

Preparing the Academy of Today for the Learner of Tomorrow

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Introduction

Predicted to be America's first generation to exceed 100 million persons,¹ the wave of Net Geners entering colleges and universities brings a blend of behaviors, attitudes, and expectations that creates opportunities—as well as challenges—for higher education. Opportunities arise from students' familiarity with technology, multitasking style, optimism, team orientation, diversity, and acceptance of authority. Challenges, on the other hand, include the shallowness of their reading and TV viewing habits, a comparative lack of critical thinking skills, naïve views on intellectual property and the authenticity of information found on the Internet, as well as high expectations combined with low satisfaction levels. Not surprisingly there is an increasing gap between most institutions' IT environments and the technologies the Net Gen uses. These factors lead, in turn, to the greatest challenge for higher education leaders, faculty, and staff—nearly all of whom belong to earlier generations: to understand the Net Generation learner and through this understanding provide the learning environments, services, and facilities needed to help these students achieve their potential.

Most institutions profess intense interest in the academic, social, and personal needs of their students. Yet, generational differences are not often used to gain a better understanding of students' behaviors, attitudes, and expectations. Perhaps this is because generations represent a historical perspective, better illuminating the past than the present or future. Change and adaptation within the academy proceed at a slow, deliberate pace. Adapting institutional processes and services to the needs of a specific generation of students requires advance planning and action; the timeframe for planning and deliberation may exceed the time the learners are enrolled. Planning is complicated because personal characteristics are not homogeneous within generational groupings; for example, individuals born late in the Gen-X cohort may think and behave more like Net Geners, making it difficult to take a standardized approach. Unfortunately, the generational literature fails to predict the characteristics of future generations.

Institutional leaders need to find ways to think about generations in designing campus and individual student initiatives, as well as to discern trends that will allow future-directed planning.

Generations and Technology

The technologies available as a generation matures influence their behaviors, attitudes, and expectations. People internalize the technologies that shape information access and use, as well as the ways they communicate. Matures (born 1946–1964) were exposed to large vacuum-tube radios, mechanical calculators, 78 rpm records, dial telephones, and party lines. Baby Boomers grew up with transistor radios, mainframe computers, 33 $\frac{1}{2}$ and 45 rpm records, and the touch-tone telephone. Gen-Xers matured in the era of CDs, personal computers, and electronic mail. For the Net Generation, the prevailing technologies are MP3s, cell phones, and PDAs; they communicate via instant messaging, text messaging, and blogs. For each successive generation "technology is only technology if it was invented after they were born."²

Technology has experienced its own series of generations. In computing, the nexus has shifted from the mainframe to the minicomputer to the personal computer, and now to mobile devices. In line with Moore's Law, computing and communication devices have radically decreased in size and increased in performance. Connectivity has experienced a similar transition across generations, from no connectivity to proprietary device-to-device cabling, to globally interconnected local area networks, and now to wireless. Computers were initially developed as number crunching devices. The early emphasis on processing numbers, then words, has been joined by multimedia: graphics, images, video, sound, and interactive games. Prevalent among today's applications are interpersonal and group communication tools. The use of early computers was batch-processing-oriented and required programming skills and arcane commands. Today's graphical user interfaces and the Web make the operation of computers highly interactive and achievable by nearly anyone. The Internet has led to the kind of global village of information and communication envisioned by Marshall McLuhan.³

Behaviors of the Net Generation are expressed through technologies to an extent not observed in previous generations. At one level, Net Geners are the beneficiaries of decades of technological development that preceded them; at another level, as students they use these technologies in new ways, and in so doing are redefining the landscape in higher education and perhaps beyond. The behaviors of the Net Gen (multitasking, always-on communication, engagement with multimedia, and the like), as well as the capabilities of modern technologies (personal, multifunctional, wireless, multimedia, communication-centric), are in close harmony. To a great extent, the behaviors of the Net Gen are an enactment of the capabilities afforded by modern digital technologies.

