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**EDUCATING THE NETGEN:  
STRATEGIES THAT WORK**

**APPENDICES**

**to the Participant Packet**

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## THE NEXT-GENERATION STUDENT

by Wendy Rickard and Diana Oblinger (This essay is from the Higher Education Leaders Symposium held at Redmond, WA, June 17-18, 2003)

### Preface

Times change. Today, it is no longer reasonable to assume that a well-paying job is within reach without a college degree. In addition, there is increased pressure to improve educational outcomes and a rising demand for accountability. Students change; they are more diverse—in terms of age, ethnicity and goals—than ever before. And, they are technologically savvy. Institutions express the desire to better meet the needs of a changing and diverse student body.

How can institutions of higher education be successful in the face of such changes? More than ever, planning for success means knowing and understanding students: who they are today and who they'll be tomorrow. If higher education truly intends to put students at the center, it must think about the populations it will serve and the attitudes, sensibilities, and priorities of the next generation of students. Assuming today's students are the same as prior generations of students may be fallacious.

Trite, but true, technology is having a profound effect on how, where, and when we work, learn, and live. The attitudes and expectations developed in the emerging customer service culture influences the expectations of colleges and universities.

The impact of information and communications technologies (ICT) is clearly manifested in our youth. Today's precollege teen represents an entirely different generation from today's 22-year-old college senior. They grew up with distinct influences, attitudes, and expectations. From their earliest years, they learned to sort through and manage vast amounts of information. And rather than viewing computers as machines for analysis and data processing, they view technology as a natural extension of their lives: for work, entertainment, and learning.

People are products of their environment; ICT is an influential part of that environment. Those influences are inextricably linked to the learning styles and characteristics of the next-generation student. Most would admit that educators and educational institutions are lagging behind the new generation of students in their use and implementation of technology. Is it even possible to imagine higher education staying one step ahead of tomorrow's student?

In June 2003, Microsoft Corporation brought together a diverse group of higher education leaders, experts, and students—many of whom are working on advanced educational environments in both traditional and nontraditional settings—to discuss the next-generation student. The purposes of the symposium were to describe the next-generation student and to identify the distinctive characteristics that have implications for the ways colleges and universities attract, educate, and support the next-generation student.

## ***Section I: The Student Today, Tomorrow, and the Day After***

### *The Student Today*

Today's college seniors are part of a generation in transition. They bridge two cultures, being comfortable in traditional learning environments yet attached to their cell phones, instant messaging, and e-mail. In some respects, the demographic profile of today's traditional college student is not that much different from the traditional students of the generation before them. Today's traditional college students are predominantly white (68 percent), with slightly more women than men enrolled (56 percent). The majority (59 percent) are full-time students. Most (71 percent) attend their first-choice college, with 79 percent attending college in their home state. And the majority (52 percent) consider themselves "middle of the road" politically.<sup>1</sup>

What makes them different from the previous generations of students are their numbers, their characteristics, and their diverse learning needs and preferences. College is no longer dominated by 18- to 22-year-olds who live on campus and are enrolled full-time. Today more students than ever attend college part-time. Many are older (43 percent are older than age 24). According to the National Center for Educational Statistics, three-quarters of all undergraduates exhibit some combination of characteristics associated with so-called nontraditional students: delayed enrollment, attendance at college part-time, working full-time, financially independent, having dependents, being single parents, or lacking a high school diploma.<sup>2</sup>

### *Raised in a Wired World*

Steve Jones, University of Illinois at Chicago professor and principal author of the report, *The Internet Goes to College: How Students Are Living in the Future with Today's Technology*,<sup>3</sup> discovered that "the most important uses of technology are the unintended uses." Text messaging via instant message (IM), for example, was regarded by its creators as a throwaway feature as cell phones transitioned from analog to digital technology. It has since become an essential feature for cell phone users—and a revenue generator for providers.

Reflecting on the results of the report, Jones admits it was no surprise to learn that college students are heavy users of the Internet. What did surprise the researchers—and what makes it possible to piece together the cultural implications of technology use among teenagers—is how students use connectivity devices. For instance, while attending a rock concert in spring 2003, Jones noticed that when the lights went down, all that could be seen throughout the crowd was the glow of tiny blue screens. "In our day, we lit matches in the air at rock concerts," said Jones. "Today the sea of tiny lights among concert goers are cell phones, on which they can IM friends or have them listen to the music. They were doing what they do best; they were connecting."

Connecting is what the current generation of students is all about. According to the report, college students use the Internet as much for social reasons as for academic reasons. But as Jones points out, a big part of the college experience is learning how to develop and maintain social relationships. "Through technology, today's college students are maintaining relationships with their high school friends and family more than generations before."

Do students say the Internet is having a positive impact on their academic experiences? According to the report, they do. But they don't seem to be enhancing their educational experience by pursuing e-mail relationships with their professors. Even as the Internet has opened up new possibilities among students—such as online study groups, which enable students who are geographically dispersed to meet and discuss class material—students today tend to refrain from contacting professors via e-mail too often. In fact, only 19 percent of students said they communicate more with their professors via e-mail than in person. And just 11 percent of college students surveyed said they contact their professors via e-mail once or twice a week. Thirty-four percent said they contact their professors via e-mail once every two weeks. And 51 percent seldom contact professors via e-mail.

How do today's traditional college students react to the availability of online learning? With nearly every institution of higher education in America investing in some form of online education, only a small number of traditional students are taking online courses. "To traditional students, distance-learning courses are viewed as correspondence courses," said Jones. Conversely, college students seem to want the best of both worlds: they want the in-class experience when it suits them, yet they want to be able to download lectures, homework assignments, and reading materials. However, online learning, at their age and in their life situation, is generally not a priority. Nor do they necessarily represent the market that online learning aims to serve.

