Double-Loop Learning in Higher Education

By John Tagg

T he scenario is familiar to us all: A college is conscientiously trying to improve its performance on the array of challenges that go by terms such as "assessment," "retention," "accountability," and "general education." The president of the college appoints a task force to address these many interrelated issues, the third or fourth such group on

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the campus over a period of 20 years. The general-education program has been revised twice. The college had offered departments a series of grants to develop assessment plans for the better part of a decade, but these disappeared in a year of cutbacks. It had offered several learning-community courses, which also disappeared when the faculty involved retired—although the college continues to offer a first-year program and an honors program. In short, the task force discovers that most of the ideas proposed in their first brainstorming session have already been tried *on that campus*.

However, the task-force members also discover that there has been no systematic attempt to track the results of these vari-

ous experiments. In some cases, no data were gathered. In a few, studies were conducted for a year or so, then were discontinued once the program assumed permanent status. Overall, the institution has no evidence about what students learn in their courses or how long that learning lasts.

After two hours' discussion at their fifth meeting, a chemistry professor summarizes the situation as he sees it: "We're running in place. We take two steps forward, then slide back. Nothing we do makes any demonstrable difference."

"But if that's true," says the director of information technology, "then how do we even know if we're doing a better or a worse job? We don't." The task force adjourns until the next week with the following question echoing in members' minds: Does anything we do make a difference?

The Learning Gap

The most fundamental problem of colleges is that, in some respects, the people within them don't learn very well. That is largely true of the students, to be sure. College students who do well on tests of short-term recall may quickly forget what they have supposedly learned. Students who don't get the grades they want may "study harder" and, as a result, improve their grades. But whether this effort has any long-term benefit depends on how they were studying in the first place and whether they study differently or just more. If "study" means trying to commit to memory discrete items of information that might appear on a test, then doing more of it will lead both to remembering more in the short term and forgetting more in the long term. Doing more is not doing better unless what you are doing makes an important difference.

Colleges have a similar problem. Dissatisfied with their completion rates, they may "study" how to improve the situation. The results of these efforts, however, will usually be like those of the student who spends extra hours cramming for the test.

Most faculty, staff, and administrators in higher education genuinely believe in the importance of undergraduate learning and want to improve it. And many colleges innovate a lot, frequently in an effort to make those improvements. But in the domain of its core activities, the college doesn't learn easily. While faculty may innovate in their disciplinary research and may expand courses to cover new material or decide to offer new courses, when it comes to changing the basic pedagogy or the framework for student learning, faculty seem to have a learning disability.

Diane Halpern, professor of psychology at Claremont McKenna College, and Milton Hakel of Bowling Green State University have studied the application of contemporary cognitive science to college teaching. "We have found precious little evidence," they report, "that content experts in the learning sciences actually apply the principles they teach in their own classrooms. Like virtually all college faculty, they teach the way they were taught." Even experts in learning can't learn in their role as agents of the college. Even the young dogs can't seem to learn new tricks. Why?

Theories-in-Use and Espoused Theories

A major part of the explanation resides in the nature of colleges and universities as organizations. Why do people in an organization find some subjects essentially "undiscussable," to the extent that they change the subject when those issues come up? Why do people new to an organization, even after reading the written rules and going through initiation rituals, find many practices confusing and need to observe the old-timers at work for a while before they "get it"? Why is it that veterans of an organizational culture can correct novices when they make mistakes but often can't explain why what the novices are doing is unacceptable? Why, in other words, do people in organizations often behave in ways that even they cannot explain?

They do so for the same reason that people who advocate change in an organization's practices—for what seem to them good reasons—find that, even when no one opposes or disagrees with their ideas and even after months or years of careful planning and development, substantive change seldom happens. When things *do* turn out differently after a "reform," the results often exhibit a completely unforeseen and unplanned pattern of difference.

All organizations, not just educational institutions, operate using a set of tacit assumptions, often invisible even to those within them, about how people in the organization should behave. These assumptions are frequently at variance with the written mission. As organizational theorists Chris Argyris of Harvard University and the late Donald Schön of the Massachusetts Institute of Technology long ago pointed out, people's behavior in organizations is often governed by an unstated but systematic and logical set of rules, a *theory-in-use*, which can differ a great deal from what the same people would be willing to defend—their *espoused theory*. The result is that, as Argyris put it, "Managements, at all levels, in many organizations, create, by their own choice, a world that is contrary to what they say they prefer. ... It is as if they are compulsively tied to a set of processes that prevent them from changing what they believe they should change."

