

VIRTUAL UNIVERSITIES

REAL POSSIBILITIES

By Rhonda M. Epper and Myk Garn

Virtual colleges/universities (VCUs), as we know them in the United States,¹ were created amid the technology boom of the mid-to-late 1990s. Technology in general, and distance learning in particular, seemed to hold great promise in solving a number of problems in higher education. The trigger event sparking the creation of VCUs was the announcement of the establishment of Western Governors University (WGU) in 1996. Before this, there were many successful distance education operations, but the idea of a “virtual” university, utilizing the inexpensive delivery mode of the Internet, was catalytic. WGU and companion multi-state initiatives, such as the Electronic Campus of the Southern Regional Education Board (SREB), established the basic concept of the VCU.

Rhonda M. Epper is Director of Online Program Development at Community College of Denver. Myk Garn is Senior Advisor for Distance Education at the Kentucky Council on Postsecondary Education.

State leaders took note. Many believed that distance learning could expand educational access and increase economic development and that putting resources into a consortial, multi-campus VCU made sense financially. Statewide agencies saw opportunities to explore, develop, and influence policy innovation outside of traditional structures. By the year 2000, almost every state in the nation had created some initiative or entity resembling a VCU.

Then 2001 brought an economic downturn, hitting the technology sector especially hard and driving more realistic assessments of the realities, costs, and payoffs of distance learning. In the following years, whereas Internet-based distance learning slowly became a growing enterprise for individual campus-based initiatives, the multi-campus consortial VCUs remained neither fully embraced nor fully understood by the higher education community. The VCU has been questioned as a duplication of institutional responsibility and an unnecessary layer of bureaucracy—especially during tight budget years. Yet one fact is certain: while policy leaders, institutional leaders, VCU leaders, and industry observers debate the value and appropriate role for VCUs, students are enrolling in courses via the Web sites and are using these services to meet their educational goals.





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A VCU Study

Multi-campus consortial VCUs were created for similar reasons in various states: to provide educational opportunities that would result in a better-educated workforce, personal prosperity for citizens, and a strong economy. These are all worthy goals, but leaders need greater understanding about whether the VCUs are meeting the goals for which they were designed. In 2002, more than five years into the VCU movement in the United States, very little was known about these organizations and their impact. In addition, very little guidance or research was available to help leaders determine the feasibility of creating or joining a multi-campus VCU. Neither were there benchmarks or measures by which state and institutional “investors” in VCUs could judge their success.

In response to the lack of research, in June 2002 the State Higher Education Executive Officers (SHEEO) and the Western Cooperative for Educational Telecommunications (WCET) jointly undertook a national study to examine the goals, functions, challenges, and outcomes of VCUs across the United States.² For the purposes of this study, we used the term *virtual college/university*, or VCU, to refer to distance learning consortia composed of public higher education institutions (two-year and/or four-year) within a single system or state. Multi-state initiatives, such as Western Governors University and SREB’s Electronic Campus, were excluded from the analysis, as were individual institutions. Single institutions sometimes refer to their distance learning programs as VCUs, and indeed some are quite significant (e.g., University of Maryland University College, Penn State World Campus). This study, however, examined only consortial, multi-institutional VCU initiatives. From October 2002 through January 2003, we sent surveys to the sixty-one U.S. organiza-

tions that met the definitional boundaries.³ In March 2003, we conducted in-depth interviews with six VCU leaders.

This article, based on the SHEEO-WCET study, summarizes six major findings regarding the progress of VCUs today, discusses the implications for institutional leaders and policy-makers, and sets forth a revised taxonomy that offers insights into possibilities for VCUs in the future.

Six Findings

Finding #1: Organizational Models

The VCUs appear to be gravitating toward two distinctly different service models: one is *centralized*, providing both administrative and academic services to students; and the other is a *distributed* service model, in which the VCU hosts an online catalog but institutions provide most of the services. There is also emerging evidence that some VCUs engage in business practices leading to sustainability and a perceived higher level of goal achievement.

- Since 1996, at least sixty-one VCU organizations have been established in forty-five states across the nation.
- Seventy percent of VCUs are accountable to a systemwide governing board or statewide coordinating board. Some are charged with a direct role in creating policy change on behalf of distance learners. All are subject to shifting political pressures that affect state higher education boards.
- Those VCUs with a strong focus on a particular sector (two-year or four-year) are more likely to have a centralized model. Those VCUs serving the entire statewide spectrum are more likely to have a distributed model.
- VCUs that have adopted business management practices, such as quality assurance, benchmarking, standardization, and scalability, experienced greater perceived success in achieving

their goals than did those that have not adopted these practices.

