1-1-2005

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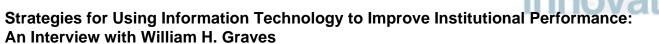# Strategies for Using Information Technology to Improve Institutional Performance: An Interview with William H. Graves

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Strategies for Using Information Technology to Improve Institutional Performance:
An Interview with William H. Graves
by James L. Morrison and William H. Graves

William H. Graves is professor emeritus of mathematics at the University of North Carolina (UNC) at Chapel Hill. From 1989 to 1997, he also served UNC as senior technology officer (under various titles) and as founder and director of the Institute for Academic Technology. Graves took leave from the University in 1997 to found the nonprofit Collegis Research Institute (with support from Collegis, Inc.). In 1999 he retired from UNC to found Eduprise, an academic technology services firm that subsequently merged with Collegis, Inc. The company is now known as SunGard Collegis Inc.; Graves serves as senior vice president for academic strategy. He is a pioneering leader in helping higher education better manage information technology (IT) and apply it to improve institutional performance.

I sat down with Graves at the October 2004 EDUCAUSE conference in Denver. In the interview, he elaborated on the key ideas published in his first column for *Campus Technology* (Graves 2004).

James Morrison [JM]: Bill, many people are concerned about the increasing costs of IT on college campuses, in public schools, and in corporate and governmental training domains. Some doubt whether the cost is worth it. You argue that IT is not only a necessary cost that must be managed, but an investment that can pay off in measurable institutional performance improvements, including improved learning outcomes and reduced per-credit expenses. Can you elaborate on this argument?

Bill Graves [BG]: Jim, I believe that IT is a necessary competitive cost for providing ubiquitous access to the new Internet-enabled modes of transacting services and creating, sharing, discussing, and archiving knowledge. Most of your readers probably would agree that any educational organization is at peril if it provides a poorly integrated set of administrative and academic applications via a poorly supported, unreliable network—or if it provides no IT at all!

How can IT improve institutional performance in an educational organization? As a starting point for this discussion, it might be helpful to step outside the field of education and consider how banks have used technology to redesign their traditional services. Today's banking services are based on a customer-centric and cost-effective flex services model that combines convenient, online self-service with alternative access options for securing expert help when customers need or want it. Automated teller machines are the most familiar form of self-service, but online banking (from any Web connection) can provide self-service at its best by allowing customers to manage their accounts, set up automatic deposits and payments, apply for loans, and so on. Most banks also provide toll-free or online access to a customer-service representative during extended hours or even 24/7. And face-to-face help is available during business hours in convenient branch locations and the main office.

Bankers don't market "distance banking" and label customers as "traditional" or "nontraditional." They realize that different customers have different needs and preferences for how they obtain services. Banks also know that time-shifted online self-service can reduce costs while increasing customer satisfaction, which is why they frequently offer incentives for self-service. As a group, banks outsource and merge or partner with each other to lower unit costs and enlarge the customer base to a level commensurate with ever-growing competitive pressures on profit margins. The result is that banks can more effectively compete for and retain customers. Some banks will succeed in this increasingly competitive environment; some may not. The outcome depends on how the redesign effort and resulting services are executed to improve service quality and lower service costs.

JM: This kind of redesign makes sense for banks, but how does the model apply to educational organizations and justify the expense of such systems? Can you give an example, perhaps one related to higher education?

BG: Consider two examples. Each illustrates a different technology-enabled redesign strategy for improving institutional performance.

First, Benedictine University is a nonprofit, independent university facing a range of competitive pressures. For example, within the Chicago area, it competes with other institutions (including the for-profit University of Phoenix) to attract students interested in earning an MBA. Benedictine accordingly set a goal to increase its MBA enrollments and to increase the "profitability" of the program. Using technology, the university developed a more flexible version of the traditional MBA program; the resulting Web*Flex* MBA features significantly reduced requirements for real-time student/instructor interaction as well as a host of 24/7 support services for students. A second redesign of the program targets students who cannot or will not participate in real-time interactions; this version is fully online and has no synchronous requirements to preclude enrollments from outside the Chicago market. To fill gaps in its internal resources and improve time-to-market, Benedictine has outsourced some support services, including those that help faculty members plan and implement the new programs. So, with a *program and service flex redesign strategy*, Benedictine has met its enrollment and profitability goals, and it now competes more effectively and efficiently for students in terms of quality, flexibility, and price. Other successful flex examples include UMassOnline, UBOnline (at the University of Baltimore), and the Tennessee Board of Regents' Online Degree Programs.

