plethora of articles, books, and presentations now advocate alternative ways to approach teaching and learning in higher education. If we consider each of these new learning strategies as a product for sale, every faculty member now has the option to buy or not to buy—basing their decisions on written "advertisements," word of mouth, peer pressure, resources, and workshop demonstrations. "Sales" have been going up for the last decade, so we clearly have an interested market. But why is it that the product often fails to deliver as promised? Faculty who make the effort to try something more innovative than lecturing sometimes get discouraged when their experiments don’t

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work as expected. Is this false advertising or user error? Perhaps it’s a little of both, and we should go back and reread the instruction manuals.

A closer look at the research on learning innovations reveals a number of notable points: use is diversified across disciplines, every success has its share of failures, and use improves with practice. A common theme among those that are successful is an awareness of the bigger picture instead of narrow purposes. Adopting only one innovation, without accounting for the forces that work against it, can neutralize or negate desired outcomes.

Even with wider acceptance, full and effective use of teaching and learning innovations still has a long way to go. And it is far less likely that any one approach—whether active, collaborative, service, technology-enhanced, or student-centered—will prove better than a holistic approach that looks at teaching and learning from an integrated perspective. Such an approach—based on repeatedly adding small increments of innovation and using multiple strategies to capitalize on their synergy—surely offers the greatest potential for impact.

Some will worry about intrusiveness and will question whether there is a real urgency to change our teaching and learning paradigm. But there is growing evidence to suggest that ongoing shifts in cultures, technology, and the economics of academe are moving us toward a “tipping point” for change. By taking stock of this unique window of opportunity and addressing specifically some of the ways we can make our way through it, I hope to make a compelling case for holistic learning.

THE “TIPPING POINT”

Malcolm Gladwell’s The Tipping Point: How Little Things Can Make a Difference, published by Little-Brown in 2000, was instantly popular because it made a convincing and readable argument about how change really happens. My case is similar. Based on a number of converging factors, I believe we have reached just such a “tipping point” with regard to alternative pedagogies. Consider the following questions: Who will be in the classrooms of the next decade and what are these students like? To what extent have faculty actually adopted various alternative learning approaches and environments? What external pressures face academic institutions that could impact the classroom? By zooming out to take in the bigger picture, we can see how these factors converge.

Millennials are coming (and Boomers are leaving). The so-called “Millennial Generation,” born in 1982 or later, are quite different from the “Generation X” group, born in the 1960s through 1981. Neil Howe and William Strauss, consultants and lecturers on generational issues, paint a striking picture of just how students have changed, beginning with the high school graduates of 2000. Consider what has occurred in the last two decades with respect to two-parent incomes, structured day care, physical and mental health, organized sports and extra-curricula activities, and electronic technology.

Outcomes-based education has established standards for learning to which schools are being held accountable. The Millennials are children of older parents who wanted and protected them, planned around them, spent time with them, got directly involved with their schools and activities, and pushed them to achieve. Consequently, colleges can expect incoming students who have strong self-confidence and feelings of self-worth that render them less at odds with authority.

Members of this new college generation are experts at time management, smarter at test-taking, and are optimistic that they can rise to the occasion to save the world. Unlike the GenX group that was given freedom—and lots of it—Millennials know about structure. While GenXers get criticized for being self-centered, for possessing a sense of entitlement and learned helplessness, or for lacking cooperation and initiative, Millennials have strong collaborative skills; as team players, they willingly follow rules for the good of the whole.

Millennials are also technology-smart. They are the first generation to have always known VCRs, computers, camcorders, and microwave ovens—why should they fear anything digital? Pockets of technology integration have existed for two decades in the public schools, but broad-based movements to incorporate technology into K-12 school systems are burgeoning. West Virginia’s notebook program (1999), Pennsylvania’s Digital School District (2000), and Maine’s laptop proposal (2002) are just three examples of statewide technology efforts designed to boost K-12 education systems. Michigan’s governor signed a statewide high-speed Internet access bill in 2002.
The 1994-2000 Internet Access Statement from the National Center for Education Statistics reports that 98 percent of public schools now have Internet access, that 77 percent of K-12 classrooms are connected, and that the ratio of students to computer is now 5-to-1. Such technology-infusion efforts often focus on middle schools, so many students entering college after 2005 will have experience with ubiquitous computing and will expect the same wired, laptop environment at the colleges and universities they choose. Simply telling these students that they’ll have to use computers to type their papers will fall far short of the mark.