Single-Loop Learning and Double-Loop Learning

This is not to say, of course, that people in organizations—and colleges in particular—don't learn. Of course they do. But they learn most readily in a certain way and with certain constraints. Argyris and Schön, following Ross Ashby, a pioneering theorist in cybernetics and artificial intelligence, made an important distinction between two levels of organizational learning: single-loop learning and double-loop learning.
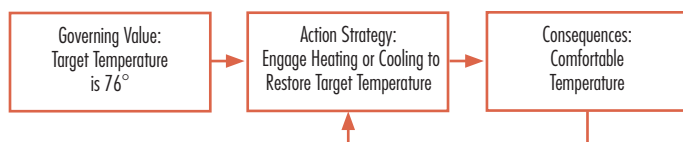
> When things *do* turn out differently after a "reform," the results often exhibit a completely unforeseen and unplanned pattern of difference.

We act most of the time out of habit, and most of the time habitual actions produce the consequences we hope for, or a reasonable facsimile thereof. It is usually when they do not that we are called upon to learn. Learning is a process by which we discover how to achieve our objectives or to correct or redress negative consequences of our actions.

We embark upon every action with some (usually unstated and often unconscious) assumptions about what we want to achieve and what it is possible for us to do—our *governing values*. When we are acting in an organizational context, these governing values are implicit in the organization's theory-in-use. If the action strategies we adopt within the constraints imposed by the governing values achieve the consequences that we seek, no learning is called for, except to the extent that a successful outcome tends to reinforce the strategies for action we have already adopted.

It is only when we do not achieve satisfactory consequences that we are called upon to revise our thinking and our actions—to learn something. Consider a very simple example, first posited by Ashby and elaborated by Argyris and Schön: a heating and cooling system governed by a thermostat. The thermostat is a very simple model of *single-loop learning*. The governing value in this system is the thermostat setting, say 76°. The "learning loop" as the thermostat changes the room temperature to the desired level might be diagrammed this way:

Under normal circumstances, the system will operate ef-

fectively in this way. But what if something from outside the system introduces a factor that the system's original assumptions did not allow for? For example, what if the humidity changes, so that what was a comfortable temperature yesterday becomes unpleasant today? Single-loop learning will no longer suffice.

When the single-loop approach fails to achieve a comfortable environment, the only way to get better results is to move up to *double-loop learning*. What needs to be adjusted now is not just the action strategy but the governing value itself. In the case of the thermostat, when 76° proves too warm for a muggy day with a room full of people, we need to adjust the governing value to 72°:
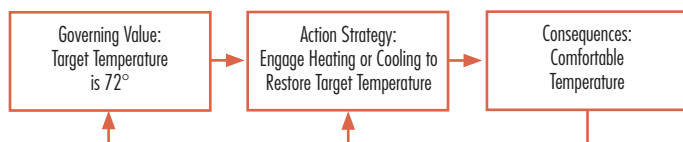
The distinction between single-loop and double-loop learning applies to much that we do in higher education. And it explains why most innovations, even those that produce unambiguously good results, fail to transform institutions. Most innovations alter action strategies without moving on to make the second loop and reexamine the governing values.

ORGANIZATIONAL HABITS AS GOVERNING VALUES

To find the values that govern a system's theory-in-use, don't ask people what they believe—watch what they do. The governing values that determine the institutional learning system are embodied in the standardized routines of educational practice. Some years ago, John Meyer and Brian Rowan, organizational theorists at Stanford University, characterized these routine practices as "ritual classifications." They include such things as the academic calendar, the class, the grading system, and the pedagogical practices. These are the operational components and metrics of the organization's theory-in-use.

These routine practices and formal classifications are largely invisible because we take them for granted. G. K. Chesterton's observation, "The things we see every day are the things we never see at all," is as true in organizational life as it is in personal life. These structural features and organizational habits are part of the theory-in-use of colleges but hardly even appear in the espoused theories of educators.

"One of the most difficult learning problems organizations face," says Argyris, "is to learn that they are not able to learn, *and* that the cause of this inability is the focus on what is taken for granted, namely, routines."

THE CALENDAR

Consider the academic calendar, which at nearly all colleges is structured on either a semester or a quarter system. The semester or quarter imports into most academic processes a governing value that constrains the action strategies available—in this case, mandating that all students should learn all subjects in, say, 16 weeks. That is the functional implication of the formal routine that all courses are offered in a 16-week calendar.

