

GAME CHANGERS

EDUCATION and INFORMATION TECHNOLOGIES

Edited by **DIANA G. OBLINGER**

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Game Changers: Education and Information Technologies

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FROM THE EDITOR

I would like to thank the many people who made this book possible, particularly Gregory Dobbin for managing the project and Karen Mateer for her research.

—Diana G. Oblinger

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University of Phoenix

William (Bill) Pepicello

Introduction

THE UNIVERSITY OF PHOENIX WAS FOUNDED IN 1976 on the principle that a large number of people wished to earn a degree but that full-time attendance during the day was impossible for them. The founder, Dr. John Sperling, from San Jose State University, understood that the coming years would bring revolutionary changes to the economic landscape. He was also a strong advocate of lifelong learning and understood that to remain competitive, the United States would have to embrace lifelong learning, as well.

Thirty-five years later, what was initially considered unorthodox is now the norm. Today's college students do not look like the typical student of the '70s—73 percent of college students fall into a nontraditional category. They must work at least part time, cannot rely on parental support or have dependents, and do not stop their lives to continue their learning. These are the people who must be educated to stay competitive in the job market, and they are the people who will help the United States remain globally competitive.

With more Americans wanting and needing quality education—and with American prosperity riding on it—higher education must find a way of accommodating growing numbers of students while ensuring a quality education. Academic quality includes a measure of integrity in which key indicators that tie academic outcomes to student success are part of a system of continuous improvement. The second quality is student achievement.

The University of Phoenix has sought to improve the quality of its educational offerings by focusing on the essential elements of the student academic experience, identifying those elements that must be addressed through

an internal system of continuous improvement and elements tied to external benchmarks to ensure that students are being better served.

Through this process we have identified curriculum, assessment of student-learning outcomes, and faculty preparation as basic to our enterprise. These elements must be continually improved as part of the internal integrity process that defines academic quality at the university and that results in student achievement that can be compared externally. This is a three-step process: (1) build quality, (2) measure quality, and (3) deliver quality. The university began this process with the release in 2008 of the *Academic Annual Report* and has continued to do so each year since then. Through the *Academic Annual Report*, the university reports on student outcomes as compared to those of their peers at other institutions, as well as on internal indicators of institutional effectiveness.

The evolution of the University of Phoenix has been inextricably linked with advances in technology. Computers and laptops have given way to smartphones and computer touchpads with previously unimagined capacities and capabilities. Dr. Mark Weiser, chief technology officer at Xerox Palo Alto Research Center (PARC), understood this when in 1991 he said, "The most profound technologies are those that disappear. They weave themselves into the fabric of everyday life until they are indistinguishable from it. Say goodbye to your computer—it's about to disappear. That is, it will be so much a part of your life that you won't even know it's there."¹ Dr. Weiser's vision is close to reality in almost every aspect of life today, with one notable exception—higher education.

Education Responsive to Learner Needs

Today's students have changed; their lives have changed. The way they are expected to learn has not.

The skills required for today's workplace are far different than they were in the manufacturing age. Students must have global awareness and financial and entrepreneurial literacy, as well as information and media literacy. Along with these skills, employers seek workers who are innovative and creative and who have honed their abilities in critical thinking and problem solving, self-direction, and adaptability and accountability.² Institutions must be able to make adjustments quickly to respond to student needs and to the marketplace.

If higher education is to change, traditional beliefs and roles will have to be challenged. Consider the role of faculty. Many faculty view their role as being the locus of all knowledge transfer through teaching. Many believe the lecture/midterm/final paradigm is tried-and-true. However, this model does not

fit all students, particularly those who have grown up in a world of immediate information, immediate feedback, and immediate results. It is critical to move from a teaching focus to a learning focus.

University of Phoenix Adaptations

Students should have an engaged learning experience, resources that support students' success, and interaction with faculty and classmates. From the outset, the University of Phoenix has sought to provide this type of learning experience.

For many people, University of Phoenix is synonymous with online education, even though the university began in 1976 as a campus-based institution that now has a physical presence in forty-one states, the District of Columbia, and Puerto Rico. In the early days, all students enrolled in classes at their local campus. In 1989, the university pioneered online education—students had the option to enroll in courses from anywhere there was a phone line. The technology consisted of a bulletin board program delivered to the student on a disk via the postal system. Students downloaded the program to their computers. All learning materials, including textbooks, were delivered by mail. Work was completed via a dial-up modem.

The online campus predated the dot-com revolution, and student enrollment was initially limited to those with the digital expertise and equipment. With the World Wide Web now generally accessible, the University of Phoenix has leveraged this to deliver a wide array of digital services to students. Students may take courses in a classroom or virtual classroom, giving them the choice to take courses best suited to their learning or personal needs. Students have the advantage of face-to-face instruction when that works for them or a virtual classroom when they find online study meets their learning styles, when they must travel, or if they need the flexibility of class anywhere, anytime.