Finding #2:

Programs, Enrollments, and Students

Most VCUs are expanding access to geographically underserved populations. Over half (52 percent) of responding VCUs reported that the majority of their students were physically at a distance from a campus. On the other hand, 42 percent of VCUs identified campus-based students as their primary users. Whereas serving campus-based students has often been viewed as an unintended side effect of the VCU, it also represents a broadening of the definition of *access*.

- Multi-sector VCUs (those that serve both the two-year and the four-year sectors) offer access to a broader range of degree programs than do single-sector VCUs. Single-sector VCUs have limited degree programs but provide a higher level of service to support those programs.
- More than half of VCUs, especially distributed VCUs, do not collect or report enrollment data. Centralized VCUs are more likely to report enrollments, but variance is high. In some states, the VCU is a major producer of enrollments (10,000 or higher) for its member institutions. In others, the numbers are scarcely noticeable (less than 1,000).

Finding #3: Financing of VCUs

Most VCUs were initiated with direct or indirect state appropriations and continue to rely heavily on this funding source for operations. However, there is emerging evidence that some VCUs are building sustainable revenue streams as reliance on direct and indirect allocations has decreased slightly and the role of tuition and service fees has increased slightly since founding.

- Although there is a wide disparity among VCU funding levels, approximately one-quarter of VCUs are self-supporting.
- A subset of VCUs (20 percent) reported annual funding of “zero dollars,” indicating the presence of “bootstrapping” in establishing the funding for some VCUs.

Finding #4: VCU Goals in Transition

Out of twenty goals studied at a VCU's founding and at present, current goals appear more attuned to increasing state or system higher education efficiency and meeting state workforce needs. Though still among the highest priorities, providing access and serving the underserved—the traditional goals of distance education—have declined slightly in importance.

- The goals with the largest increases in importance are those related to higher education efficiency: increasing communication and collaboration; developing new courses and programs; leading in new learning technologies; and reducing costs.
- Seeing nearly as large an increase are goals that emphasize meeting state workforce and economic needs, such as creating a better-educated workforce and increasing economic development.

Finding #5: The VCU Role in Policy Change

The majority of VCUs (63 percent) are expected to play a role in system- or state-level policy change related to distance learning.

- VCUs believe their greatest impact on policy change has been in supporting inter-institutional collaboration.
- Centralized VCUs reported greater impact across the areas of tuition policy, duplication, articulation, and transfer than did distributed VCUs.
- Over half of the VCUs stated that ensuring the quality of online courses was solely a provider concern. Centralized VCUs are more than twice as likely to review and approve courses as are distributed VCUs.
- Less than half the VCUs are active in the standardization or scalability of VCU courses. Almost two out of three centralized VCUs, but only one in four distributed VCUs, play a role in these issues.

Finding #6: Progress and Impact

In general, the higher a VCU's funding level, the more likely it was to perceive that its overall goals had been met. Further, the more highly funded and more centralized a VCU, the more likely it was to report an impact on policy change (tuition policy, duplication, articulation, and transfer).

When VCU leaders were asked what they thought the lasting impact of the VCU would be, a common thread among responses was “bringing people together to make things happen.”



- Only 20 percent of VCUs have identified other VCUs to benchmark against. Another 20 percent expressly stated they saw no competition for the VCU.
- VCUs vary in their measurement of progress toward their goals. The most highly rated goal for VCUs—“expanding access”—is also the goal that VCUs measure most often.
- Three highly rated and rising goals—increase economic development, provide for a better-educated workforce, and improve the higher education response to state needs—are among the goals that VCUs measure least often.

Implications for Policy-Makers

When VCU leaders were asked what they thought the lasting impact of the VCU would be, a common thread among responses was “bringing people together to make things happen.” They thought their legacy would be to have set in place a collaborative structure and process that might be carried into future realms. Almost all of the VCU leaders interviewed envision a time when the VCU will no longer be needed.

The VCU was created with high hopes. But in fact, the VCUs that generated the most fanfare (i.e., Education Network of Maine, WGU) did not meet the early and grand expectations set out for them. With the rise and fall of the economy in recent years (not to mention a few years of experience), expectations today are more realistic.

