DOES SIZE MATTER?

Awareness of the Pew Grant Program in Course Redesign is beginning to grow. As most readers of this newsletter know, the purpose of the program is to enable colleges and universities to redesign their instructional approaches using technology to enhance student learning while reducing instructional costs.

Because of the program’s focus on large-enrollment introductory courses and because the majority of grant awards thus far have been made to relatively large institutions, many folks are under the impression that the concepts and practices employed by the program are applicable only to large institutions and not to small ones, especially to small, residential liberal arts colleges. Let me try to correct that misimpression and describe the applicability of these redesign ideas to small institutions.

[This issue of The Learning Marketplace will focus on quality enhancement aspects; our next issue will explain how the cost reduction ideas can apply in the small college context.]

First, a few words about terminology. Focusing on large-enrollment courses as the target for redesign derives from the fact that a mere 25 courses account for approximately 50 percent of any community college’s enrollment and 35 percent of any four-year institution’s enrollment, regardless of institutional size. Thus, “large” (as in large-enrollment courses) is relative to the institution. In each case, we are looking at the top 20 - 30 (in terms of enrollment) undergraduate courses at any given institution. For some, that enrollment would be 300; for others, it would be 3,000. Fairfield University, a grant awardee, has 3,100 full-time undergraduates, and their introductory biology course enrolls 260 annually. That is a large-enrollment course for Fairfield, and that course enrolls 15 percent of Fairfield’s freshmen.

Also, please note that we are talking about redesigning courses, not classes. Like most small institutions (and many large ones), Fairfield teaches its biology course by dividing it into seven sections (or classes), each taught by an individual faculty member. Virginia Tech’s linear algebra course has an annual enrollment of 1520. Like Fairfield, VT divides that course into 38 sections (or classes), each taught by an individual instructor. In both cases, the goal is to redesign the entire course, not a particular class.

The simple point here is that all institutions have large courses, regardless of institutional size and regardless of individual class size. Those large courses are the targets of redesign because of their relatively large impact on the institutions, again regardless of size.

A second misconception about these redesigns is that because they use technology, they are “distance learning” projects. Most (although not all) small liberal arts colleges are less than enthusiastic about distance learning because they often view “distance” as the polar opposite of “residential” or “community,” core concepts for their images and identities. The reality is that only one of the twenty projects funded thus far is a redesign of a distance-learning course; the other 19 are on-campus efforts and all include a significant amount of face-to-face contact. Again, the strategies employed in these redesigns are unquestionably appropriate for residential students.

Let’s use Fairfield as an example again. Fairfield’s redesign of its introductory biology course is part of a concerted effort to create a campus ethos that focuses on student-directed learning. Despite the fact that biology class size at Fairfield is relatively small, student surveys indicate a nearly unanimous dissatisfaction with the traditional approach. Based on faculty perceptions and student surveys, Fairfield has found that student-professor interactions in “small” classes of 35 - 40 often were no different than in larger classes (~140 students per class) that were taught ten years earlier.
The lecture portion of the biology course relies upon passive learning; it is a traditional "chalk-and-talk" format. In-class-technology consists of an overhead projector with transparencies. Likewise, labs do not make use of any computer-based activities, despite the integral use of computers in biological research today. Instead, the laboratory component is comprised of a series of canned modules where students are asked to focus on memorization rather than to apply scientific methodology to answer biological questions. This format emphasizes individual "cookbook" type experiments and does not allow for student-centered independent investigation. Preliminary data indicate that students are not retaining material and that the department is not retaining possible majors.

In their own words, Fairfield wants to replace the "sage on the stage" by the mentor, advisor and coach. (This is Fairfield, not the University of Minnesota!) Faculty, administrators and students, they say, are shifting away from a model that defines learning as memorization of facts and that views the teacher as one who lectures to the students with the purpose of imparting knowledge. The emerging new model of active and engaged learning replaces the old lecture/presentation format of teaching with dialogue, immersion, inclusion, teamwork, and experiential learning. With the aid of information technology, interactive teaching and learning extends beyond the traditional classroom to become part of the larger student and faculty experience.

In their redesign, Fairfield will condense their multiple lecture sections into a single large-classroom format. Students will work in teams of two to three around individual laptop computers, each connected to an instructor-controlled computer via wireless technology. Software modules that focus on inquiry-based, student-centered instruction will enable student teams to lead in-class discussions via a peer-mentoring format. Students will also use the laptops in labs to conduct independent investigations using modern software packages and Web-based exercises, thus creating a dynamic, inquiry-based environment. Those of you familiar with Virginia Tech's Math Emporium will see many comparable features in both design strategies.

Is Fairfield unique among small liberal arts colleges in identifying academic problems similar to those of large institutions? My own undergraduate experience at the College of William and Mary, widely regarded as an exemplary liberal arts institution, consisted of lectures and passive learning with a heavy dose of memorization in all but my freshman English and foreign language classes. My personal favorite was a senior seminar in Victorian literature of nine students taught by the chairman of the department. He lectured brilliantly at every class meeting. To be sure, it was somewhat easier to interrupt the lecture to ask a question in classes of nine (or 20 or 40) than in lectures halls of 250 (if one were to be so bold), but the pedagogical approach was the same, regardless of size.

Does size matter? Perhaps in some things, but when it comes to using technology to assist in improving student learning, I don't think so.

[Next month we'll consider the issue of size when it comes to reducing instructional costs.]

