Course Redesign and Active Learning Implementation Toolkit

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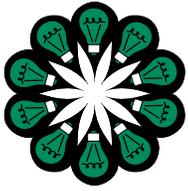
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Table of Contents

Introduction

Pearson has embarked on a global education initiative to dedicate itself to the pursuits of improved learner outcomes and improved efficacy—the measurable impact on improving an individual's life through learning.

Data indicate that both course redesign and active-learning implementations are proven ways to accomplish both. To that end, we created the Course Redesign and Active Learning Implementation Toolkit—a combination of best practices for successful implementations of Pearson digital products and the achievements of course redesign objectives developed jointly by the National Center for Academic Transformation (NCAT), Pearson's Faculty Advisor Network, and other industry thought leaders. Whether you're embarking on a full-scale course redesign or you're looking to simply implement a different active-learning model in your classroom, application of the best practices discussed herein have again and again resulted in positive learning outcomes. Content is organized first by chapter and then by topic—for convenient download and printing of only those pages you find most valuable.

Course redesign is a data-driven innovation designed to increase quality and improve efficiency in large-enrollment introductory courses. When combined with high-quality teaching and learning courseware like one of the coursewares in Pearson's digital family of products, an institutional redesign of academic courses achieves more-effective use of instructor time, increases student time on task and engagement in course material, and reduces institutional and, typically, student costs.

"Chapter 1. Course Redesign: Planning and Implementation" covers NCAT course redesign principles and how technology can be used both to increase higher education quality and to reduce institutional costs. In addition, we've included specific redesign characteristics and we've described proven best practices that result in repeatable, above-average learning gains as well as gains that continue to improve over time—and throughout a course sequence.

"Chapter 2. How to Build an Active Learning Strategy" comprises demonstrable evidence of how technology-enhanced instruction can both improve student learning outcomes and lead to cost efficiencies. Our experience—spanning hundreds of institutions, tens of thousands of educators, and millions of students—shows that the way educators integrate a learning technology is the single, most significant element that affects resultant outcomes.

Pearson defines *active learning* as the procedure of implementing learning activities that engage students with course content in a meaningful, hands-on way. We've only begun to scratch the surface of the various models being implemented by higher education educators around the world. We are committed to supporting those efforts by working with educators who are ready to take risks, to frequently review their results, and to refine their implementations in order to discover the best combination of best practices for their institutions.

Our most recent efficacy report, *Active Learning: Implementation Strategies for High Impact,* identifies four active-learning models—emporium/lab based, blended/hybrid, flipped class-room, and fully online—via 12 case studies across a variety of disciplines, each of them full of compelling, data-supported research.

"Chapter 3. How to Measure and Assess Your Implementation" focuses on the importance of tracking and measuring learning gains. It takes readers through a series of questions and offers data collection templates for gathering information, analyzing data, and communicating the results to the proper parties. Readers are encouraged to make decisions based on evidence and data, not just hunches.

Finally, "Chapter 4. Additional Resources" offers online resources from Pearson, NCAT, and a host of industry leaders.*

Contact Pearson with questions about the toolkit or to share ideas, best practices, and Pearson digital product implementation results.

We look forward to hearing from you.

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Topic 1. Course Redesign Getting Started Worksheet

Pearson and the National Center for Academic Transformation (NCAT) are committed to providing higher education institutions with the tools they need to achieve their student access, success, and retention goals while reducing their instructional costs. Through constant testing and refinement of its course redesign methodology and by working with a diverse group of community colleges, public and private colleges, and universities, NCAT has demonstrated that all postsecondary institutions are capable of achieving improved outcomes at reduced costs. To replicate that success, the following worksheet can help in building a road map of your redesign.

Course Name: _____

TOPIC	NOTES	PROGRESS STATUS
The Issue(s)		
What are the main issues you are trying to solve through a course redesign?		
What are the quantifiable goals you want the redesign to achieve?		
The Current Course		
Structure (meeting times per week)		
Annual enrollment		
Textbook in use		
Software in use		
Delivery (e.g., lecture, lab)		
Average section size per semester		

TOPIC	NOTES	PROGRESS STATUS
The Redesigned Course		
Which redesign model(s) have you chosen? (See The NCAT's Six Models of Course Redesign.)		
Additional Active Learning Implementation Models here.		
How will you deliver content? E.g., modularized with mastery learning (self-accelerated, students pick up the following semester where they left off), a one-semester approach with fixed due dates, etc.		
Will you use a corequisite model—blend two courses into one by sequencing topics?		
Average section size per semester		
Textbook to be used		
Technology to be used		
If you haven't yet selected course materials, how will you evaluate the content and the software you'll be using to redesign?		
Structure (meeting times per week)		
Team Leader		
Team members		
How will you measure evidence of learning gains?		

For more information, see www.thencat.org and www.pearsoned.com/efficacy.

TOPIC	NOTES	PROGRESS STATUS
The Redesigned Course, cont'd		
Cost Reduction Approach (See The NCAT's R2R Cost Reduction Strategies.)		
Will you run a pilot? If so, how many sections and when?		
Map out a timeline to implement the redesign. (See page 5 for an example.)		
Available Support		
Do you have institutional leaders (e.g., deans, provosts, chairs) who are supportive of your redesign commitments?		
What financial resources are available to support the redesign? Pearson Grant Help		
Are faculty teaching the redesign course(s) on board?		
Have you put together a training plan for faculty? (What type of training is needed and by whom?)		
Do you have the support of the campus technical or IT group?		
For more information on how Pearson can help support your redesign efforts, see Pearson's Educator Training and Support page or contact a Pearson representative.		

For more information, see www.thencat.org and www.pearsoned.com/efficacy.

TOPIC	NOTES	PROGRESS STATUS
Sustainability		
What is your ongoing training plan? Key milestone dates?		
Do you have student success data for courses in the current format to compare with data after the redesign?		
Has a system for measuring learning outcomes and student achievement been identified for the course(s) that are being redesigned?		
Have you designated someone to track data, measurements, and observations of learning gains?		

Course Redesign Timeline

This diagram shows how to build key milestones backward from an ultimate final completion date.

Interpret Data

Results: Educationally Valid?

Adjust Course

Apply Lessons Learned

Analyze Data

Results: Statistically Valid?

Compare Historical / Current Exam Scores

Run Thru Semester / Give Last Year's Final Exam

Compare Final Exam Scores

Computer Lab Available?

Selected Redesign Model

Increase Learning Effect by 0.5

Prepare Data

Implement Course

Select Measurement Tools

Evaluate Resources

Design Course

Set Goal
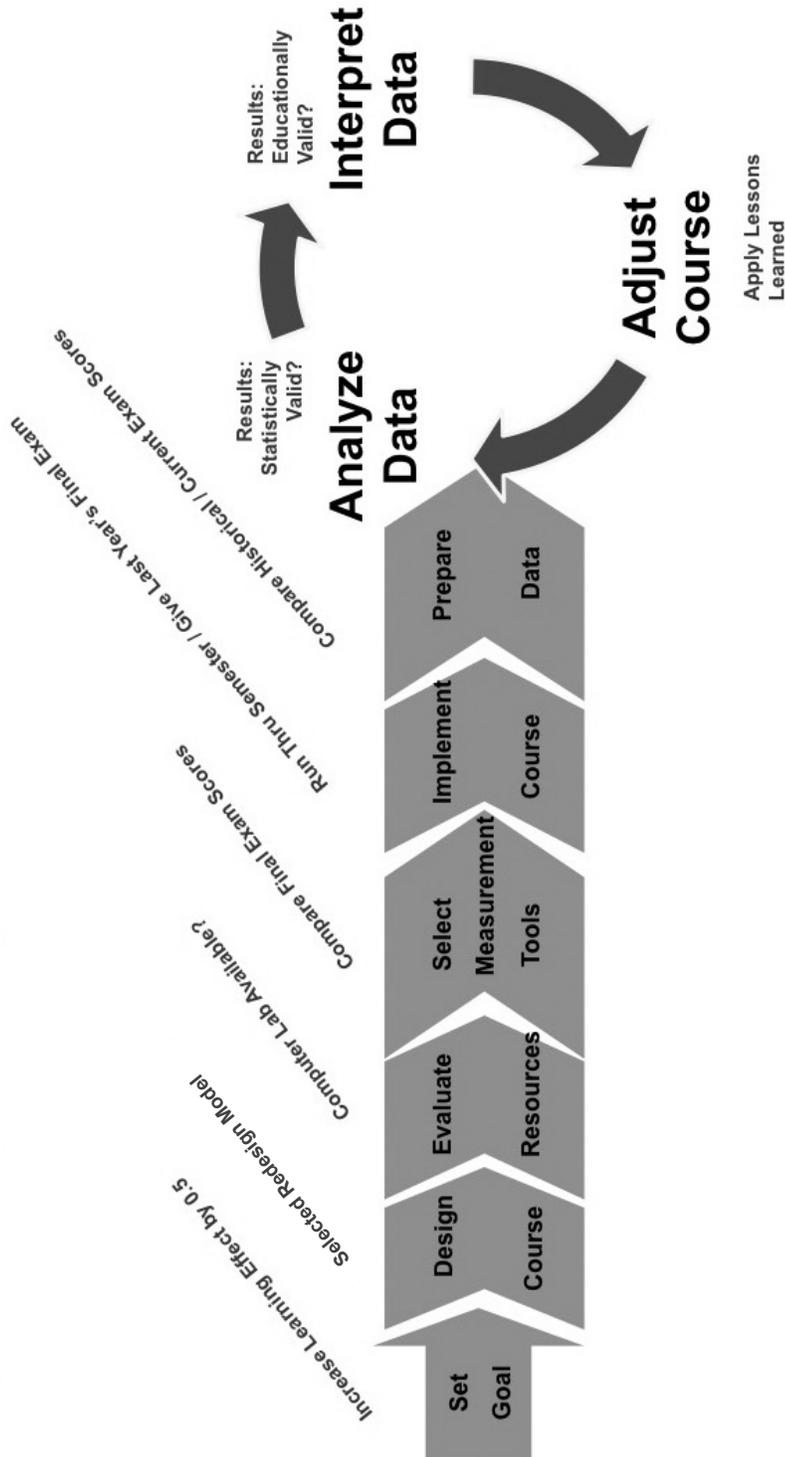
Topic 2. Readiness Checklist

Before beginning a redesign, most institutions find it useful to think through their readiness to engage in a redesign. A successful redesign requires that both institutional support and needed resources be in place before a redesign begins.

☐ **Have you clearly identified the problem/issue the redesign will solve?** Do you have data to support the extent of the problem/issue? Do others on campus also acknowledge the problem?

☐ **Do you have sufficient resources to support the redesign?** Have you identified sources of external or internal funds to support the redesign?

☐ **Do the senior administrators who make funding and space decisions understand the needs of the redesign?** Do they have sufficient information to make appropriate decisions?

☐ **If your campus is unionized, has the redesign plan been discussed with union leadership?** Have you shared the Scope of Effort Worksheet to document that the redesign will not increase workload?

☐ **Have you formed a redesign team that includes faculty, administrators, technology professionals, and assessment experts?** Does the team understand the scope of the task?

