21st Century Trends for Higher Education
Top Trends, 2008–2009

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Introduction

In 2007, the Cisco Internet Business Solutions Group (IBSG) released the first in a series of Points of View regarding key trends for higher education in the 21st century, along with the role of technology in each. The first paper[1] described IBSG's position on 11 trends affecting higher education in 2007–2008, including incoming students, faculty support, job alliances, and data management.

This paper, the second in the series, addresses 12 key trends—some new, some ongoing—for 2008 and 2009:

1. Evergreen students
2. Globalization
3. Technical and information literacy
4. Enrollment, retention, and branding
5. Mobility
6. Safety and security
7. Pedagogical centers and innovative campus commons
8. Evolution of teaching and learning
9. Collaboration
10. Strategic plans and technology
11. Edutainment
12. Green

Each trend builds on ideas presented in previous papers,[2] illustrating how current trends are constantly evolving and new ones are emerging. By understanding these trends and technologies, higher-education institutions will be able to prepare students to become the next generation of productive employees and innovative leaders the world needs.

1. "21st Century Trends for Higher Education," Tracey Wilen-Daugenti, Cisco IBSG, 2007.
2. "The 21st Century Learning Environment: Next-generation Strategies for Higher Education," Tracey Wilen-Daugenti, Cisco IBSG, November 2007.

Trend 1: Evergreen Students

Adults ages 18–26 are typically the first to adopt new technologies. Many of these early adopters are new, or "evergreen," students who bring these technologies onto college campuses. Because of this, students expect their schools to have the infrastructure to support the latest technologies.

Some of the biggest trends in 2008 include the emergence of Web 2.0 and social networking phenomena such as blogs and wikis, as well as new online video repository and delivery websites such as YouTube, iTunes U, and Big Think. The influx of smartphones, such as the iPhone, and other intelligent devices has also enhanced mobile learning (commonly referred to as m-learning), creating new channels for content delivery, video expansion online, and podcasting. Finally, the adoption of virtual reality websites such as Second Life has provided higher-education institutions with new venues for class gatherings and learning.

Universities continue to examine ways in which they can integrate these tools to further enhance the campus and learning experience and improve productivity through flexible learning environments.[3] Many universities view technology as a key asset that helps them create an intellectually vibrant and relevant campus to attract the best students and faculty.[4]

Trend 2: Globalization

The demand for higher education globally has increased and will continue to grow. There are more than 100 million college students worldwide, new campuses are being built, and existing campuses are expanding. Universities are competing internationally for resources, faculty, the best students, and education funding.

Overseas expansion creates opportunities for students and faculty in terms of exchange programs and expanded campus environments. China, India, and the Middle East have quickly become key areas for widespread campus growth. The learning model varies by country and institution, ranging from replicating the home campus, to building local capacity, to participating in faculty exchanges.

These global learning environments give students an opportunity to expand their portfolios to include experience that is valued in today's workforce. Universities in turn use their foreign campuses to attract top research talent and build international relationships, establishing a global presence and helping develop local capacity.

3. "21st Century Trends for Higher Education," Tracey Wilen-Daugenti, Cisco IBSG, 2007.
4. *edu: Technology and Learning Environments in Higher Education*, Tracey Wilen-Daugenti, Pete Lang Publishing Group, 2008.

Trend 3: Technical and Information Literacy

Increasingly, college campuses are taking steps to enhance technical literacy and create a campus culture that encourages faculty to use computers, smart devices, and other innovative tools in their curricula.[5]

Information literacy is another topical area. While many students may be device-savvy, they may not necessarily be information-savvy. Students today, having for the most part grown up with technology, possess more technical abilities with computers and software, yet many have not learned how to use technology for academic purposes. Universities are addressing this through a variety of methods, such as library programs that include workshops and instructional services.[6]

At the same time, universities are creating a technology culture through a variety of venues—common areas, support desks, and student employment programs.

Technical and information literacy continues to gain importance on campuses, ensuring that students are viable candidates in the global workplace. Universities are exploring methods for providing students with the capabilities required to use information technology (IT) both critically and wisely.

Two other trends occurring at the same time are a wave of faculty retirements (24.5 percent of tenured professors above age 60 retired as of 2004) and an influx of postsecondary teachers (an increase of 23 percent is expected between 2006 and 2016[7]). While many of these retirees tend to be less technical and more resistant to using technology than students, universities expect that incoming teachers and other staff will be technically proficient and open to innovation, thereby enabling universities to enhance their technical and information literacy programs.

Trend 4: Branding, Enrollment, and Retention

Schools realize that the Internet is a viable way to market academic programs to prospective students while enhancing the school's brand. One example is Zinch.com, a website targeted at high school students applying for college. Universities are also establishing online parties and networking websites for newly admitted freshmen, allowing them to interact virtually with campus services and the campus community before they start school.

