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Blended Learning

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Overview

The recent appearance of books, trade magazine and journal articles, conferences, and campus initiatives focusing on “blended learning” would lead one to believe that a new educational phenomenon has been discovered. In actuality, the blending of face-to-face instruction with various types of non-classroom technology-mediated delivery has been practiced within the academy for more than four decades. DeZure,¹ Buckley,² Barr and Tagg,³ and others note that the confluence of new pedagogies (for example, the change in emphasis from teaching-centered to student-centered learning paradigms), new technologies (for example, the rapid spread of the Internet, World Wide Web, and personal computers), and new theories of learning (for example, brain-based learning and social constructivism) are enabling entirely new models of teaching and learning and that this change is of sufficient magnitude to be described as an educational transformation or paradigm shift. A nexus for the development of these new models has been the online environment. Previous educational technologies, such as instructional television, have tended to replicate the classroom environment and its traditional teaching methods. Web-based learning environments invite—and may even require—reconceptualization of the learning paradigm. As reported in *Campus Computing 2003*,⁴ more than half of all college courses now reportedly use Internet-based resources, and about half of all courses in public research universities have a course Web site. A third of all college courses employ a course management system to facilitate access to online resources and interactions.

The novelty of online learning is apparent in the diversity of names given to the phenomenon: Web-based learning, e-learning, and asynchronous learning networks, among others. These efforts have been focused primarily on off-campus student populations. With the more recent on-campus emphasis, yet another set of labels has appeared, including hybrid learning, blended learning, and mixed-mode instruction. The mere existence of so many names for what is essentially a single concept suggests that no dominant model has yet been accepted as a definition of standard practice.

For purposes of this bulletin, the term “blended learning” refers to courses that combine face-to-face classroom instruction with online learning and reduced classroom contact hours (reduced seat time). The latter point is an important distinction because it is certainly possible to enhance regular face-to-face courses with online resources without displacing classroom contact hours. However, we believe that combining face-to-face and fully online components optimizes both environments in ways impossible in other formats. But what is blended learning? Is it Web-enhanced classroom instruction, or classroom-enhanced online instruction? What proportion of each is required to label a course as “blended”? And more importantly, what are the educational and organizational implications of the emerging blended learning phenomenon?

At the University of Central Florida (UCF), we recognize a continuum of instructional models ranging from fully face-to-face to fully online. Between the two are Web-enhanced courses (face-to-face courses that make pedagogically significant use of the Web through a course management system but do not reduce seat time) and blended

courses that combine face-to-face and online instruction with reduced seat time. We have observed that some institutions define a course as blended if more than a certain percent of the course is online. It is our position that blended learning should be viewed as a pedagogical approach that combines the effectiveness and socialization opportunities of the classroom with the technologically enhanced active learning possibilities of the online environment, rather than a ratio of delivery modalities. In other words, blended learning should be approached not merely as a temporal construct, but rather as a fundamental redesign of the instructional model with the following characteristics:

- a shift from lecture- to student-centered instruction in which students become active and interactive learners (this shift should apply to the entire course, including the face-to-face contact sessions);
- increases in interaction between student-instructor, student-student, student-content, and student-outside resources; and
- integrated formative and summative assessment mechanisms for students and instructor.

Our research has shown that while student success and high levels of student and instructor satisfaction can be produced consistently in the fully online environment, many faculty and students lament the loss of face-to-face contact. Blended learning retains the face-to-face element, making it—in the words of many faculty—the “best of both worlds.” Some faculty who are not yet comfortable in the fully online environment find blended courses to be an effective first step, allowing them to begin with a course that is mostly face-to-face, then expand the online component as their expertise in this environment increases.

