to study and were able to spend sufficient time on task in all of their courses to master the course content? Despite the assumption of most academics that students need to spend two hours studying outside of class for every hour spent in class, national surveys have repeatedly shown that the number of students who actually do so is somewhere between 5 and 7%. Approximately 57% spend half of that amount, and 35% spend about one-third of that amount.

Even though we know that time on task is essential to effective learning, it is difficult for faculty members in traditional formats unaided by technology to ascertain how much time on task each student is actually spending

and to take corrective action. In contrast, most software packages have excellent tracking features, allowing faculty to monitor students' time on task and intervene when they are falling behind.

It is not surprising that all of NCAT's course redesign projects have seen a strong, direct correlation between student success and time on task. While most of the projects have added greater flexibility in the times and places of student engagement with the course, this does not mean that the redesigned courses are "self-paced." Each has discovered that students need structure (especially first-year students and especially in disciplines that may be required rather than chosen) and that most students simply will not make it in a totally self-paced environment.

What are some of the lessons that we have learned about getting students to spend enough time on task?

Lesson 1. If you know that engaging in a particular learning activity will result in increased learning, you must *require* students to participate in it.

Almost every one of NCAT's math redesigns uses some form of the emporium model originally developed at Virginia Tech. Students work in a lab setting using instructional software and receive assistance on demand. Labs are open for extended hours, and students can go to the lab when it fits their schedules. What most institutions have discovered, however, is that mandatory attendance in the lab—albeit on the student's own schedule—is necessary to ensure that students spent sufficient time on task.

The Universities of Alabama and Idaho require students to spend a minimum of 3.5 hours and 2.5 hours respectively per week in the lab. In addition, both universities require students to attend weekly group meetings. Alabama students are required to attend a thirty-minute session, which focuses on students' problems and allows instructors to follow up in areas where testing has identified weaknesses. Idaho students are assigned to focus groups of 40 to 50 students each, grouped according to their majors so that particular applications can be emphasized. Groups meet once a week to coordinate activities and discuss experiences and expectations. Both universities believe that the group activities help build community among students and between students and instructors.

What happens when you do not require attendance? Several projects learned a lesson the hard way. At first, Riverside Community College faculty expected students to come to math labs voluntarily without the need for a requirement. This was not successful, and students are now required to participate in math lab activities for two hours per week. After some initial experiences, Iowa State also added mandatory attendance at computer lab sessions, which counts for a small part of the course grade. The original redesign plan from Northern Arizona University (NAU) envisaged a program where students would be "self-taught" using the software. During the proposal review process, NCAT staff talked with the NAU team about the need to "beware of self-pacing" and stressed the importance of providing sufficient structure for students within a well-articulated set of requirements. Despite these admonitions, NAU students were only required to go to the computer lab for the first three weeks of the semester. After that, attendance was not required, and students were on their own. The result was increased drops and withdrawals. The team eventually decided to require student attendance throughout the semester for any student not making a grade of A.

Lesson 2. It's not enough to require participation--you must give course points for doing so.

Many redesign projects have found that supplementing classroom experience with mastery quizzes leads to increased learning *if* they require student participation, *if* they give points for doing so, and *if* they count only the highest grade. At the University of New Mexico (UNM), general psychology students receive credit for completing three online mastery quizzes, which test both factual and conceptual knowledge, each week. Students are encouraged to take the quizzes as many times as need until they attain a perfect score. For all quizzes, only the highest scores count. The more time students spend taking quizzes and the higher their scores, the better they perform on in-class exams.

To determine whether quizzes that were mandatory (i.e., required for course credit) or voluntary (no course credit) would differentially affect exam and grade performance, UNM faculty conducted an experiment. Students in one section received course points for completing weekly online mastery quizzes; students in the other section were encouraged to take the mastery quizzes, but received no course points for doing so. On in-class exams, students who were required to complete quizzes for credit always outperformed students in the section where taking quizzes was voluntary. Students took more quizzes, scored higher, and spent longer on quizzes when course credit was at stake than students in the section where quizzes were not linked to credit. Moreover, relatively few students successfully completed quizzes when credit was not a consequence, and some students chose not to take quizzes at all.

