Using a Framework to Engage Faculty in Instructional Technologies

A conceptual framework enables faculty development planners to better estimate the potential effectiveness of various strategies

By **Nancy Chism**

Year after year and on survey after survey, the need for faculty development is consistently identified as a primary factor influencing the adoption of new instructional technologies in higher education.[1] Calls for faculty development have rarely been matched with extended discussion of how faculty grow and learn, however. We have been working without a conceptual basis. It is time to look at our assumptions and pursue more strategic routes to this important goal.

Existing activities to help faculty embrace instructional technology and use it well have been based on surveys of what faculty think about the value of instructional technology or what they feel they need to learn about it; literature on innovations and organizational change; or perceptions of faculty culture in higher education generally. This article builds on the premise that an understanding of how faculty grow in teaching is foundational to the intelligent use of any approach. It articulates a conceptual framework that will enable those who are planning faculty development efforts to be strategic about their work and to better estimate the potential effectiveness of various approaches for the context in which they are working.

How Faculty Develop in Teaching

The study of how faculty in higher education develop as teachers focuses on individual development as well as on the context in which this development takes place. Since it is widely acknowledged that faculty are professionals with a great deal of autonomy and that most have had little advance preparation for the pedagogical part of their work, the way in which individual faculty learn to teach has been studied as a type of on-the-job or experiential learning. Because this learning occurs within a social and organizational setting, however, organizational theory and change theory have also been found relevant. Both the individual and organizational dimensions are described in the model presented here.

Theories of individual growth in teaching in higher education have been informed by a long line of thinking that is often attributed to philosopher and educator John Dewey and social psychologist Kurt Lewin, as well as by the more recent contributions of psychologist David Kolb and organizational theorist Donald Schon.[2] This approach centers on faculty as problem solvers who learn through their experience of teaching by performing natural experiments, often at a very low level of consciousness.

The idea is that faculty learn to teach by engaging in cycles akin to the steps that have been described in literature on action research and depicted in Figure 1: planning a course of action, enacting their plans, observing the effects, and reflecting on the results for the purpose of informing a new cycle. These cycles go on fairly automatically as faculty develop and refine their teaching routines, but can become more transformative when a problematic situation is recognized. Realizing, for example, that students are not able to grasp an engineering or medical concept because they cannot visualize it, a faculty member may entertain a number of possible new ways to facilitate this learning and then experiment with one or more, such as using animations, interactive manipulation of graphical representations, or other types of technological solutions. The effect on student learning is observed, followed by reflection on whether this strategy should be used in the future, adjusted, or abandoned as a bad idea.

The power of this learning is that it arises from a felt need. The experimentation ensures that the learning is authentic rather than imposed, and the observation and reflection ensure that the innovation is monitored and adapted to the need. Given the cyclic nature of this model, the need actually arises from the reflection of the previous cycle, as faculty have monitored and reflected upon past actions. Hence, the cycles can be thought of as parts of an ongoing spiral, occurring frequently and with intensity during times of peak development and slowing down during times of routine practice. The developer can facilitate this process through arranging for supportive conditions that will nurture strong and continuous development activity.

As Figure 2 shows, this spiral is situated within the context of the campus and the respective disciplinary group of the faculty member. These are the main systems of values and assumptions regarding teaching that are communicated through policies, standard practices, administrator and peer pronouncements and actions, and organizational structures. The context can nurture individual growth in teaching by advocating, supporting, and rewarding it—or the opposite. It is thus important both to estimate the current nature of this context in providing support for faculty and to conduct organizational development and faculty development interventions simultaneously to influence change in the