Second, Virginia Tech has been recognized for its innovative Math Emporium. A faculty team from the math department successfully redesigned the core linear algebra course by eliminating traditional contact-hour activities in favor of as-needed help provided in the midst of guided self-study and problem-solving activities. All of this takes place in an emporium-like computer lab study space. The redesign ultimately improved the course's learning outcomes while reducing its direct per-enrollment instructional expenses by 77% (Center for Academic Transformation n.d). The Math Emporium is an example of the *common-course redesign strategy*. The University of Hawaii is another system that has started a course redesign project (in conjunction with the National Center for Academic Transformation).

JM: What can institutions learn from the Benedictine example?

BG: The strategy illustrated by Benedictine is effective for addressing workforce and economic development needs, institutional capacity, and the competitive aspects of market segmentation. Like the banking example, the idea is to offer individually customizable services while eliminating or relaxing inflexibilities and inconveniences in the delivery of academic and administrative services and programs. The goals are as follows:

- to reduce requirements for real-time interactions between students and faculty and staff by providing
  - more online, time-shifted (asynchronous) instruction and self-service;
  - less contact-hour instruction, regardless of whether faculty/students are in the same classroom or interact in real time online or in a televideo classroom;
  - fewer face-to-face or scheduled non-instructional service transactions; and
  - more customized services when needed by the individual;
- to increase students' options for conducting service transactions, scheduling courses, studying, getting expert help, and completing a degree program;
- to increase enrollment capacities; and
- to reduce dependency on the semester model.

JM: So, the flex redesign strategy applies both to non-instructional and instructional services?

BG: Yes, it applies to almost all non-instructional services and selectively to academic programs. The customizable, self-service *portal* captures the concept of flex services and promises to integrate administrative and academic services while increasing service access and flexibility. Many colleges and universities have implemented a campus portal, typically after migrating their administrative "back-office" systems—financial, human resources, and student information systems—to the latest technologies. In the system migration process, these campuses redesigned key administrative service processes in order to avoid bolting the new system onto old service processes at additional, ongoing expense. When migration and redesign are accomplished together, the benefits include the following:

- a smaller administrative staff or an increased administrative capacity to serve more students—which means better integration of data and services between departments (e.g., the admissions and business offices);
- evidence-supported academic decision-making based on data (e.g., admission yields, projected net revenues from tuition, per-credit expenses, and so on);
- improved satisfaction among students, alums, instructors, and staff members; and

JM: This model makes sense for administrative services, but how does it apply to academic programs?

BG: The focus is on redesigning degree and certificate programs for flex delivery to students who cannot (or prefer not to) participate in curricula that require a significant amount of real-time interaction. Programs with high demand or those that respond to economic, professional, or workforce needs are the target. Such programs might include business, nursing, teacher training and certification, college preparatory programs, and general-education clusters or programs.

To be successful, the institution must understand the delivery and pricing factors that will allow a selected program to compete in a targeted market; it also must balance these factors with any necessary requirements for real-time student/instructor interactions. Any effort to develop a flex academic program is likely to fail unless it carefully addresses a number of success factors, such as:

- understanding the targeted student profile,
- understanding the delivery modes preferred by the targeted students,
- assessing the competition and pricing elasticity,
- providing appropriate marketing and recruiting services,
- understanding effective instructional design practices for flex programs,
- providing professional instructional design and course development support for faculty members and instructors, and
- providing all of the instructional and administrative flex services required to support flex students and their instructors.

JM: Let's turn to the common-course redesign strategy. Please define it and explain its significance.