Maximizing success in a blended learning initiative requires a planned and well-supported approach that includes a theory-based instructional model, high-quality faculty development, course development assistance, learner support, and ongoing formative and summative assessment. In our own blended learning courses, we have consistently found high levels of student and faculty satisfaction, student learning outcomes that are higher than in comparable face-to-face and fully online courses, and high student demand because of the increased convenience and flexibility. One of the least-mentioned benefits of student participation in Web-based courses, whether fully online or blended, is the resulting increase in student (and probably instructor) information literacy, providing students with new abilities that benefit them throughout their entire academic and employment careers.

Blended learning also benefits the institution by improving the efficiency of classroom use and reducing on-campus traffic and the associated need for parking spaces. It is also possible to apply the blended model in innovative ways to both increase student learning outcomes and reduce instructional delivery costs. For example, by applying an “aggregation” model, three sections of a medium-enrollment course can be combined into a single blended “supersection,” with one third of the students attending a Monday, Wednesday, or Friday face-to-face class and all students participating in a well-designed

online environment. This configuration has the potential to increase student learning outcomes, while reducing direct instructional costs by 25 to 50 percent. “Supersection” configurations for Tuesday–Thursday and other class scheduling alternatives are equally feasible. Similarly, student flexibility and learning outcomes can be improved in some courses with very high enrollment by converting them to a blended format. In this model, one third of the students will meet face-to-face once a week (for example, Monday, Wednesday, or Friday) with other course activity occurring online.

Blended learning also brings new operational challenges. For most institutions, it is difficult to optimize the classroom scheduling process to capture all classroom hours left unused by blended courses. Presuming multiple courses can be scheduled into a single scheduling block (for example, 9:00 to 10:00 a.m., Monday, Wednesday, and Friday), an institution’s final examination schedule may place all three courses in the same testing location at the same time. Blended courses are highly likely to require a computer, projector, and Internet access in the classroom used for the face-to-face class meetings. As the number of blended courses increases, the demand for multimedia-equipped classrooms may exceed the supply.

As UCF’s distributed learning initiative has evolved, we have found that some faculty use blended courses in creative ways that makes sharing the unused classroom time particularly difficult. For example, faculty may meet every other week in a face-to-face mode with alternate weeks delivered via the Web, while others arrange their on-campus components to coincide with topics they feel require a face-to-face classroom environment. Though these strategies may be quite appropriate for instructional purposes, they reduce the opportunity to make more efficient use of classroom space. We have learned that in practice much more coordination (and buy in) from both faculty and those responsible for classroom scheduling is required. Another blended learning challenge on our campus is that while department chairs are responsible for scheduling, they often do not talk to their counterparts in other departments. A decentralized scheduling mechanism makes it much more challenging to ensure that a blended education course, for instance, shares a classroom with a blended engineering course section. Only in those departments where multiple sections of blended courses are offered (English Composition I, for instance) are those responsible for scheduling using these courses to their advantage. A centralized approach or coordination among those who schedule classroom space is necessary to help ensure efficiency.

At UCF, blended courses were first considered in 1996, when university researchers found that more than 75 percent of students enrolled in our initial fully online “distance learning” courses were also enrolled in on-campus face-to-face sections.⁵ Our concept of an online student who never came to campus but existed only in the virtual world was a fallacy. Only for those programs that are offered only fully online do students tend not to have an on-campus presence. From an administrative viewpoint, the notion of students flexibly combining both their online and on-campus experiences brought about the idea of creating courses that blended both worlds as well.

Highlights of UCF Outcomes of Blended Learning

Our research has found that blended courses have the potential to increase student learning outcomes while lowering attrition rates in comparison with equivalent fully online courses. In this regard, we have found that the blended model is comparable to or in some cases better than face-to-face. Table 1 presents comparison data showing success rates (those students achieving an A, B, or C) over two years of Web offerings. Table 2 presents comparable results for withdrawal rates.

