

Foreword: Growing Up Digital

By some counts the commercial Internet is 25 years old. From humble beginnings in 1969 as an experimental project of the Defense Advanced Research Projects Agency (DARPA), the Internet has become a mass medium and quite possibly the distribution channel of choice for voice, television, data, and other media.

Many refer to today's undergraduate college and university students as *digital natives*, or as the *Net Generation*. These names are apt, as these students grew up with one or more computers in their household and with one or more Internet connections. They have enjoyed access to the world's digital resources via the World Wide Web since elementary school. Indeed, we now believe that many U.S. teenagers, not simply college and university prospects, use the Internet (87 percent), use it daily (51 percent), play games online (81 percent), get news online (76 percent), and use the Internet to communicate with one another. More than half of U.S. teenagers with Internet access at home have access to broadband at home. Teenagers use instant messaging extensively (nearly one-fourth prefer IM to phone or e-mail) and not just to send text messages. Teens use IM to link to Web sites (50 percent), send photos or documents (45 percent), and exchange music or video files (31 percent) (Lenhart, Madden, and Hitlin, 2005).

We can reasonably speculate that college-bound teens enjoy even better access to com-

puters, the Internet, broadband, cell phones, and other accoutrements of wired life. We take it to be self-evident that college-bound digital natives are in fact *digital cognoscenti*, *sophisticates*, and perhaps even *digital connoisseurs* who will arrive at our nation's institutions of higher learning with digital gadgets of every imaginable shape and function, with insatiable appetites for all things digital, and with limited patience for the charming but antiquated artifacts of the analog academic world. Such artifacts might include not only our clock towers and ivy-covered gates, but also our lecture halls, textbooks, whiteboards—even our professors!

A great unspoken fear in the halls of higher education is that these digital sophisticates will arrive at our institutions to find aging technologies, legacy systems, congested (or bandwidth-shaped) networks, and decidedly unsophisticated purveyors of institutional IT services—or even worse, a technologically unsophisticated faculty who will curb their enthusiasm for cyberspace. It is, to borrow someone else's great conceptualization, "another opportunity for hope and fear to collide," only in this instance it could be student hopes colliding with institutional fears (Levine and Cureton, 1998).

From Dream to Reality

The 2004 ECAR study of students and technology was a giant first step in fulfilling ECAR's earliest and most ambitious vision. Robert

Albrecht, Mary Beth Baker, Diana Oblinger, and I had the audacity to imagine that ECAR, our modest start-up, might someday institute an ongoing survey of the IT practices, preferences, preparedness, and performance of collegiate students. It took ECAR Fellows Robert Kvavik and Judy Caruso, working with many others, to bring this dream to fruition. The ECAR study is a simple one. In an era of spam e-mail, dwindling attention spans, and excessive market research, ECAR investigators knew that we would at best have a limited opportunity to engage—electronically or otherwise—with freshman and senior students. We would have to navigate institutional review board (IRB) scrutiny and approval processes not once, but repeatedly. We would have to depend on the generosity and shared vision of our colleagues throughout higher education to broker the necessary cooperation of CIOs, registrars, provosts, and many others. In 2004, 13 courageous universities took a plunge and important ground was broken.

In 2005, a solid foundation has been laid upon this ground. In all, 63 colleges and universities participated in the 2005 ECAR study, and invitations to participate went to more than 140,000 freshman and senior-year students. More than 18,000 college and university students accepted our invitation to participate, providing a rich source of data and insight into the behaviors and expectations of a critical cohort—our future leaders. Lest our excitement outrun the limits of our methods, we hasten to add that our findings are conclusive only as regards students at the 63 participating colleges and universities. These colleges and universities do not per se reflect the diversity of U.S. colleges and universities and in particular underrepresent two-year institutions.

Corroborative Findings

Notwithstanding these limitations, ECAR's 2005 findings closely resemble those of 2004

and from other studies. If and as participation in the ECAR study grows, we hope to make broader inferences. In ECAR tradition, we tortured the data and the data tortured us. In the end, what emerges is an increasingly robust understanding of how students engage with information and communications technologies.