BG: The common-course redesign strategy, illustrated by Virginia Tech's Math Emporium, is used to measurably improve learning while also reducing direct instructional expenses for common courses that account for a significant percentage of all enrollments.

If you begin an ordered list of the largest-enrollment courses (counting all course sections) offered by your institution and stop the list after cumulative enrollments account for 40-50% of total institutional enrollments, you will make two striking discoveries. First, you will notice that there are only 20-35 courses on your list, despite an expansive course catalogue. Second, you will notice that almost all of the courses are taught at almost all other institutions around essentially the same subject matter. These common courses include developmental and basic skills courses, required introductory courses in the general education program or in

a few high-demand degree programs, and high-demand general education electives.

The significance of common courses lies not only in their contribution to institutional expenses, but also in their impact on retention and graduation rates. Their significance justifies using redesign strategies pioneered by the Center for Academic Transformation. With funding from the Pew Charitable Trusts, the Center offered grants to 30 institutions as each redesigned one general education course. The preliminary results demonstrate that such courses can be redesigned to improve and account for student learning while simultaneously reducing per-enrollment direct instructional expenses "by about 40 percent on average, with a range of 20 percent to 84 percent," according to the Center director (Twigg 2003, 30). When applied systematically over a period of years to almost all common courses, the potential for improved learning outcomes and institutional financial performance is sizable—an overall savings of 8-10% of institutional expenses (see Exhibit 1 for an extrapolation).

JM: Can you identify the basic tenets of common-course redesign?

BG: There is no one-size-fits-all model for common-course redesign, but the Center for Academic Transformation has aggregated various practices into five basic models (Twigg 2003). The common denominator is a collaborative effort by a faculty and administrative services team to

- plan and implement the redesign and ensure the academic quality and integrity of the effort;
- focus on the course, not course sections;
- emphasize active and collaborative (social) learning and mastery feedback assessments;
- assign learningware and other digital materials for self-study;
- customize, to the extent possible, guided study and assistance from faculty members and instructional assistants to students' unique needs;
- document differences in course learning through before-and-after or in-parallel comparisons;
- use common assessments—perhaps externally prepared and graded—and other quality-assurance strategies, as appropriate; and
- realign faculty tasks without increasing faculty labor.

Faculty tasks often are realigned with tactics that happen to increase the student/instructor ratio and, thereby, reduce per-enrollment direct instructional expenses. Such tactics include the following:

- offloading course management functions to a course management system;
- instituting team-teaching, in which instructors "divide and conquer" the syllabus instead of each instructor being responsible for the entire syllabus;
- using lower-paid course assistants for functions that do not require faculty expertise or experience;
- using testing software to deliver and grade practice quizzes and required exams; and
- focusing faculty expertise and interactions on those students who require or desire faculty assistance.

JM: Are the two redesign strategies that we have discussed mutually exclusive?

BG: Not at all. For example, Ocean County College (OCC) near the New Jersey shore is using both strategies. OCC offers a traditional nursing program; for a select group of people who already work in the healthcare field and are interested in becoming registered nurses (RNs), it also offers a flex version of the traditional RN program. The flex program requires only one day per week of site-based learning and clinical experience. It increases the capacity of OCC's existing classroom plant by reducing required contact-hour interactions, and it increases the faculty's capacity to work with more students by redesigning the common (required) courses in the nursing program. Students benefit because they can keep their healthcare jobs while enhancing their professional credentials and opportunities for advancement.

OCC is also redesigning a high-enrollment introductory psychology course (as part of the [Roadmap to Redesign](#) initiative) and common courses in developmental math and Western civilization (with support from other contracted resources). All three courses will have reduced contact hours and, in the long term, should lead to the advantages we discussed earlier: increased enrollment capacity, more flexible options for students, and reduced instructional expenses.

JM: What barriers might prevent interested educational organizations from applying technology via the redesign strategies you've described?