With a passion for connectivity comes the demand for bandwidth. "When this generation moves into the world, they'll go into it wanting broadband," said Jones. "They expect ubiquitous access, and they want to be able to use whatever machine is on hand." Along with broadband come capabilities for moving files around, as evidenced by the rise and fall and then the rise again of peer-to-peer music downloading systems, which are putting institutions at increasing risk over copyright infringement by students. College students may very well make up the largest population of file downloaders, said Jones, but that doesn't make them criminals. Students, he said, will continue downloading music until a viable alternative makes it possible to download music legally. And as Jones writes in his report: "It is important to note, too, that although activities like file downloading and instant messaging may be categorized as 'leisure,' they can also be important learning activities. They help students develop the types of skills that will be important in the future. For example, learning how to manage a file-sharing system or navigate in a real-time chat can be complicated tasks that teach college students valuable technical skills they might need in the workplace."

Perhaps most important, what the report reveals is how today's college students are blurring the lines that separate work, social life, and learning. Both instructors in learning environments and managers in the workplace will need to adapt to that phenomenon. Such issues as cell phone use and its associated etiquette and distraction issues will, according to Jones, grow both in the classroom and on the job.

### *The Next Generation of Students*

Who are the students entering college this fall? They are the millennial generation, sometimes called Ngeners or NetGeners. Born from 1982 to 2000, this dynamic group of young adults is being analyzed and examined with unparalleled fervor and fascination. According to Microsoft's Diana Oblinger, facilitator of the symposium, millennials possess a number of traits they acquired because of—but that are fundamentally foreign to—their baby boomer parents. They gravitate toward group

activity, identify with their parents' values, and spend more time on homework and housework and less time on television than those a few years older. They're almost completely unaware of a time before the Internet. Their formative years were spent in highly structured environments. They grew up acculturated by terrorism, heroism, patriotism, and globalism. They're confident and self-assured. They believe it's cool to be smart, and they're fascinated by new technologies. They're racially and ethnically diverse; in fact, one in five has at least one immigrant parent.<sup>4</sup>

These next-generation students are different from their older siblings and peers not simply because they were brought up on the Internet, on video games, and by parents who hovered over them—all of which have had a significant impact on their behaviors and attitudes; they're different because they don't fit into a single learner profile. They constitute a generation that cannot be generalized. They expect both their learning environments and their future workplaces to accommodate their wide-ranging sensibilities and needs. As Claire Raines writes in *Generations at Work*, her online forum, millennials are "sociable, optimistic, talented, well educated, collaborative, open-minded, influential, and achievement oriented. They've always felt sought after, needed, indispensable. They are arriving in the workplace with higher expectations than any generation before them, and they're so well connected that if an employer doesn't match those expectations, they can tell thousands of their cohorts with one click of the mouse."<sup>5</sup>

If higher education is to successfully educate this generation, it must be prepared to invest in learning environments that are by definition not one size fits all, that support learning as socially constructed and contextual, that are structured yet self-paced, and that are more outcome oriented than ever before. Perhaps even more than their parents, instructors, and guidance counselors, millennials want to see the connection between where they are and where they're going when it comes to their education. They're high achievers, and they take their learning environments seriously.

### *New Learning Styles of Multigenerational Students*

With all they have in common, millennials have an inherent respect for differences. They accept differences that span culture, ability—or disability—and style. Millennials are more comfortable with their learning differences than any other generation has been. They bring to the table a new set of collective and individual learning styles that challenge conventional notions about how education gets presented, delivered, and assessed. They learn best experientially. They want to know what the new ideas have to do with them. They multitask with ease, they're goal oriented, they're social, and they generally have a positive attitude. Most important, they're comfortable asserting their sensibilities, meaning, they have high expectations about their education and they're willing to express them.

While understanding millennials is a priority for educational experts, differing learning styles and demands for diverse educational environments are hardly the exclusive domain of this new generation. A multitude of generations make up the 14 million students enrolled in colleges and universities today, thereby proving that generalizations about students can be misleading. Present among the 24 experts at the Higher Education Leaders Symposium were representatives of the student population, each of whom brought to the table surprising—and sometimes conflicting—attitudes about what makes educational environments successful and what they want from their

educational institutions. What we learn from their insights and experiences is that students are not necessarily different because they're younger or older but because today's students—at any age—bring to education a much clearer sense of who they are and the learning goals they want met.

## *The Traditional Student*

This past spring, symposium participant Andrew Payne earned an undergraduate degree from North Carolina State University. He's planning to attend graduate school in the fall. Youthful, serious, polite, and articulate, Andrew exhibits many of the characteristics assigned to his age group, not the least of which is his ability to take charge of his education and his unwavering belief that education is the key to a successful and productive life.

Called upon to speak for the current generation of traditional students—in other words, those who are attending college full-time, working toward or finishing up a baccalaureate degree, and planning to pursue advanced degrees—Payne drew a vivid picture of his peers in two simple sentences: "It's perfectly normal for a group of college students to watch TV with their laptops in front of them. They'll check their campus mailbox once a day but their e-mail every five minutes."

How else are today's students confirming our assumptions? According to Payne, they are indeed connected and communicative. They're avid users of the Internet for file sharing and leisure-time activities as well as for research. They expect their professors to use technology to enhance the classroom experience, which is how they're used to operating in the world. Payne says today's traditional college students have high expectations of their educational institutions and environments. Accordingly, such students expect that:

- > The classroom experience will be enhanced through technology, including video, PowerPoint, or other forms of presentation.
- > Technology will be used to facilitate communication between professors and students (although Payne says students won't instant message faculty because IM is perceived as a very personal form of communication).
- > All aspects of their coursework—including syllabi, lectures, handouts, grading, and home work—will be available online in one form or another.
- > Differing learning styles will be accommodated, most likely through the use of technology.
- > Professors will be proficient in e-learning.
- > The university will provide educational and technical support.
- > Required courses will relate directly to their degrees.

What about the use of scholarly resources by the traditional college student? According to Payne, Google has become the de facto research tool, mainly because "the library is complicated and students simply don't want to exert too much energy."