☐ **Have you established specific assignments for team members and others for the planning period?**

☐ **Have the team and others read about successful redesigns on the NCAT website or on Pearson's Results Library or here, and discussed them?**

☐ **Have you visited other campuses that have implemented successful redesigns, or have you had telephone discussions with their faculties and administrators?** Were others who might have reservations about the redesign invited to join the visits or the phone calls?

☐ **Have you considered asking one or more NCAT Redesign Scholars or Pearson Faculty Advisors to visit your campus and provide advice about the redesign?**

To connect with a Pearson Faculty Advisor, contact your local Pearson representative or visit http://community.pearson.com/fan.

Topic 3. Planning and Implementation Checklist

The following list from NCAT's Essential Elements of Course Redesign can help make sure that every component of a successful redesign gets addressed prior to the pilot term. If you can thoughtfully answer each question, your plan will have an excellent chance of achieving its academic and financial goals as well as fully attaining its benefits for students, faculty, and your institution. Although some institutions assume that once the questions have been addressed, the redesign activity is over. Truth is, the questions should be actively addressed in the planning phase, implemented in the pilot, reviewed and modified during the revision stage, and then carefully monitored and updated for future terms. Your ongoing attention to those actions will help sustain the positive effects of your redesign.

Redesign the whole course and establish greater course consistency.

- ☐ Do you intend to redesign the whole course?
- ☐ How will you establish greater course consistency?
- ☐ Which redesign model do you intend to use? Why have you selected it?
- ☐ Has the importance of consistency for all students been clearly established among all faculty—both full-time and adjuncts? How will that consistency be ensured?
- ☐ How will you build and maintain consensus among the multiple redesign stakeholders?
- ☐ How will you prepare students and their parents for transition from the traditional format to the redesigned format?
- ☐ Has a course coordinator been identified? Have the coordinator's responsibilities been specified?
- ☐ Have a training plan and a schedule been established for full-time and adjunct faculty?
- ☐ How do you plan to move beyond the initial course design team and enlist other faculty in teaching the redesigned course?

Require active learning.

- ☐ How will students be actively engaged with course content?
- ☐ How many lab/classroom hours will be required each week?
- ☐ Do faculty members understand how their roles will change under an active-learning model?

Increase interaction among students.

- ☐ How will you increase interaction among students?
- ☐ Have you thought about incorporating small-group activities that can take place in the lecture hall? in the classroom? in the lab? online?
- ☐ Who is going to lead and monitor small-group activities? Have you thought about alternative staffing strategies?

Build in ongoing assessment and prompt (automated) feedback.

- ☐ How do you plan to incorporate ongoing assessment and prompt feedback for students?
- ☐ Do you have a plan to automate grading when possible, such as grading of low-stakes quizzes and homework exercises?

Provide students with one-on-one, personalized, on-demand assistance from highly trained personnel.

☐ How will you provide students with more-individualized assistance? Who will do this and how?

☐ Have you considered the use of various kinds of personnel who can provide needed student assistance and complete administrative tasks, such as under-graduate peer tutors, graduate teaching assistants, course assistants, and tutors? Who will do what?

☐ How will you select, orient, and train personnel both initially and on an ongoing basis?

Ensure sufficient time on task.

☐ How will you ensure that students spend sufficient time on task?

☐ Do you plan to develop materials in addition to the software (notebooks, directions, task lists) to help keep students on task? Have the materials been reviewed for completeness and clarity?

☐ Do you have a clear timeline and weekly schedules for students that will enable students to finish on time?

Monitor student progress and intervene when necessary.

☐ How will you monitor student progress? How will you deal with students who are falling behind?

☐ Have you investigated how the software can monitor and track student performance and support course administration?

Measure learning, completion, and cost.

☐ Have you selected a method for obtaining data that will compare student learning outcomes during the pilot and full-implementation phases?

☐ Will you be able to use existing traditional data, or will you collect parallel data from the traditional and redesigned sections during the pilot term?

☐ Which of the four measurement methods will you use in each phase?

☐ Have you decided how you will implement your assessment plan, including working with others who may need to collect or analyze data?

☐ Have you investigated whether the traditional format contained grade inflation?

☐ Have you selected a cost reduction strategy to be used in the redesign?

☐ Have you completed the assessment-planning forms, the completion forms, and the Cost Planning Tool to document your plans?

# Topic 4. Essential Elements of Course Redesign

An excerpt from the National Center for Academic Transformation Course Redesign Guide

From working with large numbers of students, faculty, and institutions since 1999, NCAT has learned what works and what does not work in improving student learning while reducing instructional costs. The NCAT approach to conducting redesign programs has been first to establish a set of broad parameters (e.g., redesign the whole course, use instructional technology, reduce cost) and then to let experimentation bloom within them. From that iterative process, a number of redesign solutions have emerged—some of them anticipated, some not.

Although all successful course redesigns at NCAT's partner institutions embody the Essential Elements of Course Redesign discussed later, each has chosen a redesign model that implements the elements in ways that vary according to the discipline involved, the particular student audience, and faculty preferences. After examining the similarities and differences in the ways those common elements are arrayed in the various redesigns, NCAT has identified six distinct course-redesign models, which are described in Topic 6. A key differentiator among them is where each model lies on the continuum—from fully face-to-face to fully online interactions with students.

NCAT has identified eight elements that are essential to successful course redesign. If any of those eight elements are absent, it is unlikely that student success rates will improve at reduced instructional cost. If all of the elements are present— and you select an appropriate cost-reduction strategy as described in the NCAT's R2R Cost Reduction Strategies—we guarantee that student success rates will improve and costs will reduce. Through the years, faculty members have said to us, "We've done course redesign"—by which they mean they use some form of technology in their classes. Course redesign is not, however, one or two of the following elements; the combination of and interaction among all eight are what make course redesign so successful.

Element #1: Redesign the whole course and establish greater course consistency.

Element #2: Require active learning.

Element #3: Increase interaction among students.

Element #4: Build in ongoing assessment and prompt (automated) feedback.

Element #5: Provide students with one-on-one, on-demand assistance from highly trained personnel.

Element #6: Ensure sufficient time on task.

Element #7: Monitor student progress and intervene when necessary.

Element #8: Measure learning, completion, and cost.
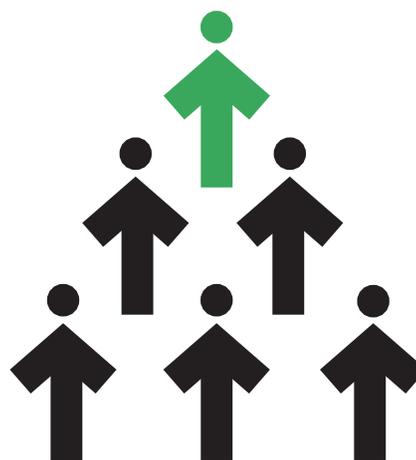
Element #1: Redesign the whole course and establish greater course consistency.

In each course redesign model, the whole course—rather than a single class or section—is the target of redesign. The course is treated as a set of learning materials and activities that can be continuously worked on and improved by all faculty rather than as a one-off that gets reinvented by individual faculty members each term. The collective commitment of all faculty teaching the course coupled with the capabilities provided by information technology leads to success. Information technology enables best practices to be captured in the form of interactive, Web-based materials supported by sophisticated course-management software. Faculty can systematically incorporate feedback from all involved in the teaching and learning process, thereby adding to, replacing, correcting, and improving an ever-growing body of learning materials and best practices.

In the traditional format, consistency among different instructors or different campuses within the same institution is typically lacking. Any course taught by multiple instructors faces the problem of course drift, especially when large numbers of adjunct faculty members are involved. The phrase course drift refers to what happens when individual instructors teach the course to suit their individual interests rather than to meet agreed-upon learning goals for students. Course drift results in inconsistent learning experiences for students and inconsistent learning outcomes. Students are usually assessed not in one single way but in a variety of ways, which in turn leads to overall grading differences and grade inflation. Contributors to grade inflation in the traditional format include (1) having no clear guidelines regarding the award of partial credit, (2) allowing students to fail a required final exam yet still pass the course, (3) failing to establish common standards for topic coverage (in some sections, entire topics are not covered, yet students pass), and (4) failing to provide training and oversight of instructors, especially part-time ones.

Course redesign creates consistency of course content and course delivery. A team of faculty is responsible for course development and course delivery strategies to ensure that all students have the same learning experience regardless of the instructor or campus location. And students are assessed on common outcomes by means of common assessment methods. Redesign that ensures consistent content coverage and consistent learning experiences for students produces significant improvements in course coherence and quality control. Training and ongoing monitoring of all instructors (full-time faculty and adjuncts) and other instructional personnel also contribute to consistent student learning experiences and outcomes.

Element #2: Require active learning.

In the traditional format, students spend a lot of time watching or listening to a lecture given by someone else. The three hours that students spend listening to lectures each week are three hours that could be spent actively engaged with course content.

Each redesign model makes significant shifts in the teaching-learning enterprise so that it becomes more active and more learner centered. Lectures and other face-to-face classroom presentations are replaced with an array of interactive materials and activities that move students from a passive, note-taking role to an active-learning orientation. As one math professor put it, "Students learn math by doing math, not by listening to someone talk about doing math." Course redesign obligates students to become actively involved in learning course material. And the role of the faculty moves from one of dispenser of knowledge to one of partner or helper in the learning process.

Instructional software and other Web-based learning resources assume important roles in engaging students with course content. Resources include tutorials, exercises, and low-stakes quizzes that provide frequent practice, feedback, and reinforcement of course concepts. Students may be required to spend a minimum number of hours each week online or in a lab using interactive software for instruction and practice with support from instructors and other instructional personnel.

Online tutorials present course content with links to a variety of additional learning tools: video lessons, lecture notes and exercises, animated examples, step-by-step explanations, electronic textbooks, study plans, homework assignments, quizzes, practice tests, and posttest. Navigation is interactive; students can choose to see additional explanations and examples along the way. The software gives students multiple resources (hints on how to solve problems and exercises, videos, animations, solutions to frequently asked questions, and links to the e-textbook) to correct their understanding if they do not master a skill. Instructional software supports auditory, visual, and discovery-based learning styles. All resources are in the same online location and can be accessed anywhere, anytime. And students can work on assignments from any computer with Internet access.

Software both provides support and frees up in-class time for other active-learning practices such as in-class or online team-based learning and use of personal response systems. In moving from an entirely lecture-based to a student engagement approach, learning becomes less dependent on words uttered

by instructors and more dependent on interaction with the content undertaken actively by students.

Element #3: Increase interaction among students.

Students in lecture classes large or small tend to be passive recipients of information, and student-to-student interaction is often inhibited by class size. Course redesign restructures courses explicitly to increase discussion and group work among students. Small-group interaction can be created in large lecture halls, in labs, online, or in a combination of formats.

It is possible to create an active learning environment within a large lecture hall setting by using a combination of group work and student-response systems (e.g., clickers or Pearson's Learning Catalytics). Class time can be divided into 10- to 15-minute lecture segments followed by sessions in which students work in small groups applying concepts to solve problems posed by the instructor. Group responses can be reported through a student-response system. The instructor moderates the discussions and draws out key issues to reinforce specific ideas or reveal misconceptions. Students can peer-mentor each other during in-class discussions. More-knowledgeable students can quickly answer questions from less-knowledgeable ones in their groups, thereby preventing the latter from falling behind.