At Florida Gulf Coast University (FGCU), the redesign of its introductory fine arts course has produced improved student performance on standardized exams. The FGCU team attributes this improved student performance directly to students taking required practice tests. In the course redesign pilot, practice tests only counted as part of students' participation grade. Because of this, students needed to take the practice tests no more than once--regardless of how they scored--to get full credit. After hearing UNM describe its point system, FGCU changed its strategy. In the full implementation of the redesign, each course activity that the students must complete is assigned a point value. Each practice test includes 10 questions worth two points each, and the practice tests receive their own grade. The grade that is recorded is the highest score. Students now take the assignments more seriously, banking their points as they progress through the semester. Students take the practice tests repeatedly, with some students taking them as many as 25 times. Those students who take the practice tests three or more times regularly score A's on the module exams.

Lesson 3: It's not enough to require participation and to give points for doing so—you must also monitor whether students are engaged and be prepared to intervene if they are not.

Despite requiring participation, despite giving points for doing so, some students are slow to become engaged in course activities, getting too far behind to catch up. Worse yet, some students never begin. Our redesign projects have found that developing early alert intervention strategies to get these students involved will lead to increased student success. Some have established a kind of "class management by exception" process, whereby baseline performance standards are set and those who fall too far behind are contacted. At UNM, students who score 75% or less on the first exam at the end of the third week are required to attend a weekly 50-minute studio for the remainder of the semester. Those students who were advised to attend a studio but failed to do so typically failed the course. In contrast, the more studios a student attends, the better their course performance.

Rio Salado College's initial redesign of its introductory algebra sequence added a course assistant to monitor students' progress. If the course assistant identified a student who appeared to be falling behind schedule, he/she immediately contacted the instructor. The assistant also telephoned or emailed students who had not been online for more than seven days or had not had correspondence within the last 14 days. The original intent of this innovation was to reduce the workload for course instructors and allow them to focus on providing academic help when needed. What began as a single course assistant assigned to four math courses has now become an institutional office supporting all online courses. Assistants call students during the first two weeks to be sure that they have successfully accessed the course, have received their texts and are moving forward. If a student has poor grades or has not submitted work, the assistants contact him/her to help make a connection to the various kinds of help that is available.

In analyzing data from its spring 2005 redesign pilot, Eastern Washington University (EWU) discovered that students who failed the course did not participate in scheduled learning activities (e.g., they did not take online mastery quizzes.) Approximately 90% of students passed the course *if* they participated in taking online quizzes in each of the first three weeks. An analysis of what EWU calls "non-participating students" (roughly 30% of the course enrollment) revealed that 50% of students who did not log on for a mastery quiz during the first week failed the course. In response to these findings, EWU has developed a scaffolding procedure to provide non-participating students with support, solutions and motivation to succeed. Students who do not log on in the first week are required to attend a workshop to determine the nature of their problem and to be sure that they understand how to use the technology. Students who do not log on during the second week are referred to their academic advisors for counseling. Students who do not log on by the third week are told that they will receive a failing grade if they miss another week without taking a quiz. They are asked to sign a contract agreeing to complete all remaining mastery quizzes. Breaking the contract by missing a fourth week results in their failing the course. The escalating scaffolding procedures have reduced the number of non-participating students from 30% to approximately 3%.

Another innovative strategy is to recognize that some students simply need more time to succeed. After carefully monitoring student progress, Seton Hall University discovered that some students in their developmental math sequence were working but working more slowly than others. Seton Hall decided to implement three progress tracks for students: fast, regular and gentle. If students are failing the course after the second chapter test, they are encouraged to sign a learning contract, which states that they will work through the course material in two semesters instead of one (the gentle track.) As a result of this innovation, 12 students are currently attending a class which covers the second half of the material in the subsequent term. A few students working on the fast track have finished the course before the end of the semester. They enjoyed having extra time to focus on their other courses at the end of the term when the workload is the heaviest.