Within the parameters set by this governing value, faculty will pursue a range of action strategies. They will develop syllabi for all of their courses that attempt to cover a body of material that the "average" student might be able to handle in 16 weeks, and they will develop assignments and assessments that can be paced over the 16-week period. Sometimes this will work fine—but sometimes the consequences will be disappointing:
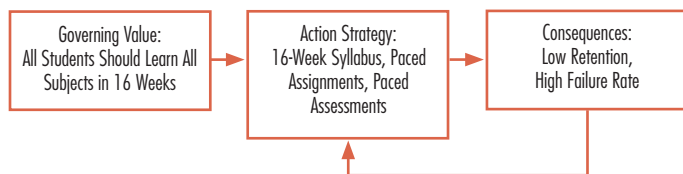
When the consequences are unsatisfactory, most teachers and institutions will take the single-loop approach by modifying the action strategies—changing the assignments and altering the assessments:
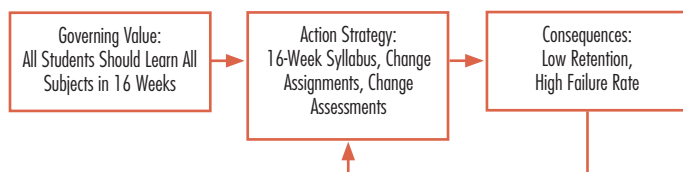
Sometimes these new action strategies will be effective. But many improvements will last only for the short run, and problems will recur.

When you consider yourself as a learner, you instantly recognize that you take longer to master some subjects than others. You may even recall the experience of being pre-pared for the final exam early in your math class, while you ardently wished for another two weeks to complete your term paper in philosophy. Or vice versa. Indeed, both the research and the rhetoric of higher education abound with the recognition of the cognitive and functional diversity of learners.

But that is our espoused theory. Our theory-in-use is tied to the governing value that tells us that all students are functionally alike. As long as we are constrained by that value, we will tinker around the edges without addressing the underlying problem. The situation calls for double-loop learning, for reconsidering the governing value:

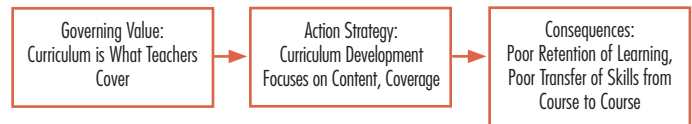| Governing Value: Different Students Learn Material at Different Rates | → | Action Strategy: Self-Paced Courses, Modular Courses, Variable Scheduling | → | Consequences: Improved Retention, Increased Success |

Modifying the governing value opens up a whole array of action strategies that were previously closed off. Mesa Community College in Arizona reorganized a "graveyard" math course into modules, allowing students to progress at their own pace but requiring them to successfully complete each module before advancing to the next. Students could take up to a year to complete the course, as long as they were making progress. The success rate in the course nearly doubled. At North Central Technical College in Wisconsin, one of its vocational programs allows students to move at their own pace, starting and completing courses when they get the work done without reference to the academic calendar. The experiment is still young, but it appears that different students take a range of different time periods to successfully complete the same sequence of tasks. California State University, Channel Islands, is giving students the option of selecting different amounts of time to complete a challenging gateway course.

All of these experiments have been successful; none has been expanded beyond a single course. Why? Because the theory-in-use in the institution as a whole, incorporated in the academic calendar, still prohibits the innovation. So it remains marginal, even when it works spectacularly well.

The Curriculum

The academic calendar is a formal framework for delivering instruction. The content of that instruction is the curriculum. If we look at the standardized routines that largely define the work of curriculum committees, we can see the governing value at work. Most curriculum committees operate under a theory-in-use that the curriculum is what teachers cover in their classes, so that is what the committees examine. This detemines the action strategies available to those involved in developing and revising the curriculum:

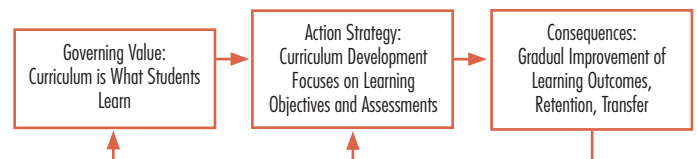| Governing Value: Curriculum is What Teachers Cover | → | Action Strategy: Curriculum Development Focuses on Content, Coverage | → | Consequences: Poor Retention of Learning, Poor Transfer of Skills from Course to Course |

The curriculum is hotly contested on many campuses. Faculty members, administrators, and staff expend enormous effort certifying, organizing, and validating—according to the rules in place—the definitions and content of classes. But there is substantial evidence that, for many students, curriculum in this sense doesn't make much difference.