According to a report from the Pew Internet & American Life Project,⁴ one in five of today's college students began using computers between the ages of 5 and 8; by the time they were 16 to 18, all of them used computers. Nationwide, nearly 90 percent of college students have gone online, compared with about 60 percent of the general population. Use of the Internet or campus networks is nearly universal in higher education. Eighty-five percent or more of college students own a computer, and nearly all of the rest have ready access to one. Sixty percent of college students regularly play computer or online games, and they are twice as likely to have downloaded music as the general population. The Net Generation students exhibit technology-related behaviors that may be unfamiliar to many in the academy: social networking, photo sharing, swarming, blogging, instant messaging, and text messaging. As continuous multitaskers, the Net Geners are adept at context switching, often engaging in several activities at the same time (in the classroom, this behavior can be disconcerting to instructors). Four out of five students believe that Internet use has had a positive impact on their academic experience, and three out of four say they use the Internet for research more than they do the library.⁵

Students are very familiar with the top online commercial sites such as amazon.com and ambercrombie.com; they hold these sites to be the standard against which they judge colleges' online services. And, of all of the generational groups, the Net Generation is least satisfied with their higher education experience.⁶

Net Geners have access to affordable multifunctional devices (for example, cell phones equipped with digital cameras and Web browsers that can play digital audio and video recordings, as well as send and receive e-mail and text messages) that readily support their interpersonal communication needs and multitasking behaviors. Between classes, students bustle about with cell phones attached to their ears. Silberman described the prevalence of cell phones among Net Geners in Finland, and how cell phones' voice and short messaging capabilities allow them to move in synchronization "like schools of fish ... on currents of whim."⁷ This behavior has since become well established in America, where it is known as *social swarming* or *smart mobs*.^{8, 9}

Emerging Patterns

The mobility enabled by wireless communication, combined with an expanding class of wireless-equipped portable computers and PDAs, is leading to new instructional and social patterns. No longer do students need to go to a specific place, or even be seated, to use a computer. An array of multifunctional PDAs capable of wireless communication is allowing such devices to follow their users wherever they go, serving as "prosthetics for information, memory, or creativity."¹⁰ This is challenging the very definition of learning spaces because learning can now occur both in and out of the classroom, in both formal and informal settings, and by lone scholars or among groups.

Net Gen students not only use technology heavily, they also trust it implicitly. They are as likely to get their news online as from a newspaper and conduct research through Google as visit a library. Their belief that anything accessible online should be free leads many to download or share music, movies, or software they have not purchased. The extent of this activity has surprised many institutions; campus networks often became saturated when students returned to school in the fall. In some cases this is followed by copyright violation notices from organizations such as the Recording Industry Association of America.

The interactive and exploratory way the Net Generation uses technology is also a break with the past. The French anthropologist Claude Lévi-Strauss described the process of bricolage—tinkering—through which individuals learn by exploring and manipulating objects around them.¹¹ Turkle¹² and Brown¹³ described how changes in technology and its use have moved from a rigid, top-down environment to a new bottom-up style in which the mode of interaction and learning has shifted from programming and commands to exploration and bricolage. The Net Gen approaches computers and other technologies as environments for communication, socialization, learning, and game playing, not as machines to be programmed.¹⁴

A challenge for campus planners is the increasing gap between the institutional IT environment and the technology environments Net Geners have created for themselves. To be sure, today's students are avid users of Web, e-mail, telephones, and other IT resources; however, their rapid adoption of instant messaging, cell phones, blogs, wikis, social networking Web sites, and other resources that are not generally part of the core campus infrastructure leads to a host of new concerns. There is increased potential for incompatibilities between the technologies adopted by students and campus standards. Other problems such as excess bandwidth consumption, inappropriate use of intellectual property, or security

threats are becoming more prevalent. An existing institutional context for the use of these technologies is unlikely, leading to frustration and decreasing satisfaction on the part of both students and faculty.

Although it may be desirable in some instances, it is not necessary that institutions rush to become providers of instant messaging, blogs, wikis, computer games, social networking sites, or any of the array of students' favorite technologies. The real opportunity lies in observing and talking to today's students to learn more about how they conceptualize and use these new tools. With this knowledge institutions can create contexts for technology use that enhance learning, improve student services, and enrich students' social lives.