Lecture time can also be replaced with individual and small-group activities that take place in computer labs staffed by faculty, graduate teaching assistants and/or peer tutors. Increased lab hours enable students to receive more one-on-one assistance. Students welcome the reduction in lectures and the opportunity to work in groups to apply what they have learned from resource materials. Students learn from each other, and they increase their skills in working collaboratively on projects. In addition, peer pressure within groups is a powerful incentive for students to keep up with their work.
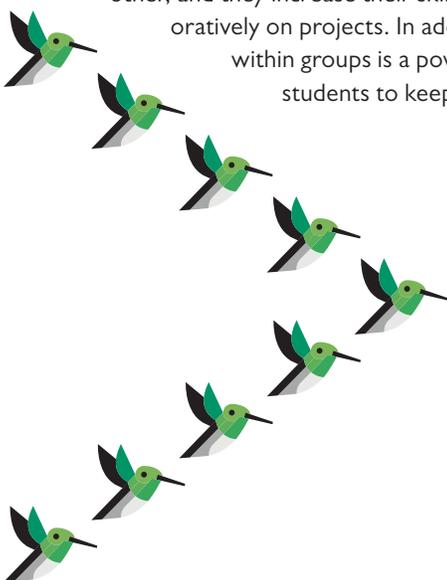
Small online discussion groups provide useful and convenient opportunities to increase discussion among students. In smaller discussion forums, students can participate actively. For instance, groups can read and comment on a relevant article in response to questions posed by the instructor, collaborate on homework assignments, and work on group projects. Software enables instructors to more easily and more carefully monitor the frequency and the quality of students' contributions to discussions than they can in a crowded classroom.

Increasing the interaction among students is a well-accepted pedagogical principle that leads to improved student learning. As Arthur W. Chickering and Zelda F. Gamson note in their 1987 Seven Principles for Good Practice in Undergraduate Education, "Learning is not a spectator sport. Students do not learn much just sitting in classes listening to teachers, memorizing prepackaged assignments, and spitting out answers. They must talk about what they are learning, write reflectively about it, relate it to past experiences, and apply it to their daily lives. They must make what they learn part of themselves. Working with others often increases involvement in learning. Sharing one's own ideas and responding to others' reactions sharpens thinking and deepens understanding."

Element #4: Build in ongoing assessment and prompt (automated) feedback.

Increasing the amount and frequency of feedback to students is a well-documented pedagogical technique that leads to increased learning. In the traditional model, students typically turn in homework that is hand graded and then returned days after they do the homework and make mistakes. By the time students see the graded homework, they are not sufficiently motivated to review their errors and correct their misunderstandings.

Course redesign utilizes computer-based assessment strategies. A major advantage of using interactive software is the immediate feedback provided for students. Students receive individualized help from the tutorials, practice exercises, and guided solutions that are built into the software. Instant feedback lets students review their errors at the time they make them. A large bank of quizzes for each course topic is built into instructional software, and assignments are graded on the spot. When working a homework assignment, students get immediate feedback that tells them whether an answer is correct or incorrect. Automation of the feedback process grades every problem or question, and students receive specific information about their

performance. That automated process in turn leads to more-efficient and more-focused time on task and higher levels of learning.

Course redesign also shifts the traditional assessment approach from one that relies on midterm and final examinations to one of continuous assessment. Students can be tested regularly on assignments via short quizzes that probe their preparedness and conceptual understanding. Such low-stakes quizzes motivate students to keep on top of the course material, structure how they study, and encourage them to spend more time on task. Quizzing encourages a do-it-till-you-get-it-right approach, meaning that students can be allowed to take quizzes as many times as they want to until they master the material. Automation of assessment facilitates repeated practice and provides prompt and frequent feedback—pedagogical techniques that research has consistently shown to enhance learning.

Element #5: Provide students with one-on-one, on-demand assistance from highly trained personnel.

The traditional model increases the likelihood that students will get discouraged and stop doing the work for two reasons: First, they have to do most of their work (homework) without immediate support, and those who are unable to receive help at the time they need it will too often give up and not complete the assigned task. Second, in traditional lecture and classroom formats, students are usually unlikely to ask questions because of having to admit in front of fellow students what they do not understand. Most students would rather remain invisible than interact with the instructor in that public way—to protect themselves from embarrassment—and so they usually do not get answers to their questions. Office hours attempt to mitigate that problem, but students notoriously do not take advantage of them. Students need help at the time they are stuck rather than during fixed times or by appointment.

Course redesign either replaces or supplements lecture time with individual and small-group activities that take place in computer labs or help rooms staffed by faculty, graduate teaching assistants, and/or peer tutors and/or online, which enables students to access more one-on-one assistance. Highly trained instructional staff are available to provide individual assistance if students encounter difficult concepts while working on course work. The availability of on-demand individual assistance in the lab or in the computer classroom or online ensures that students receive immediate help when needed.

Offering students help when they need it rather than according to a schedule not only addresses the particular problems they encounter but also helps keep them on task. Students cannot live by software alone. When they get stuck, the tutorials built into most software programs are not enough to get them moving again. Students tune out less when they receive targeted information to meet their perceived needs. They need human contact as well as encouragement and praise to assure them that they are on the right learning path. Helping students feel they are a part of a learning community is critical to persistence, learning, and satisfaction.

An expanded support system enables students to receive help from a variety of people. The varying levels of personnel let students seek help from someone with whom they are most comfortable and whose teaching style is best suited for their individual learning needs. So-called teachable-moment opportunities in the lab or classroom enable instructors and students to build relationships and further foster learning. In addition to providing individualized assistance for students, faculty and others responsible for the course can learn which areas are most difficult for students and can continuously improve the learning activities included in the course.

By constructing support systems comprising various kinds of instructional personnel, course redesign applies the right level of human intervention to particular student problems. Highly trained, expert faculty members are not required for all of the tasks associated with a course. By replacing expensive labor (full-time faculty members and graduate teaching assistants) with relatively inexpensive labor—less expert (adjunct faculty members, undergraduate peer mentors, and course assistants) when appropriate—it is possible to increase the person-hours devoted to the course and the amount of assistance provided for students.

Element #6: Ensure sufficient time on task.

As Chickering and Gamson note in Seven Principles for Good Practice in Undergraduate Education, "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." 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 then take corrective action.

NCAT has learned that student participation in all course activities—whether in the classroom, in the lab, or online—must be required. As NCAT's Redesign Scholars have repeatedly said, "Don't even bother to redesign if you are not going to require participation in all learning activities." It is absolutely necessary to have an incentive for attending lab or class as well as for participating in online activities and to have a penalty for not attending lab or class and not participating in online activities. At successful institutions, attendance/participation counts as 5 to 10 percent of the final grade, which provides sufficient motivation for most students to attend lab or class and participate online. Some institutions penalize students for lack of attendance (e.g., students who miss, say, 12 hours of class are administratively withdrawn from the course).

Since 1999, NCAT has repeatedly seen that when institutions have neither an attendance/participation policy nor a reward (points) for meeting that policy, most students do not attend or participate consistently. "Freshmen don't do optional" is another mantra of successful course redesign. Whenever optional activities are offered, the vast majority of students fail to take advantage of them. When students participate and do the work, they become able to master the concepts and succeed. Students participate more, score higher, and spend longer amounts of time on learning activities when course credit is at stake.

Even though course redesign may add greater flexibility to the times and places of student engagement with the course, the redesigns are not self-paced. Some institutions initially thought of their designs as self-paced, open entry/open exit, but they quickly 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 succeed in a self-paced environment.

Course redesign ensures student pacing and progress by requiring students to complete learning activities and master specific learning objectives according to reasonably established milestones for completion. Students need a concrete learning plan, especially in more-flexible learning environments. Weekly, achievable schedules provide a guideline for students in terms of the pace of work necessary to complete the course on time. Such schedules are of significant value in helping students see what they have left to accomplish in the course and in ensuring that each course can be finished within one semester.

Element #7: Monitor student progress and intervene when necessary.

Requiring attendance and awarding attendance points are essential, but they are only the starting points. Two additional steps need to be taken: First, someone—typically, the instructor but sometimes another person—must monitor each student to see who is and who is not meeting the attendance policy. Which students are lagging behind? Which students are not coming to class and not doing the work? Second, once those students have been identified, follow-up is crucial. Someone must consistently contact them—by e-mail, telephone, text, or tweet or in person—and indicate clearly that they are expected to come to class and do the work.

Most software packages have excellent tracking features, enabling faculty members and others to monitor the time each student spends using the software and completing assignments plus how well the student performs on quizzes and exams. Record keeping is made easy through an online Gradebook. Instructors who require that students spend hours in an open lab can be provided with logs in which they indicate the dates and time intervals that students visit the open labs.

Other options for monitoring student progress include use of (1) a weekly score sheet that shows points for staying up-to-date with videos, worksheets, homework, and quizzes as well as points for class and lab attendance and (2) a paper work-book or notebook that students are required to maintain that contains class notes, notes from the software's learning tools, and solutions to exercises and that facilitates working through the steps of problems by hand. By recording the progress of all students every week in each student's respective workbook or notebook, instructors can knowledgeably discuss progress in the course with each student.

At many institutions, instructors or other personnel meet weekly with each student individually to assess the student's progress and help the student design a course of action for the next week. That face-to-face meeting helps students develop a sense of personal responsibility for their work. Such weekly meetings enable both students and instructional personnel to become more comfortable with each other, and they provide additional support and encouragement for students. Whatever the method, instructors must monitor each student's progress as well as time on task and take appropriate action when needed.

Element #8: Measure learning, completion, and cost.

Very few institutions consistently measure student learning under the traditional model. Almost none measure instructional costs. Some may know their "pass" rates based on final grades, but few have examined whether or not those grades are awarded fairly. National statistics show that exit rates from many introductory courses are not what they should be at most institutions, yet few are changing how they teach; and even fewer are measuring the impact of any changes they try to implement.

An important element of course redesign is measurement—both initially and on an ongoing basis. To demonstrate that course redesign (1) increases student-learning outcomes, (2) improves student success rates, and (3) reduces instructional costs, NCAT's redesigns measure those three factors under the traditional format and again after a redesign is fully complete. As a result, we have hard data that demonstrate conclusively that course redesign accomplishes those three goals.

Measurement of whether redesign has in fact met the three aforementioned goals provides clear evidence of course redesign's efficacy for those who feel uncertain about whether redesign is a good idea. Having data that demonstrate that students learn more content and complete courses in greater numbers while costing both students and the institution less is persuasive to both faculty and administrators. Data that show

no change or poor results are clear signals to the redesign team that something has gone amiss in the implementation.

Measurement of the three factors must be ongoing. NCAT has found that over time, initial learning and completion results after the first term of full implementation have continued to improve at higher rates. The only way to know that such improvements occur and continue—and the only way to know whether the results do not continue—is to consistently collect data and analyze the results. By annually assessing student-learning outcomes, course completion rates, and instructional costs, an institution can assure all stakeholders that redesign continues to work as initially conceived and implemented.

See "Chapter 3. How to Measure and Assess Your Implementation, Topic 6. How Pearson Can Help You" to learn more about how Pearson can help you measure and assess your course redesign or implementation.