The lingering question is, “Do VCUs add any value?” Undoubtedly, VCUs have brought information, services, and programs within closer reach for some students. VCUs have served as a catalytic force for change within some states and systems. Whether they will be permanent fixtures in higher education remains to be seen. State higher education boards should periodically assess whether VCUs are essential to meeting the complex set of

demands for online education or whether institutions alone can meet the need.

Over and over, VCU participants noted that one of their greatest challenges was a lack of understanding among leaders (especially institutional leaders) about the role and purpose of the VCU. Our research points to a need for greater understanding in the following areas:

- *Setting clear expectations for the VCU.* Expectations should be consistent with a VCU's organizational type and funding level. Almost all VCUs have as their major goal “expanding access.” Yet policy-makers should expect different results from a distributed VCU with no budget than they do from a high-service, high-budget VCU.
- *Defining VCU enrollments and users.* System and state higher education leaders should work in conjunction with VCU leaders to develop common definitions for distance learning enrollment. The relationship of enrollments to VCU effectiveness and efficiency is nebulous at best. Few VCUs can legitimately or accurately identify students as “VCU students.” Many of the VCUs neither generate nor manage the students who benefit from VCU policy efforts or use VCU infrastructure or services, and in all cases the courses and programs in which students are enrolled are accredited by the provider institutions. If policy leaders expect to assess the impact of VCUs on expanding access, statewide data collection must be revised to accurately reflect “real” VCU-supported enrollments and users.
- *Establishing VCU policy roles.* Institutions need to understand the role that the VCU is expected to play in statewide or system-wide policy change. Institutions are more likely to collaborate with an organization that has a clear mandate from the system or state and has the resources to accomplish its mission.

- *Holding the VCU accountable for measuring progress toward and meeting its goals.* VCUs should be encouraged to benchmark against peer VCUs.
- *Implementing sustainable business practices.* VCUs can build cost-efficient, sustainable models by taking more aggressive roles in collaborative program development, quality assurance, standardization, and scalability.

Finally, policy-makers need to remember that VCUs are still early in their organizational life-cycles. Most VCU leaders believe that they have met their goals in an overall sense but that there is much work left to do. Organizational maturity looms far in the future, and indeed it may never be reached. VCUs were once a policy innovation that nearly every state had to have—a home for entrepreneurial administrators and unruly academics. Although that spirit remains strong at the VCU, there is also a sense of responsibility and pressure to prove its value and long-term viability. This would be expected of any public institution, and in-

deed policy-makers should expect no less from the VCU.

A Revised Taxonomy

Researchers have proposed different classification strategies for VCUs. For example, David Wolf and Sally Johnstone's taxonomy classifies VCUs along a dimension of collaboration ranging from independence to highly distributed collaboration.⁴ Roughly, the four types are as follows:

Type 1 – Degree-granting

Type 2 – Central student services and academic articulation

Type 3 – Limited services; little or no articulation

Type 4 – Electronic course catalog; little or no services; no articulation

Yet conceptualizing VCUs along a single dimension of consortial collaboration (the degree to which VCUs link policies, programs, services, and infrastructure) provides too limited a view of the activities in which the VCUs are involved, their success in conducting the activities, and their im-

act on state-level goals and aspirations. Building on the 1999 Wolf and Johnstone taxonomy for VCUs, our research leads to a revised taxonomy, one that better represents current VCU structures and behaviors. Viewing VCUs along two dimensions—the degree of centralization and the degree of business practice implementation—provides a broader and more informative perspective on how VCUs are evolving. Table 1 shows these two dimensions, along with the four VCU models: (1) Distributed Agency Model; (2) Distributed Enterprise Model; (3) Central Agency Model; and (4) Central Enterprise Model.

In this taxonomy, VCUs are classified as either taking an approach of centralizing the management of services associated with online learning across a state/system (high centralization) or supporting a distributed environment of online instructional endeavors (low centralization). The taxonomy also considers how the VCU conceptualizes itself: as a quasi-independent business (high business practice emphasis) or as an academic agency (low business practice emphasis).

