Is It Age or IT: First Steps Toward Understanding the Net Generation

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Introduction

A junior at the university, Eric wakes up and peers at his PC to see how many instant messages (IMs) arrived while he slept. Several attempts to reach him are visible on the screen, along with various postings to the blog he's been following. After a quick trip to the shower, he pulls up an eclectic mix of news, weather, and sports on the home page he customized using Yahoo. He then logs on to his campus account. A reminder pops up indicating that there will be a quiz in sociology today; another reminder lets him know that a lab report needs to be e-mailed to his chemistry professor by midnight. After a few quick IMs with friends he pulls up a wiki to review progress a teammate has made on a project they're doing for their computer science class. He downloads yesterday's chemistry lecture to his laptop; he'll review it while he sits with a group of students in the student union working on other projects. After classes are over he has to go to the library because he can't find an online resource he needs for a project. He rarely goes to the library to check out books; usually he uses Google or Wikipedia. Late that night as he's working on his term paper, he switches back and forth between the paper and the Internet-based multiplayer game he's trying to win.[1]

Information technology is woven throughout Eric's life, but he probably doesn't think of it as technology. One generation's technology is taken for granted by the next. Computers, the Internet, online resources, and instantaneous access are simply the way things are done. Eric is a member of the Net Generation; he's never known life without the Internet.

Children and Teenagers

Today's Net Gen college students have grown up with technology. Born around the time the PC was introduced, 20 percent began using computers between the ages of 5 and 8. Virtually all Net Gen students were using computers by the time they were 16 to 18 years of age.[2] Computer usage is even higher among today's children. Among children ages 8 to 18, 96 percent have gone

online. Seventy-four percent have access at home, and 61 percent use the Internet on a typical day.

Exposure to IT begins at very young ages. Children age six or younger spend an average of two hours each day using screen media (TV, videos, computers, video games), which nearly equals the amount of time they spend playing outside (1:58 hours versus 2:01 hours). Both significantly exceed the amount of reading time (39 minutes). Half of the children in this age group have used a computer; among 4-to-6-year-olds, 27 percent spend over an hour a day (1:04) at the keyboard. "It's not just teenagers who are wired up and tuned in, it's babies in diapers as well." While earlier generations were introduced to information through print, this generation takes a digital path.[3]

Home digital media use (computer, games, Internet) is approaching the amount of time spent watching TV. Thirteen-to-17-year-olds average 3.1 hours a day watching TV and 3.5 hours with digital media. Note that students may use more than one medium at a time. Consistent with the multitasking found in older students, it is the norm for children and teenagers to be online while simultaneously watching TV, talking on the phone, or listening to the radio. A sizable percentage of kids report visiting a site mentioned by someone on the phone, seen on TV, or mentioned on the radio.[4]

Children may be developing greater digital literacy than siblings who are just a few years older. For example, over two million American children (ages 6-17) have their own Web site. Girls are more likely to have a Web site than boys (12.2 percent versus 8.6 percent).[5] And, the ability to use nontext expression—audio, video, graphics—appears stronger in each successive cohort.

Access to computers for the majority of children and teens is through the home. However, home access to technology is not uniform across populations. One possible variable is race. Ninety-six percent of whites report they have gone online, compared to 95 percent for Hispanics, and 92 percent for African-Americans (ages 8-18). The figures are similar (within two percentage points) when making comparisons based on parental education or median family income. When considering Internet access at home the differences are greater (80 percent for whites, 67 percent for Hispanics, and 67 percent for African-Americans). For children whose parents have a high school education or less, 68 percent have Internet access at home. This contrasts with 82 percent for those whose parents completed college. The distribution based on median family income is similar: 84 percent of families with incomes over $50,000 have Internet access at home; for those making less than $35,000, the percentage is 66.[6]

Whether or not students have access to computers and the Internet from home, they consider such access important. When high school students were asked why technology is essential to their education, responses included:

By the teenage years, students use the Web extensively for school research (94 percent) and believe it helps with schoolwork (78 percent).[8] Although technology is used heavily, students seem to keep technology in perspective. In their words:

- It's part of our world.
- Technology is so embedded in our society, it'd be hard not to know how to use it.
- It's really helpful—it makes things faster.
- Abstract concepts are often easier to grasp when technology is used effectively as a teaching tool.
- Some students at my school who weren't great students are better ones now thanks to

computers.
- Technology allows us to learn as much as we want to about virtually any topic.
- I usually connect with friends either to get help or to help others.[7]
- Teachers are vital to the learning process. Tech is good, but it is not a perfect substitute.
- Computers can never replace humans.
- Learning is based on motivation, and without teachers that motivation would cease to exist.
- A major part of school is building social skills. If we were to always communicate through technology and not in person, then the way we would view life would change dramatically.[9]

Perhaps because home computers and the Internet have become almost as prevalent as the telephone, instant messaging is a common communication and socializing mechanism. Not only is IM accessible, it can support multiple, simultaneous conversations. Seventy percent of teenagers use IM to keep in touch, slightly less than those who use e-mail to stay in touch with friends and relatives (81 percent). Still, nearly 13 million teenagers use IM. "Talking to buddies online has become the information age way for teens to hang out and beat boredom."[10] A separate study found that 74 percent of teenagers use IM as a major communication tool compared to 44 percent of online adults.[11] Once they leave for college many will use IM to stay in touch—oftentimes daily—with high school and childhood friends. Forty-one percent of teenagers indicate they use e-mail and instant messaging to contact teachers or schoolmates about class work. Greater than half (56 percent) prefer the Internet to the telephone.[12] In fact, students in grade 7-12 know more screen names than home phone numbers.[13]

When teenagers are asked what they want from the Internet, the most common response is to get "new information." Close behind, at about 75 percent, is to "learn more or to learn better." The use of the Internet to learn is not limited to school work. Students are often informal learners, seeking information on a variety of topics, such as personal health. Other common activities involve participating in online communities, showing others what they can do, or voicing their opinions.[14]

College Students

The characteristics of traditional age (18-to-22-year-old) college students—a group sometimes called the Millennials—have been described by Howe and Strauss as individuals who:

- Gravitate toward group activity
- Identify with parents' values and feel close to their parents
- Believe it's cool to be smart
- Are fascinated by new technologies
- Are racially and ethnically diverse; one in five has at least one immigrant parent
- Are focused on grades and performance
- Are busy with extracurricular activities

When asked about the biggest problem facing their generation, many respond that it is the poor example that adults set for kids.[15]

Individuals raised with the computer deal with information differently compared to previous cohorts: "they develop hypertext minds, they leap around."[16] A linear thought process is much less common than bricolage,[17] or the ability to or piece information together from multiple sources. Among other differences are their:

- **Ability to read visual images**—they are intuitive visual communicators

- **Visual–spatial skills**—perhaps because of their expertise with games they can integrate the virtual and physical
- **Inductive discovery**—they learn better through discovery than by being told
- **Attentional deployment**—they are able to shift their attention rapidly from one task to another, and may choose not to pay attention to things that don't interest them
- **Fast response time**—they are able to respond quickly and expect rapid responses in return[18]

Although many observations can be made about the Net Generation, several merit special mention because of the potential impact on higher education.

Digitally Literate

Having grown up with widespread access to technology, the Net Gen is able to intuitively use a variety of IT devices and navigate the Internet. Although they are comfortable using technology without an instruction manual, their understanding of the technology or source quality may be shallow.

The Net Gen are more visually literate than previous generations; many express themselves using images. They are able to weave together images, text, and sound in a natural way. Their ability to move between the real and the virtual is instantaneous,[19] expanding their literacy well beyond text. Because of the availability of visual media, their text literacy may be less well developed than previous cohorts.

Students are more likely to use the Internet for research than the library (73 percent).[20] When asked, two-thirds of students indicated they know how to find valid information from the Web. However, they realize that the Web does not meet all their information needs.[21]

Connected

"As long as they've been alive, the world has been a connected place, and more than any preceding generation they have seized on the potential of networked media."[22] While highly mobile, moving from work to classes to recreational activities, the Net Gen is always connected. According to one student, "I like how cell phones work—you can always get ahold of someone, and it goes with you wherever you go." The particular device may change depending on circumstance (for example, laptop, cell phone), but they are constantly connected and always on.

Immediate

Whether it is the immediacy with which a response is expected or the speed at which they are used to receiving information, the Net Gen is fast. They multitask, moving quickly from one activity to another, sometimes performing them simultaneously. They have fast response times, whether playing a game or responding to an IM. In fact, more value may be placed on speed than on accuracy.