Table 1. Percentages of Students Succeeding (Grades of A, B, or C) in Face-to-Face, Blended, and Fully Online Courses at UCF

	Spring 2001	Summer 2001	Fall 2001	Spring 2002	Summer 2002	Fall 2002	Spring 2003
Face-to-face	91	93	91	90	94	91	91
Blended	91	97	94	91	97	92	91
Fully online	89	93	90	92	92	92	91

Table 2. Percentages of Students Withdrawing from Face-to-Face, Blended, and Fully Online Courses at UCF

	Spring 2001	Summer 2001	Fall 2001	Spring 2002	Summer 2002	Fall 2002	Spring 2003
Face-to-face	6	3	4	5	3	3	5
Blended	6	2	5	5	2	6	5
Fully online	10	6	8	8	6	6	7

In addition, we find that blended learning results in success and attrition rates comparable to the face-to-face modality for all ethnicities. Figures 1 and 2 indicate success and withdrawal rates for the spring 2003 semester. In our past seven years of research, these trends remain consistent. Blended learning appears to provide students with an alternative instructional modality with success rates and attrition comparable to face-to-face courses.

Figure 1. Success Rates by Ethnicity for Spring 2003

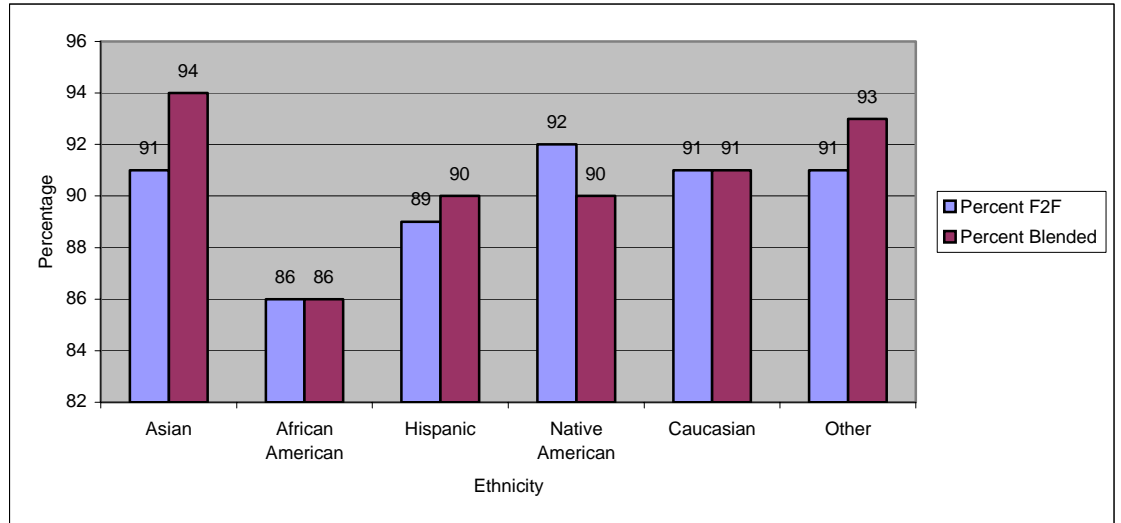
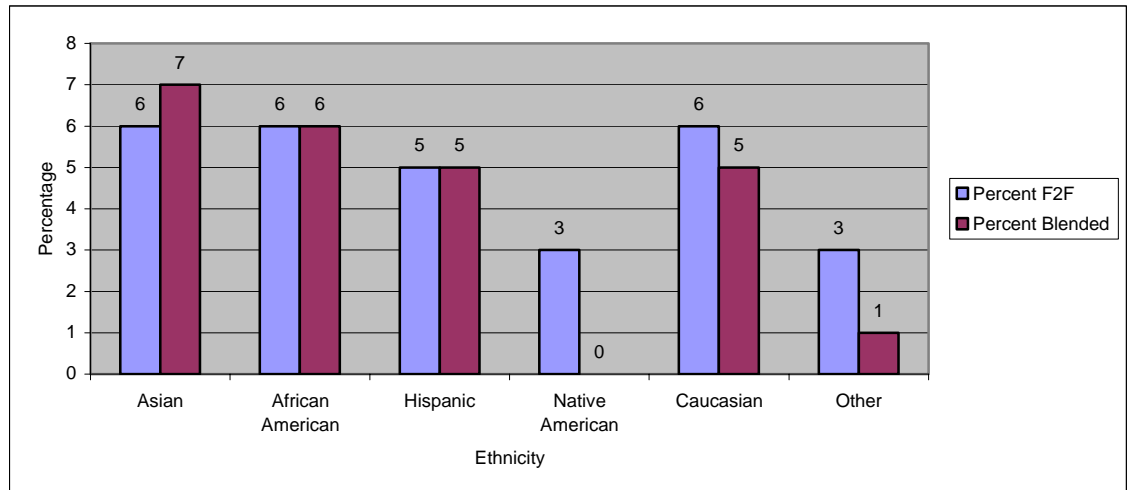