—CAT

PARADIGMS, POINTS OF INFLECTION AND PARANOIA

Joseph Schumpeter in his 1942 work, Capitalism, Socialism and Democracy writes, "... it is not (price) competition which counts but the competition from the new commodity, the new technology, the source of supply, the new type of organization... competition which... strikes not at the margins... of the existing firms but at their foundations and their very lives."

Just two decades later, Thomas Kuhn in The Structure of Scientific Revolutions observed, "Normal science, the activity in which most scientists inevitably spend almost all their time, is predicated on the assumption that the scientific community knows what the world is like... Normal science, for example, often suppresses fundamental novelties because they are necessarily subversive of its basic commitments... That is why the unexpected discovery is not simply factual in its import and why the scientist's world is qualitatively transformed as well as quantitatively enriched by fundamental novelties of either fact or theory."

This dissonance in the environment of an enterprise was called "chaos" by Tom Peters, "future shock" by Alvin Toffler and, more recently, Andy Grove observed that one had to be paranoid to survive "strategic inflection points."

Now, what do an economist, an historian of science, a management guru, a futurist and a captain of industry have in common? Each, in his own terms, has tried to come to grips with those periods in an enterprise when the old "truths" are no longer valid, when "standard operating procedure" just won't get the job done, when business as usual results in lost competitive position--or worse. Each has tried to read the tell-tale signs of the paradigm shift, as Grove called it, the 10X factor--the ability to do something ten times faster, or better or cheaper--or as Kuhn saw it, the dissonance between establishment theory and practical fact.

Certainly not since the advent of movable type and commercial printing has higher education been impacted by technological change of this magnitude. Will computer and communications technology have this much impact on teaching and learning and, as a consequence, on the higher education enterprise? There are those, and I am one, who will say that it will.

Will institutions of higher learning continue to focus on the past--a winning football team, increased budgetary support from the state legislature, more physical plant and university development (the current euphemism for
Many, perhaps most, will. And, if we are in one of Grove's strategic inflection points, what will happen to them? They will be marginalized to serving the resident undergraduate student who will account for less than 15 percent of the students pursuing post-secondary learning experiences. Their costs will continue to rise faster than inflation, the quality of their learning experiences will remain relatively static, and the number of students they serve will likely contract.

Future competition for student learning experiences will not come from fast transforming traditional institutions (although some may make this transition) but rather from new, mostly for-profit, entities which will not be encumbered with football teams, dining halls, facilities maintenance and subsidy generation. Nor will they be constrained by legislatively proscribed service areas, differential tuition for those in and those out of that service area and arbitrary caps on the ratio of students in each category.

The new competitors will eschew the seat time model in favor of outcomes assessment. Disaggregating the learning experience from the plethora of ancillary activities that characterize the traditional institution of higher education will break with the historic model of vertical integration and substitute in its stead a model of horizontal specialization. There will be content providers, a few of which are already operating and many more preparing to enter the arena. There will be application service providers, a number of which have already assumed major roles in complementing the work of faculty in transferring learning experiences to the Web. We will see services that do nothing but testing. Similarly we will see services that operate as credit banks and generally serve the role of college registrars. We can already witness the glimmer of organizations that will provide library-like services for the not-on-a-campus student.

But, some will say, why will all this happen? Isn't there uniform agreement that we do a good job of educating people in our traditional institutions of higher learning? Aren't we, in the United States, the best in the world at doing this? Perhaps so. But it was not that many years ago in our vertically integrated business enterprises that IBM and AT&T were arguably the best in their businesses as well. Both of those businesses went through the transformation from vertical integration to horizontal specialization and both lost market leadership in the transition. Both were slow to read the impact of new technology on their markets. Leaders of both businesses were heard to observe that they were "best of class" and why should they change.

We have observed before, that in these periods of fundamental change in an industry, the winners will be those who interpolate their way to a new future rather than those who attempt to make simple extrapolations from their current status based upon past history. Is it reasonable to expect that many of our traditional institutions of higher learning are prepared to seriously and honestly assess their future in this new world of technology enhanced education? Probably not. Planning done by "committees of the whole" with equal representation drawn from all the old units will never come to grips with a future that includes lessened roles for any of the current players, much less roles for new players that don't currently exist. Extrapolation and tinkering at the margins may be the only avenue of change open to our traditional institutions of higher learning.

We are in the midst of an incredible transition in teaching and learning. Kuhn used the term "paradigm shift", Grove called it a "strategic inflection point". Whatever you call it, you probably will have to be paranoid to survive.

—RCH

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UPCOMING LEADERSHIP FORUM EVENTS

STATE-OF-THE-ART LEARNING ENVIRONMENTS: PEW GRANT PROGRAM IN COURSE REDESIGN

ROUND I RESULTS

February 26, 2001, Dallas, Texas

Co-sponsored by the Executive Forum in Information Technology at Virginia Tech

This seminar will present the results of the first of three rounds of the Pew Grant Program in Course Redesign. Learn from faculty project leaders how to increase quality and reduce costs using information technology. Faculty from four institutions will talk about their models of course redesign, including their decisions regarding student learning objectives, course content, learning resources, course staffing and task analysis, and student and project evaluation. These models provide varied approaches that demonstrate multiple routes to success, tailored to the needs and context of each institution.

These seminars provide a unique opportunity for you to:

- Learn firsthand how to increase quality and reduce costs using information technology from successful faculty project leaders.
- Find out how to design learning environments for the future by tapping the expertise of those who have done it.
- Talk with experienced faculty from multiple institutions about how and why they made their redesign decisions.
- Move beyond "today" and learn where on-line learning is going . . . find a model that will work for your institution.

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