



## NCTI 2008 Innovators Conference

**Session Title** Breakout Session: Mobile Global  
**Names of Presenters** Larry Goldberg, Tom Greaves, John Horrigan, Bruce Wilcox  
**Date** Thursday, November 20, 2008

**Summary** Panelists discussed the present state and challenges of mobile computing and the types, audiences, and uses of mobile devices. They celebrated the potential of these devices to improve education and accessibility for everyone.

**Larry Goldberg**, Director of [Media Access, WGBH](#) (*Moderator*)

Larry forecasted the issues to be discussed during the session: mobile learning, mobile devices used around the world, the background on the proliferation of mobile devices, the audience and uses of mobile devices, and the potential for mobile devices such as closed captions on mobile devices, assessments on cell phones, Apple added iPod *Spoken Menu* on Nano due to complaints about accessibility for the blind, museums using uploading text descriptions iPod for voice to make art more accessible.

**Tom Greaves**, Chairman, [The Greaves Group](#)

Tom lamented the fact that education mobile computing is the fastest growing tech segment worldwide and the U.S. is not leading the revolution. Tom identified the following key technology success factors:

1. Strong support from administrative leaders
2. Robust implementation – 99.9% uptime
3. Ongoing professional development, including in-classroom mentoring
4. Balanced uses of technology
5. Mobilized curriculum
6. “Best of Class” methodologies

Tom then addressed the bandwidth crisis- the average student should have 40kb, but the average student only had 2.2kb in 2006. E-rate will not be sufficient to address the growing bandwidth problem because E-Rate is capped at \$2.25B/Yr and Priority 1 Services will exceed \$2.25B cap by 2011. E-rate will not accommodate the increase in required data bandwidth; consequently, in a few years, most schools will be paying the unsubsidized rate for additional bandwidth (could be \$100/student/year).

Tom offered the following recommendations:

- Build five year bandwidth usage models for each application area
- Look at alternative models – applications and connectivity



- Get the word out to policy makers and legislators
- Get behind national bandwidth recommendations, such as SETDA's
- Lobby to expand E-Rate funding to current need levels and have it indexed upwards each year. (In 1996 \$2.25B was just fine. Not now!)
- Urge a re-look at what constitutes a priority 1 service  
e.g. WiMAX, EVDO, LTE
- Special considerations for geographically challenged schools

For some with disabilities, mobile computing is physically a must. For all, mobile computing is the key to the delivery of a full range of educational tools and applications.

**John Horrigan**, Associate Director for Research, [Pew Internet & American Life Project](#)

John pointed out that many people (42%) are using their mobile devices for non-voice related tasks with African Americans and Hispanics leading the way in using non-voice data applications (over 50%). This finding leads to the anticipation of a more diverse mobile space and creates opportunities for innovation if there is enough spectrum to encourage carriers to make devices open for innovation from outside developers such as open source. John cautions that the use of mobile access is a compliment, not substitute, for inter-access.

**Bruce Wilcox**, Founder and CEO, iAprender!

Bruce spoke about lower cost computing design- \$100 laptop was meant to drive down the price of other laptops. Ultra-mobile PC (UMPC) is becoming more affordable due to heightened investment, but this has created a confused vendor environment (identity crisis). Small devices are increasing in size and sophistication. Bigger devices are becoming smaller. Large service providers are increasingly subsidizing lower cost devices (i.e., phones that are increasingly more like computers). All of these changes are converging and resulting in mobile internet devices. One outcome of this change could be a virtual tutor which would allow urban kids having to bus to school for 2 hours to make that commute classroom time. Bruce predicts the emergence of a learning service provider (aggregates content applications, delivers application, etc.); the edge, FREE, is irrelevant to the purchase decision; the FCC/eRate (or other ubiquitous bBand) provides nearly free education access; QOLS (Quality of Learning Services) criteria emerges to differentiate managed services & scalability; and mobile optimized chipsets usurp the traditional PC duo.

## Discussion

(Larry asked the audience to keep a wish list of accessible mobile devices in mind throughout the panel.)

*Comment: Digital audio books on an mp3 player would be on my wish list. There is already Braille to text to speech. Open source screen reader for mobile devices is also on wish list.*

*Question: What broadband access will be available in the future?*

Tom Greaves: LTE will move beyond the current Wimax. Wimax is currently gaining



momentum across the country. Wimax got some educational interest because of its use of educational spectrum licensed spectrum from schools.

John Horrigan: The educational community driving the need for something like Wimax will be great and helpful regarding consumer acceptance which will be an issue.

*Question: what do you see on the horizon for adults with disabilities?*

Larry Goldberg: The development of platforms like G4 and for the iPhone; also the use of text messaging & GPS on devices.

*Comment: We're moving away from doing assessments with technology to doing assessments (like reading assessments) on technology which would then give reading suggestions.*

Bruce Wilcox: The industry sees this as an emerging platform and is moving in the direction of using cell phones for assessments. Educational Testing Services has already done a trial with delivering questions via cell phone texts. U of Michigan has been touting handheld learning- learning mobile optimized education.

Tom Greaves: Be aware that the problem with assessments on cell phones is that officials will be fanatical about cognitive load and the ability to see the whole test item on the screen- no test will be delivered on smaller than x by x screen. For this reason, I do not foresee the emergence of benchmark assessments on cell phones. The industry may start off with lower stakes assessments.

*Question: Aren't there also security issues involved before this [assessments given on cell phones] could become more widespread? Confidential student information.*

Tom Greaves: There are a wide range of issues that need to be addressed. For these reasons, I do not see widespread adoption of cell phones in school without carriers support and convincing schools that cell phones will solve a wide range of issues that the schools are having (rather than just assessment).

*Comment: I'm very impressed with Larry showing captions from his phone on the laptop and projecting onto the screen. For future conference presentations, have speakers face projected on the screen with captions beneath the speaker's face. That would be great!*

Larry Goldberg: The industry is close to automatic translation from sign language to text.

*Comment: I work with students with severe physical disabilities, mostly working with accessing computer, combining augmentative with laptop. These devices are always very glitchy. Smaller laptops are always being developed but they don't have much memory or only run the communication software. We need something smaller than a laptop but more powerful than what's currently offered where something other than office and communication software can run on it – something the students could take to work. Something as small as an iPhone, but also could also use to scan.*

Bruce Wilcox: The drive for cheap and less expensive devices is an explanation for developers not using the most cutting edge processors. Also, with the green wave of using less power, we'll see smaller machines with better processors. The lack of



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progress is also due to the fact that the industry has worried about the erosion of more lucrative markets. They industry is on their way but about 3 years behind. The issue of cost and the erosion of higher markets are to being cast aside by global competition.

*Comment: To deal with the bandwidth crisis and peak times, we cash certain WebPages because this allows us pull recurrently instead of having to bring the page from the web. We maximize time.*

Tom Greaves: Cacheing is a good option, but is not a solution because some things cannot be cached.

*Question: Aren't there certain educational applications that lend themselves more to mobile devices where as some are just as good with stationary work stations?*

Tom Greaves: Everyone should start with the premise that education is better individualized; to individualize we need digital devices. If the device is digital, it must be accessible wherever the student is – the only way to do that is to have a mobile connected device. Mobile computing (cell phones, GPS, etc.) allow students to be out in the field doing things and learning. How do we get applications that exploit mobile connected computing?