Assessing the Generations in Online Learning

The Research Initiative for Teaching Effectiveness (RITE) at the University of Central Florida (UCF) regularly conducts formative and summative surveys of students' online learning experiences. These data become transformative because they are instrumental in modifying the organization, structure, and processes of our distributed learning initiative. We believe that both qualitative and quantitative research yield a more valid assessment of students in the online learning environment. When we ask respondents to complete objective statements followed by a reflective narrative, we obtain a more authentic characterization of their attitudes, beliefs, and behaviors. In the latest survey conducted at UCF, students used a series of 5-point Likert-scale questions to evaluate their online learning experience around two components previously identified through extensive numerical work.¹⁵ The first domain—learning engagement—encompassed six items where students indicated their:

- ❖ Overall satisfaction with online learning
- ❖ Ability to integrate technology into their education
- ❖ Ability to control their own learning
- ❖ Ability to study efficiently
- ❖ Ability to meet their educational objectives
- ❖ Willingness to take another online course

The second domain—interaction value—asked students to evaluate their online learning experience in regard to:

- ❖ Ease of interaction
- ❖ Amount of interaction with students
- ❖ Quality of interaction with students
- ❖ Amount of interaction with the instructor
- ❖ Quality of interaction with the instructor

In addition, the survey protocol asked the learners to state their opinions on whether they changed their approach to learning because of their online experiences (nominal yes–no format). This was followed with a request for an explanation of any reported change. To obtain a directly interpretable measure for assessment, the authors designed a scoring protocol for student responses to learning engagement and interaction value compared to the maximum possible value. For example, if a student scored 66 on learning engagement, his or her positive perception was 66 percent of the maximum possible.

Using the Generations as a Basis of Comparison

At a metropolitan research institution such as UCF, a substantial portion of students represent diverse generations—principally Baby Boomers (born 1946–1964) and Generation X (born 1965–1980). These two cohorts provided the backdrop for our analysis of Net Gen (born 1981–1994) students' learning engagement, interaction value and changed learning approach. There is an important additional generation on the UCF campuses: the Matures (born prior to 1946). Because our demographic and survey work suggests that they represent less than 2 percent of UCF's online population, we have not included them in the comparisons.

Baby Boomers

Through sheer numbers, Baby Boomers have impacted nearly every aspect of American society. They experienced rapidly expanding economic circumstances that led to a sense of financial security. An enduring optimism permeates Baby Boomers, who are process-oriented, preoccupied with convenience, and willing to go into debt. They populate high positions in all sectors of American culture and attract attention for their likely impact on the nation's economy when they retire.¹⁶⁻¹⁹