Click here for more information on how to redesign a college course using NCAT methodology.

Topic 5. Six Models for Course Redesign

Six course redesign models emerged from NCAT's course redesign programs. Following is a summary of each model's main characteristics.

The Supplemental Model

The supplemental model retains the basic structure of the traditional course and a) supplements lectures and textbooks with technology-based, out-of-class activities, or b) also changes what goes on in the class by creating an active learning environment within a large lecture hall setting.

The Replacement Model

The replacement model reduces the number of in-class meetings and a) replaces some in-class time with out-of-class, online, interactive learning activities, or b) also makes significant changes in remaining in-class meetings.

The Emporium Model

The emporium model replaces lectures with a learning resource center model featuring interactive computer software and on-demand personalized assistance.

The Fully Online Model

The fully online model eliminates all in-class meetings and moves all learning experiences online, using Web-based, multi-media resources, commercial software, automatically evaluated assessments with guided feedback and alternative staffing models.

The Buffet Model

The buffet model customizes the learning environment for each student based on background, learning preference, and academic/professional goals and offers students an assortment of individualized paths to reach the same learning outcomes.

The Linked Workshop Model

The Linked Workshop model provides remedial/developmental instruction by linking workshops that offer students just-in-time supplemental academic support to core college-level courses.

Topic 6. How to Assess Student Learning

The basic assessment question is, has improved learning been achieved as a result of the course redesign? Answering that question will require that you compare learning outcomes from the course as delivered in both traditional and redesigned formats. First, establish a method of obtaining data and then choose the measurement method.

How and when do you obtain the data?

There are several ways to acquire the data.

During the Pilot Term
This comparison can be accomplished in either of two ways.

- *Parallel Sections (Traditional and Redesign)*
  Run parallel sections of the course in traditional and redesigned formats and look at whether there are any differences in outcomes—a classic "quasi-experiment."

- *Baseline Before (Traditional) and After (Redesign)*
  Establish baseline information about student learning outcomes from an offering of the traditional format before the redesign begins and compare the outcomes achieved in a subsequent (after) offering of the course in its redesigned format.

Note: The number of students assessed should include at least 100 from the traditional format and 100 from the redesigned format.

During the First Term of Full Implementation
Because there will not be an opportunity to run parallel sections once the redesign reaches full implementation, use baseline data from an offering of the traditional format before the redesign began, or the parallel sections of the course offered in the traditional format during the pilot phase.

The keys to validity in all cases are (a) to use the same measures and procedures to collect data in both kinds of sections, and (b) to ensure as fully as possible that any differences in the student populations taking each section are minimized (or at least documented so that they can be taken into account).

What measures should you use?

The degree to which students have actually mastered course content appropriately is, of course, the bottom line. Therefore, some kind of credible assessment of student learning is critical to the redesign project.

There are four measures that may be used.

1. Comparisons of Common Final Exams
One approach is to use common final examinations to compare student learning outcomes across traditional and redesigned sections. This approach may include subscores or similar indicators of performance in particular content areas as well as simply an overall final score or grade. *(Note: If a grade is used, there must be assurance that the basis on which it was awarded is the same under both conditions, e.g., not curved or otherwise adjusted.)*

Examples:
- *Parallel Sections.* "During the pilot phase, students will register for either the traditional course or the redesigned course. Student learning will be assessed mostly through examination developed by departmental faculty. Four objectively scored exams will be developed and used commonly in both the traditional and redesigned sections of the course. The exams will assess both knowledge of content and critical-thinking skills to determine how well students meet the six general learning objectives of the course. Student performance on each learning outcome measure will be compared to determine whether students in the redesigned course are performing differently than students in the traditional course."

- *Before and After.* "The specifics of the assessment plan are sound, resting largely on direct comparisons of student exam performance on common instruments in traditional and redesigned sections. Faculty have developed a set of common, objective questions that measure the understanding of key concepts. This examination has been administered across all sections of the course for the past five years. Results obtained from the traditional offering of the course will be compared with those from the redesigned version."

2. Comparison of Common Content Items Selected from Exams
If a common exam cannot be or has not been given, an equally good approach is to embed common questions or items in the examinations or assignments administered in the redesigned and traditional delivery formats. This design allows common baselines to be established. For multiple-choice examinations, a minimum of 20 such questions should be included. For other kinds of questions, at least two or three complex problems should be included.

Examples:
- *Parallel Sections.* "The primary technique to be used in assessing content is common-item testing for comparing learning outcomes in the redesigned and traditional formats. Direct comparisons of learning outcomes will be obtained from 15 common complex problems embedded into course assessments: five early in the semester, five at midsemester and five in the final examination in both the traditional and redesigned courses."

- *Before and After.* "The assessment plan will address the need to accommodate a total redesign. The plan calls for a before/after approach using 30 exam questions from the previously delivered traditionally-configured course and embedding them in exams in the redesigned course to provide benchmarks for comparison."

3. Comparisons of Pre- and Posttests
A third approach is to administer pre- and posttests to assess student learning gains within the course in both the traditional and redesigned sections and to compare the results. By using this method, both posttest results and value-added analyses can be compared across sections.

Examples:
- *Parallel Sections.* "The most important student outcome, content knowledge, will be measured in both redesigned and traditional courses. To assess learning and retention, students will take: a pretest during the first week of the term and a posttest at the end of the term. The faculty, working with the evaluation team, will design and validate content-specific examinations that are common across traditional and redesigned courses. The instruments will cover a range of behaviors from recall of knowledge to higher-order thinking skills. The examinations will be content-validated through the curriculum design and course objectives."

- *Before and After.* "Student learning in the redesigned environment will be measured against learning in the traditional course through standard pre- and posttests. The college has been collecting data from students taking this course, using pre- and posttests to assess student learning gains within the course. Because the same tests are administered in all semesters, they can be used to compare students in the redesigned course with students who have taken the course for a number of years, forming a baseline about learning outcomes in the traditional course. Thus, the college can compare the learning gains of students in the newly redesigned learning environment with the baseline measures already collected from students taking the current version of the course."

4. Comparisons of Student Work Using Common Rubrics
Naturally occurring samples of student work (e.g., papers, lab assignments, problems) can be collected and their outcomes compared—a valid and useful approach if the assignments producing the work to be examined really are quite similar. Faculty must have agreed in advance on how student performance is to be judged and on the standards for scoring or grading (a clear set of criteria or rubrics to grade assignments). Faculty members should practice applying the criteria in advance of the actual scoring process so as to familiarize themselves with them and to align their standards. Ideally, some form of assessment of interrater agreement should be undertaken.

Examples:
- *Parallel Sections.* "Students complete four in-class impromptu writing assignments. A standard set of topics will be established for the traditional and redesigned sections. A standardized method of evaluating the impromptu essays has already been established and will be used in grading each assignment. The essays are graded by using a six-point scale. The reliability measure for this grading scale has been established at 0.92. In additional, each paper is read by at least two readers. The grading rubric will be applied to the four standard writing assignment prompts administered in parallel in simultaneously offered redesigned and traditional course sections."

- *Before and After.* "The assessment plan is quite sophisticated, involving both before/after comparisons of student mastery of statistics concepts in the traditional course and the redesigned course. The design itself involves direct comparisons of performance on common assignments and problem sets using detailed scoring guides (many of which were piloted and tested previously and are thus of proven utility). Because the department has already established and benchmarked learning outcomes for statistics concepts in considerable detail, and uses common exercises to operationalize these concepts, the basis of comparison is clear."

Topic 7. NCAT's Cost Reduction Strategies

Traditional course format requires instructors to carry out all of the development and delivery aspects of a course on their own. The traditional format often assumes that small classes are necessary in order to produce positive learning results because the instructor is responsible for all interactions. But responding to every inquiry, comment, or discussion personally; preparing lectures; and the hand grading of assignments, quizzes, and examinations are labor-intensive.

Course redesign involves substituting technology for much of that effort, often with assistance from different kinds of personnel. Making the substitutions discussed in the following sections will enable each instructor to teach more students than before—without increasing the workload.

How can redesign lead to reduced instructional costs?

Redesigning a whole course eliminates duplication of effort on the part of instructors and creates opportunities for using alternative staffing patterns. Faculty begin the design process by analyzing the amount of time that each person involved in the course spends on each kind of activity, which often reveals duplication of effort among multiple faculty members. Faculty members teaching the course divide their tasks among themselves, and their efforts target particular aspects of course delivery. By replacing individual development of each course section with shared responsibility for both course development and course delivery, faculty can save substantial amounts of their time while achieving greater course consistency.

When redesigns reduce the number of lectures or other classroom presentations that faculty members must prepare for and present and replace those formats with interactive learning resources and team-based learning strategies, faculty time can be reallocated to other tasks either within the same course or in other courses. Moving away from viewing instructors as the sole sources of content knowledge and assistance and instead toward greater reliance on interactive learning materials and greater student-student interaction offers many opportunities for reducing instructional costs.

Replacing hand grading with automated grading of homework, quizzes, and exams makes it possible to reduce the cost of providing feedback while improving its quality. Online weekly practice quizzes can replace weekly homework grading, and all grading and record keeping can be automated. Replacing time-consuming human monitoring of student performance with course management software makes it possible to reduce costs while increasing the level and frequency of oversight of student progress. Using instructional software also radically reduces the amount of time that faculty members typically spend on nonacademic tasks like calculating and recording grades, photocopying course materials, posting changes in schedules and course syllabi, sending out special announcements to students, and documenting course materials like syllabi, assignments, and examinations so that they can be used in multiple terms.

How can we restructure the course to reduce instructional costs?

There are three ways to restructure the course to reduce costs.

1. Have each instructor carry more students by

     a. increasing section size, or

     b. increasing the number of sections each instructor carries for the same workload credit.

2. Change the mix of personnel from more expensive to less expensive.

3. Do both simultaneously.

Each of these strategies can be used whether your enrollment is growing or stable. When enrollment is stable, cost reduction means fewer resources are devoted to the course. When enrollment is growing, cost reduction means more students can be served on the same resource base. In each case, the cost per student is reduced.

Are there examples of having each instructor carry more students by increasing section size?

Here's a calculation showing how this works:

Stable enrollment
If your enrollment is stable, this will allow you to reduce the number of sections offered and the number of people teaching the course.

Traditional
800 students: 40 sections of 20 students each taught by 40 instructors. Student-faculty ratio = 20:1

Redesign
800 students: 20 sections of 40 students each taught by 20 instructors. Student-faculty ratio = 40:1

Growing enrollment
If your enrollment is growing, this will allow you to serve more students with the same number of people teaching the course.

Traditional
800 students: 40 sections of 20 students each taught by 40 instructors. Student-faculty ratio = 20:1

Redesign
1,600 students: 40 sections of 40 students each taught by 40 instructors. Student-faculty ratio = 40:1

Chattanooga State Community College. The college reduced the cost of offering General Psychology by decreasing the number of sections (18), which ranged in size from 18 to 95 students annually, to 6 sections of 100 students each. Capacity was increased from 522 students in the traditional format to 600 students in the redesign. The traditional lecture format of the course, which met three times per week, was replaced by one face-to-face meeting and a variety of online activities. The number of full-time faculty teaching the course was reduced from 10 to 6, and all adjunct instructors were eliminated, with the added benefit of providing greater consistency among sections. One adjunct faculty member led two optional one-hour discussion groups per week, monitored mandatory threaded discussions, and provided technical support for students. Overall, the cost per student decreased from $130 in the traditional format to $42 in the redesign. Because each faculty member was responsible for three rather than nine hours of lecture per week, faculty had time to develop and teach new upper-level courses. In addition, classroom space was made available for other uses.