With the Baby Boomer generation entering retirement, meanwhile, college and university faculty will be dominated by GenXers, who tend to be more adventuresome and relaxed than their predecessors. The need to retain control of a classroom from behind a lecture podium is less important to them and less apt to inhibit the adoption of teaching innovations; the same is true for career protocol issues. One emerging danger may be the confusion that results from GenX faculty providing too little structure to Millennial students who expect it. But, on the whole, these generational shifts seem optimal for change.

**Innovation diffusion is going critical.** According to diffusion theory (see Rogers in Resources), we should be able to predict the holding power of an innovation by looking at its adoption curves and the characteristics of the latest adopters. Among college faculty, the “Innovator” frontrunners continuously experiment with their courses, asking themselves, “I wonder what would happen if…” They willingly take risks with their own careers to test a theory. Being an Innovator is largely a personality trait, not a condition of age, so these individuals run the gamut from brand-new faculty to those long-tenured.

The masses of faculty, however, ignore them as mavericks. Only when the “Early Adopters” arrive—as respected leaders in their disciplines and institutions—does anybody begin to pay attention. They refine, expand, or document the Innovators’ work and carry enough institutional weight along with them to get the kind of funding and committee action needed to morph an innovation into a saleable idea. Without these opinion leaders, few innovations diffuse to the next group. These are the “Early Majority” faculty who attend workshops and ask for and follow peer advice but continue to deliberate costs, benefits, and logistics. Eventual buy-in from this large group provides the critical mass for accepting innovation.

“Late Majority” faculty, more set in their ways, resist change until they sense that they’re being left behind and little doubt remains about the value of adoption. They may fear looking foolish in the classroom, want to retain control, or to focus exclusively on research. Finally, some faculty will never adopt an innovation, for reasons valid and not.

Given these various faculty types, what is the current diffusion “score card” for the adoption of alternative learning strategies in higher education? A ready-to-hand measure might be the number of books, articles, and presentations generated in any given year on a subject. An easy way to estimate this measure is to count how many items are located through a search of a library periodical database like ERIC (Educational Resources Information Center) using the compound keyword phrases “higher education” and “active learning.” Looking at

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**CHART 1. ADOPTION CURVES FOR SELECTED TEACHING AND LEARNING STRATEGIES**

![Chart](image)

The accumulation of occurrences over time, does this measure chart an adoption curve? The answer, shown in the Adoption S-Curve Graph for five typical strategies (see Chart 1. Adoption Curves for Selected Teaching and Learning Strategies), is a resounding “yes.”

Overall, we know that about half of the faculty surveyed through the 1999 National Study of Postsecondary Faculty (NSOPF) reported that they continue to use lecture and discussion as their “primary” means of teaching across all their courses. The 2001 NSSE benchmark statistic reflecting exposure to active and collaborative learning for senior students is also close to 50 percent. One conclusion is that a variety of teaching and learning innovations are reaching majority groups simultaneously, and further innovation diffusion is ready to tip the scale.

**External pressures are not just administration’s worries any more.** In the past, faculty were less (or not at all) concerned with “administrative” issues like competition, retention, accountability, and productivity. But today’s climate has brought these concerns into the classroom in a way faculty can’t duck. Consider the reduced pool of high school graduates that will increasingly pit higher education institutions against each other in a competition for enrollment.

Rigorous marketing campaigns to get students in the front door include promises of teaching excellence—delivered with high-tech savvy and a personal touch. With their consciousness raised by such campaigns, both parents and government bodies are demanding visible signs of delivery and value for money. Though the administration must provide the infrastructure and will be held externally accountable, it is the faculty who ultimately have to deliver on these promises, while still being pressured to keep productivity at acceptable levels.

