

## Cost Reduction Strategies

Previous NCAT redesign projects have used a variety of strategies to reduce instructional costs. Here is a summary of the strategies that have proven to be most effective.

Step 1. Identify the enrollment profile of the course

- Is the course enrollment stable?

If the course enrollment is relatively stable (and accommodating more students is not a goal), you must reduce the number of people involved in teaching the course and/or change the mix of personnel in order to produce cost savings.

- Do you want to accommodate enrollment growth?

If accommodating more students is a goal, you do not have to reduce the number of people involved in teaching the course in order to produce cost savings, although you can do this. You can reduce the cost-per-student by teaching more students with the same staffing.

Step 2. Choose the labor-savings tactic(s) that will allow you to implement the chosen strategy with no diminution in quality.

Traditional formats require instructors to carry out all of the development and delivery aspects of a course on their own. Course redesign involves substituting technology for much of that effort, often with the assistance of different kinds of personnel. Making the substitutions listed below allows each instructor to teach more students than before without increasing his or her workload.

- Substitute coordinated development and delivery of the whole course and shared instructional tasks for individual development and delivery of each individual course section.
- Substitute interactive tutorial software for face-to-face class meetings.
- Substitute automated grading of homework, quizzes, exams for hand grading.
- Substitute course management software for human monitoring of student performance and course administration.
- Substitute interaction with other personnel for one-to-one faculty/student interaction.

Completing the [Course Planning Tool](#) (CPT) will allow you to analyze which of these labor-savings tactics make the most sense for you to use in your planned redesign.

Step 3. Choose the appropriate cost reduction strategy.

There are three ways to re-structure the course that will reduce costs.

1. Each instructor carries more students. (The instructor may be a tenured full-time faculty member, a temporary instructor, a graduate teaching assistant or an adjunct faculty member.)

This can be done by

- a. increasing section size, or
- b. increasing the number of sections that 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 that fewer resources are devoted to the course. When enrollment is growing, cost reduction means that more students can be served on the same resource base. In each case, the cost-per-student (total resources devoted to the course/total course enrollment) is reduced.

### **1. Each instructor carries more students.**

(The instructor may be a tenured full-time faculty member, a temporary instructor, a graduate teaching assistant or an adjunct faculty member.)

#### a. Increase section size

*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.

#### Examples

*Traditional:* 800 students: 40 sections of 20 students each taught by 40 instructors.

S/F ratio = 20:1

*Redesign:* 800 students: 20 sections of 40 students each taught by 20 instructors.

S/F 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.

#### Examples

*Traditional:* 800 students: 40 sections of 20 students each taught by 40 instructors.

S/F ratio = 20:1

*Redesign:* 1600 students: 40 sections of 40 students each taught by 40 instructors.

S/F ratio = 40:1

#### b. Increase the number of sections that each instructor carries for the same workload credit.

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

### Examples

*Traditional:* 800 students: 40 sections of 20 students each; each instructor teaches one section for the same workload credit. S/F ratio = 20:1

*Redesign:* 800 students: 40 sections of 20 students; each instructor teaches two sections for the same workload credit. S/F 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.

### Examples

*Traditional:* 800 students: 40 sections of 20 students each; each instructor teaches one section for the same workload credit. S/F ratio = 20:1

*Redesign:* 1600 students: 80 sections of 20 students; each instructor teaches two sections for the same workload credit. S/F ratio = 40:1

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

*Stable enrollment:* If your enrollment is stable, this will allow you to offer the same number of sections and reduce the total cost of the people teaching the course since adjuncts, tutors and undergraduate tutors are paid less than full-time faculty, and tutors and undergraduate tutors are paid less than adjuncts.

### Examples

*Traditional:* 800 students: 40 sections of 20 students each; 30 sections taught by full-time faculty; 10 sections taught by adjuncts.

*Redesign:* 800 students: 40 sections of 20 students; 10 sections taught by full-time faculty; 30 sections taught by adjuncts.

*Growing enrollment:* If your enrollment is growing, this will allow you to serve more students, offer more sections and reduce the cost-per-student since adjuncts, tutors and undergraduate tutors are paid less than full-time faculty, and tutors and undergraduate tutors are paid less than adjuncts.

### Examples

*Traditional:* 800 students: 40 sections of 20 students each; 30 sections taught by full-time faculty; 10 sections taught by adjuncts.

*Redesign:* 1600 students: 80 sections of 20 students; 20 sections taught by full-time faculty; 60 sections taught by adjuncts.

## **3. Do both simultaneously.**

Most redesigns employ both strategies simultaneously as the examples below illustrate.

### **Examples**

[Cleveland State Community College](#): In the traditional model, Cleveland State's developmental math program comprised 55 24-student sections in fall and spring, 45 of which were taught by full-time faculty (82%) and 10 by adjuncts (18%). Each course met three times per week. The total cost of the traditional course was \$270,675. In the redesigned model, Cleveland State offered 77 18-student sections in fall and spring, all of which were taught by full-time faculty at a cost of \$219,258. Each section had one

class meeting per week in a small computer lab and students were required to spend two additional hours in a larger lab staffed by faculty and tutors. The total cost savings was \$51,418, a 19% reduction. The FTE teaching load per faculty member went from 21.2 to 26.0 with no increase in workload. Faculty used to teach five sections per semester. In the redesign, faculty members taught 10-11 sections, which met once per week, and worked 8–10 hours in the lab. Increased faculty productivity enabled the department to eliminate the use of adjunct instructors while increasing course offerings. Overloads were also reduced as a result of the redesign project.