With some experience in online courses, Payne says not all courses are suitable to online environments. Statistics, for example, is the type of course he says benefits from face-to-face interaction. And while online homework is becoming more popular, Payne isn't comfortable with the lack of instructor feedback. "Some students prefer the traditional classroom experience," he says. And he expresses irritation over what he refers to as a "rush to create online courses," which, he fears,

removes resources from the classroom. Mirroring a skepticism often heard among faculty, he asks, “What do we know about their [online courses’] quality?”

Payne is not entirely in support of computers in every classroom. “I’m not sure how all this enhances learning,” he says. “Registration online is great, but computers in the classroom create a distraction. It makes it irresistible to conduct online chats. And they’re noisy. The sound of typing on a keyboard is a distraction in itself.”

## The Nontraditional Student

In some ways, David Taylor is the student higher education has in mind as it rethinks its delivery mechanisms and its ability to accommodate the growing number of nontraditional learners, most of whom are older, are employed full-time or have experience in the workplace, and attend school part-time. Taylor is a Ph.D. candidate at the University of Washington. In the 30 or so years since beginning his formal education, he’s earned an undergraduate degree at a small college, worked full-time, completed an M.B.A., and received technical training at a community college. “All of those experiences were different,” he says. And now he’s looking for a different type of experience again.

In contrast to Payne, Taylor is less concerned about the changes in higher education brought on by technology. He seems more concerned that the changes aren’t happening fast enough. “Business is far ahead of academia in terms of computer use,” he says, adding that it’s due in large part to a culture that values research and publishing over innovations in education and student learning. “We’re not rewarding the academic community for using technology to improve education. The business world, on the other hand, knows how to build in rewards for changing behavior.”

Taylor also worries about how dependent higher education is on the traditional publishing model. “When it comes to academic journals, it could take two years from submission to publication,” he says. “We need to move to Web-based publishing, and Web-based journals need to be valued.” In addition, Taylor wants higher education to catch up with the business world in its baseline technologies as well as the ways it applies technology to improve its products, services, and operations. “In higher education,” he says, “one can have a faster connection from home than from a university office.”

Like Payne, Taylor says online courses have their place, but they may not be appropriate for all learning. Case-based, experiential learning—such as work involving negotiation—is difficult online. And as participant, presenter, and Microsoft representative Suze Woolf pointed out, even as new studies are showing that learning outcomes are better for online learners, traditional students don’t seem to like it as much.

## *Teaching Today’s Student--And the Student of Tomorrow*

More than ever, the gap between the instructor and the student is widening. Roles are changing. Rather than rule, next-generation students expect instructors to guide, coax, and coach. With students today much more confident in expressing themselves, they’re making it clear that they

don't want to be preached at, ignored, or bored. The challenges that faculty face are significant. Students expect their learning materials to be available online; they expect their instructors to be proficient at e-learning; and they expect those instructors to learn to use and apply course management systems. Beyond those changes, faculty are being asked to adopt new teaching methods and styles, such as in the case of the studio classes developed at Rensselaer Polytechnic Institute<sup>6</sup> or the Math Emporium at Virginia Tech.<sup>7</sup> Even the physical layouts of classrooms are altered so that students are at the center.

For some faculty, the changes don't constitute a hardship. Many embrace new forms of development and delivery, stimulated by the opportunity to improve the quality of their courses. Others fear that the changes are, at best, unnecessary demands on their time and attention and, at worst, antithetical to good teaching practices.

Like today's students, current faculty cannot easily be generalized by age, experience, or background. Many senior faculty are advocates of new learning environments that aim to accommodate a new generation of students. And many junior faculty are resisting the changes.

Clearly, there also are cultural and political barriers that prevent faculty from changing or that thwart institutional leaders from establishing a culture of change. As Taylor points out, rewards are not always in place for innovative, technology-minded faculty members, even though colleges and universities are making huge investments in technology-enhanced educational environments and infrastructures. While many institutions are ramping up their faculty-support programs to help faculty adapt to next-generation students, not enough is available to enable them to stay one step ahead of students.

## ***Section II: How the Next-Generation Student Is Changing Higher Education***

While a fair amount of focus is on the impact and influence of technology on higher education, participants made it clear that learners, not technology, are changing education. Perhaps the most important thing to remember about technology, however, is that the next generation of learners were raised on it. Their comfort level and the extent to which they depend on technology have made them learners and consumers of education who are very different from their predecessors or their professors. It allows us to respond to different learning styles. ICT offers innovations that can be applied to the learning process—innovations that were not possible—or even imagined—before.

In addition, the next generation of learners are not necessarily from the same generation. Symposium participants emphasized the importance of understanding that college students will never again be classified as a single group. With that in mind, it is essential to plan not only for larger numbers of students but also for students of varying backgrounds, ethnicities, physical as well as learning abilities and disabilities, learning needs, and learning styles. Plus, each student expects to be treated as an individual.

In general, next-generation students are demanding a higher level of service than ever before, personal attention, flexibility, and educational outcomes that directly relate to their professional goals. Meeting their needs means enterprisewide change, often involving technology. Partici-

pants emphasize the need for institutional leaders to respond to the needs of these new students or risk declining relevance and competitiveness.

## *Service*

Throughout the discussion, participants emphasized the theme of service; today's students think of themselves as customers who have options—and who are willing to make choices. They tend to be much more demanding of colleges and universities than previous generations of students were. And they're highly sophisticated customers. Carol Scarafiotti, dean of instruction at Rio Salado College, knows about customer service. As one of the leading providers of distance education in the United States, Rio Salado offers roughly 300 Internet courses and a broad range of student services, such as registration, tutoring, academic advising, library services, and counseling. Clearly Rio Salado's students are the courses' and services' customers, and they have specific goals and limited time. "Our students look for a certain level of service or they won't stay," Scarafiotti says. "Students think about more than courses, and they appreciate having other needs met, such as questions answered by someone other than a professor, 24/7 help, and grades posted immediately. So customer service is a big issue. And from the start, we wanted to astonish our customers."