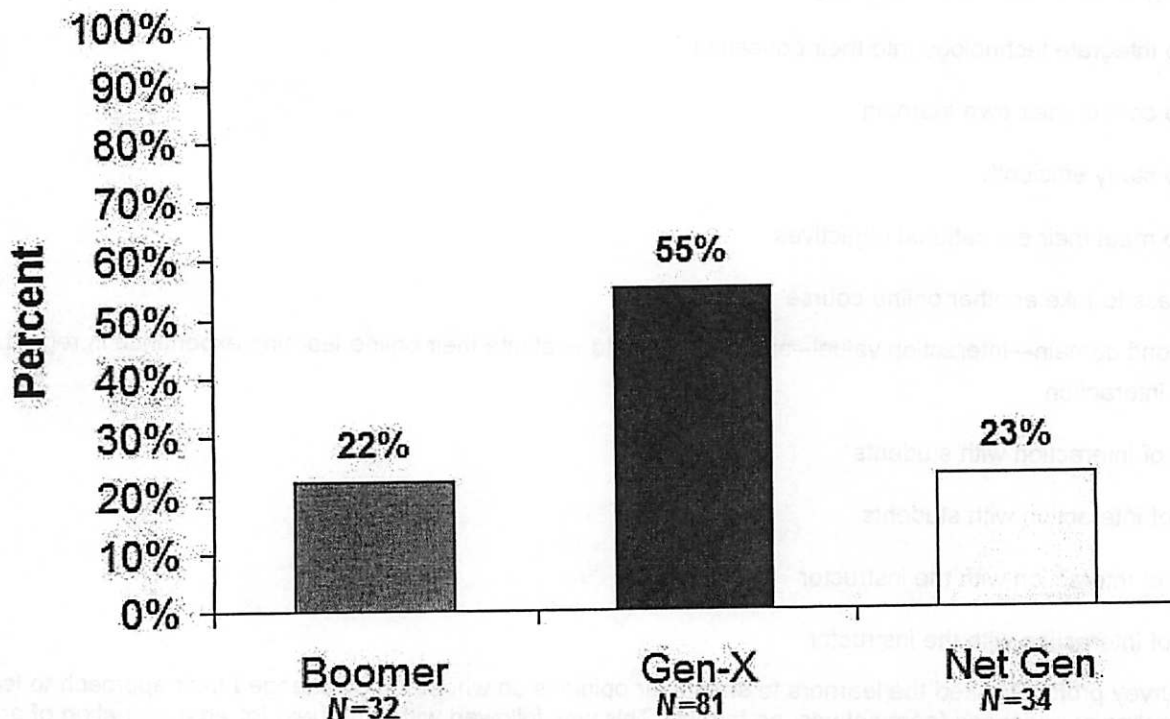
Generation X

The Generation Xers were the first "latch key" generation and strongly influenced by emerging technological developments. Financially, they experienced wide-scale job loss and runaway inflation that led to their sense of economic and social skepticism. These events shaped their hallmark characteristics: they mistrust most of society's organizations and institutions, and they believe that stabilizing influences such as job security are a myth. They seem impertinent because of their confrontational style. For Generation X, versatility is the key to stability.¹⁹⁻²¹

Learning Engagement, Interaction Value, and Enhanced Learning in the Generations

The current UCF survey yielded 1,489 online student responses, representing a return rate of approximately 30 percent. Figure 1 depicts the generation membership of the respondents. The sample contained a majority of Generation X students with approximately equal proportions of Baby Boomers and the Net Gen. This finding reinforces the expectation that there is substantial age diversity in the distributed learning population in metropolitan universities.

Figure 1. Generations of Online Students



As Figure 2 illustrates, older learners reported more positive learning engagement. The Net Gen, with 73 percent of maximum, shows a steep decline compared to Boomers' 85 percent rating. The positive narratives for all three groups stressed flexibility, convenience, and self-paced learning for their online experiences. Those points converge on reduced opportunity cost for obtaining an education thanks to online learning. The less positive perceptions of the generations showed extensive variability. Baby Boomers lamented the lack of face-to-face interaction in the online environment, a comment consistent with this generation's tendency to discuss and tell stories. Generation X was uncomfortable with the continual connectedness of online learning that contradicts their penchant to "get to the point" and "move on with it." The Net Gen respondents were disappointed; they perceived a lack of immediacy in their online courses and felt that faculty response times lagged behind their expectations.

