

In spite of impressive resources directed toward undergraduate reform in the past 30 years—no *revolution* (that is, a quantum change in results) has occurred. There can be no revolution, because the current system is in a stable state. Furthermore, until the whole system is changed, beginning with graduation requirements, there will be no further substantive improvement. While implementation of quantum system change must of necessity be developmental (taking as long as 30 years to complete fully), the term “incrementalism,” as used here, means partial or marginal change that does not clearly have as its superordinate goal from the beginning to fundamentally alter the mission, goals, design, control, and results of the whole system.

“There have been changes, but hardly a ‘revolution.’”

—TED MARCHESE

In his farewell editorial in the May/June 2000 *Change*, Marchese suggests that, after 30 years of undergraduate education reforms, there is little evidence that we are any better off today. Lazerson, Wagener, and Shumanis, in the same issue, agree with Marchese, pointing out that “for all the pedagogical innovations—even the advent of the Web—there has been precious little deeper reform.” Schneider and Shoenberg, a year earlier in *Change*, describe persistent “organizational realities—structural features...that work silently but powerfully to undo” curricular reform.

But in spite of consistent failures, all three authors continue to be hopeful—as have many others for the past three decades. Marchese has expectations for the Web, new competitors, certificates, and accreditation. Schneider and Shoenberg speak of “building more purposeful, powerful, and integrative forms of undergraduate education.” Lazerson *et al* say that “the need is to

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weave together the incremental changes that have occurred in assessment and teaching practices into a pattern of systemic reform,” and they hope that “if enough incremental changes are woven together, perhaps one day institutional prestige in higher education will be based on teaching and learning, not just resources and research.”

“A goal beyond the capability of the system will not be reached.”

—W. EDWARDS DEMING

Weaving incremental changes into the existing stable system of undergraduate education cannot result in significant improvement. Why? It is precisely because most pedagogical, curricular, and other educational reforms are aimed at partial and incremental improvement of a stable system that they will continue to fail. From a systems-theory point of view, it is folly to expect substantial improvement in outcomes from an obsolete and stable system.

Deming emphasizes repeatedly—over 10 times in *Out of the Crisis*—that a stable system is simply not capable of continued improvement. “If you have a stable system,” he writes, “then there is no use to specify a goal. You will get whatever the system will deliver. A goal beyond the capability of the system will not be reached.”

Other systems theorists agree. Peter Senge insists, “Every system is perfectly constructed to produce the results that it achieves.” David Langford explains, “The system always wins.” Industry leaders of change concur. Robert W. Galvin, former CEO of Motorola, for example, asserts, “For quality, one must first have a quality system in place. Then, one must measure the right things.”

Stable system improvements will be marginal for another reason as well: there are limits to improving an obsolete system piecemeal by adding improved parts. The concept of technological discontinuity explains that when any given technology approaches its limits, a shift to a new technology with greater potential must be made to stay competitive.

Adding state-of-the-art replacement parts to a Model-A Ford may marginally improve performance, but certainly not to current standards. At some point, the only way to achieve further improvement is to design an entirely new car using new technology.

It is conceptually similar with human organizational systems. Try running a high-tech information technology firm using Max Weber’s concepts of bureaucracy or Henry Ford’s ownership control model. The failed reform programs of the past 30 years are clear evidence of the need to shift to a new technology, a new system. We know that systems control behaviors and outcomes. We know that a system in a stable state will have stable outcomes.

“Today’s problems come from yesterday’s solutions.”

—PETER SENGE

The prevailing core learning process for undergraduate education is based on the course-credit model, developed circa 1890. This model was designed by administrators to track students efficiently in, through, and out of the institution—just count credits or courses completed and compute a cumulative grade point average. These measures tell us nothing about students’ development of intellectual skills or the ability to make conceptual connections across a variety of disciplines, of course. But the purpose of the course-credit model was to increase efficiency, not effectiveness. Learning theory, or talent development, did not drive design.

The course-credit model has been accepted largely because of the ease of measurement and the high degree of independence it gives to faculty and departments. It fails because 1) institutional *purpose* (mission-in-use) is to maximize resources and reputation, not learning; 2) the *goals* for the core process are ill-defined, and means (courses) are taken as ends; 3) *operational definitions* and measurement of core process goals are practically nonexistent; 4) the *core learning process* is not designed for continuous assessment and improvement (this is known as the Shewhart cycle), and thus incremental improvement is infeasible; 5) the model encourages competition and discourages cooperation, thus instilling fear and driving out learning; and 6) the control structure encourages independence rather than interdependence and cooperation.