Experiential

Most Net Gen learners prefer to learn by doing rather by being told what to do. The role having grown up with video games plays in this preference is unclear, but Net Gen students learn well through discovery—by exploring for themselves or with their peers. This exploratory style enables

them to better retain information and use it in creative, meaningful ways.[23]

Social

"Prolific communicators, they gravitate toward activities that promote and reinforce social interaction—whether IMing old friends, teaming up in an Internet game, posting Web diaries (blogging), or forwarding joke e-mails."[24] The Net Gen displays a striking openness to diversity, differences, and sharing; they are at ease meeting strangers on the Net.[25] Many of their exchanges on the Internet are emotionally open, sharing very personal information about themselves. The Net Gen has developed a mechanism of inclusiveness that does not necessarily involve personally knowing someone admitted to their group. Being a friend of a friend is acceptable. They seek to interact with others, whether in their personal lives, their online presence, or in class. (Sometimes the interaction is through an alternative identity. Significant numbers of teens assume an online identity that is different from their own.)[26] Although technology can't change one's personality, introverts, for example, use the Internet as a tool to reach out. These social connections through e-mail might not have happened before. Extroverts can make their circle of friends even larger.[27]

The Net Gen also exhibits learning preferences that are closely related to their characteristics. For example, their social nature leads aligns with their preference to work in teams or interact peer-to-peer. Net Gen learning preferences that may impact higher education include the following.

Teams

The Net Gen often prefers to learn and work in teams. A peer-to-peer approach is common, as well, where students help each other. In fact, Net Geners find peers more credible than teachers when it comes to determining what is worth paying attention to.[28]

Structure

The Net Gen is very achievement oriented. "They want parameters, rules, priorities, and procedures … they think of the world as scheduled and someone must have the agenda."[29] As a result, they like to know what it will take to achieve a goal. Their preference is for structure rather than ambiguity.[30]

Engagement and Experience

The Net Gen is oriented toward inductive discovery or making observations, formulating hypotheses, and figuring out the rules. They crave interactivity. And the rapid pace with which they like to receive information means they often choose not to pay attention if a class is not interactive, unengaging, or simply too slow.[31] The Net Gen may need to be encouraged to stop experiencing and spend time reflecting.

Visual and Kinesthetic[32]

The Net Gen is more comfortable in image-rich environments than with text. Researchers report Net Gen students will refuse to read large amounts of text, whether it involves a long reading assignment or lengthy instructions. In a study that altered instructions from a text-based step-

by-step approach to one that used a graphic layout, refusals to do the assignment dropped and post-test scores increased. The Net Gen's experiential nature means they like doing things, not just thinking or talking about things.

Things that Matter

The Net Gen readily takes part in community activities.[33] Given a choice, they seem to prefer working on things that matter, such as addressing an environmental concern or a community problem. They believe they can make a difference and that science and technology can be used resolve difficult problems.[34]

Nontraditional Learners

At the same time that colleges and universities are graduating their first Net Generation learners, most campuses are experiencing an influx of nontraditional students. Three-quarters of all undergraduates are "nontraditional," according to the National Center for Educational Statistics. Nontraditional students are defined as having one or more of the following characteristics:

- Delayed enrollment—did not enter postsecondary education in the same year they graduated from high school
- Attend part-time, for all or part of the academic year
- Work full time—35 hours or more—while enrolled
- Financially independent as defined by financial aid
- Have dependents, other than a spouse, which may include children or others
- Single parent, having one or more dependent children
- Lack of a high school diploma[35]

The more nontraditional characteristics students possess, the less likely they are to persist in college after the first year or to graduate. Nontraditional learners tend to be concentrated in specific types of institutions. In community colleges, for example, nearly half the students have delayed beginning postsecondary education. Half also had two or more persistent risk factors. In contrast, 91 percent of students in four-year colleges enrolled immediately after high school; 85 percent had no persistent risk factors.[36] Adult learners represent a significant category of nontraditional learners:

- 35 percent of undergraduates are adult learners
- 70 percent of all adult learners are female
- 38 is the median age of undergraduate adult learners
- 80 percent of adult learners are employed[37]

The motivation for going to college is often different for adult learners compared to the Net Gen. Among adult learners 70 percent have a degree as their goal; the other 30 percent are seeking a certificate or a specific set of skills.[38]

Product of the Environment

It is often said that we see the world through our own eyes. Our experiences and the environment around us shape how we think, behave, and act. Consider birthplace. If you were born in the south, you might have a southern accent; if raised in Canada, you would speak differently. Tastes in food and clothes might differ, as would customs and expressions. We are all products of our

environment—and technology is an increasingly important part of that environment.