Pervasive Technology

Today, technology is embedded throughout the students' experience. It even helps potential students determine if the University of Phoenix is the institution they wish to attend and if they are ready to do so. Prospective students interested in the university—in any modality—can sign on to the Visiting Student Center (VSC) to learn about the university and about themselves, taking a variety of assessments that include learning styles, readiness, and technology.

Technology has become a part of our everyday lives, so many prospective students believe they have the technological acumen required to complete either an online program or a local campus program. However, texting, gaming, and social networking do not provide all the skills required of today's college student. Visitors to the VSC are able to compare their skills to what are considered minimum expectations of the university.

Technology provides a robust array of scalable, digital resources to all students, regardless of their primary mode of delivery. There are a number of virtual student support services, learning assets, and tools available. The following are a description of some of them.

Student and Faculty Portal

Once enrolled, all students and faculty have access to the university portal, which allows them to perform a variety of administrative and support functions, and also to access academic materials, learning assets, and tools. For online students, the portal is the entry point for their courses. For students attending local campuses, the portal provides forums for learning teams and the ability to submit assignments and receive graded assignments with feedback from faculty between class meetings.

In 2001, the university made all course materials available electronically, including all textbooks, supplemental reading materials, multimedia files, and other support materials. This platform provided a means of developing and delivering curriculum and materials via a centralized database, giving curriculum developers the ability to easily adjust courses based on instructor/student feedback. Course-delivery scalability was essential as enrollments grew.

Course Builder

Course Builder is an interface utilized by faculty and curriculum developers to create, manage, and deliver curriculum. The portal allows for the integration of additional learning applications into students' course and program pages. Features within Course Builder include enhanced course-level customization, a structure that is aligned to best practices in instructional design, and an intuitive user interface. Course Builder upgrades included a more nuanced system for version control and archival of curriculum materials, allowing for more granular assessment and programmatic evaluation data collection/interpretation. Faculty have access to virtual resources that enable them to develop scalable, consistent curriculum.

University Library

With an average of 5,000,000 downloads each month, the university library is one of the most utilized learning assets available via the portal. The university library makes more than 300 licensed databases as well as 95,000 scholarly journals and periodicals accessible to students and faculty. These databases are commercially licensed products not available through an Internet search. Additional services available to students and faculty include "Ask a Librarian" and the Document Delivery/Interlibrary Loan service.

eBook Collection

The eBook Collection is an aggregation of more than 1,600 digitized textbooks licensed from the university's academic publishing partners. These texts have been converted to XML format to allow searching across the collection. This also permits licensed content to be disaggregated, allowing the more granular material to be repurposed in support of specific learning objectives. The entire eBook Collection is available to all students and faculty. Digital-rights management protocol is built in to protect intellectual property rights of authors and publishers.

Virtual Organizations

Virtual Organizations are realistic simulated environments that model businesses, schools, health care, and government. Students apply critical information-utilization and problem-solving skills to determine the economic health of an organization. Students use Virtual Organizations to examine complexities of organizations and to mine, analyze, and apply data. Using the data found within the company's or institution's websites, students must solve problems, even if only partial information is available, determine what they are looking for, in what area they might find it, and the context in which it is to be used. More than 50,000 unique users log in to Virtual Organizations in an average month.

Simulations

University of Phoenix began embedding simulations across the curriculum in 2004. Simulations are used as problem-solving exercises, class assignments, discussion starters, case studies, and tutorials. Simulations reinforce concepts and encourage practical application of material presented in course discussions

and texts, and they provide students opportunities for higher-level learning. Students can hone their decision-making skills in safe environments. Scenario review and feedback are immediate.

e-Portfolios

The university has acquired licensed electronic portfolio (e-portfolio) software from TaskStream. The College of Education has made completion of the DRF e-portfolio a requirement for teacher education programs.

Remediation

Most studies indicate that close to 40 percent of students entering college require remediation in mathematics and/or English and writing skills. Due to the availability of assistive technology, remedial assistance can be made available to all students throughout their entire course of study. It is available in most cases twenty-four hours a day, seven days a week. The technology aiding in the just-in-time remediation includes centers for writing and math excellence:

Center for Writing Excellence. The university began providing online writing assistance in 1999. In 2002, the Center for Writing Excellence (CWE) emerged, an online writing lab designed to assist students in developing essential written communication skills. In 2004, the automated review and feedback system WritePoint was added. Since that time, the CWE has continued to add services for students wishing to improve their writing skills, including:

- WritePoint, an automated review system providing feedback on grammar, punctuation, and style points;
- CWE Review, review with feedback from faculty members;
- El Centro de Redacción (a Spanish writing lab);
- Tutorials and guides; and
- Turnitin plagiarism checker.