Figure 2. Withdrawal Rates by Ethnicity for Spring 2003



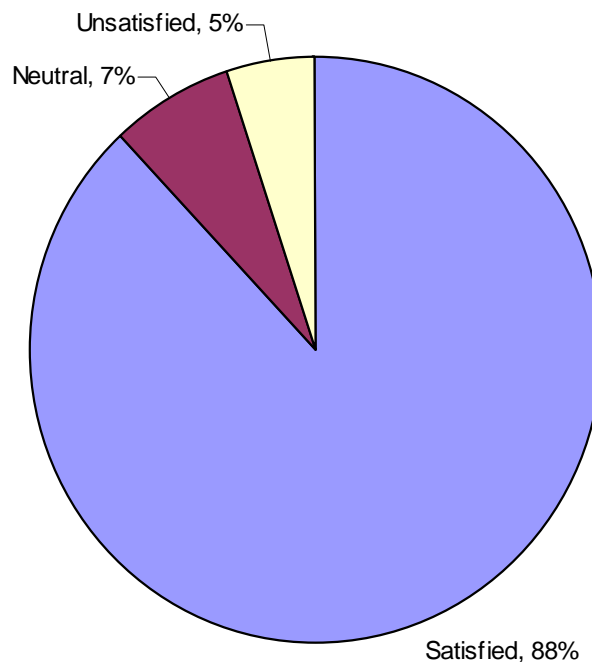
We attribute the success of these courses to effective instructional design and the extensive support provided for both faculty and students. While blended courses have less Web instruction compared to fully online courses, they require similar support structures. On-campus labs and virtual student support mechanisms such as online learner aids and help-desk service provide students with mechanisms for receiving help when needed—often in the wee hours of the morning. However, sound instructional design becomes critical, with the most successful faculty reevaluating their course design as a whole rather than looking for chunks to transfer to the Web while leaving the remaining instruction untouched.⁶

As our faculty develop their blended courses, they are encouraged to focus on learner-centered, engaging instruction using components such as discussion groups, chat rooms, and e-mail to facilitate increased interaction among students and with the

instructor. Assessment often becomes creative and authentic. For example, faculty develop rubrics for measuring learning through discussion content and incorporate active learning components. At UCF, a faculty development course (delivered in a blended format that encompasses sound instructional design principles) facilitates this transformation process. Faculty learn requisite technological skills, pedagogical principles, and success strategies. Through discourse and interaction with instructional designers, as well as other faculty who have become veterans at delivering Web instruction, they formulate, then implement their plans for course redesign. As with teaching in any mode, faculty develop and mature as they become more experienced with delivering instruction in a blended learning format. Often, they go on to transform multiple courses with Web components as they continue to reevaluate and improve their teaching methods.