Consider general education—the only curricular program at most institutions that applies to all students. Alexander Astin, the long-time head of the Higher Education Research Institute at UCLA, examined the effect of various general-education programs on 22 outcomes directly relevant to the expressed goals of general education. He found that "the particular manner in which the general education curriculum is structured makes very little difference for these twenty-two outcomes." In other words, the whole curriculum process at many institutions is much ado about not very much in terms of the outcomes of the process for students.

A single-loop approach to curriculum reform is likely to perpetuate current difficulties into the indefinite future. Juggling the courses students are required to take, altering the subject matter covered, or increasing bureaucratic oversight—none of this will substantially alter the outcomes of the curriculum as a whole.

| Governing Value: Curriculum is What Teachers Cover | → | Action Strategy: Change Content, Heighten Bureaucratic Oversight | → | Consequences: Poor Retention of Learning, Poor Transfer of Skills from Course to Course |

The fatal flaw resides in the governing value itself, which is embedded in higher education's standard routines. It is not the teachers who do the learning, it is the students. The only way to liberate the curriculum from the constraints of single-loop learning is to revise the governing value:

| Governing Value: Curriculum is What Students Learn | → | Action Strategy: Curriculum Development Focuses on Learning Objectives and Assessments | → | Consequences: Gradual Improvement of Learning Outcomes, Retention, Transfer |

If we adopt in practice the governing value that the curriculum is what students learn rather than what teachers teach, it will dramatically change the way we make decisions about it. The emphasis will shift from what teachers are doing to what students are doing. We will have to ask what we want students to learn in a course, what we want students to be able to do during and after a course. The traditional curriculum-committee questions will suddenly appear, at best, partial and sketchy. Instead, the means of assessing student learning and providing feedback to both faculty and the students themselves will become central action strategies for executing the curriculum.

Alverno College, in Milwaukee, Wisconsin, made the second loop some decades ago and restructured its curriculum around the ongoing assessment of student learning. As Marcia Mentkowski and her colleagues at Alverno put it, the curriculum is not simply a set of courses, it is a description of "learning experiences organized as frameworks for learning." In other words, it is primarily about what students do and only secondarily about what teachers do. Kings College in Wilkes-Barre, Pennsylvania; Olivet College in Olivet, Michigan; and California State University, Monterey Bay are examples of other institutions that have taken the second loop and defined what the curriculum means in terms of student learning.
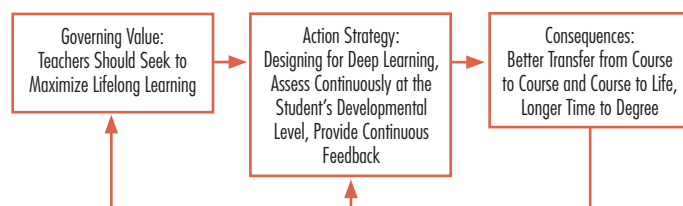
The Time Horizon of Learning

Faculty are apt to believe that the students coming into their classes are inadequately prepared. The solution generally is to propose changes in requirements and assessment to better prepare students for advanced work. But all of this innovation reflects a governing value embedded in both the calendar and the curriculum: that the goal of the classroom teacher should be to maximize what students know at the end of the semester or quarter, when the final exam is given.
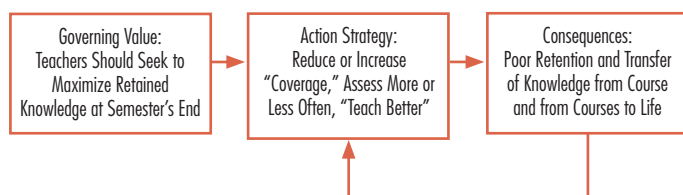
The issue here is what we might call the time horizon of learning. The time horizon that a person adopts in thinking about a decision or action depends on the answer to the implied question, "How long will I have to live with the consequences of this action?" We all invest less effort and involvement in choices that have a short time horizon than in choices that have a long one.

While a lot can be done by a single teacher in a single course, the time horizon for an isolated course is relatively brief. As long as the teacher's involvement ends with the term, students tend to see the course as ending with the final exam.