A New Philosophy for Higher Education

These strategies represent a 180-degree turn from traditional sink-or-swim philosophies of student learning that get expressed in phrases like "either you get it or you don't" and "look to the right and to the left--one of you will be missing by the end of the semester." NCAT's premise is that our society cannot afford these outdated, out-to-lunch views of higher education. The innovative institutions involved in NCAT's course redesign programs are showing us ways to ensure that our students succeed because they are spending enough time on task. Why aren't all institutions following their lead?

--Carol A. Twigg

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2. WHAT'S NEW

Featuring updates and announcements from the Center

Twigg Testifies Before Federal Commission on the Future of Higher Education

On April 6, 2006 , Carol Twigg testified before the Secretary of Education's Commission on the Future of Higher Education in Indianapolis , IN. The Commission is charged with developing a comprehensive national strategy for postsecondary education and answering such questions as: 1) how can we ensure that college is affordable and accessible? and 2) how well are institutions of higher education preparing our students to compete in the new global economy? As part of a session on "affordability," Carol described the Program in Course Redesign, emphasizing that NCAT has shown how information technology can be used to improve key courses that contribute to student persistence and success and to change our current labor intensive model in higher education. Carol made four recommendations to the Commission. 1) We need to create a climate of accountability in higher education—-for learning outcomes and for instructional costs. 2) We need to know the facts about failure rates in key introductory courses and shine a spotlight on the academic problems we face in order to address them. 3) We need to establish programs to teach institutions how to redesign key courses and

showcase the redesign models that result. 4) We need to build incentives into the ways in which we fund higher education—at the national, state and local levels—that emphasize measuring learning outcomes and instructional costs and making improvements, rewarding those who make constructive changes and penalizing those who do not. The Commission will submit a final report by August 1, 2006 with specific findings and recommendations. To learn more about the Commission, see http://www.ed.gov/about/bdscomm/list/hiedfuture/factsheet.html.

California Community Colleges Consider Course Redesign

Enrollment in California's community colleges is exploding. In addition, success rates at many institutions are discouraging. Course redesign offers a potent strategy to address these challenges. On March 1, Carol Twigg presented the results of the Program in Course Redesign (PCR) at a seminar entitled "Focus on Community Colleges: Improving Productivity through Course Redesign," sponsored by the Stanford Institute for Higher Education Research and the William and Flora Hewlett Foundation. Responders to her presentation included Bernadine Chuck Fong, President, Foothill College; David Longanecker, Executive Director, Western Interstate Commission on Higher Education; and, Robert S. Gabriner, Director, Center for Student Success, City College of San Francisco. On March 2, representatives of the Hewlett Foundation, the California Community College System, the California Assembly and others met to learn more about the PCR. The goal of the meeting was to explore how California might join NCAT's initiative to scale its course redesign methodology to benefit California 's students. Also participating in this meeting was Chris Juzwiak from Glendale Community College who has used technology to produce effective strategies for improving learning and controlling costs in developmental education. (See the description below in the Common Ground section.) As these conversations continue, the focus will remain on increasing student success while accommodating the growing demand for higher education in California .

University System of Maryland Seeks Effectiveness and Efficiency

In fall 2004, the University System of Maryland (USM) launched an Effectiveness and Efficiency Program (E&E) to optimize the use of system resources and yield an estimated $26.6 million in savings and costs avoidance by June 30, 2006 . The savings will be redirected to help the system maintain nationally eminent academic, research, and service programs; accommodate a growing student enrollment; and moderate tuition increases. On March 14, 2006, Carol Twigg addressed a group of Board of Regents members, system senior staff and campus academic leaders to describe how NCAT's course redesign methodology can help USM meet these important goals. To learn more about USM's important initiative, see http://www.usmd.edu/eeproject/.