[Florida Gulf Coast University \(FGCU\)](#): FGCU reduced the number of sections from 31 to 2 and increased the number of students served in the first year of its fine arts redesign from 800 to 950. Full-time faculty taught 20% of the traditional course, and adjuncts taught 80%. FGCU eliminated adjuncts completely; the course is now taught 100% by full-time faculty supported by a new position called the preceptor. Preceptors, most of whom have a B.A. in English, are responsible for interacting with students via email, monitoring student progress, leading Web Board discussions and grading critical analysis essays. Each preceptor works with 10 peer learning teams or a total of 60 students. Replacing adjuncts independently teaching small sections (\$2,200 per 30-student section) with preceptors assigned a small set of specific responsibilities (\$1,800 per 60-student cohort) in the context of a consistent, faculty-designed course structure will allow FCGU to accommodate ongoing enrollment growth while steadily reducing its cost-per-student.

[Louisiana State University \(LSU\)](#): The redesign of College Algebra at LSU produced cost savings by serving the same number of students with one-half of the personnel used in the traditional model. Section size stayed at 40-44 students, but the number of class meetings each week was reduced from three to one. The redesigned format allowed one instructor to teach twice as many students as in the traditional format without increasing class size and without increasing workload. In the traditional format, each instructor taught one three-day-a-week section with 44 students. In the redesigned format, that same instructor taught two sections of 44 students and spent four hours tutoring in the lab. This could be accomplished because the class only met once a week and because no hand-grading was required. While the cost of adding tutors in the learning center as well as increased time for coordination and systems administration reduced the net savings, the redesign reduced the cost-per-student from \$121 to \$78, a 36% savings

[Tallahassee Community College \(TCC\)](#): In its redesign of English Composition, TCC reduced the number of full-time faculty involved in teaching the course from 32 to 8 and substituted less expensive adjunct faculty without sacrificing quality and consistency. In the traditional course, full-time faculty taught 70% of the course, and adjuncts taught 30%. In the redesigned course, full-time faculty taught 33% of the course, and adjuncts teach 67%. Further savings were realized by reducing the amount of time and resources that the Writing Center staff had traditionally spent in working with students on basic skills. Mid-stage drafts were outsourced to SMARTTHINKING, an online tutorial service. Overall, the cost-per-student was reduced from \$252 to \$145, a savings of 43%. Full-time faculty were freed to teach second-level courses where finding adjuncts was much more difficult.

[University at Buffalo \(UB\)](#) and [University of Colorado-Boulder \(UC\)](#): Both universities substituted undergraduate learning assistants (ULAs) for graduate teaching assistants (GTAs). In UB's computer literacy redesign, the number of assistants available to help

students was doubled. The hourly cost of a GTA was \$39 compared to \$8 for an ULA. ULAs turned out to be better at assisting their peers than GTAs because of the ULAs' better understanding of students' common misconceptions and their superior communication skills. While the employment of ULAs in UC's astronomy redesign was driven by the need to reduce costs (\$23 vs. \$9 per hour), the ULAs were more effective than most GTAs. ULAs were highly motivated to make the course a success. Because students regarded the ULAs as peers, they were more open about their learning difficulties with them than with GTAs.

[University of Idaho](#): The University of Idaho redesigned three pre-calculus courses enrolling a total of 2,428 students by moving them to the Polya Learning Center modeled after the Virginia Tech Math Emporium. In the traditional format, the courses met three times per week in sections of ~50 students taught by lecturers and graduate students using the didactic lecture format. Out-of-class assistance was provided by a tutoring center. The university moved all structured learning activity to the Polya center where students received just-in-time assistance from instructors and undergraduate assistants. Instructors also met students in a once-a-week focus group that focused on student problems and built community among students and instructors. Faculty preparation hours were reduced by 27% while interaction time with students more than doubled. One faculty member coordinated the course and a Lab Manager supervised personnel in the lab. The redesign reduced the total cost of offering all three courses from approximately \$338,000 to \$235,000, a reduction of 31%. Savings generated from this redesign remained with the department to be reinvested in redesigning additional math courses to be taught in the Polya Center.

[The University of Southern Mississippi \(USM\)](#): USM reduced the number of sections from 30 to 2 and increased the number of students in each section from 65 to 1000. These changes enabled the university to reduce the number of faculty teaching the course from 16 (8 full-time faculty and 8 adjuncts) to the equivalent of 2 full-time faculty and 4 GTAs. Prior to the redesign, 50% of the course was taught by full-time faculty, and 50% was taught by adjuncts. Southern Mississippi eliminated adjuncts completely. The course is now taught 100% by full-time faculty supported by GTAs for writing assignment grading. By making these changes, six full-time faculty were freed to teach other courses, and the funds previously used to hire adjuncts were made available for a variety of academic enhancements in the department. The University of Southern Mississippi reduced the cost-per-student by 56%.

### **Further Opportunities for Cost Savings**

After several terms of fully implementing your redesign strategy, you may achieve further savings through such things as improved retention (increased course completion rates), the impact of modularization and/or reduced space requirements. There are, however, a number of variables that may influence whether or not you are able to realize those additional savings such as the number of students who accelerate vs. the number who move at a slower pace, scheduling complexities, and so on. Because it is difficult to predict how these various elements will play out until you have some experience with the redesign over time, your plan for cost reduction must include one of the strategies listed above which will result in immediate savings during the first term of full implementation.