Unfortunately, the competition to get students through the front door is compounded by double-digit rates of student departure after the freshman year. Many studies correlate student retention with factors beyond just academics. They conclude that social, emotional, and intellectual connectedness really matter. The lecture mode may continue to produce modest academic gains, but it does very little to enhance an institution’s broader retention appeal. The classroom environment
Adoption Curves for Selected Teaching and Learning Strategies

- **Collaborative and Cooperative Learning.** From the early 1980s, there have been pioneers in this area whose work was synthesized later in the decade. A subsequent and significant jump in ERIC citation search results for collaborative and cooperative approaches around 1988-1990 suggests adoption by an Early Majority. This pace accelerated through the next decade, achieving a point of critical mass, and peaking around the year 2000. At about that time, the National Survey of Student Engagement (NSSE) announced an "encouraging finding" that 90 percent of participating students reported having done some group-project work. This finding suggests that Late Majority adopters now possess at least some level of acceptance for peer-learning and use group work in their courses.

- **Active Learning.** Although the active learning movement began at about the same time as its counterpart in cooperative and collaborative learning, a look at its adoption curve shows slower growth and less penetration in higher education. Perhaps it took the Early Adopters longer to iron out the wrinkles in their techniques, or perhaps active learning approaches are simply "too different" from traditional instruction. Though often embedded in collaborative and cooperative learning, active learning strategies do not require the use of groups. But implicit acceptance of active-learning principles may be higher than the literature indicates because they are an inherent part of other, more visible strategies. Improvements in communication about active learning as a distinct body of innovation in teaching and learning may help generate greater interest.

- **Service Learning.** Like active learning, little documentation about service learning as an explicit instructional strategy appeared before the mid-1980s and, as is apparent, real growth began 10 years later. More recent evidence suggests that service learning is gaining momentum. For example, in 2001 NSSE reported that more than 60 percent of student respondents have been involved in service learning. Early Majority faculty may thus be increasingly comfortable with service learning and acceptance could quickly escalate.

- **Educational/Instructional Technology.** The value of instructional technology in higher education—from distance learning to computers in the classroom—has been hotly debated through two decades of conflicting studies and changes in popular support. The Early Majority joined the technology bandwagon when personal computers became easier to use and their costs decreased. The Late Majority came on board with the emergence of "instructional technologists" who could skillfully guide them through the technical hoops. The 2001 Campus Computing Project showed continued growth in technology use and student acceptance of mediated instruction. Laptop initiatives in higher education have also increased. Ray Brown, executive director of the Associated Colleges of Central Kansas, tracks laptop institutions and has found that there are 137. Wired Colleges 2001 increased this count to rate the top 200, and added a special category for two-year institutions and another for small colleges.

- **Internet Integration.** Winning the award as the most recent, yet the fastest-growing innovation, Internet usage in higher education parallels the explosion of the Web in 1994. While certainly a component of the broader technology-adoption movement, it is significant enough to deserve recognition as a force in its own right. Early Majority concerns over content accuracy diminished due to high-quality organizational Web sites and better-informed users. In a longitudinal study of Internet integration at Northern Michigan University from 1999-2002, for example, student expectations for the technology remained high and stable, while faculty adoption shot from 38 percent to 82 percent because of a mandatory laptop initiative.

The most popular motivations cited were the improvement of course quality, the increased communication and dissemination of materials, the growing need for college graduates to have technical and Internet skills, the desire for professional development, and the promotion of self-learning. True, some faculty "adopters" in this study may only be using group E-mails, while others have sophisticated Web sites with tightly integrated assignments. But the trend is clear and solid. Consider the change over the past five years in the "E-political correctness" of the following faculty comment to a student: "I don't use E-mail." We are rapidly closing the stage of Late Majority for college faculty with respect to at least some use of the Internet.

plays an important role in student satisfaction, subsequent persistence, and impact on the institution's bottom line. The compound phrase "high-tech/high-touch" is not just about teaching and learning, but is deeply bound up with economic factors that affect institutional survival.