North Central Association Learns More about Course Redesign

A frequent question that we encounter when we talk about course redesign is, "What do the accreditors think about what you're doing?" What's behind this question? We believe that many in higher education have the mistaken idea that accreditors still consider "seat-time" a fundamental measure of quality. In fact, all of the accreditors we know see NCAT's emphasis on increasing student learning and measuring the results as a model for instructional improvement. On April 4, 2006 , Carol Twigg shared this model in a keynote speech at the annual meeting of The Higher Learning Commission of the North Central Association of Colleges and Schools (NCA) in Chicago, IL . NCA accredits higher education institutions in 19 states. To learn more about NCA, see http://www.ncacasi.org/.

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3. CENTER CHRONICLES

Featuring initiatives to scale course redesign through state- and system-wide redesign programs

Student Learning Increases at the University of Hawaii

In the first round of redesign projects at the University of Hawaii (UH) system, faculty in the Department of Information and Computer Studies at UH-Manoa redesigned Tools for the Information Age, an introductory course with an enrollment of 550-600 students each term. The redesign has been fully implemented with excellent results. Students in the traditional course scored 66.18 and 68.95 on mid-term and final exams respectively compared to redesign students who scored 83.52 and 75.93 on the two measures. The goals of the redesign were to increase consistency among sections, increase student learning of course concepts, and reduce the cost of delivering the course. Students now spend two hours in lecture and two hours in lab rather than four hours in lecture. In addition, lectures are podcast in thirty-minute segments so that students can listen to them as they complete lab exercises and homework. While students can elect not to attend the lectures, about two-thirds continue to do so. Five-minute podcasts of chapter summaries are also available. The UH-Manoa team cited several important changes that have occurred as a result of the redesign such as greater consistency in grading and content covered, the ability to accommodate more students with the same staff, and an increase in level of questions asked by students indicating greater depth of learning in the new course format. For more information, contact David Nickles at nickles@hawaii.edu or Michael-Brian Ogawa at ogawam@hawaii.edu.

Preliminary Results from Connors State's Redesign of Developmental Math

As previously reported, Connors State College received a "Brain Gain" grant from the Oklahoma Board of Regents to redesign three developmental math courses with NCAT's help. At least one of these courses (Basic Math, Introductory Algebra and Intermediate Algebra) is taken by more than 70% of new students at the institution. Currently, over 500 students are enrolled in the three courses. Connors State has established Math Learning Labs at each main campus and staffed them with full-time and part-time faculty. Students use

MyMathLab to learn math concepts and take low-stakes quizzes; they also meet once a week in groups. To encourage students to complete the developmental math sequence, Connors State has worked with the publisher to bind the textbooks for two or three of the courses together. If students place in the first of the three courses, they buy the text for all three courses; if students place in the second course, they buy the text for the two courses needed. Because they have already purchased the texts needed to progress through the sequence, Connors State believes that students will be motivated to continue. In addition, they can move on when they have completed a course without waiting for the next term to begin and without buying another book. Preliminary findings during the pilot show a slightly higher success rate in Basic Math with fewer adjunct faculty required to teach the courses. For more information, contact Jo Lynn Digranes at jdigran@connorsstate.edu.

Boise State University Conference

On April 11, 2006 , Boise State University (BSU) sponsored a day-long conference focused on redesigning large-enrollment courses. One of the academic problems facing BSU is high enrollment growth in introductory courses, leading to long waiting lists. Carolyn Jarmon provided over 230 participants with an overview of the successes achieved by the Program in Course Redesign in a keynote speech. She also conducted a late-afternoon overview of NCAT's methodology. Other speakers included Dr. Brad Lister, Director of the Center for Innovation in Undergraduate Education at Rensselaer Polytechnic Institute. Brad provided insight into the changes RPI has made in the studio model as well as examples of new active learning opportunities being developed at RPI in partnership with Thomson Publishing. Conference attendees included faculty and administrators from BSU as well as faculty from other Idaho public and private institutions.

