

## 6 Technologies That Will Change Education

- 05/17/11

Over the next five years, six technologies will have a profound impact on teaching and learning, according to a new report released Tuesday by the New Media Consortium (NMC) in collaboration with the Consortium for School Networking (CoSN), "2011 Horizon Report K-12 Edition."

The annual Horizon Report focuses on the key technology areas that researchers identify as likely to have a major impact on educational institutions and other learning-focused organizations within the next five years, broken down into the technologies that will have an impact in the near term, those that are in the early stages of adoption (two to three years out), and those that are a bit further out (four to five years). The report also identifies trends and "critical" challenges facing education in the near future.

Researchers and analysts this year identified six technologies that they indicated have the potential to expand the classroom toolset without increasing costs, that will extend learning into the home, that will inform decision making, and that will increase student engagement.

### Near-Term Technologies

In the near term--one year or less--those technologies include cloud computing and mobile devices.

For education, the relevance of cloud computing this year--as opposed to last year, when cloud computing was focused more heavily on data systems--will be in allowing schools to expand the tools available for learning and teaching in ways that desktop software, with its restrictive licensing and often high costs, cannot.

"Schools are increasingly taking advantage of ready-made applications hosted on a dynamic, ever-expanding cloud that enables end users to perform tasks that have traditionally required site licensing, installation, and maintenance of individual software packages," according to the authors. "E-mail, word processing, spreadsheets, presentations, collaboration, media editing, and more can all be done inside a Web browser, while the software and files are housed in the cloud."

Mobile devices, of course, are already having an impact, but their potential, according to the report, has increased considerably with the launch of Apple's iPad, as well as the new and upcoming slate of Android- and webOS-based tablets that will help solidify the mobile/handheld device class as a well rounded and feature-rich technology category.

"With always-on Internet, mobiles embody the convergence of several technologies that lend themselves to educational use, including electronic book readers, annotation tools, applications for creation and composition, and social networking tools," the report said.

### Mid-Term Technologies

Technologies whose impact will be felt in education a little further out--in two to three years--include game-based learning and open resources, according to the report.

Analysts said that while educational gaming has been around for years, game-based learning has recently made strides in K-12 adoption through the "proliferation of gaming platforms and the evolution of games on mobile devices." Game-based learning is still a few years out though owing in part to the "scarcity of quality educational games" and the inability of education developers to keep up with the technology used in consumer games.

"This year, there has also been a great deal of traction surrounding online games and game apps for mobile devices," the report said. "Schools are beginning the transition from blocking Web-based games to integrating them into their classrooms and curriculum."

Open content is also a few years out, largely owing to restrictions on textbook adoption imposed on schools by some states. But the benefits of open materials are numerous, including cost savings over traditional textbooks, agility for tackling new information, convenience when delivered digitally, interactivity, and potential for collaborative learning.

"While universities ultimately paved the way for open content as an instrumental classroom tool, its recent entrance in the K-12 sector is partly rooted in the financial benefits," the report said. "For example, launched in South Africa, Free High School Science Textbooks serves disadvantaged schools by providing royalty-free, open source books written by volunteer experts."

### **Longer-Term Technologies**

On the four- to five-year horizon are two technologies new to the Horizon Report: learning analytics and personal learning environments.

Personal learning environments are similar to traditional learning management systems but focus less on the "ephemera" of learning (calendars, assignments, and such) and more on the learning itself and "experiences at an individual level."

"In concept, personal learning environments would encourage students to approach learning in ways best suited to their individual needs. Visual learners, for example, might be able to obtain material from a different source than auditory learners. Students using PLEs may further benefit from the practice of keeping track of, and curating, their own resource collections. Personal learning environments are seen as a way to shift the control over learning--particularly its pace, style, and direction--to the learner."

The technologies for constructing PLEs are available now; but PLEs are identified as longer-term technologies for schools owing to the dearth of documentation and the fact that they're still fairly conceptual in nature and lack a solid body of case studies.

The phrase "learning analytics" refers to a combination of technologies for monitoring and responding to student academic performance, including technologies that can be used to trigger interventions for students at risk or even before they reach that stage--for example, by monitoring time away from a course management system that might imply problems down the road.

According to the report, "Currently, most of the research into learning analytics has taken place in the higher education sector. While it has centered primarily on identifying at-risk students who can then receive attention to avoid failure in a particular course, it is increasingly being utilized to determine the most effective pedagogical approaches for specific learning styles, which makes the topic very interesting to K-12 stakeholders. The growing interest in learning analytics goes beyond the data mining

technology itself; the potential applications of the information the analytics provide are now being explored in different capacities, from the impact on vocabulary acquisition to career readiness."

The report's authors also indicated that the greatest promise for learning analytics will be in differentiating instruction by helping to determine individual student needs.

The 2011 report, available today, also provides examples of technologies and their use in K-12 educational settings. A toolkit will also be available in June, along with a printed version of the report, to help facilitate conversations among education leaders on the issues discussed in the report. A complete copy of the new 2011 Horizon Report K-12 Edition is freely available now via a Creative Commons Attribution License and can be downloaded in PDF form [here](#).

#### About the Author

Dave Nagel is the executive editor for 1105 Media's online education publications and electronic newsletters. He can be reached at [dnagel@1105media.com](mailto:dnagel@1105media.com). He can now be followed on Twitter at <http://twitter.com/THEJournalDave> (K-12) or <http://twitter.com/CampusTechDave> (higher education).