That sentiment was echoed by Dominique Abrioux, president of Canada's Athabasca University, a purely distance-learning institution. While Abrioux says he feels strongly that his institution offers educational quality, he adds that he believes he's in a service industry and that without a high level of service, Athabasca will lose students. "Getting the academics right is easier than getting the service right," he says.

Service comes in many forms. For Rio Salado and Athabasca, it means just-in-time education (courses offered every few weeks), automated registration, flexible enrollment, asynchronous instruction, 24/7 help, and, in the case of Rio Salado, a promise that courses will never be canceled. For others, it's about educational quality and the student's perception of having a successful educational experience. According to participant Carole Barone, vice president of EDUCAUSE's National Learning Infrastructure Initiative, access is a critical service. Beyond making *courses* available to students when, where, and how they want them, Barone says today's students each bring a different cognition to the classroom and that the *subject matter* needs to be made intellectually accessible.

An institution doesn't have to specialize in distance learning to be concerned with customer service. For traditional students, customer service means preserving campus life and community while catering to a technology-savvy generation. It means easy access to information that enables students to select an institution; it means integrated admissions, registration, and financial aid systems; and it means the ability to track their progress, build an electronic portfolio, transfer to another institution without worrying about transferability of credits, and obtain transcripts on demand. It means classrooms that are both wired and wireless, instructors who understand how to use technology in the classroom, and high-quality course management.

## *Learning Styles*

Service is also about listening to students, understanding and accommodating various learning styles, and meeting the needs of students with physical and/or learning disabilities. Pat Wasley, dean of the College of Education at the University of Washington, reminded participants that not too long ago, it was assumed that some students were simply better suited for higher education. “We used to believe in the bell curve,” she said. “Today we know that all people have the capacity to learn.”

Wasley suggests looking at preconceptions as the path to understanding how students in general—and new generations of students in particular—learn. “Students come into learning environments with their experiences, their expectations, and their preconceptions,” says Wasley. Faculty do the same. What we know from research is that learning is socially constructed, experiential, and interactive. “Profound learning experiences rarely happen alone,” she said.

Wasley says higher education is good at delivering facts but falls short when it comes to building a conceptual framework and a retrieval system for students, which, she says, is what separates novices from experts. Her point is particularly relevant given what we know about today’s students and the generation that will soon be entering college—that is, that they’re context driven, accustomed to structure, and influenced by new technologies. For them, education is effective when it’s relevant. “Interest is essential to engagement,” says Wasley. And while there are basic characteristics of how people learn that cross generations, millennials expect much more personalized attention and freshness of approach. “They can figure out routines quickly,” Wasley warns.

Symposium participants identified a number of preconceptions that go beyond millennials. According to Barone, traditional students raised on interaction come to higher education unprepared for the passivity of the traditional lecture. Scarafiotti points out that distance-learning students, many of whom are working adults, are often surprised to find out that the online environment can be highly interactive.

There are also the preconceptions, challenges, and support needs specific to immigrant populations and students with disabilities. Participant Nancy Rickerson, research coordinator of the University of Washington’s DO-IT (Disabilities, Opportunities, Internetworking and Technology) program, points out that for students with disabilities, service means universal design, adaptive technology, access to learning, funding, and resources. Steve Kerr, associate dean for academic programs at the College of Education of the University of Washington, raised the issue of learning needs and styles specific to immigrant populations, such as those who need to learn English in order to get jobs and be productive citizens. Melvin Johnson, Provost at Winston-Salem State University, reinforced the notion that education must be tailored to the specific cultural, stylistic, and economic needs of African-Americans and urban residents.

For most participants, the combination of service and learning styles is simultaneously parallel and difficult to pull apart. Learning, as Wasley says, has an emotional base as well as a contextual framework. It is both structured and highly personal. It is born out of one’s relationship to experiences, institutions, individuals, and groups. Abrioux commented that today, online learning environments serve different populations with the same approach. “In the future,” he says, “those markets will not be serviced by the same products.”

## *Institutional Culture*

Students change. Faculty change. But as participants observed, institutional culture seems resistant to change. Encompassing a wide range of processes, behaviors, and the environment in which higher education operates, an institution's culture is affected by, among other things, mission, scope, size, and history. The culture associated with a research-extensive university, for example, is different from that of a baccalaureate institution or a community college. And although research is not the *raison d'être* for all institutions, the search for external funds to augment the enterprise as well as the prestige associated with research has led to an increased research focus for many.

Culture is also based on values. Academic institutions are rooted in a set of values shared by all types of institutions. For example, autonomy is a tightly held value whether the institutional focus is on research or on undergraduate instruction. A strong sense of autonomy is reflected in the principles of academic and intellectual freedom that pervade all institutions. How does this sense of autonomy support the needs of the next-generation student?

Community is another important characteristic of campus culture. Colleges and universities see themselves as communities of scholars and students engaged in thoughtful reflection and discourse, somewhat set apart from day-to-day concerns. Within those communities, access, civility, inclusiveness, and respect for others are core beliefs. The sense of community draws people to academic and campus life, but it may also insulate it from external changes. In reality, campus communities are not isolated, but their own culture may overshadow others. Will our academic communities enhance or inhibit the ability to address the needs of the next-generation student?

How do faculty, staff, and administrators navigate institutional culture and the changing needs of next-generation students? Some symposium participants say individuals want to adapt to change but see the lack of institutional rewards as the problem. Others suspect that fear of technology—and of change—makes it less likely that the status quo will be altered. Certainly there are cases in which faculty, staff, administrators, and institutions are adapting to the wants and needs of the next-generation student, but there are concerns about whether the requisite support and rewards are in place to sustain those changes.

While technology can force us to alter almost overnight the way we perform our tasks, cultural changes happen at a much slower pace. For instance, the debate over instructional technology has spanned more than a decade. Some point to the lack of data proving its efficacy. Others cite increased costs. Responses often fault the so-called bolt-on approach of adding technology to an unchanged process.