5. *edu: Technology and Learning Environments in Higher Education*, Tracey Wilen-Daugenti, Pete Lang Publishing Group, 2008.
6. Ibid
7. http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2007175

The presence of schools in virtual online communities such as Second Life helps enhance the brand. YouTube's education channels and iTunes U are effective not only for teaching and learning, but also for marketing a university's other, less-academic strengths. Videos[8] of sports rallies, seminars, concerts, and other events are posted to these sites, effectively giving prospective students a glimpse of the university's offerings.

Colleges are also using technology to help build an attractive brand—one that assures prospective students and parents that upon graduation, students will be prepared to participate in a technologically advanced, global economy.

To attract prospective students, some universities have developed student blogger programs, where an assigned roster of current students blogs about their daily routines.[9] Some universities also have respective "fan pages" on Facebook to enable communications with incoming freshmen.

Voice-over-IP call centers and text messaging are two methods being used not only to attract students, but also to retain them. For example, one university advertises on Google and routes leads to its central call center as prospective students click on the advertisement. Another university uses call centers as a way to leave voicemails for students who have missed a number of classes and to assist those who may have health, work overload, or personal issues. This "personal approach" is effective in keeping students from dropping out of school. Text messages are also being used in the same manner.[10]

Trend 5: Mobility

College students today depend heavily on their mobile phones and PDAs. One-third of the 97 percent of college students who own a cell phone no longer use land lines to make voice calls.[11] The freedom, convenience, and cost savings that mobile phones provide are invaluable to students, whether they are living away from home or commuting daily to and from school, home, and work.[12]

With the proliferation of mobile phones on campus, colleges everywhere are compelled to capitalize on feature-rich phones that are capable of much more than just voice calls. Adoption of the BlackBerry, iPhone, and other smart devices that have Internet access allows students and faculty to perform a wide range of tasks virtually anywhere they have cell phone service. These tasks range from administrative (registration), to academic (downloading class materials), to social (instant messaging), to functional (checking transportation schedules).

8. *edu: Technology and Learning Environments in Higher Education*, Tracey Wilen-Daugenti, Pete Lang Publishing Group, 2008.
9. "Social Networking: The New Face of Recruiting," L. L. Briggs, *Campus Technology*, March 6, 2008 (http://campustechnology.com/articles/59448).
10. *edu: Technology and Learning Environments in Higher Education*, Tracey Wilen-Daugenti, Pete Lang Publishing Group, 2008.
11. "Cell Phone Usage Continues to Increase," *The Harris Poll*, No. 36, April 4, 2008 (http://www.harrisinteractive.com/harris_poll/index.asp?PID=890).
12. *edu: Technology and Learning Environments in Higher Education*, Tracey Wilen-Daugenti, Pete Lang Publishing Group, 2008.

Mobile phones are also being used to access computer files from a remote location. With services like Soonr (www.soonr.com), students who have forgotten to bring an assignment to class can prove to their professor that they have finished the assignment by using their cell phone to access the completed work on their dorm-room computer.

Mobile applications such as Twitter and CitySense help students schedule meetings or study dates remotely. For example, students can facilitate text blogging, helping mobile classmates map each other's location quickly.

Mobile learning is also on the rise on college campuses that are exploring using PDAs and smartphones to deliver courseware, field data, short tutorials, and classroom polls.[13]

Trend 6: Safety and Security

The physical safety of college campuses has always been a top priority for schools, but the prevalence in recent years of being "always on" has compelled educational institutions to make security a top IT issue every year since 2003. Top of mind are improving physical safety, protecting student records and key campus data, providing asset tracking, increasing disaster recovery, and adding more security services to the network.

In the aftermath of the Virginia Tech shootings in April 2007, 66 percent of schools have revised their emergency plans, and 41 percent have increased funding for campus safety, according to a *Campus Safety* report, "Virginia Tech 1 Year Later: How Campuses Have Responded," published in March 2008. According to the report, since April 2007, the percentages of institutions that have purchased or will purchase the following equipment or systems within the next six months are:

- 73 percent, mass notification
- 55 percent, security camera systems
- 44 percent, access control and management systems
- 40 percent, emergency communications and two-way radios
- 28 percent, patrol vehicles
- 27 percent, weapons

The United States House of Representatives passed a bill in February 2008 that would require colleges and universities to issue public warnings within 30 minutes of an emergency or threat, as well as notify the public of campus safety information. In April 2008, the bill was revised to require public warnings within 30 minutes of *confirmation* of an emergency or threat.[14] Universities must have the equipment to be able to issue these warnings quickly and directly to the campus population and surrounding community.