Figure 1

Faculty Learning Cycle

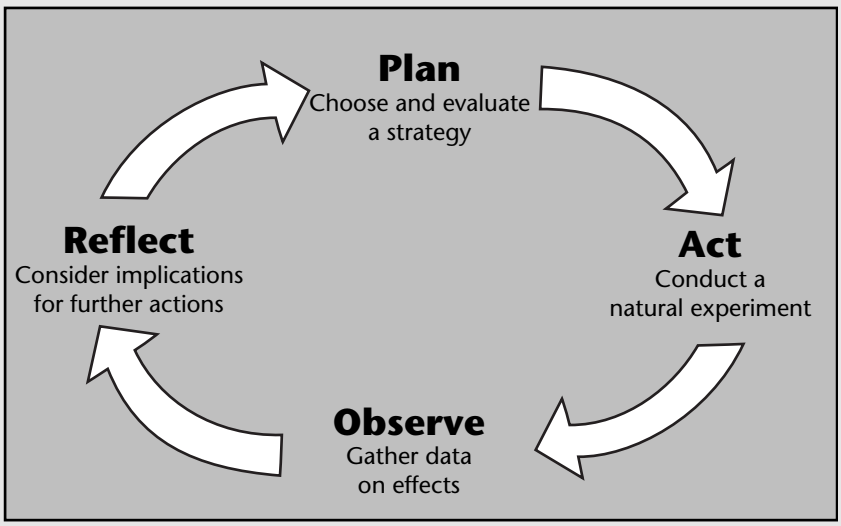
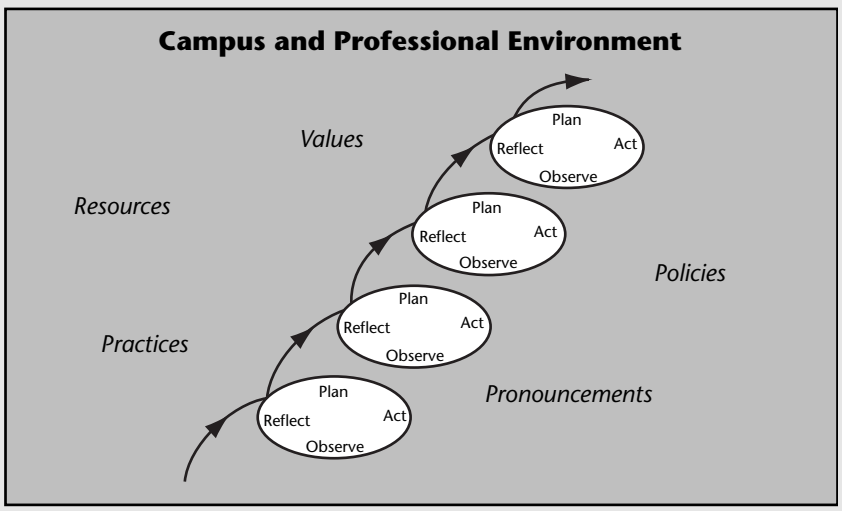


Figure 2

Faculty Learning in the Context of the Campus and Profession



environment as well as in individual practice.

Faculty can resist stimuli to engage in teaching development opportunities, and individual life situations and capacities influence how active the learning cycles of specific faculty members will be during any given period. The tendency to reduce complexity and stress by relying on routines is not unhealthy until it slows new learning to the point where burnout or ineffective practice occurs. At such times, the regular faculty performance appraisal process should generate signals that help is needed. This situation is an illustration of how faculty development and organizational systems (in this case, the appraisal and reward system) can complement and reinforce each other. It is also possible that the internal drive to grow in teaching may be so great that it will prevail even within unfavorable organizational climates or, conversely, that resistance may be so strong in an individual that even a supportive culture cannot influence it. While individual impetus and organizational support are considered together here, they sometimes operate independently.

Fitting Approaches to the Cycle

Working from the model of individual learning within the surrounding teaching context, developers can consider common approaches to faculty development in using instructional technology in terms of when and under what conditions a given approach is likely to succeed in their environment. Best of all, they can gain an understanding of why some attempts fail and others succeed. Approaches are suggested below for each of the four phases of the learning cycle (reflecting, planning, acting, and observing) in terms of developmental approaches and environmental support needed during each phase.

Reflecting

Within the developmental cycle, reflection occurs when faculty consider information on the effects of their past practice in terms of its implications for future practice. They may simply be bored with what they are doing, annoyed that they are not as efficient as they want to be, or, more likely, unhappy with the student learning that is occurring. They might have received some information that stimulates exploration of new options, such as poor student evaluations or good results from their initial forays in a new direction.