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4. THE ROADMAP TO REDESIGN (R2R)

Featuring progress reports and outcomes achieved by the Roadmap to Redesign

During spring 2006, **Calhoun Community College** fully implemented its redesign of Business Statistics I. In summing up their experiences, the team commented, "It's all going so smoothly! We wonder what happened to all the computer snarl-ups and student confusion we experienced before. Glitches still occur but with less frequency and seriousness, and student confusion is nearly absent altogether." As before, online quizzes provided discipline for students and made sure that they kept up with their work rather than putting it off. As was expected, students now accept the online element as part of the course rather than as an "extra" imposed upon them. The team looks forward to comparing results from spring 2006 with past semesters. For more information, contact Randy Cox at rlc@calhoun.edu.

Spring 2006 was the fourth term that **Chattanooga State Technical and Community College** (CSTCC) offered its redesigned psychology course. The team experienced fewer design glitches, better student participation, and lower faculty and student frustration during the term. Enrollment in six redesigned sections was 461 students (capacity is 600 students per term.) A week before the drop date, the team directed each student to look at his or her cumulative points, add the remaining possible points, then decide if he or she could earn the desired final grade. This strategy motivated some at-risk students to ask for help or to drop before failure. The team introduced a *Psychology of Study* unit that reviewed exams, presented tips for study, test-taking and memory, introduced helpful web links, and discussed personal study strategies in students' online writing assignments. In addition, students completed a short assignment to help them identify their learning strengths and weaknesses using North Carolina State 's *Index of Learning Styles*. Most students were fully engaged in this assignment. The learning style assessments also refocused instructors' attention to class activities such as more discussions and worksheets, visual presentations and real life examples to support different student learning styles. Other changes included adding a "Getting Started" link, which helped students who missed the first day of class get up to speed, and using an audience response system in the classroom. These and other changes have increased student participation. Overall CSTCC is experiencing less faculty, staff, and student confusion about the new format and improved quality of student work. To learn more, contact Donna Seagle at donna.seagle@chattanoogastate.edu.

 During winter quarter, **Eastern Washington University** (EWU) added a third section of the fully implemented redesign of Introductory Psychology enrolling 250 students. EWU will start the fourth and final redesigned section during the spring 2006 quarter, meeting their enrollment goal of approximately 1000 students for the academic year. Raw performance scores (percentage of questions answered correctly) for the fully-implemented, fully-enrolled fall 2005 redesigned sections were superior to that of both spring 2005 pilot redesigned sections. Student ratings for the fully implemented sections were also substantially higher than either of the two pilot sections. EWU's scaffolding procedures designed to provide students with support, solutions, and motivation to succeed seem to have worked. The number of non-participating students has been reduced to approximately 3%. To learn more, contact Bill Williams at BWilliams@mail.ewu.edu.

In spring 2006, full implementation of the redesigned College Algebra (7 sections) and Precalculus (21 sections) courses at **Georgia State University** (GSU) continued. In addition, Georgia State piloted one section of Beginning Algebra and two sections of Intermediate Algebra in a redesigned format. Faculty continued to meet each month to discuss facilitated learning, the *MyMathLab* software, the creation of homework/quiz/test material and various administrative issues. The team also introduced facilitated lessons in the Mathematics Interactive Learning Environment (MILE) for students. Another focus was on student success rates in future math courses. Those students who have taken the redesigned College Algebra and Precalculus courses have a 48% success rate in Calculus I. The project is progressing nicely, and the cost savings have provided money to hire graduate learning assistants and to provide training and workshops. For more information, contact Margo Alexander at malexander@gsu.edu.