Arizona State University. The redesign of Organizational Management and Leadership enabled the university to increase section size from about 45 students to about 90 and to reduce the number of sections from six to four each term. Those changes reduced the cost per student by 59 percent, from $373 per student in the traditional format to $153 after the redesign. The traditional lecture format of the course, which met twice a week for 70 minutes each, was replaced by one face-to-face meeting and one online meeting. After the initial redesign, the course could accommodate 360 students rather than the 270 under the traditional format. The team believes that once the course is being taught in a new building with larger classrooms, enrollment can increase to as high as 250 students per term because one classroom will hold 150 and a second classroom will hold 100. This means that the annual enrollment can be increased to about 500 (from the current 360) without additional resources.

For more information, see **The NCAT's R2R Cost Reduction Strategies.**

Topic 8. A Written Redesign Plan: Why It's Important

It would be hard to overstate the importance of having a written, specific course redesign plan. Writing things down ensures that you have addressed each issue. Writing things down ensures that everyone involved in the redesign knows what has been agreed to. And a written plan can be referenced and revised throughout the process when necessary, serving as a road map to keep everyone on track.
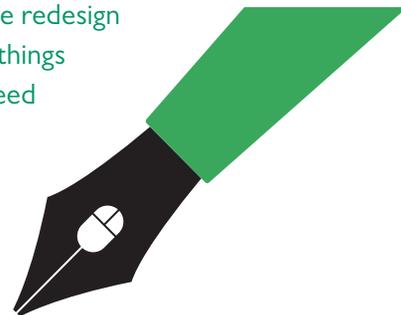
In a written redesign plan, you should address the following:

- **Select a redesign model and explain why you chose it and how you intend to embody the Eight Essential Elements of Course Redesign within it.**

We describe the Eight Essential Elements of Course Redesign in Topic 5. You need to describe specifically how you will embody those elements within your redesign implementation.

WHY: If any of these elements are absent, it is unlikely that student success will improve at a reduced instructional cost. If all of these elements are present and you select an appropriate cost reduction strategy, we guarantee that student success will improve and costs will be reduced. We call these elements essential because they are. You need to be sure you have addressed each one of them in your plan.

- **Describe specifically the changes to the traditional course structure that will result from the redesign (i.e., number and kinds of class meetings, number and kinds of sections including sizes, staffing plans, student requirements, testing, attendance management and other relevant logistics).**

Course redesign involves a lot of change and a lot of moving parts (and people). You need to think through and make decisions about all of the specific changes you intend to make and be able to describe them for multiple audiences.

WHY: Being specific about your course redesign prior to its initiation will ensure that the number of issues and problems you'll need to deal with during the start-up phase will be minimized.

- **Name and describe the learning materials/software you intend to use.**

You need to make a decision about what software you will use. That decision should be made prior to beginning your redesign implementation.

WHY: Redesign is not a software-centered process. It focuses on pedagogy and course structure and organization. Choosing a software package upfront will allow you to focus on the more important and more difficult elements of redesign. In addition, you cannot begin to implement your redesign without having made a software choice. This should be done early in the planning process.

- **Describe the assessment method you will use. Complete the two Assessment Forms for the pilot and full implementation of your redesign project.**

You need to capture your plan for assessing student learning in the traditional and redesigned formats on the Assessment Forms.

WHY: Because you will face skepticism about implementing your course redesign (because it represents change, and lots of people do not like change), you will want to be able to "prove" that it works. Having valid and reliable student learning outcomes data that demonstrate improvement will address that skepticism and assure you that you are on the right track. Data trump subjective judgment.

- Complete the two Course Completion Forms for the pilot and full implementation of your redesign project.

Comparing course completion rates between the traditional and redesigned formats can be a complex issue due to prior grade inflation. You need to investigate your particular situation. Capture your plan for measuring comparative course completion on the Completion Forms.

WHY: If all students who take the final exam score more than 90, but only 50 percent of students take the final exam, you have a problem. An important goal of course redesign is to improve completion rates. You need to measure completion rates for the same reasons that you need to measure student learning outcomes: data trump subjective judgment.

- Describe the cost reduction strategy you intend to use. Complete the Cost Planning Tool.

You need to capture your plan for reducing instructional costs on the Cost Planning Tool (CPT). You need to provide a brief narrative that explains the entries in the CPT when necessary. You also need to explain why you chose a particular strategy and what you intend to do with the savings.

WHY: Course redesign has two goals: improving learning and reducing costs. Our purpose here is not to convince you of the value of reducing costs; it is to help you understand how to accomplish it and how to document it.

- Describe how you will build and maintain ongoing consensus about the redesign.

You need to describe specifically how you will address each of the relevant stakeholders in the pilot, during the first term of full implementation and on an ongoing basis.

WHY: The best-laid plans often go astray. Even though it is impossible to anticipate all of the problems you may encounter in your redesign implementation, you should at minimum prepare for those that hundreds of others have faced.

- Include a brief timeline for your redesign project.

WHY: Thorough planning is essential to ensuring a successful redesign implementation, but moving to implementation of your redesign as quickly as possible is equally important. Practice makes perfect!

- Develop a project budget that describes the support needed for your redesign effort and a budget narrative that explains each expenditure category.

WHY: The budget may include funding for (1) building, rehabbing, or repurposing computer labs/classrooms; (2) equipment purchases; and (3) released time for faculty team leaders. The total dollar amount will vary from institution to institution depending on what is already in place and what will need to be purchased.

The best-laid plans often go astray. Even though it is impossible to anticipate all of the problems you may encounter in your redesign implementation, you should at minimum prepare for those that hundreds of others have faced.

Topic 9. Choosing the Right Instructional Software Package

Some teams initially believe they will choose the software that accompanies the textbook they're currently using. Although that's certainly a possibility, it's useful for teams to consider the range of software options now on the market. Prior to making a software selection, a team should invite various vendors to demonstrate products and discuss individual institutional needs in order to determine how well a software package could meet those needs.

The following list was developed by Phoebe Rouse, director of precalculus mathematics at Louisiana State University. It provides a structure for teams to use as they consider which software package would work best with their students at their institutions.

Must Haves (without these, nothing else matters!)

- **Reliability.** Students and faculty need to know that the software will operate consistently—and without major or frequent downtimes.

- **High-quality content.** Faculty must feel confident that the content included is comprehensive, current, and well explained.

- **User-friendliness.** The software must be easy to use. Explanations to faculty for setting up the software with the appropriate learning resources, homework, and assessments should be clear. Software should be easy for students to use so that they can focus on learning the course content, not learning the software.

Other Features to Consider

- Ease of installation
- Cost to student
- Cost to institution
- Quality and accessibility of technical support
- Vendor willingness to provide training
- Browser restrictions
- Platform restrictions
- Capability for faculty to communicate with students
- Algorithmic exercises available

- Tutorial features
- Textbook included
- Videos
- Partial credit for multipart questions
- Pooling for tests
- Sophistication of testing mechanism
- Coordinator/master course capability
- Grade book features
- Ease of ability to export grades
- Feedback after submission
- Ability to print student work
- Multiple attempts allowed on assignments
- Settings for individual students
- Software compatibility with Americans with Disabilities Act

For a demonstration of how a Pearson digital product can be used to support your Course Redesign goals, please contact your local Pearson representative.

Topic 10. Resources

Resources on the NCAT Website

These materials are copyrighted, but free. You may share them, print them, or use them with groups on campus. Please give the National Center for Academic Transformation attribution.

- **How to Redesign a College Level Course Using NCAT's Methodology.** Designed for those seeking to improve learning and reduce costs in all sections of a single course in any academic area other than mathematics.

- **How To Redesign A College-Level or Developmental Math Course Using the Emporium Model.** Designed for those seeking to improve learning and reduce costs in a math course using NCAT's Emporium Model. It describes how to redesign a single math course at either the developmental or college level.

- **How to Redesign a Developmental Math Program Using the Emporium Model**. Designed for those seeking to improve learning and reduce costs in a developmental math program using NCAT's Emporium Model. It describes how to redesign an entire developmental math sequence (typically offered at community colleges), rather than a single course.

Topic 1. Planning Your Active Learning Implementation

Active learning is the implementation of learning activities that engage students with course content in a meaningful, hands-on manner. Pearson is committed to providing educators with the tools they need to achieve their active learning implementation goals while also reducing instructional costs. Our experience—spanning hundreds of institutions, tens of thousands of educators, and millions of students—shows that how educators integrate a learning technology is the single, most significant element to affect outcomes. Use the following worksheet to strategically integrate your digital product and successfully build your active learning implementation.

Course Name: _____

TOPIC	NOTES	PROGRESS STATUS
The Issue(s)		
What are the main issues you are trying to address?		
What are the quantifiable goals you want to achieve? (e.g., increase retention rates by 10 percent in a semester, increase success rates by 15 percent in a semester)		
The Current Course		
Structure (meeting times per week)		
Annual enrollment		
Textbook in use		
Software in use		
Delivery (e.g., lecture, lab)		
Average section size per semester		

TOPIC	NOTES	PROGRESS STATUS
The New, Active Learning Course		
Which active learning implementation model(s) did you choose? (e.g., emporium/lab-based, blended/hybrid, flipped-classroom, fully online, corequisite, accelerated/compressed, integrated reading and writing, modular, contextualized learning/learning communities, non-course-based remediation, pathways, or a combination)		
When will you start integrating a Pearson digital product into your course?		
Will you start with a pilot course?		
If so, at what point do you foresee moving into a full implementation?		
Average section size per semester		
Textbook to be used		
Technology to be used		
Do the textbook and technology selected align with your intended outcome?		
If you have not yet selected your course materials, how are you planning to evaluate the content and the software you'll be using?		
Structure (meeting times per week)		

TOPIC	NOTES	PROGRESS STATUS
The New, Active Learning Course, cont'd		
How will you measure success? (e.g., retention rates, final exam scores, final course grades, subsequent success)		
What percentage will your Pearson digital product contribute to a student's final course grade?		
Map out a timeline for your implementation. (See page 5 for an example.)		
Available Support		
Do you have institutional leaders (e.g., deans, provosts, chairs) who are supportive of your commitment to a new active learning model?		
Do you have the support of the campus technical or IT group?		
Do you have or must you seek approval from your school's institutional review board?		
Have you pursued grants or initiatives? Visit Pearson Grant Help to learn more.		
Do you have concerns about implementing a Pearson digital product?		
Do you or other faculty teaching the new model need training on the Pearson digital product selected?		

continued next page

TOPIC	NOTES	PROGRESS STATUS
Available Support, cont'd		
For more information on how Pearson can help support your implementation goals, see Pearson's Educator Training and Support page or contact a Pearson representative.		
Sustainability		
What is your ongoing training plan? Key milestone dates?		
Will you use historical data to support the efficacy of your Pearson digital product?		
Has a system for measuring learning outcomes and student achievement been identified for the course(s) that are being implemented?		
Have you designated someone to track data, measurements, and observations of learning gains?		
At the end of the course, would you like assistance analyzing your data? If so, contact your local Pearson representative or the relevant efficacy results manager.		