13. *edu: Technology and Learning Environments in Higher Education*, Tracey Wilen-Daugenti, Pete Lang Publishing Group, 2008.
14. www.securityoncampus.org/congress/041408/index.html

Securing computer networks and campus data is another priority among educational institutions. Since the beginning of 2008, at least 30 U.S. universities and colleges have experienced data breaches either from computer theft or from inadvertent exposure of personal information on the Internet. In today's environment where identity theft is becoming more common, campuses must be equipped with various ways to protect the wealth of sensitive, personal information within their networks.

Trend 7: Pedagogical Centers and Innovative "Campus Commons"

In addition to new and renovated buildings, several higher-education institutions have created areas called "campus commons." These areas redefine how traditional buildings, rooms, and spaces are designed, built, and used. High-traffic areas such as the campus library or computer lab typically are the starting point for developing campus commons. For example, many universities are transforming their libraries into campus commons by building food courts, creating social gathering and computer gaming areas, and adding collaborative seating arrangements.[15]

Libraries have been at the forefront of this conversion as books are increasingly digitized and space is reevaluated.[16] Campus commons are evolving to become key locations where technologies can be showcased and explored. Some institutions are reinventing these spaces as pedagogical or innovation centers where faculty can learn how to integrate technology into the curriculum, or where students can go to watch and make video projects.[17]

As institutions increase their use of technologies, applications, and smart services, additional areas such as language labs will transition from the influx of technology.

Trend 8: Evolution of Teaching and Learning

The education process continues to evolve from one-to-one (teacher to student) to collaborative learning. Web 2.0 and social networking tools such as blogs and wikis, and online social gathering websites such as Flickr, are enhancing and facilitating collaborative learning and are being used widely on many campuses. The delivery of content has evolved dramatically, as many professors opt to post all class material, including complete audio and/or video recordings of lectures, on sites like iTunes U and YouTube. Because students spend much of their time online, university professors see the value of posting academic materials on these popular sites where students can download and interact with the course materials in a location where they also seek entertainment. Open source course-management systems such as Moodle and similar systems on Facebook are just some applications being reconfigured to support more content and student collaboration.[18]

15. *edu: Technology and Learning Environments in Higher Education*, Tracey Wilen-Daugenti, Pete Lang Publishing Group, 2008.
16. Ibid
17. Ibid
18. Ibid

Open-content initiatives—such as OpenCourseWare[19] from MIT, and the Research Impact Initiative[20] and open content website,[21] both from UC Berkeley—continue to grow, along with book digitization programs first initiated by Google. In addition to universities, libraries, museums, and various government offices are also beginning to make their content available over the Internet. For example, the U.S. Library of Congress[22] and the New Bibliotheca Alexandrina[23] in Egypt are sharing collections and linking to other global libraries to create an expansive environment of knowledge. Museums that have digitized significant parts of their collections and have virtual galleries on their websites include the Louvre Museum in Paris,[24] Tate galleries in the United Kingdom, Rijksmuseum in Amsterdam,[26] and the San Francisco Museum of Modern Art.[27] The U.S. government also provides access to a variety of statistics and databases over the Internet.[28]

Trend 9: Collaboration

Collaboration is a distinguishing attribute of higher education. Universities are seeking ways to facilitate collaboration to enhance research, classes, foreign exchanges, alumni relationships, and private sector partnerships. A variety of venues have emerged to make collaboration easier and more accessible.[29]

Virtual meeting-place and application-sharing tools such as Cisco® WebEx® are efficient web-based collaboration solutions that help improve productivity and decrease communication and travel. WebEx simulates the visual communications that occur between students and teachers in the traditional classroom setting. For example, professors use the WebEx "attention indicator" feature to monitor whether students are giving the class their full attention. Professors can also require students participating in the WebEx session to turn on "desktop sharing" to ensure that the students are actively engaged in the class.

Ultra-high-definition systems such as Cisco TelePresence take productivity, collaboration, and costs savings further. TelePresence enables participants to conduct virtual meetings from nearly any location worldwide, creating a sense of "being there in-person." To date, TelePresence has saved Cisco approximately US$120 million in travel costs. TelePresence can be used in higher education to facilitate administration and cabinet meetings, dissertations, interviews and recruiting, student-professor meetings, overseas campus connections, and distance learning.

19. http://ocw.mit.edu/
20. http://lib.berkeley.edu/brii/
21. http://webcast.berkeley.edu
22. www.loc.gov/library/libarch-digital.html
23. www.bibalex.org/English/index.aspx
24. www.louvre.fr/llv/musee/visite_virtuelle.jsp?bmLocale=en
25. www.tate.org.uk/learning/studydays/
26. www.rijksmuseum.nl/collectie/ontdekdecollectie?lang=en
27. www.sfmoma.org/education/edu_online.html
28. www.fedstats.gov
29. *edu: Technology and Learning Environments in Higher Education*, Tracey Wilen-Daugenti, Pete Lang Publishing Group, 2008.