We clearly have a systems problem that requires a systems solution. The course-credit system has been and continues to be in a stable state. The now-famous phrase that seemed so effective

The incremental approach aimed at patching up a stable obsolete system works only if one is not determined to produce student learning.

in the 1992 Clinton presidential campaign, "It's the economy, stupid!" might be modified to sum up the undergraduate education problem: "It's the system, stupid!"

ALVERNO: A PURPOSEFUL, GOAL-DRIVEN SYSTEM

While all of us can point to examples of successful *programs*, how many readers can name a single educational institution that has revolutionized its whole *system*? One noteworthy example is Alverno College. Thirty years ago Alverno designed its system from scratch. Based on explicit assumptions about learning, it defined its *mission* to develop in students those skills and abilities they need to be successful as learners, and set an explicit set of eight abilities as system *goals*. Alverno's leaders *operationally defined* those goals and developed measures to assess the college's success in reaching them. They developed a primary pedagogy and *learning process* capable of continuous improvement, conceptually similar to the Shewhart cycle in quality management theory. They designed a matrix structure that guided collaborative faculty work across disciplines and that facilitated integrated student development.

They required students to demonstrate competence in the eight abilities as a condition for graduation, replacing course credits and GPAs with a sophisticated performance assessment system. The Alverno system thus differs radically on at least seven system essentials: theory of organization, mission, goals, operational definitions, measurement, core process design, and structure. Alverno has built the "purposeful, powerful, and integrative form" of undergraduate education envisioned by Schneider and Shoenberg.

CHANGING GRADUATION REQUIREMENTS POWERFULLY DRIVES, FOCUSES, AND CONTROLS EVERYTHING ELSE

Changing graduation requirements

based on mission—in Alverno's case, a set of ability outcomes—is elegant and powerful. That one alteration changes everything else: student motivation and focus, learning methods and process, program and curricular design, institutional structure, and focus and coordination of effort. In systems terminology, an institution's set of ability outcomes is the criterion of system design and control; thus, quality and its controls are designed into the system from inception. Everything in the system is designed to achieve these goals and thus the mission. Alverno College provides an exemplary model for a new system, and its 30 years of experience and research provide sound evidence of that model's viability.

"The system always wins."

—DAVID LANGFORD

Systems determine outcomes. Over the past 20 years, Alverno College has hosted thousands at its workshops. These participants learn about Alverno's eight ability outcomes and about assessment-as-learning. They learn how to develop the criteria and scoring rubrics that constitute the operational definitions of the outcomes. They even learn how to perform criterion-related multidimensional assessments and how to provide developmental feedback. They return home, however, not having sufficiently learned the necessary condition for any lasting improvement. They have seen the trees but not the forest.

They have failed to understand that, without changing graduation requirements, they will be merely overlaying new elements on a stable system, a graft that cannot take. They return home only to be unable to enact significant change; thus, they burn out, and Langford proves prophetic—"the system always wins."

One unfair criticism of Alverno has been that other institutions have failed to replicate its model. Alverno's leaders have clearly communicated the eight abilities, their importance, and the mes-

sage that these goals guide the design and control of the Alverno system. Yet participants still fail to understand that unless a new system is designed—focused on student learning, with clear goals, operationally defined and measured, and with students made accountable for results through graduation requirements—their systems will remain the same, producing essentially the same results. This failure to understand fully the necessary condition for lasting change that produces substantive and lasting improvement in student learning has led to a rash of partial and what Birnbaum calls "virtual adoptions."

"Mankind are [sic] more disposed to suffer, while Evils are sufferable, than to right themselves by abolishing the forms to which they are accustomed."

—U.S. DECLARATION OF INDEPENDENCE

Peter Ewell suggests that adoption of "all-or-nothing" innovations requires a total rethinking, and that is a "hard place to begin a conversation indeed." True. But Alverno has already done the tough work of developing the principles and building a model. All we have to do is adapt these principles to develop our own unique systems—still, hard indeed. The incremental approach aimed at patching up a stable obsolete system works only if one is not determined to produce student learning.

The sponsors of the incremental approach have provided almost endless support for new programs and for program administrators seeking grants. Foundations and other granting organizations have fueled this approach by focusing on partial and incremental improvements, not whole-system change.