Underneath the technology debate are such issues as fear of failure, lack of time, and lack of rewards. Even though institutional leaders may understand the importance of a student-centered environment, instructors may see little incentive for investing the time and effort it takes to leverage the instructional benefits of information technology. While faculty feel pride in their instruction, their tenure, promotion, and merit pay may suffer if their focus is not in line with institutional expectations—expectations that are partially determined by institutional culture. For example, too much emphasis on using technology or serving students and not enough on research may

be risky at a research-extensive institution. The pattern is not immutable, though. As one participant noted, it is the faculty who control the tenure and promotion process.

The prevailing process of graduate education was also cited as an impediment to adapting to the next-generation student. In most institutions, the preparation of future professors focuses on research. Little or no attention is paid to making sure that future faculty will be sensitive to student attitudes and learning styles or that they are mentored to become good instructors, advisers, or course developers. Pedagogy and classroom experience have had little place in Ph.D. programs designed to develop research expertise. However, a few institutions are beginning to modify graduate education to include skill development in classroom techniques as well as the understanding of how students learn.

It is widely held that the U.S. higher education system is the envy of the world, leading to an attitude that participants cited as another cultural barrier. If you believe you're the best, why change? Of course, being the best today does not ensure being the best tomorrow. Without a continually renewed focus on learners, service, and support—at all levels of the institution—how will the quality of education be maintained?

What are the possible remedies to break down the cultural barriers that inhibit meeting the needs of the next-generation student? Two remedies were offered, but the success of both, according to participants, depends on expanding the discussion beyond those who advocate for change. First, institutions must assume leadership when it comes to meeting the needs of the next-generation learner. This implies addressing institutional priorities including tenure and promotion criteria as well as graduate student education. Second, institutions should engage in broad discussions about who their learners are and how those learners' needs can best be met.

### ***Section III: The NextGen Student, Technology, and Higher Education***

While it was agreed that technology was neither the theme nor the point of the discussion, it is intricately tied to the process of education because of its ability to drive and respond to needs and change. As many participants agreed, technology makes it possible to accommodate differing learning styles and individual needs more efficiently than human intervention alone. It expands options that make education more relevant and more appropriate to both traditional and nontraditional students regardless of their generation. It offers benefits in terms of access, making education a greater possibility for remote students, students with disabilities, professionals, and lifelong learners. And ICT benefits higher education through efficiencies that affect academic productivity.

#### **What Does Technology Have To Do with New Learning Styles?**

In order to understand the impact of technology on learning, one needs to understand how students learn—well before they reach college age. Research reveals that children learn best when they're engaged, when they're thinking critically, when they're solving problems, when they have choices, and when they're making decisions. The tools available to millennials enhance those activities and encourage the development of skills they'll need later in life. Parents who've felt their child was lost to PlayStation 2 or Xbox may be relieved to know that the countless hours their child spends with the joystick are not wasted. As Randy Hinrichs of Microsoft pointed out in a presentation about

new educational tools, Pokemon cards teach data structures; Tycoon games teach economics and complex systems; flight simulators teach aeronautics and estimation; Cesar II and Age of Empires teach marketing and history; and the Sims teach community formation, social identity, and architecture. Students raised on simulations and games are simply more adept at managing and manipulating digital environments than those who were not.

What technology does best is enable students to control and pace their learning experience and make adjustments to accommodate their abilities. In many ways, the learning styles of younger students are the results of the integration of technology into their lives. For older students, technology has helped them learn in the way that works best for them.

### *Expanding Options*

As Oblinger pointed out at the beginning of the symposium, today's institutions of higher education are not yet designed with the learning preferences of the next-generation student in mind. While millennials like structure, they also need to feel they're in control of their learning experience. They want easy transferability. They'll rarely take the time to hunt down information beyond what they can find on Google. And even though they don't like carrying a laptop, they want access to technology wherever they are; mobility is essential. Institutions have been designed around lecture halls, around learning based on books and print publications, and around faculty who are not necessarily rewarded for innovations that accommodate digital learners.

According to symposium participants, while the characteristics of the next-generation student are at the heart of educational transformation, it is the technology that will create new options for accommodating a wide range of learning needs. Initially modeled on correspondence courses, technology-enabled distancelearning environments make it faster and easier for professionals and working adults to hone their skills or be retrained. Traditional institutions are using technology to reengineer large-enrollment classes for the purpose of reaching more students more efficiently, improving the educational experience in those classes, and accommodating the needs of students who are more comfortable being at the center of the learning experience.

Technology also provides greater options for immigrants, who, as student-participant David Youn comments, want to improve their English but don't want to face the social barriers of certain types of learning environments. "Technology-aided ESL [English as a Second Language] departments and services now offer truly personalized and customized learning tools that simulate real-life situations," he says.

More generally, technology has made it possible for institutions to enlarge where, expand the ways, and extend the time that education can be delivered, according to what students need. It makes it easier for institutions to meet the needs of its learners, and it makes it possible for newer types of educational institutions to meet the needs of narrower markets.

## **Section IV: What Changes Are Needed?**

Twice during the day-and-a-half-long symposium, participants were asked to engage in facilitated discussions that teased out the implications of next-generation students for specific aspects of higher education. Having identified the attributes of the next-generation student, participants began articulating the implications of the next-generation learner for faculty and faculty development, courses, student services and support, and infrastructure. The discussions yielded the following results.

### *Implications of the next generation students for faculty and faculty development*

- > Faculty should be part of development and implementation of strategies for professional development; they also need to be part of the course development process as members of a team.
- > Faculty need to adopt a service culture and assume a service mentality.
- > Faculty need to be open to changes and open-minded about new pedagogy.
- > Faculty need new skills, such as learning diagnosis, engaging students in the learning process, and evaluation and assessment of learning outcomes. They will need the tools to address those issues.
- > More than likely, faculty recruitment will be different, with faculty needing new skills and newer attitudes.
- > Leaders need to create a new set of expectations for faculty as well as new systems for rewarding innovation in technology-rich learning environments.
- > The role of faculty will be unbundled. Faculty will move from teaching to coaching. Is it possible that the term *faculty* will refer to a team?
- > New policies will need to be put into place to clarify who owns learning strategies and course content in technology-rich learning environments.