Virtual locations in Second Life are creating alternative collaboration spaces, and emerging technologies are paving the way to integrate, or blend, virtual and physical realities.[30] These venues, and others, will continue to facilitate collaboration.

Trend 10: Strategic Plans and Technology

Budget and efficiency are ongoing concerns in higher education. In response, institutions are starting to adopt certain practices from private enterprises, such as strategic planning that integrates technology as a key component.

"Cloud computing"—a process that allows files and data to be stored on a remote network using the Internet—is another approach that may potentially lower IT costs and is also a current topic of interest among universities.

In addition, universities are developing long-term financial strategies to ensure that technology is incorporated into the budget. Leasing IT equipment is becoming a more common way to manage IT costs and budgets. Leasing has become more popular and is being used effectively by a number of higher-education institutions[31, 32] to ensure that the allocation of funds for new technology and upgrades is consistent. Evaluating core technology efficiencies through ROI analysis is becoming a key factor in planning as well—particularly in the areas of security, storage, unified communications, and ERP systems.

Trend 11: Edutainment

Higher-education content and entertainment (edutainment) are becoming more intertwined. The first indications of this took place on iTunes and YouTube, sites commonly used for entertainment content only. Professors are now combining the two, using various videos that contain both educational and entertainment value in podcasts and posting course content on education channels to create a more engaging learning environment. Computer gaming is emerging in teaching and learning[33] as well, and more than 120 schools have a presence in Second Life, using these virtual spaces for socializing, teaching, learning, and branding.

Television broadcasting companies such as the BBC, MTV, NBC, and ABC are quickly developing methods to integrate broadcast media with higher education. This trend supports the marked increase in the use of multimedia devices on college campuses where content is accessible not only through computers, but also through TVs and smartphones. Campuses are evaluating the benefit of broadcasting campus TV programs over IP networks.

30. www.iftf.org/
31. "Wireless Network Improves Learning, Enhances Reputation of Premier Liberal Arts University," Cisco IBSG, 2007.
32. "Maintaining Excellence by Capitalizing on Existing Network Solutions," Cisco Systems Capital.
33. *edu: Technology and Learning Environments in Higher Education*, Tracey Wilen-Daugenti, Pete Lang Publishing Group, 2008.

Trend 12: Green

Green has become a key topic in many industry sectors globally, including higher education. Universities are continually seeking and identifying ways to conserve energy efficiently, provide energy using alternative methods and resources, and recycle discarded technology hardware components known as "e-waste." Green dorms,[34] green institutes,[35] and green blueprints[36] are just a few examples of green programs on college campuses. Common conservation practices include implementing cloud computing through server virtualization; providing resource sharing; collocating equipment to reduce energy consumption, costs, power, and space; buying energy-efficient equipment; donating IT equipment; deploying recycling programs; and supporting teleworking.[37]

Communication is critical to ensuring that conservation initiatives on campuses are effective. Universities are being proactive in educating students, faculty, and staff about their solutions. Many professors, of their own accord, are opting to use email, instant messaging, or short message service instead of paper to issue assignments and provide feedback.

The annual "College Sustainability Report Card" by the Sustainable Endowments Institute[38] showed that in 2007:

- 45 percent of colleges made strides in fighting global warming by cutting carbon emissions
- 59 percent have high-performance green-building standards for new buildings
- 42 percent use hybrid or electric vehicles
- 37 percent purchase renewable energy, and 30 percent produce some of their own energy using wind or solar generators
- 70 percent buy food from local farms, and 64 percent serve fair trade coffee

Conclusion

In the 21st century, technology will play an increasing role in higher education. Institutions will adopt innovative solutions that will change the way students learn, communicate, produce, collaborate, and study both on and off campus—solutions that will also improve interactions among faculty, staff, and students. Creating innovative services from current and future technologies requires a powerful, reliable, expandable, and secure IT infrastructure that has adequate bandwidth, quality of service, and storage. Many colleges and universities have already developed short- and long-term plans to ensure success in meeting their current and future needs.

34. www.stanford.edu/group/greendorm/greendorm.html
35. www.ce.cmu.edu/GreenDesign
36. http://ecenter.colorado.edu/greening_cu/index.html
37. "On Being Green," C. Golden, *EDUCAUSE Review*, Vol. 43, No. 3, May/June 2008.
38. www.thedailygreen.com/environmental-news/latest/College-Sustainability-47102702g

Notes

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More Information

The Cisco Internet Business Solutions Group (IBSG), the global strategic consulting arm of Cisco, helps CXOs and public sector leaders transform their organizations—first by designing innovative business processes, and then by integrating advanced technologies into visionary roadmaps that address key CXO concerns.

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