When moments of exploration occur, faculty mentally try out different solutions, selecting the ones that they judge most likely to be effective in the context they face.

Developmental gain depends on the quality and depth of this reflection, since it generates the next cycle of learning in defining a need to address or general direction to pursue. This is primary to efforts to engage most faculty in using instructional technology: they must first perceive an instructional need. Absent this need, experimentation with instructional technology is only attractive to the small number of faculty who are naturally intrigued with technology itself.

Developmental Approaches. Helping faculty surface needs through reflective practice is the major way in which developers can facilitate growth at this point in the cycle. This step is independent of the question of technology use in itself, yet it creates the conditions under which technology may be embraced as a possible direction to pursue.

Important for sustaining motivation during this phase of the cycle is peer support. Although many think of reflection as a solitary activity, it is enhanced in a social environment, where probes, affirmation, and additional insights can be brought to the task. Faculty learning communities, teaching circles, or scholarship of teaching and learning groups can bring faculty into contact with peers who can help them extend their thinking in a supportive way. These have been used with documented success[3] for faculty development in technology adoption as well as in other domains.

For example, in the Faculty Learning Community model used by Miami University and several other institutions through a dissemination project, groups of about eight faculty members meet regularly to explore teaching issues. Whether about promoting critical thinking, large course instruction, laboratory courses, or any other topic, the conversations and the focus on individual or group projects stimulate faculty to think about their practices in these domains. Individual mentoring by a colleague or instructional developer might also enhance reflective activity.

Environmental Support. A culture in which reflection on teaching is supported by structures and resources as

well as advocated in pronouncements and policies is evidenced by

- the existence of adequate time for reflection to occur,
- units or individuals assigned to the task of creating occasions for dialogue on teaching (such as the teaching and learning centers on many campuses), and
- explicit encouragement and recognition of these efforts by administrators.

External pressures can also promote reflective activity. Structural strategies, such as changes in the academic schedule or classroom space, can create dilemmas that stimulate reflection for those faculty who normally avoid occasions to reflect. The need to teach a new course or revise a course, as well as student or administrator requests for increased use of technology, can also stimulate the birth of a learning cycle by creating an occasion for the faculty member to review past practice in light of new demands or opportunities. Indeed, student requests have been found to be a key stimulus to technology adoption on many campuses.

Planning

In addressing the need that arises from reflection on past practice, faculty can consider future teaching actions in terms of usual routines, or they can explore new possibilities. When moments of exploration occur, faculty mentally try out different solutions, selecting the ones that they judge most likely to be effective in the context they face. At this stage of the development cycle, information on the potential effectiveness of given courses of actions is thus important, as well as the size of the pool of ideas from which faculty can select.

Development Approaches. The developer can help promote growth at the planning point in the cycle by enriching the pool of ideas from which the faculty member can choose. The developer can also provide information and support that will help the faculty member judge the usefulness of the ideas for the context in which they might be employed. Modeling new practices and idea-seeding come into play here. Development is supported when faculty encounter solutions found effective by others or have access to a special resource, such as a reusable learning object in MERLOT,[4] that comes with an accompanying rationale and testimony to its effectiveness. Ideas encountered at past workshops and conferences may be surfaced and evaluated at this point.

Many faculty abandon or prematurely curtail experiments with new teaching approaches when they lack sufficient internal drive, confidence, or needed skills to realize their plan.

Even though the effectiveness of workshops is treated with some skepticism as a faculty development tool, workshops have a role in the cycle in that they introduce ideas that may later be embraced when the need occurs. The TLT (Teaching, Learning, and Technology) Group's (http://www.tltgroup.org/) emphasis on low-threshold applications, for example, led to the "59 Minute Workshop" series at Indiana University Purdue University Indianapolis (IUPUI), which exposed faculty to easy-to-implement technological innovations for enhancing their courses and led to printable one-page tip sheets (http://opd.iupui.edu/ctl/it/resources.htm). These ideas might not have been adopted immediately, but those attending the workshops left with a broader idea of what is possible for use later when an instructional need surfaces. If those who support faculty synthesize and disseminate these ideas into a best-practices database, they are supporting faculty in more ongoing ways. Other ways of helping faculty to recognize the promise of an approach include testimony from peers or from an instructional developer with experience in its use, as well as making available any synthesis of the research that has been done with the approach in question, contained in print or electronic publications.