The 2005 ECAR study findings to a very great extent corroborate the findings uncovered in 2004. Key among those findings:

- ◆ Students own a variety of information and communication technologies and use them regularly to communicate, find and exchange information on the Internet, do class work, and recreate.
- ◆ Students want a “moderate” amount of technology in their courses.
- ◆ Freshmen and seniors report different skill levels and preferences for technology in support of course activities.
- ◆ Male and female students report differing hours of IT use, skill levels, and IT application preferences, but these differences can be ascribed almost entirely to either males' extra time spent in gaming or their higher enrollment in business and engineering disciplines.
- ◆ The choice of academic major is closely associated with students' perceived skills in certain IT applications and their reported preference for technology in courses.
- ◆ Students are overwhelmingly positive about course management systems but want greater consistency in their use and availability.

Exciting Conjectures

The associations and findings above derive from a strict statistical reading of the data. In a more conjectural mode of inquiry, we might suggest some tendencies or indications. Two such tendencies or indications will be tracked in ECAR studies going forward. Call them hypotheses.

First, the 2005 ECAR data suggests our institutions of higher learning might become places where digital natives come to mature. Such a suggestion should not be considered preposterous, since young adults come to us for many other aspects of their social and intellectual development. Viewed in a context that includes findings of the Pew study of teenagers and the Internet, it is tempting to surmise that freshman students arrive at our institutions with a set of electronic core skills. Such skills include communications (telephone, e-mail, text messaging, and IM), Web surfing (not to be confused with research skills), word processing, and video gaming. Despite these skills, the freshmen in our survey express a *lower* interest in technology in their course activity and report lower skill levels in course-related technologies. One is tempted to conclude that these young people can make technology work but cannot place these technologies in the service of (academic) work.

A second thread, perhaps even more faint, is the hypothetical birth of the *media generation*. Not surprisingly, among the students of the 11 institutions who participated with ECAR in both 2004 and 2005, few things changed. What did change was the number of respondents claiming knowledge of presentation software, along with knowledge of software for creating or editing video/audio and Web sites. While not findings, these suggestions are interesting enough to track and report on.

Too Many to Thank

I know that I owe Robert Kvik and Judy Caruso a lot for their work. I think the higher education community as well is indebted to them. This work is not only difficult in the usual analytical and logistical ways, but it also poses a big administrative challenge. Quite rightly, the study of students demands and receives the full measure of protections under a variety of state and federal regulations. In particular, research on students often falls

under the purview of college and university IRBs. IRB approval is never a foregone conclusion and is rarely easily obtained. For this study, approval was received from every institution that participated. At each institution, one individual handled the necessary and often complex coordination associated with obtaining the necessary approvals to move forward. These people are named—with our considerable thanks—in Appendix B. I'd also like to thank ECAR Fellow Mark Nelson, who analyzed a great deal of the responding students' voluminous answers to open-ended survey questions, and Diana Oblinger for her careful review of the manuscript.

In addition, various campus operating leaders shepherded the process of developing randomized samplings of their freshman and senior populations and deploying the survey to resulting sample members. We owe this large cadre of active supporters a lot.

I'd like to thank those individuals who coordinated and participated in our on-site focus groups. In particular, James Jonas, information services/electronic resources librarian at the University of Wisconsin–Madison, and analyst Ronald L. Huesman Jr. of the University of Minnesota were exceptionally helpful. The opportunity for us to speak directly to instructional technologists and to students enlarged our understanding of the student experience of IT tremendously. And it was fun.

Finally, as always, the EDUCAUSE team is up to the task. Toby Sitko, Nancy Hays, and Gregory Dobbins coordinate the work of a talented group of editors, design professionals, and printers to ensure that good research is well presented. Their attention to detail and to deadlines is critical to our success, and I thank them here for their contributions.

Like Fish Describing Water

My colleague and friend Kristina Woolsey recently commissioned her three college-aged

children to write about their experiences with IT. Based on her daughter Erika's reply, Woolsey remarked, "One thought is that asking a kid about technology is like asking a fish about water. It is clearly critical, but so ordinary it is not a very compelling topic to write about." Of the students in the 2005 ECAR study, all are engaged with technology, most are competent, many are literate (if not multilingual), some are fluent, and for a few, like Erika, technology is quite simply the universe of

instruments and environments that make it possible to express themselves. The nuances that distinguish the "competent, but not confident" from the fluent or the immersed are essential for educators, policymakers, and instructional technologists. Our data remind me that while our *digital freshmen* are indeed digital, they are, even more, freshmen. The Net Generation is real, but as it is with all generations, it is not a monolith.

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