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Implementation Timeline

This diagram shows how to build key milestones backward from an ultimate final completion date.
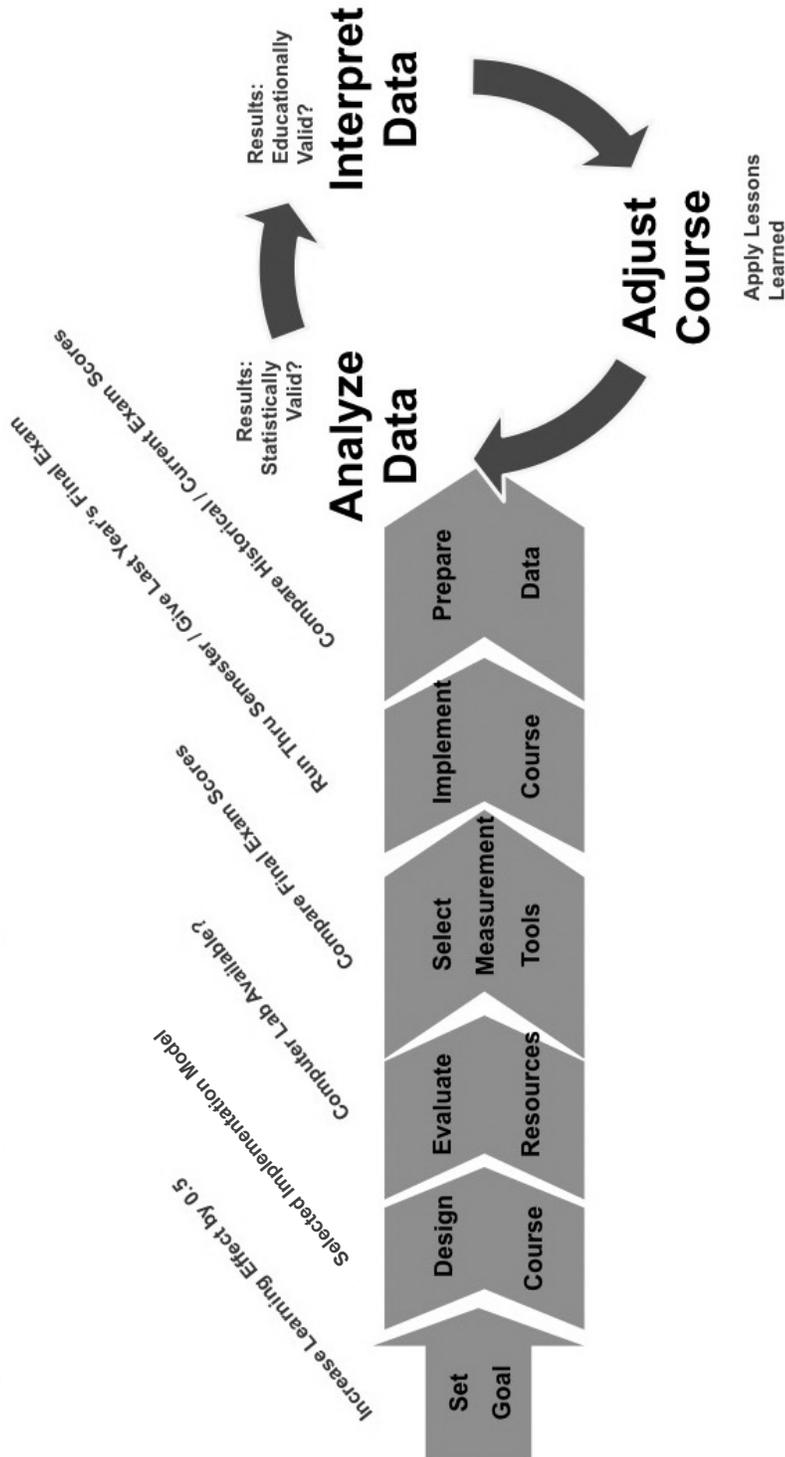
Topic 2. Communication

Effective communication is an essential aspect of measuring and assessing any active learning implementation. The following questions will help you prepare your communications to key stakeholders. Consider to whom, when, and what you will need to share your results. Modifying your answers throughout the process will help keep you and/or your team on track.

Part 1.

Who are the key stakeholders?

_____

_____

_____

_____

What successes and challenges do you want to communicate?

_____

_____

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_____

How and when should those successes and challenges be communicated?

_____

_____

_____

_____

Part 11.

List each active learning implementation success or challenge that you want to communicate, as well as who will receive that communication.

SUCCESS OR CHALLENGE	RECIPIENT OF COMMUNICATION

For more information, see www.thencat.org and www.pearsoned.com/efficacy.

Part III.

For each of your active learning implementation's successes and challenges (from Chapter 2, Part II), list how the communication will take place and its timeline.

FORM OF COMMUNICATION	COMMUNICATION TIMELINE

Topic 3. Course Structure

A specific, well-thought-out, written plan is critical to the success of your implementation. Committing the details to writing will ensure that you have addressed each issue and that everyone involved in the implementation process is on track. Use the space provided to construct a written plan that can be referenced and revised throughout the process.

Part 1.

If you could design the ideal structure for an active learning implementation model, what would it look like?

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Part 1I.

What knowledge do you have that would help you move toward your ideal design?

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What are the institutional resources available to help you and/or your team move toward your ideal design?

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Topic 4. Professional Development

Part 1.

If this is a team effort, how will you identify faculty to teach the courses using this new active learning implementation model?

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How will you address faculty who do not want to participate ("conscientious objectors")?

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Part 11.

Consider how and when to prepare faculty who are new to teaching this active learning implementation model.

TRAINING MODULES	TRAINING TIMELINE

Topic 5. 10 Steps to Successfully Implementing Your Pearson Digital Product

Successful implementations do more than simply add learning technology to their curricula: the *ways* a Pearson digital product is implemented significantly contribute to their positive results. Below you'll find 10 recommended best practices that will help you and your students get the most out of your active learning implementation.

1. **Identify the problems you want to solve.** An examination of the most-successful Pearson digital product implementations show that one common thread emerges: schools that have achieved success knew precisely what they wanted to accomplish. They established clear educational goals at the outset and then designed implementations specifically so as to achieve them.

2. **Choose the learning technology, textbook, and method of delivery that best fit your goals.** Assign the specific Pearson digital product features that will help you achieve your stated goals.

3. **Build an assessment plan.** How will you measure success? What are the quantifiable goals you want to achieve? Pertinent metrics might include comparisons of homework grades, exam scores, final course grades, or retention rates with those of previous semesters; correlations between Pearson digital product assessment scores and exam scores; or student success rates in subsequent courses they take.

4. **Get everyone—and keep everyone—on the same page.** Communicate your goals clearly to colleagues, students, and administrators. Train all full-time instructors, part-time instructors, adjuncts, tutors, and other key players—and make available plenty of opportunities for continuous training. Pearson provides product and implementation training to help ensure that your implementation aligns with your goals.

5. **Start small.** Slowly integrate Pearson digital products into your course. Start with requiring homework such as chapter exams, study plans, or writing assignments. When you're ready, add more assignments and activities.

6. **Position students for success.** Students tend to skip optional assignments. Experienced users recommend counting use of a Pearson digital product as at least 10 percent of the final course grade. Provide structure: clearly communicate course and workload expectations and set firm and consistent deadlines. Finally, conduct a Getting Started orientation on the first day of class to show students how to access the MyLab & Mastering materials and assignments they'll be responsible for. Visit www.pearsonmylabandmastering.com/educators/support for details.

7. **Connect and engage with students.** Educators implementing Pearson digital products in their classes are unanimous about the importance of individually connecting with students both in class and outside class. Some educators recommend not waiting for students to ask questions about their work. Rather, they suggest circulating in the classroom proactively to assess what students need, thereby avoiding student embarrassment. For outside class, consider sending weekly emails containing kudos for those doing well and offering support and intervention to those who are having trouble or not completing their work.

8. **Employ personalized learning.** The most-successful learning solutions include personalization and immediate feedback that engage students in active learning and enhance and inform assessment. Students using Pearson digital products can complete assessments at their own speed and, via diagnostics performed as they progress, can follow a personalized learning path that both targets the exact content/skills they need to work on and delivers the right material they need for mastering the requisite skills.

9. **Conduct frequent assessments.** Educators have long recognized the necessity of assessment as both a measurement of how well students are learning and a tool for critical feedback. Pearson digital product implementations enable educators to exponentially increase the *power* of assessment by increasing the *number* of assessments, thereby offering students a firsthand account of what they know and what they do not know and providing educators more opportunities to intervene before a student falls too far behind.

10. **Track learning gains.** What you don't track you can't measure. And what you haven't measured you can't prove has actually happened in your class. Educators who consistently track and measure learning gains are able to make informed decisions about course transformations, redesigns, or programmatic shifts and can strengthen their ability to prove institutional effectiveness, meet accreditation standards, track quality-enhancement plans, and fulfill grant requirements.

Topic 6. Additional Training and Support

A comprehensive list of products and associated training and support materials.

ACCUPLACER/MyFoundationsLab

- *Interactive Training Guide*

MasteringA&P

- *Implementation Guide*

MasteringAstronomy

- *Implementation Guide*

MasteringBiology

- *Implementation Guide*

MasteringChemistry

- *Implementation Guide*

MasteringEngineering

- *Implementation Guide*

MasteringEnvironmentalScience

- *Implementation Guide*

MasteringGenetics

- *Implementation Guide*

MasteringGeography/MasteringMeteorology

- *Implementation Guide*

MasteringGeology/MasteringOceanography

- *Implementation Guide*

MasteringHealth/MasteringNutrition

- *Implementation Guide*

MasteringMicrobiology

- *Implementation Guide*

MasteringPhysics

- *Implementation Guide*

MathXL

- *Implementation Guide*

MyAccountingLab

- *Implementation Guide*

MyAnthroLab

- *Implementation Guide*

MyArtsLab

- *Implementation Guide*

MyAutomotiveLab
Select your textbook to view its implementation guide.

- *Automotive Technology: Principles, Diagnosis, and Service,* 5e
- *Automotive Technology: Principles, Diagnosis, and Service,* 4e
- *Automotive Technology: Principles, Diagnosis, and Service* (Canadian Red Seal Edition), 1e

MyBCommLab

- *Implementation Guide*

MyBizLab

- *Implementation Guide*

MyBRADYLab
Select your textbook to view its implementation guide.