### *Implications of the next generation students for courses*

- > Courses that are online or hybrid (some combination of online and face-to-face) will require built-in services.
- > Learning will be more collaborative.
- > Continuous assessment and refinement of student learning styles will need to take place.
- > There will be great potential for customization of courses to meet learners' needs, taking into account background, learning preferences, and so on.
- > Courses will expand from *the course* to a variety of course styles, such as tutorials, independent study, investigation, internships, intensives, and apprenticeships.
- > Courses will run across multiple institutions and sources.
- > There will be improved course transferability.
- > The development of courses is more likely to take into account the student as consumer.

### *Implications of the next generation students for student services and support*

- > All administrative functions—such as financial aid and student accounts—will be Web enabled.
- > Just-in-time learning will demand customization and personalization.
- > Security issues will need to be addressed.
- > Services and support may end up being cross institutional.

- > Institutions need to be prepared to pursue postgraduation relationships that affect Internet service providers and e-mail.
- > “My grad program” will monitor graduate school progress.
- > There will be increased need for academic support services such as references and research.
- > Technology-enhanced peer-to-peer/student-to-student support will need to be in place.
- > Online advising will need to be in place.
- > Online application processes, online recruitment, online e-portfolios, online job postings, and online access to grades and transcripts will need to be made available.
- > Institutionally driven networks of professionals, counselors, and advisers will need to be offered.

### *Implications of the next generation students for infrastructure*

- > New demands for learning resources and new learning environments will mean the redesign of campus learning spaces such as the library, dorms, classrooms, and social spaces. Institutions must expect and plan for increased demand for wireless by learners and faculty. They must expect that less space may be required for computer labs but that more resources may be necessary for laptop loaners and other wireless devices.
- > There will be a new role for the campus bookstore, incorporating e-books and, possibly, development of just-in-time learning materials, in preference to traditional textbooks.
- > Residential students will demand high-speed access from dorms, classrooms, and other locations.
- > Resource-leverage strategies may mean closer relationships between universities and the towns in which they're located, as the lines blur.
- > Strategies will be required to balance infrastructure and security.
- > New learning environments and demands will mean new partnerships between higher education, businesses, and K–12 to ensure seamless transitions from primary school to high school, to higher education, to lifelong learning.
- > There must be portability of courses and credits.
- > More collaboration will be needed between institutions so as to develop new infrastructures, policies, and relationships that will facilitate greater flexibility for learners.
- > Public policy will take center stage.

By day two, participants were asked to describe areas of the institution that will be most significantly affected by the next-generation learner, to describe changes that should be made in the learning environment to better support the next-generation learner, and to describe impediments that institutions that seek to address the next-generation learner will face, such as lack of funds and unwillingness to change.

### *What areas of the institution will be most significantly affected by the next-generation learner?*

- > Textbooks and media
- > Faculty: workload, expectations, agreements, development
- > Policy development
- > Resource management
- > Student services and advising
- > Information technology support for students and faculty

- > Enrollment
- > Libraries
- > Courses
- > Programs
- > The possibility of new profit centers

*What changes should be made in the learning environment to better support the next-generation learner?*

- > Affordable, convenient access to appropriate technology and increased opportunities for undergraduate research
- > Classrooms designed to facilitate group work, flexibility and adaptability of the curriculum, and multiple means of connectivity and communication
- > Just-in-time support in areas of technology, class content, and policies that promote student centeredness over administrative/faculty centeredness
- > Interorganizational networks promoting a global experience and global calendaring within colleges and evolution of transcripts to meet the needs of a more-collaborative effort
- > Teaching professors to be better teachers within the context of distance education, for example, teaching them to be proactive

*What impediments to change will face institutions that seek to address the next-generation learner?*

- > Lack of funds or unwillingness to reallocate funds
- > The need to change incentives and rewards
- > Limitations of existing buildings and space utilization
- > Faculty loyalty to the discipline over the institution
- > Faculty fear of loss of academic freedom and self-governance
- > Failure to acknowledge the student as customer
- > Students being treated as customers rather than partners
- > A disconnect between the information technology department and faculty vision
- > Lack of knowledge of good examples
- > Limited opportunities for legitimate experimentation
- > Greater focus on content over student learning
- > Information technology environments that don't match the capabilities of new students
- > Inability to capitalize on student knowledge, capabilities, and energy
- > Fear of change among faculty, institutions, and publishers
- > Existing institutional processes
- > Lack of vision
- > Fear of failure
- > Territoriality
- > Success defined historically rather than futuristically
- > Time for development and support
- > A widening digital divide, including cultural capital in using and working with information

The results made clear that the extent to which higher education can think expansively and creatively about how it does business is almost limitless. The results show that while higher education has been operating in more or less the same fashion and within more or less the same culture for

decades—or centuries, depending on the point of view—changes are on the horizon. Higher education institutions that successfully meet the needs of next-generation students will be in a state of constant change. The attributes of the new academy will be flexibility, responsiveness, and ongoing transformation. In other words, like the next generation students it will serve, higher education needs to become comfortable with change.

What are the barriers that are preventing institutions from engaging in effective transformation? Participants identified several areas:

- > Hesitancy to reallocate funds or to change the funding structure
- > Fear of and resistance to change by educational leaders, faculty, and publishers
- > Lack of incentives and rewards
- > Lack of institutional vision

How can higher education be successful? Participants suggest that institutions:

- > Show leadership.
- > Focus on new learners and not on new technologies.
- > Use the ideal to drive change but reality to achieve practical, realistic results.
- > Recognize barriers to change.
- > Collaborate to find solutions and leverage resources.
- > Make sure the message is put squarely in front of stakeholders, from educational leaders to Ph.D. candidates, to students.
- > Imagine the future.