Environmental Support. Creating a climate that emphasizes innovation includes providing resources for workshops and other vehicles for sharing ideas and exchanging information on effectiveness. Some campuses, such as The Ohio State University and IUPUI[5] have scheduled year-long programs of talks by national experts to address faculty on the potential of instructional technology and have associated these programs with key academic leadership, such as the provost, rather than the technology unit. Some disciplinary societies also foster exchange through conference sessions and Web descriptions. For example, the American Psychological Association's journal *Teaching of Psychology* has a special section called "Computers in the Classroom." Other societies circulate—generally to key leaders or faculty—occasional papers or Web collections that summarize results of studies of the effectiveness of instructional technology under specific conditions. (See, for example, the "Significant" and "Non-Significant Difference" pages assembled by Russell for TeleEducation at <http://teleeducation.nb.ca/nosignificantdifference/> and <http://teleeducation.nb.ca/significantdifference/>).

Acting

As faculty attempt to enact their plans, their work is influenced by their levels of energy and commitment, sense of support from the surrounding environment, personal tolerance for risk, and feeling of urgency about needing a new course of action. Support in implementing the innovation is paramount at this point in the learning cycle. Many faculty abandon or prematurely curtail experiments with new teaching approaches when they lack sufficient internal drive, confidence, or needed skills to realize their plan.

Development Approaches. Here, faculty development activities geared to providing support are important if the cycle is to continue. Faculty need help in dealing with snags as they try new methods. This can come from a peer or instructional developer experienced in the approach. Here is where hands-on, just-in-time help and troubleshooting are particularly important in instructional technology applications. A department technology consultant, centralized support in the form of student technology assistants or professional support staff, and departmental mentoring programs are examples of how this help can be provided.

Faculty also need personal encouragement from peers and instructional developers to sustain their energy and commitment. This can come through mentoring arrangements or regularly scheduled meetings of support groups organized by the department or central support team.

Environmental Support. Experiments can be much harder to enact if they are plagued by difficulties. Technology that works reliably, standard designs, and user interfaces that are easy for faculty to recognize and use are important to sustain innovation at this point in the cycle. Also important to experimentation are incentives such as release time to pilot test and refine ideas and recognition of innovation efforts within the reward system. Examples include internal grants programs for course development or encouragement of participation in national projects such as those sponsored by the Center for Academic Transformation (http://www.center.rpi.edu/) or the National Science Foundation. Those campuses that promote and actively support a culture of innovation and strive to be learning organizations provide a helpful backdrop for faculty experimentation.

Observing

As experiments with new teaching strategies are enacted, faculty learn of their effectiveness at this point in the cycle through gathering data about impact. At a very basic level, they may judge this by simply looking at students (except in a virtual environment) to see what kind of response is occurring. They may seek more knowledge by asking for informal oral or written student reactions periodically or using a mid-semester course evaluation process. To get deeper information, they will look at the impact on student learning by evaluating student products or performances on tests of various kinds. They may analyze these findings in comparison to those found in past courses or look for patterns of error or success associated with the new approach. The extent to which faculty collect systematic and meaningful data is critical at this point in the cycle.

Development Approaches. Helping faculty approach experimentation in a scholarly way is the development task at this point. On many campuses emphasis on assessment strategies and classroom research has increased faculty awareness of the benefits of inquiry on teaching practices. Sometimes support in doing this research can come from a campus group. For example, the University of Central Florida has had great success in helping faculty assess the results of experiments with technology through its Research Institute for Teaching Effectiveness program.[6] Tools or methods for collecting information may also be contained in best practices compilations or reusable-learning-objects banks supported by individual campuses.

Environmental Support. Collaboration of the campus technology and institutional research units is important in assessing the impact of use of instructional technology. Making course statistics readily available, either through data collected by a course management environment or information on student demographics, can help foster the collection and use of good information by faculty. Also helpful is making available such resources as the Flashlight tool of the TLT Group[7] or having site licenses for common qualitative and quantitative research tools, such as databases, text retrieval systems, and statistical packages.