Figure 2. Percent of Maximum Scores on Learning Engagement for the Generations

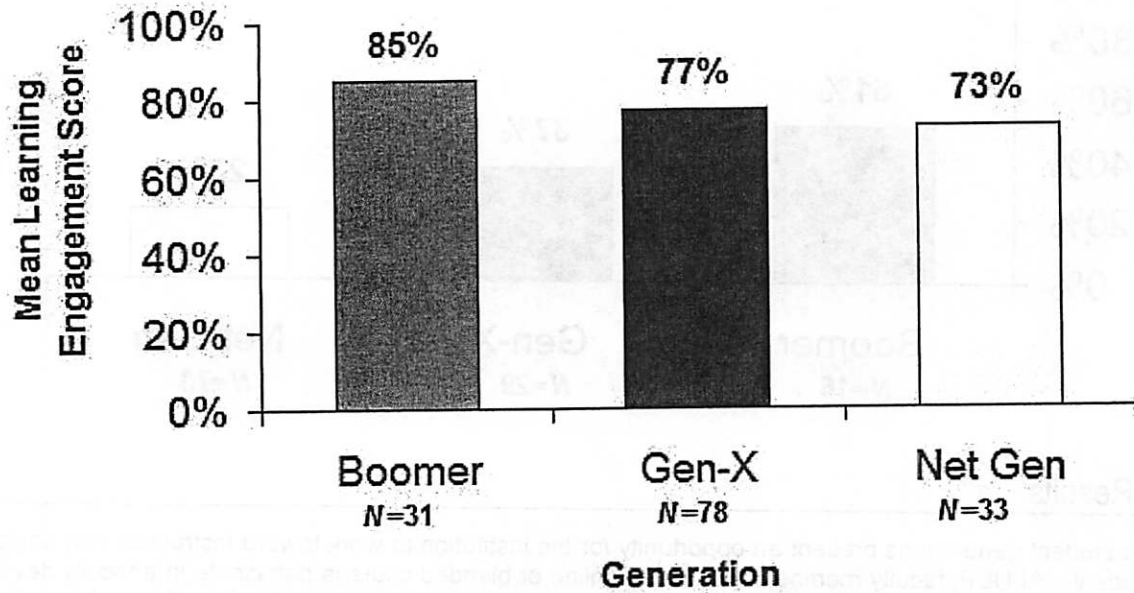
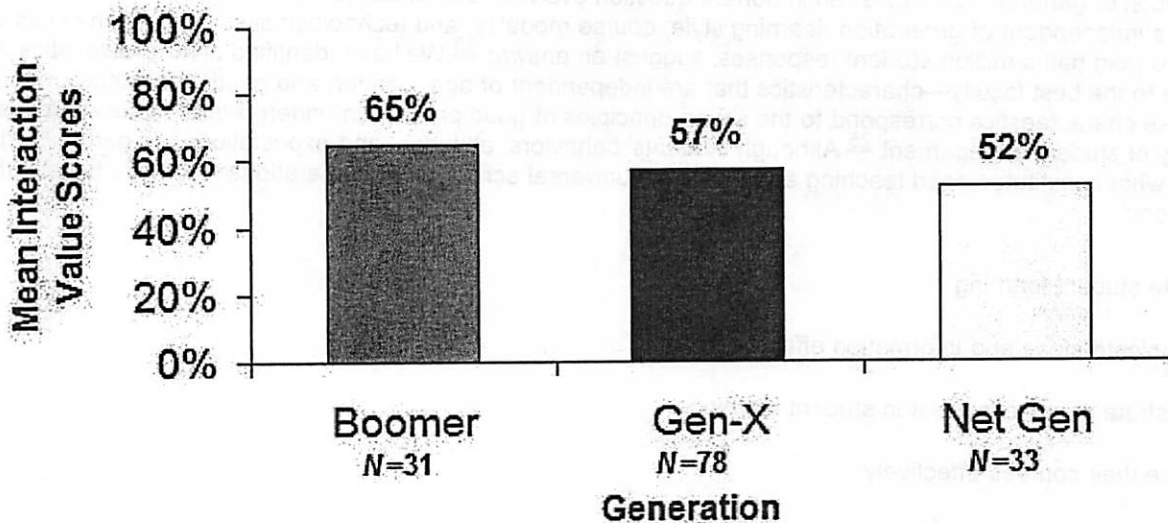