Center for Mathematics Excellence. Since 2006, the university has continually expanded just-in-time remediation. The Center for Mathematics Excellence (CME) website serves all members of the university with resources to assist quantitative teaching and learning. In an average month, more than 40,000 students access the CME homepage.

The center addresses needs of students who have not practiced math for some time or who suffer from math anxiety. This site helps address these

issues, dispels math-anxiety myths, and suggests study and coping skills for those who struggle with math classes. Selected math and statistics courses include access to WorldWideWhiteboard web conferencing for online math assistance. Students may choose a coach to work with or they can observe coaches working with other students in real time. More than 4,000 live coaching sessions are conducted each month.

Student Success Workshops

Student workshops are three-day online minicourses designed to improve basic skills. Currently there are twenty-five workshops. All are free and require no additional purchase of materials.

Virtual Computer Labs

The University of Phoenix teaching/learning model has always focused on experiential learning. The College of Information Systems and Technology incorporated four different resources for tutorials and virtual labs: TestOut LabSim, Visual Logic, ToolWire, and Element K. Students work with tangible components in virtual settings, which provides hands-on learning and the freedom to experiment and test expertise in safe environments.

Multimedia Resources

The Instructional Materials and Technology Department provides multimedia resources for a variety of courses. These include purpose-built, interactive graphics with audio and/or video. These are used to present, explain, test, and assess important instructional objectives and to complement other instructional materials such as published content and textbook resources. The group creates custom as well as rapid-authored multimedia, including video productions as well as podcast-style lectures.

PhoenixConnect

Research indicates that social and emotional connections affect students' perceptions of relevancy; a lack of these connections can lead to disengagement.³ To address this issue, the university established a proprietary academic social media site called PhoenixConnect in 2011. Students and faculty can interact to discuss academic topics, meet new friends with similar interests, reach

out to alumni, or launch a professional group. In a matter of a few months, more than 450,000 students and faculty have begun using PhoenixConnect.

PhoenixConnect is organized into communities with over 10,000 discussion topics. The communities include:

- *Learning Communities.* Students and faculty can find information, post questions, or contribute to conversations about classes, programs, and academic interests.
- *Career and Professional Development.* Students can connect with others around specific professional areas, dialogue with experts, and get assistance with job hunting.
- *Campus Life.* Students and faculty who have similar extracurricular interests can connect with each other. Discussions include events in various areas, sports, and hobbies.
- *Support Communities.* Students can ask questions and share experiences about the university, their programs, or financial aid.

In addition to communities, more than a thousand student-generated groups engage around academics, professional networking, and extracurricular activities. Faculty and students maintain more than 3,000 blogs. Real-time chat is also available. Users can see who is online and can connect with each other. In the fall of 2011, the university began implementing group chat as an aid for student learning teams.

Administrative and Student Services Available via Online Portal

In addition to academic support services for students, administrative tasks can be performed online as well. These include the following:

- Reviewing contact information
- Registering for classes
- Paying tuition
- Meeting with a representative online
- Requesting transcripts
- Submitting assignments
- Receiving graded assignments with feedback
- Obtaining grades
- Registering for Student Success Workshops
- Accessing e-mail

Faculty use administrative services to submit grades to an online

automated gradebook, which then sends the grades, comments, and assignments with feedback to the students and posts the final grade to the system. Faculty also receive and accept contracts via the portal and can sign up for faculty development activities, including faculty workshops. Of course, faculty also have access to all the academic assets that are available to the students.

Nursing Labs

In addition to virtual assets available through the student and faculty portal, in 2009 the university established nursing labs. The university's Licensed Practical Nurse to Bachelor of Science in Nursing (LPN-to-BSN) program, currently the university's only program dedicated to training and licensing new registered nurses (RNs), has incorporated high-fidelity nursing scenarios as a core component of its campus-based curriculum.

The four nursing simulation labs located in Arizona, Colorado, Hawaii, and California are equipped with high-fidelity simulations and manikins. Used in conjunction with simulated hospital rooms, these manikins are part of an innovative simulation program involving both students and faculty. Each simulation occurring in the lab is a medical situation carefully constructed by faculty to teach students a particular lesson.

The key advantage of high-fidelity training scenarios is that, unlike in traditional classroom-based lectures or on-site training with real patients, students get to learn and practice essential nursing techniques in critical-care situations without putting themselves or patients at risk.

The Role of Faculty in a Technology-Enhanced Environment

Too often, discussions and research about e-learning are centered on distance education. All educational systems, just like our lives, must be a blend of technology and face-to-face interaction to be effective. A single delivery system is not sufficient to engage students in learning, to inspire them to take responsibility for their learning, or to encourage innovative and creative thinking and promote quality outcomes. Today's students—the ones who have to work, who have children to care for, who all institutions need to serve—not only want this same kind of access to their learning resources and classes that they encounter in the real world, they *must* have it to succeed.