While not aimed exclusively at the assessment of technology innovations, the Scholarship of Teaching Initiative of the Carnegie Foundation for the Advancement of Teaching and the American Association for Higher Education fosters inquiry and suggests ways of approaching course-based assessment. (See the resources at <http://www.carnegiefoundation.org/CASTL/highered/resources.htm>.)

Discussion and Conclusions

A common recommendation of those engaged in faculty development for instructional technology is to situate such efforts in teaching and learning rather than in technology. The model described in this article takes this advice as a starting assumption, showing how blends of approaches typical to any pedagogical development effort, as well as those specifically geared to instructional technology, are important for substantive change. The idea is to make technology use integral to faculty's teaching practice rather than allow it to take on the status of an add-on or curiosity.

Major observations about the model and its implications for supporting faculty adoption of instructional technology include the following:

- *The primacy of the problem or need.* As many have observed, interventions promoting instructional technology are likelier to succeed if they emanate from a felt need on the part of the faculty member concerning ways in which students can learn better. Deeper faculty development that prompts critical reflection on practices and their effects is required to stimulate the need to change. In some cases, however, structural changes in the environment or student or administrator suggestion can prompt this activity.
- *Just-in-time ideas and skills training.* Although ideas may be regularly seeded out to create a level of awareness that may later prompt faculty to seek more information, the timing of idea dissemination is very

important. Ideas posed in response to a need are far more likely to be considered than those promoted when satisfaction with routines is the prevailing state. Similarly, skills are best learned in the context of using them for a real purpose, underlining the importance of project-based work or consultation.

- *Mentors and consultants.* Coaching by experienced peers or instructional developers is important at several stages of the process. Rather than merely being highly proficient technologically, however, these people need to be knowledgeable about teaching and learning and capable of understanding differences in disciplinary approaches to teaching and learning. They need coaching skills, as well. Assuming that past innovators or skilled technology assistants can do this work is risky. It is unlikely that the "lone ranger" profile of many innovators indicates that they are comfortable with coaching or talking about teaching and learning dilemmas. Quite possibly instructional developers will need to serve as a conduit between technology staff and faculty.
- *Incentives and rewards.* While both are important, they are far less so than the existence of a felt instructional need. Extra time during experimentation and reflection is critical, as is the existence of support and approval for the work. Although faculty often lament the lack of rewards such as promotion and tenure, these have been shown repeatedly[8] not to be as salient to the learning cycle, which feeds off intrinsic motivation.
- *Differences across faculty.* Everett Rogers' work on adoption of innovation[9] has inspired many who write about faculty adoption of technology. His use of categories such as "entrepreneur" and "early adopter" has helped distinguish among different types of faculty. An understanding of the learning cycle may generate strategies for working with specific populations. For example, several writers have suggested that reluctant faculty are more likely to be motivated by extrinsic than intrinsic rewards.[10] If so, the reward may be acting as an opportunity that stimulates the beginning of a development cycle. Helping such faculty to surface and explore solutions to instructional problems is an alternate way to stimulate growth.
- *Importance of organizational development to the success of faculty development.* Promoting faculty change in the use of information technology goes hand-in-hand with organizational development. Efforts taken to foster a climate of experimentation focus on leadership, rewards, policies and procedures, and resources. For example, information on faculty innovation in teaching, specifically use of instructional technology, can be solicited as part of annual, third-year, or promotion and tenure reviews, and grants and awards for use of instructional technology can be provided.
- *Connections between experts in teaching and learning and those in technology.* Centralized and distributed support for faculty using instructional technology must be organized in a way that connects those who know about learning theory and teaching strategies and those who know about technology. While some staff may be proficient in both, it is more likely that connections will need to be made between those in the technology unit and those in the teaching center. Ideally, joint appointments, a specialized technology staff within the teaching center, frequent staff exchanges, or an overarching advisory committee across the units would bring everyone providing support into a common working understanding of how to build on the faculty learning cycle in delivering services.

Efforts taken to foster a climate of experimentation focus on leadership, rewards, policies and procedures, and resources.