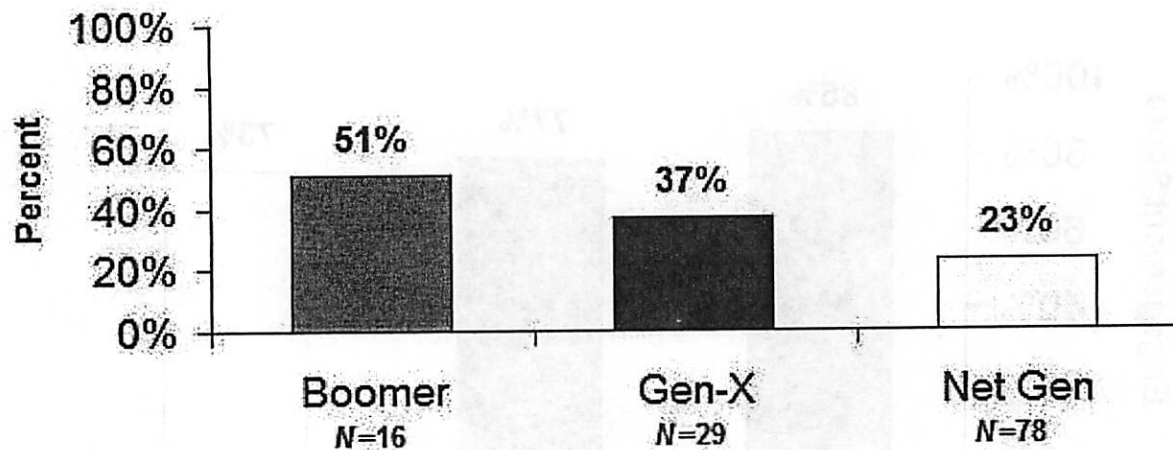
Figure 3 presents the trend in interaction value from one generation to the next. Again, a comparison of the three generations shows a high of approximately 63 percent for the Boomers, 56 percent for Generation X, and 50 percent for the Net Gen. The narratives for interaction indicated that the Boomers judged communication patterns in online classes to constitute one-on-one attention. Gen-Xers responded well to the constant availability of interaction. Net Geners enjoyed the ability to form interactive communities among their peers. On the less positive side, Baby Boomers preferred some face-to-face encounters with their instructors; Generation X students reported substantial, pointless interaction in class; and the Net Gen students felt that the interaction mechanisms designed by their instructors were much less adequate than their personal technologies.

Figure 3. Percent of Maximum Scores on Interaction Value for the Generations



Generational differences were also found in whether students changed their approach to learning as a result of their online experience (see Figure 4). The downward trend by age cohorts continues for this measure. More than half of the Boomers claimed that they modified their learning techniques; the Net Geners decreased to a low of 23 percent. The narratives showed that Baby Boomers enhanced their technology skills and integrated them into their modified student roles, Gen-X students improved their ability to manage time effectively, and Net Geners felt a heightened sense of responsibility and motivation.

Figure 4. Students Who Changed Their Approach to Learning by Generation



Responding to Results

These differences in student generations present an opportunity for the institution to work toward instruction that addresses the varying needs of students. At UCF, faculty members who teach online or blended courses participate in a faculty development course designed to guide them in both technological and pedagogical approaches to Web instruction. Through a series of interactive sessions with instructional designers and Web faculty veterans, beginning faculty are encouraged to redesign their courses to focus on being student centered and interactive. Beyond the course structure faculty learn to integrate formative and summative assessment mechanisms, both for themselves and for students. The focus is on faculty facilitating instruction and students becoming active and interactive learners.²² Blended learning provides a unique opportunity to bridge generations, providing the face-to-face contact requested by Baby Boomers, the independence preferred by Gen-Xers, and the interaction and sense of community desired by Net Geners. Extensive use of e-mail, discussion groups, and live chat increases communication and collaboration among students as well as between students and the instructor.

Excellent Teaching

From our exploration of generational issues, an important question evolved: Can students distinguish characterizations of excellent teachers independent of generation, learning style, course modality, and technological sophistication? Data collected at UCF, with more than half a million student responses, suggest an answer.²³ We have identified six characteristics that students attribute to the best faculty—characteristics that are independent of age, gender, and academic achievement. Interestingly, these characteristics correspond to the seven principles of good practice in undergraduate education²⁴ and to the national study of student engagement.²⁵ Although students' behaviors, attitudes, and expectations are generally shaped by their generation, what constitutes good teaching appears to be universal across these generations. Students believe that excellent instructors:

- ❖ Facilitate student learning
- ❖ Communicate ideas and information effectively
- ❖ Demonstrate genuine interest in student learning
- ❖ Organize their courses effectively
- ❖ Show respect and concern for their students
- ❖ Assess student progress fairly and effectively

This seemingly paradoxical way in which students determine teaching excellence through the lens of their instructors clarifies how universities must accommodate students' needs, realizing that these needs are universal, yet greatly mediated by the Net Generation.