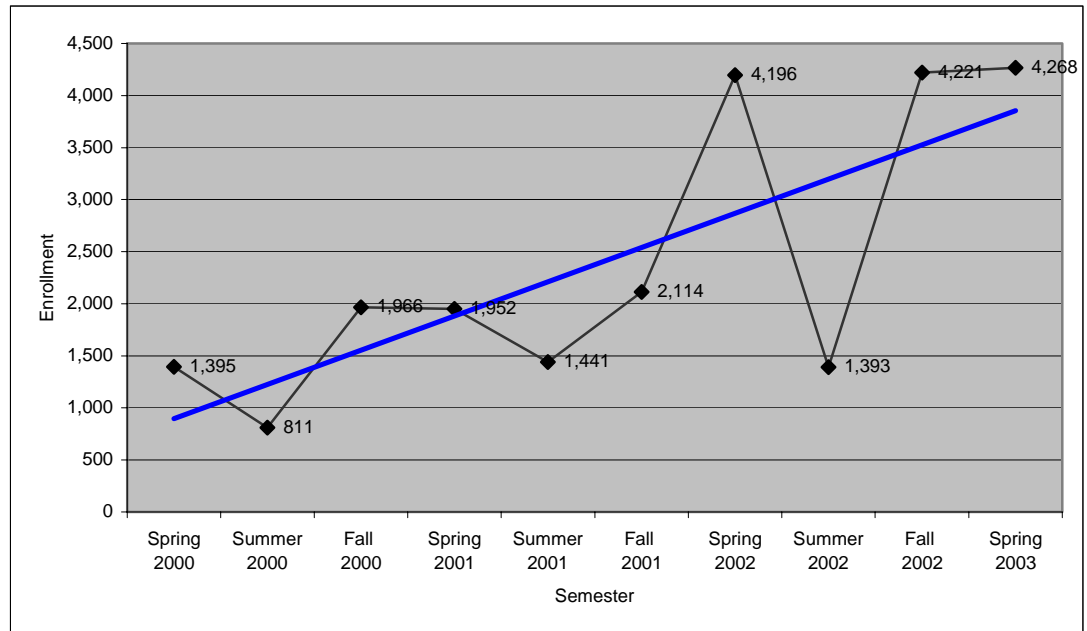
We believe a positive side-effect of providing a high level of support is that the majority of faculty are satisfied with their blended learning courses (Figure 3) and indicate they would teach another in the future. Faculty continue to respond positively regarding the convenience and increased instructional quality their Web components provide. Further, they speak of increased interaction in their blended classes and of the technology competency they have attained using Web instruction.

Figure 3. Faculty Satisfaction with Blended Learning Courses (N = 43)



The blended course initiative has experienced significant growth on our campus. As indicated in Figure 4, enrollment varies by semester, with summer semesters having the lowest enrollment; but the blue trend line indicates the rapid rate of adoption of the blended instructional model at our institution.

Figure 4. Semester Enrollment Growth in Blended Learning at UCF



What It Means to Higher Education

Blended learning offers potential for genuine transformation within the academy. A recent National Research Council report by the Panel on the Impact of Information Technology on the Future of the Research University⁷ speculated that information technology will alter the university's usual constraints of space and time, transforming how institutions of higher education are organized and financed, as well as altering their intellectual activities. This is a bold assertion that intersects what we view as the "traditional" academy with what is now becoming a transformed academy.

The transformational nature of blended courses creates complicated interactions among many components of the university similar to those found in the literature regarding complex and social systems theories. Forrester⁸ offered insights about interventions in complex systems (such as universities), suggesting they have the following common characteristics:

- Predicting the way interventions will impact the institution is virtually impossible.
- Final outcomes are often counterintuitive.
- Unanticipated side-effects, both positive and negative, must be confronted. At times, those effects have more impact than the originally planned outcomes.

Social systems theorists postulate primary changes in the roles of faculty, students, and administrators. Faculty must reassess their expectations and their students' expectations for effective instruction. Students must reevaluate their roles as blended courses require them to incur more responsibility for managing their learning.

Administrators adapt by developing organizational arrangements that accommodate new teaching and learning models in a manner that is more responsive to students and faculty. Students consistently report that blended learning represents a university model that is more congruent with their lifestyles. They say they become substantially more active in their learning and gain technological empowerment that expands beyond the confines of “the course.” They find value in the outside resources that become available in blended learning—transcending the limitations of typical faculty-student, student-student, and student-content interaction patterns.