To accomplish this, faculty must be given the time and the resources to explore new technology approaches providing the requisite training and technical support to master these new skills, methods, and technologies for inclusion in

their courses. If this does not occur, faculty may become impediments to implementing technology-assisted learning. Training does not simply entail learning how to operate the software, but rather gaining the knowledge of how and why it will assist learning.

The institution's concept of what a faculty member is and does must thus evolve as new institutional models appear. In recent years, the idea of the unbundling of faculty roles has achieved greater currency. University of Phoenix employs a core cadre of full-time faculty who oversee curriculum and instruction. The majority of the faculty are associate faculty, most of whom work full time in their professions and teach part time. University of Phoenix faculty are primarily a teaching faculty, rather than a research-oriented faculty as might be found at many traditional institutions.

The research faculty model assumes that research keeps faculty current in their fields and cutting edge in their approaches, ensuring students a sound educational experience. University of Phoenix recognizes research as a valuable scholarly pursuit, but for its students emphasizes the application of knowledge to real situations, the integration of knowledge across disciplines, and the disciplinary expertise necessary to effective teaching.

An unbundled model provides a system that rewards faculty according to their strengths and their ability to add value both to the student-learning experience and to the body of academic knowledge.

Academic Apps

In some ways, the future is already here with the introduction of the newest member of the University of Phoenix technology family—the University of Phoenix Mobile iPhone app. For busy students who are juggling work, life, and school, the University of Phoenix Mobile app, implemented in April 2011, makes it easier for users to be engaged wherever and whenever it is convenient for them.

The University of Phoenix Mobile app joins the growing list of academic application software available on iTunes for students on the go. With this free application, students and faculty with Apple iPhones or iPads are able to do the following:

- Participate in discussion forums.
- Draft and post to discussion threads, and reply to other students' posts.
- View, edit, and save drafts of discussion comments created on the classroom portal.

- View message flags, discussion questions, and class announcements.
- Receive real-time alerts when grades are posted and when the instructor posts new information.

Learning apps for other smartphones are currently under development.

Looking Forward: The Untapped Potential of Technology

What we have discussed, while representing significant advances for higher education, only scratches the surface of what current technology can offer. There is much more to be adapted from the current technological playlist for the higher education community. The most important cumulative result is that technology has the potential to increase student engagement by creating a more personalized learning environment that can incorporate adaptive features. In other words, the student learning environment can be designed to respond to the specific student.

A major source of potential here lies in ambient intelligence—that is, technology that knows the users, serves them, responds to them, and does so unnoticed. Ambient intelligence, for example, is what makes possible Amazon's recognition of users and the types of products they are interested in, and thereby puts those in front of users as soon as they log in, or perhaps even e-mails them with updates when new, similar products arrive.

This type of technology can be adapted to academic data sets in order to determine a student's learning profile and then adjust the learning environment to his or her needs. The more data points that can be gathered, the better the prescription is for learning. Once the strengths and challenges of a student are determined, programs can then be informed of skill enhancements, as well as appropriate levels and modes of content. In short, technology can make it possible to provide an individualized learning experience for every student.

Such technology not only serves the student directly, but also connects the student to faculty members in new ways so that they can mediate in a more deliberate manner than is currently possible. Faculty members will be able to see student information on online dashboards populated for each class. The information can include individual student needs and direct faculty members to resources to assist the students.

If courses are designed to include materials that are suited to different learning styles, faculty members no longer must teach to the middle of the class. Learning can and will adapt to each individual's needs. Faculty members

will know what the students have learned and what they have missed. Faculty members can use this feedback in a variety of ways. For instance, they can assist the students in specifically identified areas of concern. They can also alter their approach to address areas in which a large number of students are showing deficiencies.

When this highly individualized and interactive learning experience is combined with social networking, new levels of interdisciplinary, interprogram, and intercohort dialogue and collaboration are possible. In short, adaptive technology can enhance the student's experience, and it is expected to increase engagement and learning outcomes. However, technology is just the tool. The key to the successful utilization of technology is the empowerment of faculty members to excel.

Conclusion

In the twenty-first century, the University of Phoenix is a game changer in higher education in that it early on recognized the power of technology to increase engagement and learning outcomes. The University of Phoenix is fully cognizant that technology is just the tool. The faculty member remains critical. Technology is most valuable when it empowers faculty and students to excel. To that end, the University of Phoenix has been proactive in ensuring broad implementation of technology, which helps faculty and students ensure a successful learning experience.

Notes

1. Mark Longer Press Quotes, <http://www.ubiq.com/hypertext/weiser/WeiserNewsQuotes.html>.
2. *Framework for 21st Century Learning* (Partnership for 21st Century Skills, March 2011), http://p21.org/documents/1._p21_framework_2-pager.pdf.
3. Ibid.

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