Few generalizations are entirely correct. However, generalizations—such as those about generations—highlight trends. Today's generations can be described as follows.[39]

	Matures	Baby Boomers	Generation X	Net Generation
Birth Dates	1900–1946	1946–1964	1965–1982	1982–1991
Description	Greatest generation	Me generation	Latchkey generation	Millennials
Attributes	Command and control Self-sacrifice	Optimistic Workaholic	Independent Skeptical	Hopeful Determined
Likes	Respect for authority Family Community involvement	Responsibility Work ethic Can-do attitude	Freedom Multitasking Work-life balance	Public activism Latest technology Parents
Dislikes	Waste Technology	Laziness Turning 50	Red tape Hype	Anything slow Negativity

Other attributes show generational trends as well (for example, attitude toward changing jobs or locus of community). One of the most striking attributes is the attitude toward the Internet. For the Net Gen, the Internet is like oxygen; they can't imagine being able to live without it.[40]

Not Just an Age Phenomenon

Although these trends are described in generational terms, age may be less important than exposure to technology. For example, individuals who are heavy users of IT tend to have characteristics similar to the Net Gen. In fact, the pervasiveness of technology—in our professions and in our personal lives—virtually ensures that most individuals gradually assume some Net Gen characteristics. For example, ask yourself:

- Are you more comfortable composing documents online than longhand?
- Have you turned your "remembering" (phone numbers, meetings, and so on) over to a technology device?
- Do you go to meetings with your laptop or PDA?
- Are you constantly connected? Is the Internet always on whether you are at home or work? Is your cell phone always with you?
- How many different activities can you effectively engage in at one time?
- Do you play video or computer games?[41]

The differentiating factor may not be so much one person's generation versus another; the difference may be in experience. Generational issues are relevant to higher education because the faculty or administrator perspective may be considerably different from that of our students.

Implications

Whether the Net Generation is a purely generational phenomenon or whether it is associated with technology use, there are a number of implications for colleges and universities. Most stem from the dichotomy between a Net Gen mindset and that of most faculty, staff, and administrators.

It's Not About Technology

It is an almost instinctive assumption to believe that Net Gen students will want to use IT heavily in their education; they certainly do in their personal lives. However, if you ask Net Gen learners what technology they use, you will often get a blank stare. They don't think in terms of technology; they think in terms of the activity technology enables. In general, the Net Gen views the Internet as an access tool—a medium for distribution of resources rather than a resource with limitations.

When asked about technology, students' definitions centered on new technologies. For example, a cell phone with a new feature was considered technology; a cell phone with standard features was not. What we might consider "new technology," such as blogs or wikis, are not thought of as technology by students.[42]

The activity enabled is more important to the Net Gen than the technology behind it. For example, instant messaging wasn't considered a technology; IMing is treated as a verb—it is an action, not a technology. Students often use the word "talk" when they describe text messaging or instant messaging. Software blends into the background; it enables certain activities to occur, but it is not new, novel, or customizable—all part of the Net Gen's definition of technology.[43]

Student satisfaction with online learning exemplifies our assumptions about online learning. Since Net Geners spend so much of their time online, it seems reasonable to expect that they would have a strong preference for Web-based courses. The reverse is actually true, as illustrated by a study from the University of Central Florida. Older students (Matures and Baby Boomers) are much more likely to be satisfied with fully Web-based courses than are traditional-age students. The reason relates to the Net Gen desire to be connected with people and to be social as well as their expectations of higher education. Traditional-age students often say they came to college to work with faculty and other students, not to interact with them online. Older learners tend to be less interested in the social aspects of learning; convenience and flexibility are much more important.[44]

In response to a student technology survey the majority of students preferred a moderate amount of IT in their classes. Students appreciate the convenience provided by online syllabi, class readings, and online submission of assignments.[45] They also want face-to-face interaction, however:

> Year after year, face-to-face interactions are ranked by all students in either first or second place. This replicates the results of many distance education studies that show students often feel that something important to their learning is missing when all interactions are mediated, whether asynchronous or synchronous.[46]

The implication is that colleges and universities should not assume that more technology is necessarily better. Technology that enables certain types of activities is likely to be appreciated. For example, wireless networking enables learner mobility and makes it possible to be constantly connected. The majority of wireless network use, however, may be outside the academic realm. Using technology to increase customization, convenience, and collaboration is well received; however, its integration into most courses or curricula is not as deep as into students' personal lives.