Of course, nobody in higher education espouses a short time horizon for learning. On the contrary, the term "lifelong learning" has gained such visibility in mission statements and presidential addresses that it has become a cliché. The phrase suggests a radically long time horizon for college-level learning. The double-loop route here, as elsewhere, is to introduce what we really believe into the governing value, to replace the organizational habit with the educational truth:

Here, taking the second loop will require a number of changes in organizational habits. We can best extend the time horizon of learning beyond the class by extending the framework of performance, feedback, and assessment. The student must be engaged in a project that will extend beyond the final exam. The feedback the student receives must be relevant to work that will carry on after the semester grade is in. Common assessments must be developed by teams of faculty rather than separately by individuals.

Portland State University in Oregon has developed a general-education program that exhibits double-loop learning. The general-education program there begins with a freshman learning community, which leads to a sophomore cluster of courses with a unifying seminar and then to the an upper-division cluster. The program concludes with the senior capstone, a collaborative project in which groups of seniors work under faculty supervision on community-based projects that result in a significant work product. Portland State is developing an electronic portfolio that will track the elements of the general-education program throughout the student's academic career. In this, they are following the example of colleges like Alverno and Olivet, which have used the portfolio as a means of extending the time horizon of student learning by seeing it in terms of long-term goals and tasks.

Staying Stuck

Meyer and Rowan pointed out that educational organizations get by only by adopting what they called "the logic of confidence"—assuming that if organizational habits are being followed, the organization is achieving its purpose. This obviates the need to examine either the work or its outcomes. So if classes are being taught, the formal rituals of education are being performed, and all is presumed to be going well.

But what are instructors actually doing in these classes? Nobody knows. Pedagogical practices are considered the private business of the teacher, protected by what Lee Shulman has called "pedagogical solitude." But there is almost certainly a lot of lecturing going on. Yet Ernest T. Pascarella of the University of Illinois at Chicago, and Patrick T. Terenzini of the Center for the Study of Higher Education at The Pennsylvania State University conclude in *How College Affects Students*, "with striking consistency, studies show that innovative, active, collaborative, cooperative, and constructivist approaches shape learning more powerfully ... than do conventional lecture-discussion and text-based approaches."

Pedagogical reforms bump up against what Argyris and Schön call *organizational defensive routines*. Argyris defines defensive routines as "any action or policy that prevents human beings from experiencing negative surprises, embarrassment, or threat, and simultaneously prevents the organization from reducing or eliminating the causes of the surprises, embarrassment, and threat." Among the most deeply embedded and intractable of organizational habits, defensive routines are the mechanisms by which the organizational theory-in-use protects itself from the espoused theories of the people who run the organization.

The logic of confidence leads colleges and universities to adopt a variety of defensive routines. Thus they reject even the most obvious ideas for solving the most obvious educational problems. Students can't do the work they need to in the semester? The obvious solution is to give them more time. Students

who have completed the courses still don't have the knowledge and skills they need for more advanced work? Advance them on the basis of the demonstrated knowledge and skills instead of course completion. Students forget most of what they have learned within two months after the course is over? Assess them not just at the end of the course but on an ongoing basis. For all of these problems and many of the others that beset higher-education institutions, fairly clear and direct solutions exist that we fend off with our defensive routines.

LEARNING TO CHANGE, CHANGING TO LEARN

Colleges and universities today are assaulted by imperatives to increase access, decrease costs, increase diversity, manage athletics, work with high schools, and be accountable not merely to Tom, Dick, and Harry but also to their brother Mike, who serves in the state legislature. These issues are important. But the core challenge that will determine our ability to address any of them is to see our own theories-in-use and reconsider them when our wheels are spinning on sand and we can get no traction to move forward.

The problem that colleges face is that their defensive routines cover up their theories-in-use and make their governing values sacrosanct. One reason it is so easy to deflect conversations and questions about the espoused values of institutions is that often there is no publicly available evidence about the college's results, as was true with the hypothetical college described at the beginning of this article.

In the venerable story of the drunk crawling around under the lamp post, looking for the keys he dropped, the bystander asks where he was when he dropped his keys. "Over there," he replies, pointing to a bench some distance away.

"Then why," asks the bystander, "are you looking here?"

"Because," the drunk replies, "it's too dark over there."

Like the drunk under the lamp post, colleges look where the light is, and the light is not shining on their real values and purposes. The first step toward double-loop learning is to shine a light on what matters, the values built into an institution's operations. And if they are not producing the results we want, the second step is to change them. 𝖼

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