If any single point was gleaned from the discussion, it was that traditional students are clearly nontraditional: they're younger, full-time students raised on technology; they're older students going back to school part-time; they're laid-off workers needing retraining; and they're immigrants learning the language and culture of their new country. Beyond those categories of students there are countless submarkets that are being shaped by all generations and all types of learners.

In business it is well accepted that to be successful, one must know the customer—not just as a mass market but customers as unique individuals. In education, the same is true. It is the learner—as an individual—who will ultimately shape and reshape higher education, not a generation or mass market of learners. Learning is complex and multifaceted, and learners themselves will influence learning providers. Processes that make it possible for every learner to obtain a quality education according to individual needs will be a hallmark of successful institutions.

As Microsoft's Sherri Bealkowski commented at the close of the discussion: "It is about the learner and not about the technology. One size will not fit all."

At the same time, higher education institutions are made up of individuals whose preferences, attributes, and aptitudes cannot be generalized. Many have little or no experience with next-generation learners. As one participant pointed out, there is a generation of higher education administrators who are against change and protective of students; there are also many with new ideas and perspectives. In spite of ongoing rhetoric about change and transformation, we must recognize that in a relatively short time, higher education has made great strides in transforming itself. Online learning has exploded, large institutions are forging relationships with community

colleges, and electronic communications are changing the way instructors and learners interact. The purpose of these discussions is to ensure that the next generation of students may actually find that higher education isn't too far behind them. As Melvin Johnson says, "It takes a village to raise the next generation of students." Students, faculty, administrators, and staff must work together—with a better understanding of student needs, learning styles, and educational options—to ensure that the next generation of students turn out to be the best-educated generation, who will bring the benefits of that education to themselves, their families, and society.

## Appendix: Symposium Participants

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## Notes

<sup>1</sup> 2002 *Chronicle of Higher Education Almanac* issue.

<sup>2</sup> National Center for Education Statistics, *The Condition of Education 2002*, June 2002, <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2002025> (accessed April 22, 2003).

<sup>3</sup> Steve Jones, *The Internet Goes to College: How Students Are Living in the Future with Today's Technology*, September 2002, <http://www.pewinternet.org/reports/toc.asp?Report=71> (accessed April 22, 2003).

<sup>4</sup> Neil Howe and Bill Strauss, *Millennials Rising: The Next Great Generation* (New York: Vintage Books, 2000).

<sup>5</sup> Claire Raines, *Generations at Work: Managing Millennia*, <http://www.generationsatwork.com/articles/millennials.htm>.

<sup>6</sup> R. Byron Pipes and Jack M. Wilson, *A Multimedia Model for Undergraduate Education*, <http://ciue.rpi.edu/pdfs/mmModelUGed.pdf>.

<sup>7</sup> Virginia Tech's Math Emporium: A Model of Academic Transformation, <http://www.educause.edu/nlii/meetings/orleans99/mathemp.html>.

## 8 REASONS TO CHECK OUT A TABLET PC

So you've decided to buy a new laptop PC. It's a logical thought. After all, prices are down, features are up, and now you can get an affordable model that offers power, mobility, and a long-life battery in a package that weighs only a few pounds.

Hold on for a moment.

There is an alternative. The Tablet PC, a fully equipped PC the size of a letter-sized notepad, is worth checking out. It weighs less than four pounds. (For all you cynics: Yes, I work for Microsoft. But Microsoft will be just as content if you buy that laptop running Windows XP. I'm just suggesting you've got choices.)

For the same price as a midrange laptop — Tablet PC prices will range from \$1,600 to \$2,200 — you will get everything a notebook PC has to offer and more. Specifically, it is a more convenient size, has a pen-activated screen, and is easier to use at meetings and while traveling. It offers Microsoft's most advanced operating system to date and allows you to run any Windows XP-compatible applications.

Best of all, it enables you to edit documents and send e-mail messages in your own handwriting, and translate most handwriting into text. Included is a feature to help decipher bad handwriting (for really, really bad handwriting, maybe you should stick to typing). Some models also have voice-recognition input capabilities.

### **For road warriors and meeting hounds**

Granted, not everybody is going to want a Tablet PC. Some will lament the cost, now that laptops can be purchased for under \$1,000. Others won't like a smaller keyboard. Still others may have little use for digital penmanship, or the increased mobility, or will simply be cool to the novelty of a new form factor.

But "road warriors" and "corridor warriors" — people ensconced in meetings most of the time — will be prime candidates for Tablet PCs. So will students, salespeople, doctors and other health-care workers, architects, engineers, researchers and others who need an easy-to-operate, easy-to-transport PC.

"I've sat through a number of product demos, and I find it to be quite impressive," says Alan Promisel, a research analyst at IDC. "It's really pretty cool. And it will make some people's jobs easier." He adds that Microsoft's handwriting recognition technology — a key ingredient of the Tablet PC — has made "enormous leaps and bounds" with this offering and will continue to improve. "As it improves," he says, "more people will embrace this form factor."

### **'Convertible' and 'slate' models**

The Tablet PC comes in two basic designs — "convertible," a tablet-sized screen with an integrated keyboard that you can fold over like a notebook PC, and "slate," where the screen is detached from the keyboard and can be hooked together at a docking station.

It is being manufactured by major computer makers such as Hewlett Packard, Fujitsu, Toshiba and Acer, and will run on Microsoft's Windows XP Tablet PC Edition operating system. You won't need

specialized software — Office and any line-of-business applications you use with Windows XP will work on a Tablet PC.

“The Tablet PC is the evolution of the notebook PC,” says Todd Payne, a Microsoft product manager. “It has all the power and performance of a PC, plus many new enhancements. And you can take it just about anywhere you wish.”