Conclusion

The Net Generation possesses sophisticated technological adaptability and a remarkable capacity to incorporate multitasking into day-to-day academic activities. However, there is also a growing discrepancy between institutional infrastructure and these students' personalized facility with information. Freeland²⁶ described a corresponding trend emerging in higher education that he called practice-oriented education—the combination of liberal and professional studies. He foreshadowed the students' tendency to learn through bricolage and the university's reticence to respond: "After 1945 it [the academy] became steadily more open... [but] as its clientele became more 'modern,' higher education became more traditional."²⁷ As we move into the next decades, the resolution of that polarization compels colleges and universities to examine, and perhaps redesign, their strategic direction.

If today's students do not represent the constituency that our higher educational system is designed to teach as asserted by Prensky,²⁸ how do we remedy that situation? Possibly, by studying how students interacted (politically, economically, culturally, socially, and technologically) with institutions' instructional climate in the past. By monitoring technology developments and their impact on the student population, we will be better able to anticipate the needs of the class of 2025. This approach will thrust institutions into a forward-thinking posture rather than a reactionary one in response to incoming student cohorts.

From an instructional design perspective, we realize that knowing our students gives us many more options for engaging them in the learning process. Throughout the generations, colleges and universities have attempted to tailor instructional protocols to accommodate students' preferences for acquiring knowledge, enhance learning, reduce ambivalence, facilitate maturation, and maximize success. The audacity with which the Net generation has burst on the academic scene has accelerated our need to understand its learning characteristics. A conundrum accompanies that solution, however: adaptation for the present generation may not be adequate for the next.

Endnotes

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Further Reading

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Charles D. Dziuban, Patsy Moskal, and Joel Hartman, "Higher Education, Blended Learning, and the Generations: Knowledge Is Power—No More," in *Elements of Quality Online Education: Engaging Communities*, volume 6 in the Sloan-C series, John Bourne and Janet C. Moore, eds. (Needham, Mass.: Sloan-C, in press).

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About the Authors

Charles Dziuban is director of the Research Initiative for Teaching Effectiveness (RITE) at the University of Central Florida (UCF), where he has been a faculty member since 1970 teaching research design and statistics. He received his PhD from the University of Wisconsin. Since 1997, he has directed the impact evaluation of UCF's distributed learning initiative, examining student and faculty outcomes as well as gauging the impact of online courses on the university. Dziuban has received funding from several government and industrial agencies, including the Ford Foundation and the Centers for Disease Control. In 2000, he was named UCF's first-ever Pegasus Professor for extraordinary research, teaching, and service.

Joel L. Hartman is vice provost for information technologies and resources at UCF. As the university's CIO, he has overall responsibility for library, computing, networking, telecommunications, media services, and distributed learning activities. He previously served as treasurer and chair of the EDUCAUSE Board of Directors and currently serves as chair of the EDUCAUSE National Learning Infrastructure Initiative (NLII) Planning Committee. He also serves on the Florida Digital Divide Council, the Microsoft Higher Education Advisory Council, and the board of directors of Florida LambdaRail. Hartman graduated from the University of Illinois, Urbana–Champaign, with bachelor's and master's degrees in journalism and communications, and received his doctorate from UCF.

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Web-only Chapter Resources

- ❖ Center for Generational Studies, <<http://www.gentrends.com>>.
- ❖ Learning online at UCF, <<http://online.ucf.edu/index.html>>.
- ❖ UCF Research Initiative for Teaching Effectiveness (RITE), <<http://pegasus.cc.ucf.edu/~rite>>.
- ❖ Pew Internet & American Life Project, <<http://www.pewinternet.org/>>.

- ❖ UCF's Faculty Development Courses, <<http://reach.ucf.edu/~idl6543/>>, <<http://reach.ucf.edu/~adl5000/>>, and <<http://reach.ucf.edu/~essentials/>>.
- ❖ National Study of Student Engagement (NSSE), <<http://www.indiana.edu/~nsse/>>.
- ❖ The generational writings of Marc Prensky, <<http://www.marcprensky.com/>>.
- ❖ UCF Video on the Generations, <<http://engage.ucf.edu:28158/ramgen/ucf/cdws/parlor/parlor2.rm>>.