Faculty are critical to the successful use of instructional technology in higher education. Developmental approaches rooted in an understanding of how faculty grow in teaching and how this growth is influenced by their organizational environment are more likely to produce lasting change than those that are not. For this reason, it is important to continue to discuss different ways of modeling the learning to teach process so that efforts to influence it are intentional and effective. *e*

Endnotes

1. For example, see G. Crawford, J. A. Rudy, and the EDUCAUSE Current Issues Committee, "Fourth Annual EDUCAUSE Survey Identifies Current IT Issues," *EDUCAUSE Quarterly*, Vol. 26, No. 2, 2003, pp. 12–26, and K. C. Green, *Campus Computing 2002: The 13th National Survey of Computing and Information Technology in American Higher Education* (Encino, Calif.: The Campus Computing Project, 2002).
2. Key works of these authors generally cited in the development literature include J. Dewey, *Experience in Education* (New York: Collier and Macmillan, 1938); K. Lewin, *Field Theory in Social Science* (London: Tavistock, 1952); D. Kolb, *Experiential Learning: Experience as the Source of Learning and Development* (Englewood Cliffs, N.J.: Prentice-Hall, 1984); and D. Schon, *The Reflective Practitioner: How Professionals Think in Action* (New York: Basic Books, 1983). A good synthesis of these ideas for faculty development is in O. Zuber-Skerritt, *Professional Development in Higher Education: A Theoretical Framework for Action Research* (Brisbane, Australia: Griffith University Center for the Advancement of Learning and Teaching, 1991).
3. Information on faculty learning communities appears in M. Cox, "Faculty Learning Communities: Change Agents for Transforming Institutions into Learning Organizations," in *To Improve the Academy 19*, D. Lieberman and C. Wehlberg, eds., 2001, pp. 69–93. Other ideas are described in K. Quinlan, "Involving Peers in the Evaluation and Improvement of Teaching: A Menu of Strategies," *Innovative Higher Education*, Vol. 20, No. 4, 1996, pp. 299–307.

4. MERLOT stands for Multimedia Educational Resource for Learning and Online Teaching, which is a repository of learning objects and approaches sponsored by the National Learning Infrastructure Initiative of EDUCAUSE; see the MERLOT Web site: <http://www.merlot.org/>.
5. See archived files from <http://cio.ohio-state.edu/planit/techdays.html> and <http://online.iupui.edu/conversation.html>.
6. See <http://pegasus.cc.ucf.edu/~rite/>. This program encourages faculty to assess the results of their course redesigns by providing professional data collection and analysis assistance, using course statistics and other information.
7. Flashlight is a tool for assessing learning and other outcomes of using instructional technology. It was developed by Stephen Ehrmann and associates of the TLT Group; see the TLT Group Web site: <http://www.tltgroup.org/programs/flashlight.html>.
8. W. J. McKeachie, "Wanting to Be a Good Teacher: What Have We Learned to Date?" in *Teaching Well and Liking It: Motivating Faculty to Teach Effectively*, J. L. Bess, ed. (Baltimore: Johns Hopkins Press, 1997), pp. 19–36.
9. E. M. Rogers, *Diffusion of Innovations*, 4th ed. (New York: The Free Press, 1995).
10. See J. F. Chizmar and D. Williams, "What Do Faculty Want?" *EDUCAUSE Quarterly*, Vol. 24, No. 1, 2001, pp. 18–24; P. R. Hagner, "Faculty Engagement and Support in the New Learning Environment," *EDUCAUSE Review,* Vol. 35, No. 5, September/October 2000, pp. 27–37; P. R. Hagner, "Interesting Practices and Best Systems in Faculty Engagement and Support," an NLII White Paper, <http://www.educause.edu/ir/library/pdf/NLI0017.pdf> (accessed on August 12, 2003); and P. R. Hagner and C. A. Schneebeck, "Engaging the Faculty," in *Technology-enhanced Teaching and Learning,* EDUCAUSE Leadership Strategies, No. 5, C. Barone and P. Hagner, eds. (San Francisco: Jossey-Bass, 2001), pp. 1–12.

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