**It's Time for Synergy**

Generational change in both students and faculty, positive patterns of adoption for alternative instructional methods, and unavoidable economic pressures on institutions together seem to provide optimal conditions for a widespread "tip" toward a holistic approach in changing the collegiate learning environment. Rather than isolating technology integration from methods of alternative learning, significant synergy could result from consciously blending them with the lecture and other established methods. Most observers agree that true synergy produces more than merely the sum of its parts. So how can we in higher education move consciously toward such holism? I offer a few deceptively simple suggestions.

Avoid "innovation blinders" that focus on only one strategy. Let's take a closer look at technology integration. It shows sizeable growth, is extremely visible to the outside world, and is fairly easy to quantify—yet it is the least validated as effective by research.

Why does technology sometimes fail to add value to a course? Like a sugar high, applications like multimedia may offer glitz with little depth, and yield a short-lived impact that requires increasingly greater glitz to get the same effect. Other uses of technology inadvertently reinforce passive learning—for example, lectures using presentation slides and handouts. The 2001 Campus Computing Project reports that almost 45 percent of classes across all institutions use this approach. Though it's a marvelous tool that's easy to teach to faculty and keeps rambling professors on track, students who watch these performances, and are given detailed handouts, may simply sit there without taking notes.

Lectures have their drawbacks, but they at least generate some writing activity. Straight slides without an accompanying learning exercise will result in boredom once the novelty wears off—which will be quickly for the Millennials. Possible active ingredients include interspersing blank or "Jeopardy-type" slides to be completed by the class, having teams of stu-
As we enter a later stage of technology adoption...the era of faculty workshops on “basic skills” is closing....The thrust of faculty workshops should now be on the effective integration of multiple teaching and learning strategies.

Students create bulleted lists from the assigned readings for comparison to the ones the instructor shows, using slides to present content quickly so that in-class time can be used to solve a short problem, or asking students to go online to gather additional information.

Group work and other peer learning strategies can fall into a similar trap if an instructor assigns team projects only for out-of-class work. The Millennials really are better at teamwork, but they still frequently need—and will demand—structured coaching for guidance. By using active peer exercises in class, and adding a service-learning component, group projects are more likely to succeed.

Trying to do everything during class time is also not feasible and content coverage may suffer. To offset class time allocated for active exercises and peer learning, technology can be used to off-load the distribution of learning materials like readings and study guides, to gather student submissions, and to support fact-finding and continuing collaboration. Millennials will have few problems using their computers as legitimate communication tools and will readily accept the concept of regular E-mail checks and material downloads from a Web site as standard practice. Rather than considering technology in isolation or as an end in itself, it is better viewed as a multiplier for other innovations. And this is a lesson that applies to any new strategy.

**Provide faculty training in instruction.** Faculty members largely untrained in educational methods, should be commended for their efforts at self-training when trying to implement new instructional approaches. But as we enter a later stage of technology adoption for new pedagogies, the era of faculty workshops on “basic skills” is closing. To make a more positive impact, the thrust of faculty workshops should now be on the effective integration of multiple teaching and learning strategies.

This is especially the case for instructional technology. Instructional technologists must learn how to demonstrate that their tools weave into a larger instructional picture. Faculty must learn that small steps toward holistic adoption are more likely to reap success than climbing on a single technological bandwagon. Orientation for all new faculty should include a seminar in teaching methods, not just for its own sake, but so an appropriate tone is set: effective teaching is important. Centers for Teaching and Learning need to be established where they are not and should be funded adequately to enable them to offer continuous and convenient workshops on creating student-centered learning environments and building integrated teaching methods. These centers should sit prominently within university governance structures and should be organizationally merged with instructional technology centers to better assure synergy.