Students must come to terms, however, with the fact that previously successful learning approaches may not be nearly as effective in the blended environment. In a sense, they must relearn how to learn. The rhythms of blended courses differ from those in face-to-face classes, forcing students to stay actively engaged and connected. For students, the landscape of learning is drastically altered, although they are still able to anchor their learning experience on the familiar face-to-face class meetings.

Oblinger⁹ and Wendover¹⁰ consider the implications of generational values and education highlighting those students belonging to generation X (born 1965–1980) and the millennials (born 1981–1994), who make up the majority of today’s university population. According to Wendover, these groups have been impacted by such factors as radio, newspapers, movies, television, computers, and pagers. In addition, millennials grew up with cell phones, instant messaging, the World Wide Web, wireless communication, and advertising without boundaries. Those influences help shape the value systems of each generation. As Alan Kay summarized it, technology is anything invented after you were born.¹¹ Characteristics that describe generation X include:

- Works to live rather than lives to work
- Views jobs within the context of a contract
- Demands clear and consistent expectations
- Is kept productive by having fun while working
- Views money as part of a larger equation defined by overall contribution
- Sees versatility as providing security

One the other hand, millennials:

- Tend to live for the moment
- Are attuned to the immediacy of technology
- Respond to clear and consistent expectations
- View money as an immediate consumable
- Will give respect only after they experience it
- Tend to question everything

Based on these generational norms, Oblinger characterized the educational expectations of these students in terms of elimination of delays, customer service, experiential learning, and staying connected. Blended learning offers a mechanism for meeting the needs of these students within the value system they embrace.

Blended learning helps instructors evolve as designers of active learning environments, thus becoming much more facilitative in their teaching. Interestingly, this phenomenon is consistent with what Carl Rogers¹² called the “facilitative teacher,” where instructional environments take precedence over information transmittal.

These changes are dramatic for the faculty. Just as students have to relearn how to learn, faculty have to relearn how to teach. Faculty report having to scrutinize every aspect of their courses. This phenomenon leads professors to modify their personal professional theories of teaching and, more importantly, helps them articulate and test those theories. Faculty development for blended learning brings together instructors from different academic areas, creating a forum for mentoring and the exchange of effective pedagogical practices. With the appropriate faculty development model, this can be a value-added feature because the cross-discipline sharing strengthens the effectiveness of almost all instructors who participate. The blended model can also revitalize senior professors by refocusing them on the practice of effective instruction. For the first time, many of them experience the formal instructional systems design process as they discover flexibility, access, and degrees of freedom not possible in the face-to-face environment.

At the institutional level, university administrators experience changing role expectations just as do faculty and students, especially when entire programs or substantial portions of programs transition to the blended environment. Top-level administrators see the demand for more flexible learning opportunities in the communities they serve and can respond to these needs with blended learning initiatives. Deans can offer programs to a wider constituency than formerly possible—especially with the more-efficient classroom space use afforded by blended models. Department chairs have greater flexibility with faculty and class schedules. Generally, the college or university is able to enhance its outreach capability.

Administrators, however, must confront important transformational issues in blended learning. A predominant consideration in this area is financial effectiveness, where the university must weigh the costs of faculty and student support versus the opportunity to expand capacity while reducing the demands on brick-and-mortar infrastructure. In addition, because instructors report that teaching in the blended format is more time intensive than in face-to-face classes, especially in the conversion phase, institutions must deal with the opportunity costs of faculty involvement in this format.

In spite of these and other institutional issues, blended learning impacts higher education in a positive way by forming the underpinning of a transformational model that irrevocably alters expectations for students, faculty, and administrators. The process is always formative and sometimes opportunistic. The outcomes are most effective when participants share an inspiring vision; seek maximum possible involvement; bring out the best in others; celebrate accomplishments; and model behaviors that facilitate

collaboration. These facilitative leadership components in conjunction with blended learning create the synergy that fosters a climate for positive realignment of higher education.