Table 1. VCU Two-Dimensional Taxonomy

	Low Business Practice Emphasis	High Business Practice Emphasis
High Centralization	<p>Central Agency Model: Provides central student services and academic articulation. Organizationally and financially embedded in an academic agency, such as a system office or coordinating board.</p>	<p>Central Enterprise Model: Provides central student services and academic articulation. May be organizationally embedded in an academic agency but behaves as a business enterprise by building revenue streams for self-sustainability and engaging in quality control, performance measurement, standardization, and/or benchmarking.</p>
Low Centralization	<p>Distributed Agency Model: Provides electronic course catalog, little or no services, and no articulation. Organizationally and financially embedded in an academic agency, such as a system office or coordinating board.</p>	<p>Distributed Enterprise Model: Provides electronic course catalog, few or no services, and no articulation. May be organizationally embedded in an academic agency, but engages in limited business practices such as quality control, performance measurement, standardization, and/or benchmarking.</p>

Distributed Agency Model

Distributed Agency Model VCUs have little direct control over services beyond the electronic catalog. On the other hand, these organizations report greater success

than centralized VCUs on “collaborative” measures, such as fostering collaborative program development, decreasing duplication, and being an entity less restricted by policy—goals that seek to increase the

effectiveness of higher education through processes that involve shared negotiations and a focus on participation. An example of a Distributed Agency VCU is the Oregon Network for Education, or ONE

(<http://www.oregonone.org>). Knowing the state needed a VCU that would serve student interests yet not be expensive to maintain, leaders in Oregon intentionally designed a decentralized model. ONE was initially funded through a FIPSE grant and is operated by staff members of the Oregon University System office. It operates an electronic catalog of distance education courses offered by colleges, universities, and high schools throughout the state. Admission, registration, tuition, financial aid, advising, and other services are handled by provider institutions.

Distributed Enterprise Model

Distributed Enterprise Model VCUs are similar to Distributed Agency Model VCUs in terms of the limited number of services provided through the VCU. However, Distributed Enterprise VCUs engage in practices such as self-sustainability, quality control, performance measurement, standardization, and benchmarking—attributes that scored high on the “business practice” scale (though in all cases, their participation in these activities was lower than that of Central Enterprise VCUs). An example of a Distributed Enterprise VCU is the Louisiana Board of Regents Electronic Campus, or BOREC (<http://epscor.phys.lsu.edu/lasrec/>). The electronic campus describes itself as a “shopping mall” that puts every technical college, community college, two-year institution, and four-year institution in Louisiana at students’ fingertips. The electronic catalog allows students to search for courses and programs and then instructs them to communicate directly with the institution for all aspects of their online experience. BOREC thus operates in the distributed VCU model. It qualifies as an enterprise VCU because it exercises a limited role in both quality assurance and standardization/scalability of the courses listed on its site. Additionally, BOREC actively measures progress toward its goals, scoring in the top five VCUs nationally for measuring progress.

Central Agency Model

Central Agency Model VCUs exercise greater management authority than distributed VCUs by providing direct services to students and formal articulation

among campuses. These VCUs also report greater success than distributed VCUs in leading technology initiatives, managing distributed resources, and centralizing resources—goals that focus on increasing the efficiency of higher education by focusing on technology and shared infrastructure. An example of a Central Agency VCU is the Ohio Learning Network, or OLN (<http://www.olin.org>). In Ohio, leaders identified a need for an entity that would help institutions collaborate in the development and delivery of distance education. Since its establishment in 1999, OLN has focused principally on building collaborative degree programs and digital content (via grants to institutions). It also runs an electronic catalog and recently has expanded its reach with student services, such as advising and online tutoring. Unlike most other agency VCUs, OLN is not organizationally embedded in a system office or state board. It is a program of the Ohio Board of Regents but reports to its own governing board made up of chief academic officers from public and private colleges and universities in Ohio.

Central Enterprise Model

Ten VCUs met the Central Enterprise definition (see table 2). Central Enterprise Model VCUs differ from Central Agency VCUs by exerting even stronger management control over their operations. All are self-sustaining or plan to become self-sustaining. In addition, the Central Enterprise VCU helps to improve the efficiency of the higher education system by meeting two or more of the following criteria: playing a strong role in quality assurance; playing a strong role in standardization or scalability; actively measuring its progress toward goals; and/or benchmarking itself against its peers.

The goal of self-sustainability was supported by findings that these VCUs place a higher funding emphasis on service fees (from institutions) and revenue sharing (partial

tuition), both of which provide revenue streams tied to volume. Central Enterprise VCUs were the most likely to take an active role in promoting standardization and scalability of instruction, addressing the issues that might dramatically increase (or impede) growth of VCU user volume and thus the revenues tied to that growth.