- *Advanced EMT: A Clinical-Reasoning Approach,* 1e
- *Paramedic Care: Principles & Practice, Volume 1, Introduction to Paramedicine,* 4e
- *Paramedic Care: Principles & Practice, Volume 2, Paramedicine Fundamentals,* 4e
- *Paramedic Care: Principles & Practice, Volume 3, Patient Assessment,* 4e

(MyBRADYLab, continued)

- *Paramedic Care: Principles & Practice, Volume 4, Medicine,* 4e

- *Paramedic Care: Principles & Practice, Volume 5, Trauma,* 4e

- *Paramedic Care: Principles & Practice, Volume 6, Special Patients,* 4e

- *Paramedic Care: Principles & Practice, Volume 7, Operations,* 4e

- *Essentials of Fire Fighting and Fire Department Operations,* 6e

- *EMT Complete: A Comprehensive Worktext,* 2e

- *Emergency Care,* 12e

- *Prehospital Emergency Care,* 10e

MyBusLawLab

Guides require Adobe Reader (a free program you can install directly from the MyBusLawLab installation wizard).

- *Instructor's Guide* (PDF)

- *Student's Guide* (PDF)

MyCarpentryLab

- *Implementation Guide*

MyCJLab

Select your textbook to view training options.

- *Corrections (Brief),* 1e

- *Criminal Justice,* 5e

- *Corrections in America,* 13e

- *Policing: A Modular Approach,* 1e

- *CJ2013*

- *Criminal Investigation: The Art and the Science,* 7e

- *Policing America: Challenges and Best Practices,* 8e

- *Criminalistics: An Introduction to Forensic Science,* 11e

- *Criminal Justice Brief,* 10e

- *Criminal Justice Today,* 13e

- *Criminal Law Today,* 5e

- *Criminology,* 2e (Justice Series)

- *Criminology Today: An Integrative Introduction,* 7e

- *Corrections,* 4e

- *Criminal Procedure: From First Contact to Appeal,* 5e

- *Policing,* 1e

MyCommunicationLab

- *Implementation Guide*

MyCounselingLab

- *Implementation Guide*

MyCulinaryLab

- *Implementation Guide*

MyEconLab

- *Implementation Guide*

MyEdLeadershipLab

- *Implementation Guide*

MyEducationLab

- *Implementation Guide*

MyElectricityLab

- *Implementation Guide*

MyEngineeringLab

- *Implementation Guide*

MyFashionLab

- *Implementation Guide*

MyFinanceLab

- *Implementation Guide*

MyFoundationsLab

- *Implementation Guide*

MyGraphicsLab

MyHealthProfessionsLab

Select your textbook to view its training information.

- *Pearson's Comprehensive Medical Assisting,* 3/e

- *Pharmacy Technician,* 2e

- *A Guided Approach to Intermediate & Advanced Coding,* 1e

- *ICD-10-CM/PCS Coding: A Map for Success*

- *Medical Coding: A Journey,* 1e

- *Comprehensive Health Insurance: Billing, Coding & Reimbursement,* 2e

MyHelpingLab

MyHistoryLab

- *Implementation Guide*

MyHospitalityLab

- *Implementation Guide*

MyHVACLab

- *Implementation Guide*

MyITCertificationLab

MyITLab

- *Office 2013 Implementation Guide*
- *Office 1010/2007 Implementation Guide*

MyLanguageLabs

- *Implementation Guide*

MyLegalStudiesLab

- *Implementation Guide*

MyLiteratureLab

- *Implementation Guide*

MyLogicLab

MyManagementLab

- *Implementation Guide*

MyMarketingLab

- *Implementation Guide*

MyMathLab

- *Implementation Guide*

MyMathTest

- *Implementation Guide*

MyMedicalTerminologyLab

- *Implementation Guide*

MyMISLab

- *Implementation Guide*

MyMusicLab

- *Implementation Guide*

MyNursingLab

- *Implementation Guide*

MyOMLab

- *Implementation Guide*

MyPhilosophyLab

MyPoliSciLab

- *Implementation Guide*

MyProgrammingLab

- *Implementation Guide*

MyPsychLab

- *Implementation Guide*

MyReadingLab

- *Implementation Guide*

MyReligionLab

- *Implementation Guide*

MySearchLab

MyServSafeLab

- *Implementation Guide*

MySkillsLab

- *Implementation Guide*

MySocialWorkLab

MySocLab

- *Implementation Guide*

MyStatLab

- *Implementation Guide*

MyStudentSuccessLab

- *Implementation Guide*

MyThinkingLab

MyWeldingLab

- *Implementation Guide*

MyWritingLab

- *Implementation Guide*

RealEHRPrep with Cerner

REVEL

- *Implementation Guide*

The Neighborhood

TSI/MyFoundationsLab

- *Interactive Training Guide*

Additional Pearson Support

Course Redesign Community

A forum in which educators can ask questions and share their thoughts, ideas, and knowledge about course redesign, as well as connect with peers already involved in the redesign process.

Faculty Advisor Network

A community for educators who teach with Pearson MyLab/ Mastering, Readypoint Nursing, and Digital Library, and who are both passionate and willing to share their experiences, advice, tips, and best practices.

Teaching and Learning Blog

Join conversations with Pearson experts and industry leaders on the ideas, trends, and research currently influencing learner achievement.

Topic 7. Results

Improving Lives Through Learning

Used by more than 11 million students each year, Pearson's digital family of products deliver consistent, measurable gains in student learning outcomes, retention, and subsequent course success. To start your search for user-provided evidence, visit the Pearson Results Library.

Evidence of Impact on Learner Outcomes

Visit http://www.pearsoned.com/efficacy-and-research/ for higher education efficacy studies and user reports.

See Chapter 3, Topic 7, to learn how Pearson can help you measure and assess your implementation.

Topic 1. Data/Assessment

Educators who consistently track and measure learning gains can make informed decisions about programmatic shifts and can increase their abilities to prove institutional effectiveness, meet accreditation standards, track quality-enhancement plans, and fulfill federal grant requirements. Use the space provided to document your goals for data and assessment.

Part 1.

What data do you want to collect from your courses? Why is this data important?

DESIRED DATA	RATIONALE

Part II.

Who will collect this data? How will the data be measured?

WHO WILL COLLECT DATA?	HOW WILL DATA BE MEASURED?

What successes do you want to communicate?

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Topic 2. Data Collection Tools

Pearson offers professional consultation and data collection tools to help measure the impact your Pearson digital product has made in your course. On the following pages, you'll find two sample data tracking templates. To receive either of these tools in Microsoft Excel format, contact the relevant efficacy results manager.

Candace Cooney, candace.cooney@pearson.com
Business, Information Technology, Career, Technology, Nursing

Lauren Gill, lauren.gill@pearson.com
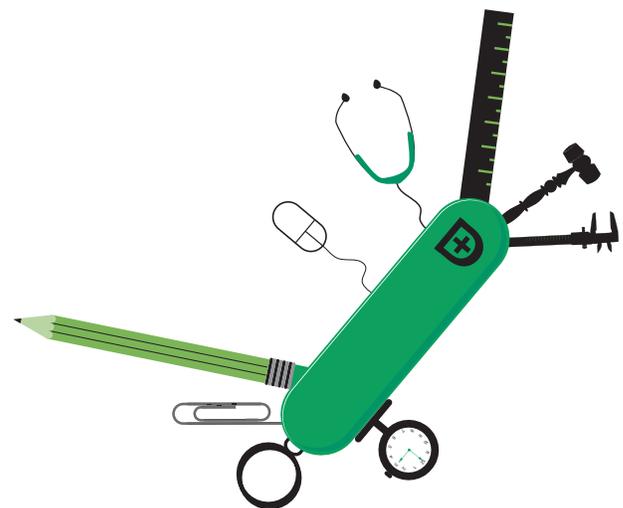College and Career Readiness

Nicole Kunzmann, nicole.kunzmann@pearson.com
Humanities and Social Sciences

Mary Jo Lawless, maryjo.lawless@pearson.com
Course Redesign

Betsy Nixon, betsy.nixon@pearson.com
Science and Engineering

Sara Owen, sara.owen@pearson.com
English and World Languages

Traci Simons, traci.simons@pearson.com
Math and Statistics

Data-Tracking Template 1

	School:	Pearson Digital Product Currently In Use:						
Name & Title:								

NOTES: If you have collected data in another format or prefer to submit raw data (and Pearson will compile), please feel free to submit your data instead of this document. DIRECTIONS: As a basis of comparison, please include historical data (data from classes before you used your Pearson Digital Product) as well as data from courses with a Pearson Digital Product in use. In row #15 please indicate technology in use (even a competitor's) or "none" for each time period and each section. If necessary, add additional columns if you have more sections. Please complete as many cells as possible. TO VIEW A SAMPLE of a generic completed data tracker, click the "Sample" tab at the bottom of this page!

	Section #	Section #	Section #	Section #	Section #	Section #	Section #
Course Name:							
Course structure: Traditional(face to face), Online, Hybrid							
Course Credit hours							
Indicate Technology-in-use or None							
Semester Start Date - End Date (Month/Year - Month/Year)							
Book in use (Author, Title, Edition)							
How many students were enrolled on the first day of class?							
Final Course Grade: How many students received within the A range (90-100%)							
Final Course Grade: How many students received within a B range (80-89%)							
Final Course Grade: How many students received within a C range (70-79%)							
Final Course Grade: How many students received within a D range (60-69%)							
Drop Withdraw Failure: How many students DID NOT complete the course?							
Pre-diagnostic Assessment Average Score (pre-diagnostic test that you create, a standardized score, a MyLab pre-diagnostic, etc)							
Post-diagnostic Assessment Average (post-diagnostic test that you create, a standardized score, a MyLab post-diagnostic, etc)							
Average Final Exam/Project Score (if you assign a final exam or assignment that is different from the post-diagnostic assessment)							
Average Final Overall Course Score							
Standard Deviation (see instructions below)							

Do you have qualitative data, such as MyLab student surveys, that you can share with us? Or, are you willing to ask your students to complete a brief survey?

Also, please let us know if you are interested in collecting any other kind of quantifiable data. We would be happy to work with you to design a data collection template.

Standard Deviation: Step 1: In an Excel spreadsheet, list your students' final exam scores. For example, if you have 25 students, listing the final exam scores in column A would give you 25 rows in column A. Step 2: go to the next cell, A26 (column A, row 26), and type: =STDEV(A1:A25) . This will give the standard deviation of the final exam scores. To determine final grade averages, go to cell A27 and type: =AVERAGE(A1:A25). This will give the average of the final scores.

Data-Tracking Template 2

Course Information	
Course Name:	
Course structure: **Traditional (face-to-face), Online, Hybrid**	
Course Credit hours:	
Semester Start Date - End Date: **(Month/Year - Month/Year)**	
Was Mastering used this term? **If so, was it required or optional?**	
Book in use: (Author, Title, Edition)	

	If applicable: Pre-test score. Please specify the range (for example, 0-100).	If applicable: Post-test score. Please specify the range (for example, 0-100).	Mastering assessment #1 score (for example, specific homework or quiz). Please specify the range (for example, 0-100).	Mastering assessment #2 score (for example, specific homework or quiz). Please specify the range (for example, 0-100).	Quiz score. Please specify the range (for example, 0-100).	Exam score. Please specify the range (for example, 0-100).	Final exam score. Please specify the range (for example, 0-100).
Student 1							
Student 2							
Student 3							
Student 4							
Student 5							
Student 6							
Student 7							
Student 8							
Student 9							
...							
Student x							

Note: Add/edit/delete colums and rows as necessary to reflect the course's students and assessments.