Communities and Social Networks

The Net Gen exhibits a tendency to work in teams or with peers and will move seamlessly between physical and virtual interactions. It is not uncommon to find students working together and still sending IMs—even though they are a few feet away. Their communities and social networks are physical, virtual, and hybrid. Personal does not always mean "in person" to the Net Gen. Online conversations may be as meaningful as one that is face-to-face. Interactions with faculty need not be "in person" to be valuable and personal.

Net Geners use technology extensively to network and socialize. In their personal lives, buddy lists, virtual communities, and social networks such as Flickr or Orkut are heavily used. "When we poll users about what they actually do with their computers, some form of social interaction always tops the list—conversation, collaboration, playing games, and so on. The practice of software design is shot through with computer-as-box assumptions, while our actual behavior is close to computer-as-door, treating the device as an entrance to a social space."[47]

Net Geners are emotionally open and use the Internet as a social technology to reveal their feelings, to express their views, to meet new people, and to experience different cultures. Many of the online exchanges by Net Geners reveal a great deal of personal information—not just facts but emotions.

Computer games provide a social outlet for large numbers of Net Geners. Students play games in groups; online communities form around games; and players add to existing games, sharing their work with others. "Games encourage collaboration among players and thus provide a context for peer-to-peer teaching and for the emergence of learning communities. … Look up any popular game on the Internet and you find robust communities of game players debating games, sharing game tips, or offering critiques to designers."[48]

First-Person Learning

Learning is participatory; knowing depends on practice and participation. Digital resources enable experiential learning—something in tune with Net Gen preferences. Rather than being told, Net Geners would rather construct their own learning, assembling information, tools, and frameworks from a variety of sources.

Digital repositories can provide raw material for learning. For example, *The Valley of the Shadow* archive (http://www.iath.virginia.edu/vshadow2/) allows students to draw their own conclusions about the Civil War using original records from two counties—similar in all aspects except one was Confederate and the other was Union. Census data, agricultural records, newspaper articles, church records, and letters from soldiers and their families constitute the original source material that allows students to engage in "first-person learning." The site also serves formal and informal learners. It is the most heavily accessed Civil War site on the Web, according to Google.[49]

Online laboratories and remote instruments enable students to collect data that can be analyzed and manipulated with the tools of the profession. For example, iLab uses a Web interface to link students with a circuit analyzer. Thanks to the online interface, the instrument is available not only to MIT students but also to students at several other institutions whenever and wherever they choose to do their experiments.[50]

Simulations and visualizations allow students to explore and draw their own conclusions—another form of first-person learning. Games and role playing provide students with the opportunity to assume another persona and learn by "being there" rather than by being told. For example, the game Civilization III serves as the impetus for students to use traditional sources of learning

material. Rather than replacing traditional resources such as maps, texts, or educational films, the game encourages students to use those media to do better. Students must deal with a range of complexities—political, scientific, military, cultural, and economic—over 6,000 years to win the game, and they must synthesize and integrate information from multiple disciplines to succeed at the game.[51],[52]

Interaction[53]

The social nature Net Geners, as well as their desire for experiential learning, implies that interaction is an important technique for colleges and universities to employ. The importance of interaction is not new; learning science has consistently demonstrated that students learn more when they interact—with material, with each other, and with faculty. The "talk, text, test" approach to teaching is not highly effective with most learners. Students do best when they actively construct their own knowledge. In addition, there is a positive correlation between interaction and student retention.[54]

The level of interactivity in a traditional lecture is low. Estimates are that students ask 0.1 questions per hour in a traditional class; faculty ask 0.3 per hour. Technology makes it possible to provide learners with anytime, anywhere content and interactions. Computer-based instruction, however, increases the number of questions posed from less than 1 per hour to 180–600 per hour.[55]

The short attention spans of Net Geners also point to interaction as an important component of instruction. They "crave interactivity—an immediate response to their each and every action. Traditional schooling provides very little of this compared to the rest of their world."[56]

> Digital Natives accustomed to the twitch-speed, multitasking, random-access, graphics-first, active, connected, fun, fantasy, quick-payoff world of their video games, MTV, and Internet are bored by most of today's education, well-meaning as it may be. But worse, the many skills that new technology [has] actually enhanced (for example, parallel processing, graphics awareness, and random access)—which have profound implications for their learning—are almost totally ignored by educators.[57]

Interaction is not limited to classroom settings. Informal learning may comprise a greater share of students' time than learning in formal settings. The type of interaction, peer-to-peer instruction, synthesis, and reflection that takes place in informal settings can be critically important. In fact, "the full range of students' learning styles is undercut when interaction is limited to classroom settings."[58]

Immediacy

"Digital natives are used to receiving information really fast. They like to parallel process and multitask…. They thrive on immediate gratification."[59] The expectation of immediacy holds true for access to friends, services, and responses to questions. According to one student, "The ever-increasing speed of the Internet is one thing I really like because I like my info now, not later."