During spring 2006, all College Algebra students at **Louisiana State University** (LSU) used the redesigned format, and LSU added a five-hour precalculus course as well. The semester moved along smoothly compared to last fall, and the inclusion of a second course has been relatively painless. In analyzing the data from fall 2005, the team found an interesting side-effect of the redesign model. It appears that the success rates of the students using this model were less sensitive to the experience and skill level of the teacher than they historically were in the traditional model. About half of the 22 redesigned sections were taught by experienced instructors and the other half by mostly first-time-teaching graduate students. The percentages of each grade earned (A, B, C, D, F, and W) were almost identical for the two groups. LSU has recently committed $400,000+ to renovate space for another 136-seat math learning lab to open in fall 2006, bringing LSU's math lab capacity to 232 seats. LSU plans to accommodate almost 3000 students using the redesigned format. Discussion has begun about bringing another course into the redesigned model in spring 2007, which would add another 1400 students. To learn more, contact Phoebe Rouse at prouse@lsu.edu.

During fall 2005, **Seton Hall University** (SHU) fully implemented its redesign of both Beginning Algebra and Pre-Algebra using *MyMathLab*. The computer-mediated program allowed students to work at their own pace within structured deadlines. The team decided to implement three tracks for students--fast, regular or gentle. If students were failing the course after the second chapter test, they were encouraged to sign a learning contract which stated that they would work through the course material in two semesters instead of one (the gentle track.) As a result, 12 students are now attending a class which covers the second half of the material. After successful completion, they will be able to go on to their college-level math class. A few students who worked on the fast track and finished the course before the end of the semester enjoyed having extra time to focus on their other courses when the workload seemed to be heaviest. Wendiann Sethi, Director of Developmental Mathematics, has shared her redesign experience at three different conferences: 1) NJEdge.net conference in November 2005; 2) BbWorld in February 2006; and, 3) a conference on Developmental Education for the New York College Learning Skills Association in March 2006. Overall the team believes that the redesign has been a success and that they are now just fine-tuning the program. To learn more about the SHU redesign, contact Wendiann Sethi at sethiwen@shu.edu.

Spring 2006 was the second semester of full implementation for 27 sections of Introductory Spanish at the **University of Alabama** (UA). Most technology wrinkles were worked on during fall 2005 so the spring semester progressed much more smoothly. As others experienced in course redesign have said, the first semester is always the hardest. This proved to be the case at UA, even though the team had run a pilot in spring 2005. Gladly, all the challenges present in fall 2005 have been surmounted as evidenced by the negligible number of student queries about the online component. This is in part due to the fixing of glitches and in part to the compilation of a FAQ sheet for students and instructors. Training of instructors has been ongoing throughout the year. Assessment based on common rubrics took place for every section. By the end of the spring semester, all assessment data for AY 2005-2006 will have been collected and compiled for the final full report. For more information, contact Alicia Cipria at acipria@bama.ua.edu.

The **University of Missouri–St. Louis** (UMSL) continued its successful redesign of College Algebra in its newly-built Math Technology Learning Center (MTLC), a large facility with about 110 computers, 70 of them in learning clusters and the rest in a testing area and space for small group work using white boards. All faculty and TAs who teach College Algebra have their office hours in the MTLC, thus encouraging students to view the MTLC as the best place to get help with math. Pass rates have steadily increased during all phases of the redesign, and the course structure is still evolving. Most recently, the student pass rate (grade of C or better) was more than 80% compared to a pass rate of 50-55% before the redesign. UMSL also introduced the redesign to evening courses, thereby bringing more uniformity to the course. The team has learned that training for instructors, TAs, and tutors is required to implement the redesign successfully, to overcome the initial desire to stick with the old way of doing things and to go through the steps of accepting a different teaching/learning model. Key to UMSL's success has been the willingness of dedicated lecturers to try something new and the support of the university in building the MTLC. To learn more about this redesign, contact Teresa Thiel at thiel@usml.edu.