Whether intentional or not, people entrusted with leadership positions in undergraduate education have failed to recognize that abolishing the form to which they are accustomed is a solu-

COMPARING THE QUALITY AND QUANTITY MODELS

Quality Model

(Concepts from Alverno College and W. E. Deming)

- 1) Organizing Principle: Graduation is contingent on the competent demonstration of a set of performance-based abilities.
- 2) Mission: The *mission-in-use* is identical to the *espoused mission* centered on student learning and development and uses the *talent development approach*.
- 3) System Goals (Outcomes): Explicitly defined performance-based student abilities (such as knowledge, skills, and attitudes—KSAs) provide a clear constitutive definition of the mission. This set is the criterion of system design and control, guiding design and coordination of curriculum and pedagogy. Comprehensive general outcomes require students to integrate knowledge, skills, and attitudes. Outcomes are determined and validated by faculty, students, alumni, employers, and others, and provide clear direction.
- 4) Operational Definitions: Operational definitions provide communicable meaning by specifying the procedures by which ability outcomes will be assessed and measured.
- 5) Measuring: Assessment is an integral part of a continuous process of improvement (Shewhart cycle). "Student progress in the curriculum is fundamentally measured in the ability validations that students accumulate...for specific levels of performance" (Loacker, Cromwell & O'Brien, 1986, p. 122). Assessment center methods that use expert judgment are primary.
- 6) Structure: A dual responsibility structure assigns faculty members to both a functional department and to an ability outcome department. Both discipline and ability department chairs form an educational policy committee, chaired by the chief academic officer. This classic matrix structure meets the high integration needs required by an outcomes driven system.
- 7) Student Focus and Motivation: Students focus on meaningful learning goals. Primary motivation is intrinsic—goal achievement is realized from continuous feedback from *assessment-as-learning*. Students experience intrinsic reward whenever they demonstrate competence on the set of abilities.
- 8) Content Knowledge: Knowledge provides the context for all learning. Students learn by making an action out of knowledge. Knowledge must be demonstrated.
- 9) Curriculum: Curriculum provides the "means" for student learning. Curriculum is unified and integrated by outcomes, creating a developmentally sequenced, logically coordinated program of courses. Curriculum should change in response to feedback and other information.
- 10) Teaching Methods: Assessment-as-learning teaching methods demand student involvement. Students learn "to do" rather than just learn "about" the course material. Students must think, judge, decide, act, and create. Students self- and peer-assess against established criteria.
- 11) System Inputs & Outputs: Institutional effectiveness focuses on student development of complex abilities (system goals). Value-added is the difference between entry and exit student performance. "Learning that Lasts" is measured longitudinally.
- 12) Cooperation: Cooperation is required in open social systems. Designing the system to focus faculty effort on student development compels cooperation. Faculty must work together to define expected student abilities, develop operational definitions and criteria for performance, assess student performance, and provide feedback; they must strive to analyze results, evaluate progress across courses and programs, and improve the process.

Quantity Model

(Course-Credit-Completion, circa 1890)

- 1) Graduation is contingent on completion of a set of courses at a given minimum GPA.
- 2) The *espoused mission* may be learning, but *mission-in-use* often focuses primarily on increasing resources and reputation.
- 3) When system goals are explicit (rare), they are generally highly ambiguous. Even most degree programs are designed in terms of required courses rather than development of explicit KSAs. Lacking an explicit set of comprehensive student learning goals, individual courses evolve as discrete packets of knowledge. No mechanism provides information and feedback from various constituencies systematically.
- 4) System goals—if they exist—are highly ambiguous and not capable of being implemented; thus, course goals that may be operationalized cannot be systematically integrated.
- 5) Tests are the primary method of measurement, with instructors evaluating content knowledge. Grades represent the level of temporary knowledge acquisition. Intellectual skills and relevant attitudes are rarely measured.
- 6) Traditional departmental structure focuses on knowledge specialization and limits coordination and integration. Because there are no system goals to provide the basis for integration, general and major studies programs are coordinated by hierarchy—activating competition among colleges and deans. Students and faculty fail to see important relationships between the development of important intellectual skills in liberal learning and the demands of the major.
- 7) Students focus on completion of individual courses. Primary motivation is extrinsic and comes from completion of courses and the degree. Students experience extrinsic reward on completing courses and at graduation.
- 8) Knowledge is the focus of individual courses—seldom developed in the context of general abilities, demonstrated in an active performance context, or transferred across courses.
- 9) Curriculum is the "end" as well as the "means" for the learning process. No unifying principle compels connections between and across courses. Individual courses are structured by individual faculty members with limited outside interaction.
- 10) Typically, professors lecture while students listen, take notes, and read the course text. Feedback to students typically is limited to test results and cursory comments. Students are inclined to be passive rather than active learners.
- 11) Institutional effectiveness is determined by inputs and measured by standardized test scores (like, SAT, ACT, HSGPA, and HSR scores), faculty credentials, faculty-to-student ratios, and so on. Outputs are increased by increasing inputs, rather than by improving processes.
- 12) The course-credit model does not require or even encourage cooperation and interdependence. Rather, it encourages competition among faculty members and students. Students compete for grades. Faculty members rarely, if ever, collaborate to define outcomes, make curricula coherent, or assess individual student development across the curriculum.

