Mobile Phone Imagination
using devices kids love for their education

By Marc Prensky

"Imagination is more important than knowledge".
– Albert Einstein

The mobile phone is an amazing phenomenon – and a harbinger of the great changes to come in the 21st century. Only 32 years old, over one quarter of the world's population owns one or more of them. The number of text messages they send and receive every day exceeds the population of the planet. They already can be printed on cardboard and use Wi-Fi, implying that the cost of basic service may soon go to pennies.

The first big wave of mobile use was voice, the second text, and the third cameras. With movies, TV, GPS and the Internet, already on the newer devices, the old bromide "you ain't seen nothin' yet" is probably literally true here. I am already greeted whenever I pick up my phone with my 6 month-old's smiling face, and has soon as he says "dada" that will be my ringtone. My phone is my camera, my mp3 player, my note-taker and my alarm clock, finally eliminating the other devices I used to carry. And as soon as someone invents a good one-handed way of entering text that is as fast as a keyboard (our biggest need at the moment, despite T9), I will do all my writing that way as well.

Of all the possible uses for mobile phone, the use that will have the greatest impact on the world in the long run, I predict, is just emerging – using mobile phones for worldwide teaching and learning. Cell phones are not just communications devices sparking new modalities of interaction between

people; they are also particularly useful computers that fit in your pocket, are always with you, and are nearly always on. Like all communication and computing devices, cell phones can be used to learn. So rather than fight the trend of kids coming to school carrying their own powerful learning devices—which they have already paid for—why not use the opportunity to their educational advantage?

I have written elsewhere (see http://www.innovateonline.info/index.php?view=article&id=83) of the ways we might use the various modalities of the mobile phone for learning. What is most important though, *is that we enlist the learners*, particularly the younger learners, in this process. The people I call today's "Digital Natives" are inventing and moving to new ways of doing things at breakneck speed (see http://www.marcprensky.com/writing/Prensky-The_Emerging_Online_Life_of_the_Digital_Native-03.pdf). I predict they will invent new ways of learning via their phones, either with us or without us.

We adults need to get away, as the young people are, from old ways of thinking. Much as we may want to brand it "cheating," calling up your friend to get an answer during an exam is a great example of on-demand learning. Those who laugh about their surgeon's getting "just-in-time training" would be amazed at just how many surgical consults go on during operations, and with the eyes and ears that a phone provides, experts could be using their mobiles to train doctors worldwide in real time.

Other questions we should be asking ourselves include:

What could we do with ringtones (already a 3.5 billion dollar business) that hasn't been done? Could we, instead of the cacophony, be making complex music together? Could teachers be using this for Music Appreciation classes? Could we be embedding other information into the sounds than just who is calling?

How would a phone optimized for learning be designed? What functions should be instantly available, as opposed to having to search deep into menus? What mini-games would be both addictive and improve people's knowledge or skills—such as *Bookworm*, for vocabulary and spelling (see http://www.popcap.com)? What applications could make the entire system better as we learn, such as the *ESP Game* that adds meta-tags to Internet images as we play? (See http://wwsw.espgame.org.)

We should be asking how we can design the radio features of phones to control their use in classrooms, perhaps limiting their access temporarily to

only the teacher's channel. Need kids exchange their sim cards to do this, or are there better, easier ways we can build into the hardware and software?

Can we create programs, or even exams, that we hand out on memory cards for students to slip into their phones? Can homework and exams get marked and annotated automatically?

Can phones replace the handheld devices used in many classrooms and corporate meetings to poll an audience?

Can phone calls from experts (doctors, lawyers, technicians, etc.) be captured (with permission), and turned into lessons of best practices and important exceptions, while giving learners a feel for what actually goes on in those peoples' day?

Can classes and schools (or subjects across those) be set up so that all classmates are permanently connected, and can pedagogies be constructed to take advantage of this?

Can every book in the public domain (i.e. all the "classics"), already recorded for the blind, be made available on mp3, and in various phone friendly text forms such as individual paragraphs or RSVP (one word at a time on the screen at a variable rate) for teachers to assign on students' mobiles?

Can experts in 21st century knowledge such as nanotechnology, bioethics, genetic medicine, neuroscience artificial intelligence, programming, and knowledge filtering hold Q&A sessions with different levels of students and the results be podcast for use on their phones? Can we take advantage of the phone for additional questions as they come up?

Can voice recognition, already used experimentally for student authentication on exams, be used for language learning? With instant translations of whatever *you* want to say?

Can the ability to capture data through cameras and other sensors such as GPS be used to make our students into real scientists?

Can the highlighted text of karaoke, already used in China to teach English, be used to learn, or interpret second, and other languages?

Can the motion sensors in many new phones be used to help kids exercise?

Can students post, blog, download, read and exchange on their mobiles as easily as they do on a laptop? Can they submit their assignments to and receive their feedback from all teachers via mobile?

How can students learn to program their mobiles (which have more power than the computer in the lunar landing module) to do their 21st bidding, beyond just downloading and search?

Interestingly, a great many of these solutions exist already. I recently thought a perfect application for mobile phones would be a universal star chart that should adjust itself to wherever you happened to be. Any GPS-enabled phone contains the data you need—place and time—and the screen is illuminated so you can see it at night. "I have that on my PDA" said a friend I asked. So why should it not come with all phones? Things like this would help enormously in getting our young kids interested in science and natural phenomena.   What other applications already exist that could easily be offered?

In the UK CTAD in Cambridge is doing interesting things with mobile phone learning. (http://www.catd.com). In China there are several companies, including the BBC, exploring the area. My previous article (see above) prompted a reply from a school in Montpellier, France, Wapeduc, which uses mobiles for education and bills itself as a "nomadic school."   ("l'ecole nomade": http://wapeduc.net).

But this is only the tiniest tip of a huge iceberg—one that we can either be hit broadside by, or learn to live on and with. All these innovations will happen—the students want them and they will, in the not too distant future, control the companies tools. But the innovations will happen much more quickly, smoothly and effectively if today's adults (whom I call our "Digital Immigrants") start mastering the language and getting involved in the new, digital culture for learning.

Imagine the possibilities!

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