Blended learning in higher education is an evolving phenomenon that offers promise for addressing challenges such as access, cost, efficiency, and timely degree completion. In addition, this approach will impact aspects of the academy such as faculty development and rewards, student retention, college and department structure, as well as the notion of lifelong learning. Our experience is that blended learning is a transformational force, even at the outer edges of its influence. In a real sense, “We’ve only just begun!”

Key Questions to Ask

- What programs in your institution are best suited for blended learning?
- What models of blended learning are most appropriate for your campus?
- What support mechanisms are necessary to ensure the success of blended learning on your campus?
- How can blended learning become an effective mechanism for meeting some of your institution’s strategic initiatives?
- How will you assess the impact of blended learning?

Where to Learn More

- Campus Computing Project, <<http://www.campuscomputing.net>>.
- Center for Generational Studies, <<http://www.gentrends.com>>.
- Learning online at UCF, <<http://online.ucf.edu/index.html>>.
- D. Oblinger, “Boomers, Gen-Xers, and Millennials: Understanding the ‘New Students,’” *EDUCAUSE Review*, Volume 38, Number 4, 2003, pp. 37–47, <<http://www.educause.edu/ir/library/pdf/erm0342.pdf>>.
- UCF Research Initiative for Teaching Effectiveness, <<http://pegasus.cc.ucf.edu/~rite>>.

Endnotes

1. D. DeZure, ed., *Learning from Change: Landmarks in Teaching and Learning in Higher Education from Change Magazine, 1969–1999* (Sterling, Va.: Stylus Publishing Inc., 2000).
2. D. P. Buckley, “In Pursuit of the Learning Paradigm: Coupling Faculty Transformation and Institutional Change,” *EDUCAUSE Review*, Volume 37, Number 1, 2002, pp. 29–38, <<http://www.educause.edu/ir/library/pdf/erm0202.pdf>>.

3. R. B. Barr and J. Tagg, "From Teaching to Learning—A New Paradigm for Undergraduate Education," *Change*, Volume 27, Number 6, 1995, pp. 12–25.
4. K. C. Green, *The 2003 Campus Computing Survey* (Encino, Calif.: The Campus Computing Project, 2003), <<http://www.campuscomputing.net>>.
5. C. Dziuban et al. (in press), "Three ALN Modalities: An Institutional Perspective," *The Journal of Asynchronous Learning Networks*, Sloan Consortium, <<http://www.aln.org/publications/jaln/index.asp>>.
6. Focus group conducted by Research Initiative for Teaching Effectiveness with Instructional Designers from UCF's Course Development and Web Services, December 2003.
7. Panel on the Impact of Information Technology on the Future of the Research University, *Preparing for the Revolution: Information Technology and the Future of the Research University* (Washington, D.C.: The National Academies Press, 2002), <<http://www.nap.edu/books/030908640X/html/>>.
8. J. W. Forrester, "System Dynamics and the Lessons of 35 Years," <<http://sysdyn.clexchange.org/sdep/papers/D-4224-4.pdf>>.
9. D. Oblinger, "Boomers, Gen-Xers, and Millennials: Understanding the 'New Students,'" *EDUCAUSE Review*, Volume 38, Number 4, 2003, pp. 37–47, <<http://www.educause.edu/ir/library/pdf/erm0342.pdf>>.
10. R. W. Wendover, "From Ricky and Lucy to Beavis and Butthead: Managing the New Work Force," The Center for Generational Studies, <<http://www.gentrends.com/articles.html>>.
11. D. Taspcott, *The Digital Economy: Promise and Peril in the Age of Networked Intelligence* (New York: McGraw-Hill, 1996), p. 17.
12. C. R. Rogers, "The Interpersonal Relationship in the Facilitation of Learning," in *Culture and Processes of Adult Learning*, M. Thorpe, R. Edwards, and A. Hanson, eds. (London: Routledge, 1983).

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