Although the Net Gen expects constant connections and immediate responsiveness, this is often an unrealistic expectation. Faculty may find it helpful to set expectations about e-mail turnaround; rather than instant response, it may take up to 48 hours for a response on the weekend.

Multiple Media Literacy

The Net Gen has been exposed to multiple media types from a young age. Prensky estimates that by the time individuals reach age 21, they will have spent twice as many hours playing video games as reading (10,000 versus 5,000).[60] The Net Generation is more visually literate than earlier generations. Many are fluent in personal expression using images; they are comfortable in an image-rich rather than a text-only environment.

For some time educators have realized that although reading text may be the preferred mode of learning for faculty, librarians, and other academics, it is not the preferred mode for most of the population. Students on average retain 10 percent of what they read but closer to 30 percent of what they see. Much of the reading done by the Net Gen has been on the Web, where they are more likely to scan than to read.[61]

In fact, overreliance on text may inhibit Net Gen participation. Net Geners "prefer their graphics before their text rather than the opposite."[62] In one course (Library 1010 at CSU-Hayward) significant numbers of students would not process extensive written directions. They would either try to infer the directions or they would turn in incomplete assignments. When the homework was altered, presenting pictures first rather than words, refusals to do the assignment dropped (by 10–14 percent) and student scores increased (an improvement of 11–16 percent); pretest versus post-test scores gained 4–9 percent.[63]

Asking the Right Questions

It is easy to assume that we understand our students, but there is often a difference in perspective between the Net Generation and faculty/administrators. As a result, it is important that colleges and universities ask the right questions and not simply assume that the current student cohort is like we were. Important questions for colleges and universities to ask include the following.

- **Who are our learners?** Although the institution may have demographic information (date of birth, home town, gender, ethnicity, and so on), we may not understand how students view the world, what is important to them, or even how they learn best. It is increasingly important that colleges and universities engage learners in a dialogue to better understand their perspective. Institutions make massive investments (IT infrastructure, residence halls, recreational facilities) for the sake of meeting students' wants and needs; basing these decisions on assumptions is risky.
- **How are today's learners different from (or the same as) faculty/administrators?** Although the Net Generation may be different in many ways from Baby Boomers, some things stay the same. Students still come to college to meet people, to socialize, and to interact with faculty. Many of the measures of student engagement have consistently shown the importance of interaction with faculty and other students, as well as a supportive campus environment. Student preferences for how they receive information are likely different, however—they favor more graphics, a rapid pace, and immediate responses. If faculty and administrators can understand the factors that lead to student success—which persist and which differ from their own college experience—they will be able to more effectively develop programs and target investments.
- **What learning activities are most engaging for learners?** It isn't technology per se that makes learning engaging for the Net Gen; it is the learning activity. If today's students are experiential learners, lectures may not be an optimal learning environment. If they are

community oriented, providing opportunities for peer-to-peer experiences or team projects may be preferable to individual activity. There are significant individual differences among learners, so no one-size-fits-all approach will be effective. Even so, learning science and the habits of the Net Generation provide some clues as to how we can improve learning.

- **Are there ways to use IT to make learning more successful?** Learning science indicates that successful learning is often active, social, and learner-centered. However, with the multiple responsibilities of faculty, staff, and administrators, as well as the large numbers of students most campuses serve, ensuring successful learning without the support of IT may be impossible. Individualization and customization are laudable goals for instruction; they are also time intensive. With the appropriate use of technology, learning can be made more active, social, and learner centered—but the uses of IT are driven by pedagogy, not technology.

Educating students is the primary goal of colleges and universities. However, reaching that goal depends on understanding those learners. Only by understanding the Net Generation can colleges and universities create learning environments that optimize their strengths and minimize their weaknesses. Technology has changed the Net Generation, just as it is now changing higher education.

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