Sources (revised): Mullin, Ralph F. and George W. Wilson, "A Violation of Assumptions about TQM: A Response to Jauch and Orwig," *Journal of Quality Management*, 1998, Vol. 3, No. 2, and *Learning That Lasts*, Mentkowski, 2000.

tion worthy of serious examination. According to Einstein, "insanity is doing the same things over and over again while expecting different results." Is it not time for sane people to consider a new strategy?

"There is nothing more difficult to take in hand, more perilous to conduct, or more uncertain in its success, than to take the lead in the introduction of a new order of things."

—MACHIAVELLI

Well over a decade ago, the then-president of The Carnegie Foundation for the Advancement of Teaching, Ernest L. Boyer, pledged to eliminate the Carnegie unit—the high-school equivalent of the course-credit model—in his lifetime. The Carnegie unit remains dominant today. Alexander Astin proposed the talent-development approach to classifying institutions as an alternative to the prevailing resources and reputational paradigms over 20 years ago. Yet that approach has virtually no takers today. We have had 30 years of incremental change resulting in pre-

cious little reform and no substantial and lasting results. We have had, in other words, a clear failure of leadership.

Alexander and Helen Astin, in January's issue of the *AAHE Bulletin*, define leadership as "a process that is ultimately concerned with fostering change...a purposive process which is inherently value-based." Robert W. Galvin similarly states, "A leader is someone who takes us elsewhere." Is there any better evidence that leadership, as Peter Drucker emphasizes, is rare? Rare or not, exceptional leadership is required to change our undergraduate system.

This challenging leadership process begins by increasing consciousness of how the fundamental values of most members of the academic community can be better supported and realized in a new system designed to develop students' capacities. University presidents and chief academic officers must demonstrate leadership that will transform their systems to achieve this goal. They must "take us elsewhere." This will not happen without redefining the job descriptions for presidents and chief academic

officers. Governing boards must select a new types of leaders, demand that they change the system, protect them while they do, and expect them to stay long enough to do the job.

Because presidential leadership is moot without faculty commitment and action, faculty must become agents of change and provide leadership in implementing the transformation. Accrediting bodies need to require schools to actually change graduation requirements from courses completed to developmental and comprehensive competence demonstrated—in addition to defining and assessing student learning-outcomes. No change in graduation requirements means no real change.

Governmental and private educational support organizations and foundations must encourage whole-system change while actively discouraging incremental reforms—quite the opposite of what they are now doing. The state governing boards' policies, standards, criteria—and rewards that are based on the prevailing model and measure the wrong things—must be eliminated or changed to measure and reward strategic efforts to replace the course-credit model with a talent-development approach.

We can continue to "adopt the trappings of process...[and] engage in its required rituals," as Ewell says about some past reforms. We can, as he says, refuse to take action to change the system, because systemic change is "a hard place to begin a conversation indeed." We can continue to practice the kind of "virtual adoption" described by Birnbaum and give failed incrementalism another 30 years—continuing to "suffer while Evils are sufferable." Or we can undertake the hard, long, and risky work required to lead a revolution and change the system. Choose one.

Author's Note: *The author acknowledges assistance from Janet K. Marta and George W. Wilson. Portions of this article are taken from "It's the System," Assessment and Accountability Forum, Fall 2000 by Ralph Mullin; and "Quality of Undergraduate Education: Examining the Current Paradigm and System," Journal of Quality Management. Academy of Management, Vol. 5, 2000, pp. 1-22, by Ralph Mullin and George Wilson.*

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