**Reward faculty (and cut them some slack).** Recall that faculty members in both the Early and Late Majority adoption groups are likely to be risk averse. To encourage their use of innovations either rewards must increase or risks must be reduced. The willingness to innovate and the scholarship of teaching should be explicitly recognized in university contracts, bylaws, and cases of promotion and tenure. Administration and faculty review boards should not penalize faculty for temporarily low student evaluations or uncertain outcomes as they move up their learning curves. Instead, those responsible should sponsor mentoring programs or learner-centered faculty support groups to resolve problems as they arise, provide conversation and assistance, and keep faculty out of narrow ruts. Institutional excellence and teaching awards should be established simultaneously and promoted by administration, with support provided for departments and teams that seek them.

When faculty members perceive increased benefits from time spent on innovation, they will reprioritize their efforts in behalf of teaching and learning. But doing so is currently a challenge. NSOPF data from 1988 and 1999 demonstrate there has been little change in faculty perceptions of rewards. In 1999, 39 percent (down from 42 percent) agreed or strongly agreed that research was rewarded more than teaching. However, 81 percent (up from 78 percent) still believe that teaching effectiveness should be the critical criterion in promotion.

Teaching-oriented faculty hold the keys to increased student retention and better learning outcomes. If provided the right incentives, they could seriously invest in learning issues.
Again, instructional technology provides a case in point. *Campus Computing 2001* reveals that 74 percent of institutions have technology resource centers, 43 percent are planning for the integration of IT into the curriculum, and 80 percent support faculty technology development. But only 18 percent visibly reward the use of IT in faculty reviews, or in promotion and tenure procedures.

**Look outside the institution for help.** Though internal support for change is usually limited, external sources of knowledge, training, and even funding abound. The Indiana University Scholarship of Teaching and Learning Initiative, for example, recently developed a robust online tutorial on the scholarship of teaching and learning hosted by the AAHE Carnegie Teaching Academy Campus Program Web Center. This tutorial is easily accessible and of extremely high quality. The Fund for the Improvement of Postsecondary Education (FIPSE) currently supports many learner-centered proposals for systemic educational reform. Academic departments should review successful FIPSE projects and consider doing something similar.

The Pew Grant Program in Course Redesign, with 30 campus projects now in play, convincingly underscores the lesson that cost savings and quality can coexist in large-enrollment classes. These findings provide institutions with tangible incentives to gain similar savings. The Lilly regional conferences and summer institute provide cost-effective training and support for teaching innovation.

Institutions need to support administrators, education specialists, instructional technologists, and key faculty to attend broad-based external conferences like these to learn how innovations are implemented elsewhere. All departments and faculty should be made aware of such resources. Institutions should also take advantage of cross-pollination when they send folks outside the campus to learn: “high-tech” faculty should attend Lilly-type seminars and “high-touch” faculty should attend TechEd conferences.

**IN CONCLUSION**

Up to now, innovations in teaching and learning have largely been pursued one at a time. But the pieces are falling into place to support a more holistic approach. Adding additional innovative ingredients without explicitly looking at the whole picture may not help, and could even exacerbate faculty doubts. By constantly blending innovations from the outset, the chances for success are greater.

Given the cost of recruiting students these days, and getting them through their first term, it is surely economical to spend money on faculty teaching and learning initiatives and holistic awareness campaigns to reduce current rates of student departure. Growing technological infrastructures and competencies at our institutions and changing student-faculty generational cultures may complement each other well. We are reaching a point where a pervasive “tip” toward new practices is feasible for the first time. We should be making the most of it.

Think about a weight-loss program; the analogy is closer than you think. People who try one diet, one pill, or one exercise usually don’t achieve their goals. It’s only when a holistic approach to health and wellness is taken, usually in small steps, that weight loss and fitness occur. So it is, too, with the health and wellness of our classrooms. It is only when the whole environment is considered, and multiple tools used at appropriate times, that higher levels of sustained learning can be achieved. Take another look at the innovation adoption curves. And as they ascend in parallel, envision the changes in teaching and learning if they merged.