The **University of North Carolina at Chapel Hill** (UNC-CH)is in the second semester of full implementation of its redesigned precalculus algebra course and the first semester of full implementation of its redesigned precalculus math course. Precalculus Algebra has experienced a number of problems including moving back to pencil and paper for exams due to the faculty's insistence that partial credit be available; experiencing technical issues related to *MyMathLab*; relying on students to use required PC notebooks rather than providing lab computers for them; failing to require attendance at the MathPort lab; and, locating the redesign in a lab some distance away from the main campus. The team has made adjustments and thinks that, with a bit more calibration, they will see improvement. Students are currently required to attend one recitation session per week, and the team is considering making attendance at the MathPort mandatory. In contrast, the precalculus math course used Thomson's *iLearn* with good results. Students expressed enthusiasm for the course structure and materials and the ability to see their test scores immediately. Compared to the algebra course, the math course was more structured in terms of mandatory time on task. In addition, the course was offered in campus space where students typically attend classes.Initial comparison of the pre-test/post-test data indicates improved learning outcomes in the redesigned sections of math. To learn more, contact Charles Green at green@unc.edu.

During fall 2005, the **University of North Carolina at Greensboro** (UNCG) fully implemented its redesign of both its precalculus sequence and its introductory statistics course. Average final examination scores in the redesigned precalculus sequence showed a significant increase over final examination results from traditional courses taught in fall of 2004. For College Algebra, there was a small decrease in final exam scores from fall of 2004 to fall of 2005. UNCG is analyzing this difference by comparing textbooks, online materials, student populations, student backgrounds and other factors. To learn more, contact Ray Purdom at rcpurdom@uncg.edu.

At **Wayne State University** (WSU), overall results have shown an 8% increase in the pass rate when using the Math Computer Lab (MCL) as compared with the previous lecture/workshop model. WSU's Intermediate Algebra course met in the MCL for the first time in fall 2005; assessment results showed a 4.5% improvement over the previous lecture format. The team expected greater gains because the previous Intermediate Algebra course was not as well designed as the previous course for Beginning Algebra. Upon further analysis, the team discovered that 18% of the students had overall scores in the 60-69% range, just missing the 70% required for passing. In the future, the team will concentrate its efforts on providing earlier help for these borderline students to help them successfully complete the course. The drop rate in Intermediate Algebra changed from 42.5% to 26.3%, a significant improvement. WSU is preparing a new 148-station lab for the fall 2006 semester. The new lab is in the shape of an L, which will allow a separate section for testing. When this lab is complete, WSU will be able to add additional courses, including Finite Math for the Social and Management Sciences scheduled for fall 2006. Their next project will be to add a homework and practice quiz component for Intermediate Algebra with Trigonometry. To learn more, contact Patty Bonesteel at patty@math.wayne.edu.

Updated progress reports for all R2R projects are now available on the NCAT web site at http://www.thencat.org/R2R/R2R_ProjDiscipline.htm.

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5. CORPORATE CONNECTIONS

Linking content and software providers with leading edge institutions

Pearson Education and NCAT Co-Sponsor Workshops

Pearson Education and NCAT are co-sponsoring two one-and-a-half-day workshops highlighting successful course redesigns that use technology to improve student learning. The workshops will feature NCAT's research-based course redesign methodology that was developed in partnership with more than 50 diverse two- and four-year institutions. The first workshop will occur on May 11-12 in Boston , MA and the second in Southern California on October 20–21. Workshop participants will hear from faculty members who have implemented course redesigns to achieve measurable and significant gains in student success. They will learn how to implement course redesign principles in English, mathematics, and Spanish. (Spanish will be included in the October workshop only.) Faculty will also have the opportunity to learn more about Pearson's leading technology products. To learn more about these workshops, see www.pearsoncourseredesign.com.