Central Enterprise VCUs also reported consistent attention to appropriate definitions of VCU “students” and “users.” For example, UMassOnline (<http://www.umassonline.net>) reports enrollments only of those students who are not matriculated as on-campus students, whereas Kentucky Virtual University, or KYVU (<http://www.kyvu.org>), counts only those users of specific KYVU services such as registration, portal, or course management software. Although these methods typically result in lower numbers than would result from counting all students in all courses that are listed on the VCU Web site, they represent attempts to provide policy leaders with more rational, relevant, and “real” metrics with which to assess the VCU’s impact.

Central Enterprise VCUs reported taking a strong role in three areas that other VCUs generally left to the institutions: (1) quality, (2) use of standardized course templates, and (3) scalability of the courses. Most reported that they reviewed—and many, that they approved—courses for quality. Second, most Central Enterprise VCUs reported that they either required or provided “master” courses or course templates to reduce

Table 2. Central Enterprise Model VCUs

Colorado Community Colleges Online
Connecticut Distance Learning Consortium
Kentucky Virtual University
Michigan Virtual University
North Carolina Virtual Learning Community
SUNY Learning Network (New York)
Tennessee Board of Regents Online Degree Programs
UMassOnline (Massachusetts)
UT TeleCampus (Texas)
Washington Online Virtual Campus



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duplication. Finally, Central Enterprise VCUs also reported that they encouraged the design and development of large-scale, high-enrollment online instruction, whereas other VCUs were far more likely to take no specific role in the standardization or scalability of courses.

Central Enterprise VCUs are also more likely to benchmark themselves against other VCUs, to actively measure progress toward more goals, and to provide an annual report of performance. In many cases, Central Enterprise VCUs were among the most highly funded VCUs. Of those reporting financial data, seven were funded at \$1 million or more annually. Central Enterprise VCUs also distinguished themselves by seeking a financial stability that would enable their operations to continue beyond state or system allocations.

As might be expected, Central Enterprise VCUs were likely to have a staff in excess of fifteen members (though not always: one reported a staff of two). The sectors that the Central Enterprise VCUs served varied, with about half serving multiple sectors and half serving single sectors. The predominant (60 percent) governance structure for Central Enterprise VCUs was reporting to a system office. Two reported to state coordinating or governing boards, and two reported to their own boards. Central Enterprise VCUs focused heavily on serving undergraduate students. Only two reported graduate enrollments larger than 20 percent of total enrollment, though for one of these, graduate enrollments were 80 percent of total enrollment. Of the seven Central Enterprise VCUs reporting data on the geographic location of their students, five reported serving primarily students at a distance from campus, whereas two reported serving primarily campus-based students.

The application of business practices appears to make these VCUs more effec-

tive at meeting their goals. An analysis of goals met (as perceived by VCU leaders) showed that Central Enterprise VCUs met their goals in every category to a higher degree than did other VCUs.

A good example of a Central Enterprise VCU is the University of Texas (UT) TeleCampus (<http://www.telecampus.utsystem.edu>). Launched in 1998, the UT TeleCampus was designed to serve as a central support system for the distance education initiatives of the fifteen campuses in the UT system. Early in its development, the UT TeleCampus focused attention on building support services for students and collaborative degree programs. With nine collaborative degree programs now in place, leaders describe the UT TeleCampus as a “collaboration engine” within the system. Quality Assurance (QA) is a driving factor behind UT TeleCampus operations, and in fact its QA model has spread to campus-based distance education initiatives, resulting in a general rise in the quality of online courses taught across the UT system. The UT TeleCampus supports standardization and scalability by providing templates that must be followed in course development and by encouraging multiple solutions for large-scale, high-enrollment (more than seventy-five students) online instruction. The UT Telecampus is planning to become at least 80 percent self-supporting within the next five years.

Concluding Thoughts

There were superior performers from both the central and the distributed VCU categories, but VCUs that implemented business practices—the enterprise models—were more likely to report success at meeting their goals than those that did not implement such practices. The key concepts contained in the enterprise models are inherently in contradiction to the culture of higher education. In fact, the degree to which traditional academic

values are violated likely increases as the VCU employs ever more entrepreneurial business practices. Yet the Central Enterprise VCUs indicated the highest overall success. One could hypothesize, though it is too early to conclude, that the most successful VCUs are those that deviate substantially from the attributes that higher education holds dear (e.g., faculty and institutional autonomy).