Why do I think a Tablet PC is worth checking out?

- 1. It will run Microsoft’s most advanced operating system to date.** Windows XP Tablet PC is actually a superset of Windows XP Professional, with the power and capabilities of XP, plus additional features to allow “pen-based computing.” More on that in No. 2.
- 2. It will extend the way you use a PC.** You can still type your notes and text, and use the Internet the way you would a notebook or desktop PC. But with “pen-based computing,” you can incorporate digitized pen-and-paper into the PC experience. Using a special “digital pen” that comes with it, and the Tablet PC’s “input panel” utility (which is like a keyboard on the screen), you can write directly on the screen and save notes in your handwriting or convert them to typed text. Your digital pen can take the place of a mouse and keyboard, or you can use a regular mouse and keyboard, if you wish.
- 3. You can take all your notes electronically.** The Windows XP Tablet PC Edition comes with a note-taking utility called the Microsoft Windows Journal, which lets you create and organize your handwritten notes. Notes, diagrams and drawings — all that you would normally create with pen and paper — are captured and stored in the Windows Journal. The Tablet PC’s advanced handwriting recognition technology allows you to search your handwritten notes quickly to find what you need. (In a demo, Payne did a search and found all the notes he’d written that included the word “budget.”)
- 4. You can work from anywhere, and you won’t disrupt meetings.** Some companies prohibit or discourage people from using notebook PCs in meetings. Why? Because the laptop screen creates a barrier of sorts between the user and the speaker. You lose eye contact while you’re plunking away on keys. By using a pen and a letter-size screen (with the keyboard folding over), a meeting participant can maintain normal eye contact and still take notes at a meeting — he can even sneak peeks at his e-mail or the Internet. Meanwhile, the same mobility and wireless capability that a laptop provides enables Tablet PC users to likewise work in coffee shops, in class, on planes and in hotel rooms.
- 5. The Tablet PC can be your primary PC.** Remember, it’s a fully equipped PC, not a PDA, so you don’t have to “synch” it up with your desktop PC. The “convertible” model, as I said, comes with an integrated keyboard that folds into a tablet. The “slate” model comes with a docking station for easy access to a keyboard while at your desk. Removal is easy, and the Tablet PC also has a speedy “resume-from-standby” time. Over time, more and more users will regard their Tablet PC as their primary PC, predicts IDC’s Promisel.
- 6. You can collaborate with co-workers effectively.** By downloading the Office XP Pack for Tablet PC, you can apply your digital penmanship to core Office XP applications (not *any* pen will work). For example, you can add handwritten comments or draw pictures in Microsoft Word 2002 documents, emphasize key points in PowerPoint 2002 presentations, write and send handwritten

e-mails through Outlook 2002 — and share handwritten documents with other PC users, regardless of whether *they* have a Tablet PC. You can highlight items, cut and paste handwritten items as you would text, and convert as much handwriting as you want into typed text.

**7. You can personalize and internationalize.** Tablet and pen settings allow you to customize your Tablet PC for left- or right-handed operation, and to program buttons to complete a variety of tasks. Also, Windows XP Tablet PC Edition is offered with English, German, French, Japanese, Chinese (Simplified and Traditional), and Korean. And it supports the Windows XP Multilingual User Interface, which lets you change dialog boxes, menus, help files, dictionaries and proofing tools for each user's language.

**8. Your data is encrypted and protected.** Windows XP Tablet PC Edition offers all of the protection features of Windows XP Professional, including the Encrypting File System security feature and the "access control" feature, and it supports the secure logon using a single CTRL+ALT+DEL button.

## ENVIRONMENTAL DETECTIVES - PREMISE

### *Augmented Reality Simulations*

The purpose of this research project is to develop and examine a new simulation platform that is designed from the ground up for handheld computers and draws on the unique affordances of handheld technologies.

### *Providing teachers and students robust authoring tools*

A critical part of this platform will be a robust set of authoring tools for students and teachers to create their own simulation games. Research has shown that the process of creating models—as opposed to simply using models built by someone else—not only fosters model-building skills but also helps develop a greater understanding of the concepts embedded in the model. Further, research from the adoption and diffusion of curriculum materials suggests that in successful educational implementations, teachers reinvent curricular materials to meet the demands of local constraints. Ultimately, the success of a program like *Environmental Detectives* may hinge on providing teachers tools to design scenarios that take advantage of their own unique local affordances and meet particular local curricular constraints.

### *Fantasy and Narrative*

The causes and consequences of toxic spills suggest endless narrative possibilities. Imagine backroom corporate scheming and cover-ups to hide covert activities from the public. The corporations aren't the only characters with shady dealings. Government regulators may be complicit in ignoring dangerous environmentalist practices. Environmentalists aren't left of the hook as rogue environmentalists are suspected of tampering with monitoring devices and planting evidence. This is to speak nothing of the lawyers...

The effects the release of these toxins are rife with melodramatic potential. Players will have to consider how toxins are spreading through their own neighborhoods. An important water source may be contaminated or an airborne toxin may make its way toward a local daycare. *Environmental Detectives* combines mystery, intrigue and melodrama to create a gaming experience enjoyable to a diverse range of players.

### *Simulation with Dangerous Chemicals*

No doubt that students can learn a great deal about toxicology by examining real environmental disasters (or by dumping a barrel of oil into the Charles River and examining its impact on the environment and human health). However (fortunately), not every community is situated near an ecological disaster ripe with potential for illuminating educational issues. Further, having students take readings of acids or titrates in the environment can be dangerous. Such procedures involve handling dangerous volatile chemicals.

The *Environmental Detectives* platform allows educators to investigate a wide range of environmental issues, ranging from airborne particles to radioactive spills to toxic chemicals transported through water. With *Environmental Detectives*, we specially design scenarios to leverage their pedagogical and entertainment potential. In short, *Environmental Detectives* does not strive to replace inquiry-based learning or environmental investigations, but rather, to make a whole new range of scenarios open to educators.

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