Thomson Learning Pilots Program at the University of Illinois

A two-semester pilot program at the University of Illinois at Urbana-Champaign College of Business found that students increased class attendance and participation, paid more attention and were more successful in test preparation in technology-enriched classrooms using *ThomsonNOW* (an online learning system with quizzes, diagnostic tools, and personalized learning plans) and Turning Technologies' *TurningPoint* classroom response system. Approximately 650 marketing students used *ThomsonNOW* for test preparation and ResponseCards (handheld clickers) to submit real-time responses to faculty questions using *TurningPoint*. Preliminary research by the Reed Group revealed: 1) 87% of students reported that they were more likely to attend class when clickers were used to take attendance; 2) 72% reported being more likely to participate in class when using clickers; 3) 61% said they were more focused on the lectures; 4) 70% reported improved understanding; 5) 96% found *ThomsonNOW* helpful for test preparation; and, 6) 63% found classes more fun. For more information, contact Molly Reese at molly.reese@thomson.com.

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6. COMMON GROUND

Reporting on initiatives that share the Center's goals and objectives

Technology and Developmental English Students Mix Well at Glendale Community College

Developmental English at Glendale Community College (GCC) has changed significantly for the better over the last five years. Chris Juzwiak, a GCC faculty member, has redesigned three developmental English courses to include online interactive activities and quizzes as well as student collaboration on essay critiques. Students can take quizzes as many times as they need to master vocabulary and grammar concepts. They practice critical reading and writing as they review passages and answer questions about content. Students are now actively engaged in refining their ideas, rewriting and working with others on these efforts. Student response has been excellent, and attendance has increased. Their attitudes toward writing and English are completely changed; success and completion rates have increased. Faculty teaching the subsequent freshman composition course have observed that students are better prepared to write at the college level. GCC has received a Carnegie grant to spread the concepts used in developmental English to other courses at the institution. To learn more, contact Chris Juzwiak at wjuzwiak@glendale.cc.ca.us or visit the course web site at http://courseweb.glendale.edu/thefullemersion/Default.htm.

Active Learning Pays Off for Physics Students

Does active engagement increase student learning in physics? Absolutely, according to Richard Hake, professor emeritus at Indiana University. Hake has developed what he calls Socratic Dialog-Inducing Labs, guided experiences featuring hands-and-heads-on experiments in introductory mechanics which engage students in observing, testing and analyzing physics problems. Hake has found that using interactive engagement methods can improve students' conceptual understanding and problem-solving skills well beyond

that achieved by traditional methods. In a follow-up study, seniors repeated the post-test used in the introductory course; students were able to retain the introductory concepts over time. Hake has developed manuals so that others can use the labs as well as sample exams to test mastery of concepts. Results of Hake's work, a list of 14 lessons learned and an extensive bibliography can be found at http://www.physics.indiana.edu/~hake. Richard Hake may be contacted at rrhake@earthlink.net.

ALEKS Adds Greater Flexibility of Use

Several institutions participating in the Program in Course Redesign considered using ALEKS, an instructional mathematics software package, as part of their redesign but found some features either missing or inadequate. *ALEKS* has since been improved to include many new characteristics with an emphasis on greater flexibility. Institutions can now tailor *ALEKS* to fit their particular needs. Students no longer need to work on topics not required for their courses; such topics can be easily edited out of *ALEKS*. At the same time, domains have been expanded so that the software covers material needed for most courses. *ALEKS* now permits the objectives or units of a course to be sequenced according to the instructor's needs. A new quiz feature can be used for a range of purposes, including focused homework assignments and tests, exams and quizzes of all kinds. As do the other principal areas of *ALEKS*, the quiz feature uses algorithmically-generated questions and administers, scores, grades, and records the quizzes/assignments automatically--a huge convenience for instructors. Finally, a student review feature permits access to all topics worked on in the past and allows students to print individualized practice worksheets. To learn more, contact Biff Baker at biff@aleks.com or see www.highedmath.aleks.com.

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7. SUBSCRIPTIONS, SUBMISSIONS, ARCHIVES, REPOSTING

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