BG: Two primary barriers come to mind. First, effective and efficient service redesign requires a robust IT infrastructure and a technical support organization that can contain expenses, satisfy users, and support institutionally selected projects. Some institutions will have tactical IT barriers. Many are too small to afford a reliable, ubiquitous, and well-supported IT infrastructure; they may need to outsource IT services or share services with other institutions in order to achieve economies of scale. Even a larger institution's central IT unit may be inadequate or dysfunctional, suffering from weak leadership, bad management, a weak service mentality, and/or staff recruiting and retention difficulties. The first step in removing these barriers is to assess the IT budget. (A good source of IT expense data is EDUCAUSE's [Core Data Service](#).) Adequate funding must be combined with sound internal or outsourced IT management as the IT foundation for improving institutional performance.

The second significant barrier is organizational will—the willingness of academic and administrative leaders to collaborate by (a) prioritizing organizational goals, (b) framing the goals in quantitative accountability and accessibility terms, and (c) supporting appropriate redesign strategies to achieve the goals. Executive leadership and faculty leadership are not always in sync, and the organizational strategic plan may not include performance metrics or link IT investments to strategic performance challenges. Moreover, the service redesign strategies that can improve academic and administrative performance are not yet part of strategic and IT planning at most institutions; they may have to be facilitated by external experts. Institutional leaders must be willing not only to provide adequate IT infrastructure and technology support, but also to manage the human issues associated with change.

JM: Assuming that it has a reliable, ubiquitous IT environment and the organizational will to proceed, how does an institution start the process of applying IT to improve institutional performance?

BG: Let me say first that today's higher education leaders are squeezed by two seemingly opposing forces: pressure to improve accessibility and accountability, and pressure to manage unreliable revenue resources (like state funding and state/federal subsidies, both of which are declining relative to other revenues). Many leaders are responding to revenue pressure by capping enrollments and raising tuition, thereby further increasing accessibility and accountability pressure. If administrators and faculty members agree to collaborate, however, the flex and common-course redesign strategies can help alleviate all of these pressures simultaneously. They might start with some of the following institutional performance issues:

- *Accountability as an academic quality issue.* Measure and report student learning as evidence of academic quality (e.g., benchmarks for grades, retention/graduation rates, and so on). The common-course strategy applies here, especially to the extent that exams in basic-skills courses and selected introductory courses can be standardized within the institution, a system, or a group of like-minded collaborating institutions.
- *Accountability as an expense issue.* Measure and report the unit expense of learning, such as the expense per credit, per full-time equivalent, and per graduate. The common-course redesign strategy applies here, especially as it incorporates flex courses as a means to increase both faculty and classroom capacity to drive down per-enrollment expenses.
- *Accountability as a responsiveness issue.* Respond rapidly to economic development and workforce needs with academic programs designed to meet the (flexible and custom) needs of strategic groups of employers, professions, and students. The program and service flex redesign strategy applies here.

- *Accessibility as a flexibility issue.* Deliver services and selected academic programs more flexibly and conveniently via a "flex" model, emphasizing online self-service supported with individualized, as-needed expert help. The program and service flex redesign strategy applies here.
- *Accessibility as a capacity issue.* Accommodate the growing demand for higher education. Both the program and service flex redesign strategy (classroom capacity) and the common-course redesign strategy (faculty capacity) apply here.
- *Accessibility as an affordability issue.* Hold to the Consumer Price Index on the rate of tuition and fee increases. Both redesign strategies also apply here (to improve faculty capacity, classroom capacity, and per-enrollment instructional expenses—and thereby reduce the need for tuition increases).

JM: Any last comments?

BG: When British mathematician and philosopher Alfred North Whitehead quipped, "Progress requires order where there is change and change where there is order," he couldn't know how well his idea applies today to managing and applying technology in higher education. Bringing order (management, integration, reliability, and support) to rapidly changing technologies may be the chief information officer's role, but applying technology to change the traditional academic order that has served higher education so well must be the shared role of faculty and executive leaders. High performance educational organizations and programs will accept the challenge, link their investments in IT to their highest academic and service performance priorities, and monitor and report the results against the expectations and metrics of the society they serve.

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