How many students were enrolled on the first day of class?	
How many students were enrolled on the last day of class?	
Final Course Grade: How many students received an A?	
Final Course Grade: How many students received a B?	
Final Course Grade: How many students received a C?	
Final Course Grade: How many students received a D?	
Final Course Grade: How many students received an F?	

For more information, see www.thencat.org and www.pearsoned.com/efficacy.

Topic 3. How Pearson Can Help You

Pearson's Efficacy Results Team: Our Mission

The core focus of the Efficacy Results Team is to help educators make efficacy—the measurable impact of learning—a reality. We partner with educators to produce evidence, including case studies, white papers, course redesign presentations, and data-rich video clips, that documents observable gains in student learning via innovative instruction using Pearson digital products and solutions. Our goal in sharing these results with educators is to highlight best practices that lead to better outcomes. To learn more, visit Pearson's Results Library or consult Efficacy in Education, a description of Pearson's long-term efficacy goals.

Participating in an Efficacy Study

Are you interested in partnering with Pearson on a case study? Perhaps you are being asked to report on student learning outcomes, are implementing a course redesign, or you are wondering, to what extent, your Pearson digital product is having an impact on your students' success. Our goal is to document and share successful digital implementations and results with other instructors interested in using (or new to using) a Pearson digital product. Your success—and how you achieved it—can be helpful and inspiring to your peers.

Questions to Consider

- What are the issues and challenges you are trying to address?

- What specific, quantifiable outcomes are you trying to achieve?

- How will you measure these outcomes?

- How will you implement your chosen Pearson digital product to generate results?

What Quantitative Results Can Be Measured?

What results you measure will depend on your specific course goals and course design, but may include:

- Comparison of grade distributions before and after a digital implementation

- Comparison of final course grades before and after required use of technology

- Comparison of test averages, pass rates, success rates, or retention rates over semesters

- Accelerated completion of remedial courses

- Completion and achievement in subsequent course success

- Classroom time savings or departmental cost savings with the use of learning technology

- Improvement of placement test scores after completing work in a Pearson digital product

Don't Forget about Qualitative Observations, such as:
- Students are coming to class more prepared and more engaged

- Improved class discussions, students are asking higher-level questions

- Students taking ownership of their learning, demonstrating agency and purpose in pursuit of their academic goals

For more information, see www.thencat.org and www.pearsoned.com/efficacy.

The Case Study Process

1. Overview call with Pearson efficacy results manager to discuss challenges and goals, identify measures of success, and agree on an implementation plan and next steps.

2. Submission of quantitative and qualitative results and discussion of outcomes. Your Pearson efficacy results manager is ready to assist with data analysis, document best practices, and share reporting for evaluation and determination of next steps.

3. Pearson completes the case study and sends it to the instructor for review and approval.

4. Pearson publishes the case study on its Results Library for sharing with other Pearson digital product users and potential users.

5. The instructor may choose to share the published results with colleagues, at conferences, and so on.

If you'd like to participate in a case study or would to receive downloadable data-collection tools in an editable format, please contact the relevant Pearson efficacy results manager listed below.

Candace Cooney, candace.cooney@pearson.com
Business, Information Technology, Career, Technology, Nursing

Lauren Gill, lauren.gill@pearson.com
College and Career Readiness

Nicole Kunzmann, nicole.kunzmann@pearson.com
Humanities and Social Sciences

Mary Jo Lawless, maryjo.lawless@pearson.com
Course Redesign

Betsy Nixon, betsy.nixon@pearson.com
Science and Engineering

Sara Owen, sara.owen@pearson.com
English and World Languages

Traci Simons, traci.simons@pearson.com
Math and Statistics

See Pearson's Efficacy Program and Standards for Efficacy Research (Topic 5) for more information on how we measure and improve our likelihood of impact on learners and ensure we're doing all we can do to equip learners for success.

Topic 4. Surveys

To receive sample student and faculty surveys, contact the relevant efficacy results manager.

Candace Cooney, candace.cooney@pearson.com
Business, Information Technology, Career, Technology, Nursing

Lauren Gill, lauren.gill@pearson.com
College and Career Readiness

Nicole Kunzmann, nicole.kunzmann@pearson.com
Humanities and Social Sciences

Mary Jo Lawless, maryjo.lawless@pearson.com
Course Redesign

Betsy Nixon, betsy.nixon@pearson.com
Science and Engineering

Sara Owen, sara.owen@pearson.com
English and World Languages

Traci Simons, traci.simons@pearson.com
Math and Statistics

Topic 5. Pearson's Efficacy Program and Standards for Efficacy Research

At Pearson, we believe that learning is a life-changing opportunity and that education should have a measurable, proven impact on learners' lives. It's what Pearson's efficacy program and tools are all about. They're how we measure and improve our likelihood of impact on learners and ensure we're doing all we can do to equip learners for success.

What Pearson Means by *Efficacy* and *Effectiveness*

- *Efficacy* describes whether a product or intervention has a positive effect on learning, such as reducing wrong answers, increasing retention rates, or raising final exam scores.

- *Effectiveness* measures the size of the educational improvement from a product or educational intervention.

Why Pearson Is Interested in Efficacy Studies

To deliver the best educational experience for students, we need to understand how Pearson's content is performing and to verify the learning gains associated with the use of our products. Toward that goal, we actively seek out educators who wish to explore educational research questions and investigate the efficacy of MyLab & Mastering products.

Pearson's Efficacy Research Team

Our research team includes PhD-level statisticians who provide practical advice about tracking and analyzing student data after the redesign of a course to incorporate technology. Our research team also includes experts in psychometrics, educational statistics, and journal publications. These individuals support instructors who want to (1) conduct efficacy studies, (2) provide our editorial staff with detailed reports on the quality of our online content, and (3) advise our software engineers of new methodologies for collecting and processing student learning data within MyLab & Mastering products.

How Pearson and Instructors Work Together

Every research project is unique. The process takes time—generally a semester or longer. Instructors interested in conducting studies should expect an interactive and rewarding partnership.

How Pearson Can Help Instructors Get Started

Pearson can provide templates, guidelines, checklists, and samples on course redesign, efficacy studies, data collection, and more. To maintain objectivity, Pearson does not offer compensation for participation in efficacy studies.

Research Standards

Pearson adheres to Software & Information Industry Association guidelines for evaluation of educational technology products. The key guidelines are:

- Ask the right question

- Support the implementation of the product or service

- Plan a study of sufficient size and duration to demonstrate an effect

- Plan for plausible causal claims

- Avoid (the appearance of) conflicts of interest

- Provide a comprehensive and detailed research report

- Make the research findings widely available

- Accurately translate research for customers

Additional Resources*

The Emporium/Lab-Based Model

The Emporium Model, The National Center for Academic Transformation.

The Emporium Model: Fact and Fiction, Getting Past Go, national public policy initiative to improve developmental studies in postsecondary education.

The Math Emporium: Higher Education's Silver Bullet, *Change, The Magazine of Higher Learning.*

The Blended/Hybrid Model

The Blended Learning Toolkit was prepared by the University of Central Florida and the American Association of State Colleges and Universities with funding from the Next Generation Learning Challenges. It is provided as an open educational resource under a Creative Commons Attribution-Noncommercial-Share Alike license.

The Evidence on Online Education, meta-analysis of online learning versus face-to-face instruction authored by the US Department of Education. The study indicates that students who took all or part of their instruction online performed better, on average, than those taking the same course via face-to-face instruction. Further, it finds that students who took blended courses appeared to do best of all.

Using Early Warning Signs to Predict Academic Risk in Interactive, Blended Teaching Environments demonstrates how the authors used on and off-line data to chart a path early on in the semester for improving course-level student success in a blended, flipped physics classroom.

The Flipped-Classroom Model

10 Published Results Supporting the Benefits of Flipped Learning, online list of 10 published findings and studies that offer qualitative and quantitative results supporting the effectivenss of flipped learning.

The Evidence on Online Education, meta-analysis of online learning versus face-to-face instruction authored by the US Department of Education. The study indicates that students who took all or part of their instruction online performed better, on average, than those taking the same course via face-to-face instruction. Further, it finds that students who took blended courses appeared to do best of all.

FlippedLearning.org, website of the Flipped Learning Network™.

HELPFUL PEARSON LINKS

Following is a list of links developed to inspire, support, and promote conversation among educators and to ensure that the most-effective practices get shared across the industry.

16 Proven Ways to Help Your Course Redesign Succeed

Active Learning: Implementation Strategies for High Impact

MyLab & Mastering: 10 Best Practices

Course Redesign Community Website

Course Redesign Website

Faculty Advisor Network

Pearson Results Gallery

Teaching and Learning Blog

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*Pearson does not endorse nor are we responsible for the content or accuracy of non-Pearson websites.

(The Flipped-Classroom Model, continued)

Flipped Learning in Higher Education, report by Pearson and the Flipped Learning Network.

Flipped Learning Is Not Just for Math and Science, article from the Flipped Classroom Workshop addressing common misperceptions about flipped teaching and learning.

Flipping the Classroom, Vanderbilt University, Center for Teaching.

Going Beyond the Basics of Flipped Learning: How educators are going beyond basic flips, eCampus News, January/February 2015, page 22.

How Socrates Can Stimulate Your Brain Activity, TED Talk by Matt Stoltzfus, Ohio State University.

Hybrid Course Design and Instruction Guidelines, Brandeis University, Online Learning Advisory Committee.

Turn to Your Neighbor, Peer Instruction blog by Julie Schell, Peer Instruction and Flipped Class Expert.

Twilight of the Lecture: The trend toward active learning may overthrow the style of teaching that has ruled universities of 600 years, *Harvard Magazine* article on Eric Mazur's Peer Instruction model.

The Fully Online Model

11 Online Learning Demands from Today's Picky Students, eCampus News.

Benefits of Synchronous and Asynchronous e-Learning, eLearning Industry website.

Evaluation of Evidence-Based Practices in Online Learning, meta-analysis and review of online learning studies, US Department of Education.

Enrollment in Distance Education Courses by State: Fall 2012, report by the US Department of Education, June 2014. Reveals that postsecondary enrollment in distance education courses, particularly those offered online, has rapidly increased in recent years.

The Evidence on Online Education, meta-analysis of online learning versus face-to-face instruction authored by the US Department of Education. The study indicates that students who took all or part of their instruction online performed better, on average, than those taking the same course via face-to-face instruction. Further, it finds that students who took blended courses appeared to do best of all.

Tracking Online Education in the United States, 2014 survey by Babson Survey Research Group and funded by Pearson.

Making Decisions with Data

Making Decisions with Data, website funded by the Texas Higher Education Coordinating Board and developed by the School of Undergraduate Studies with technical assistance from the Center for Teaching and Learning at The University of Texas at Austin. It provides instruction and resources about how to incorporate data-driven decision making into your daily work, whether you are a classroom teacher, administrator, or hold multiple roles. Its modules are designed to help education professionals understand and use data to make decisions that will improve teaching and learning. This method of using data to drive decision making has already led to pedagogical innovations, such as **Peer Instruction,** developed by Dr. Eric Mazur of Harvard University.

Each module is designed to achieve specific learning objectives and is presented in a sequential progression of knowledge and skills. You may engage with all five modules in order or choose to view the learning objectives at the beginning of each module and decide whether the content meets your current needs.