So, what do the data and findings from our research suggest about the permanence of the VCUs? Are they transitional entities that will be deconstructed and absorbed into the structure of the larger enterprise? Will they become ongoing internal entities, providing support and coordination of multi-institutional efforts? Will they emerge as self-supporting organizations that will serve and survive based on their ability to develop new client groups? Our research suggests that the ability to succeed involves whether the focus is on the external or front-end activities (such as providing an electronic catalog and learner services) or on the internal or back-end activities (such as offering policy leadership and a technology infrastructure for providers).

VCUs that focus primarily on the external activities and rely on their provider institutions to supply the internal support can expect heavy competition from accredited providers. Although there was, at one time, an opportunity for nonaccredited brokers or for brokers seeking to become accredited providers, this opportunity is on the decline, if not gone. The once-perceived gap between the ability of nimble, entrepreneurial agencies and that of slow-moving institutions to offer learning online has narrowed significantly. If the role of a VCU was to be the “techno-hare,” prompting institutions to chase after it and thus more rapidly increase their expertise, experience, and enthusiasm for online learning, the VCU has certainly played this role. But VCUs that continue to focus on external collaborative activities as their only goal will likely see their role as conveners, as leaders, and thus as entities decline.

VCUs that focus primarily on the internal activities will see themselves increasingly considered “part of the infrastructure” of learning. Successful VCUs

may or may not have a visible external presence in the future, but they will adapt and build technology and service solutions, which their constituencies depend on. In Georgia, for example, the system is investing in a multi-institutional enrollment model whereby online courses may be cross-listed in college catalogs throughout the system. Once the model is implemented, students will enroll in any online course as though it is being offered by their home campus. The backend infrastructure will handle tuition differentials and administrative data exchange between campuses. Although Georgia no longer maintains a VCU with a public presence, this more integrated approach may well represent the next generation of VCU.

Finally, VCUs that take on both internal and external activities—that seek to provide policy leadership, program development, learner services, and instructional infrastructure—will have the greatest opportunity of emerging as new, entrepreneurial educational entities. These organizations will likely be most

successful when they focus on the learner populations that are not being serviced by the established instructional providers of the state. By not being in direct competition with established institutions, these VCUs will expand educational access and increase economic development—the two goals that state leaders had in mind when they first began putting their resources into consortial, multi-campus VCUs in the mid-to-late 1990s. 


Notes

1. The term *virtual college/university (VCU)* is used today to describe a broad range of entities and activities: corporate training centers, distance learning efforts of individual institutions, nonprofit and governmental education activities, and multi-state and international learning collaboratives. Aside from institutional programs, most of these initiatives are not true “universities” in the degree-granting sense of the word. Notable exceptions lie mostly in the for-profit sector and include such entities as Jones International University and Capella University. A nonprofit degree-granting example would be Western Governors University (WGU).
2. Rhonda M. Epper and Myk Garn, “Virtual College and University Consortia: A National Study,” State Higher Education Executive Officers (SHEEO) and the Western Cooperative for Educational Telecommunications (WCET), August 2003, avail-

able as a PDF file at <http://www.sheeo.org/disted/vcu.pdf> or <http://www.wcet.info/resources/publications/vcu.pdf>.

3. Surveys were returned by fifty-one VCUs, representing forty states, for a response rate of 84 percent. For a listing of the sixty-one organizations that met the definitional boundaries, see Epper and Garn, “Virtual College and University Consortia,” table 1.
4. David B. Wolf and Sally M. Johnstone, “Cleaning Up the Language: Establishing a Consistent Vocabulary for Electronically Delivered Academic Programs,” *Change*, vol. 31, no. 4 (July/August 1999): 34–39.

RELATED RESOURCE

 For an analysis of the virtual college and university consortia national study as it pertains to campus IT decision-makers, see the ECAR publication “The Virtual University in America: Lessons from Research and Experience,” by Rhonda M. Epper and Myk Garn, *EDUCAUSE Center for Applied Research Bulletin*, vol. 2004, no. 2 (January 2004), (<http://www.educause.edu/asp/doclib/abstract.asp?ID=ERB0402>).