Scaffolding Technologies for Low Literacy Groups: From cell phone to PC in Appalachia

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Despite the exponential growth in computer networking and information technology adoption and use, the majority of the world population is not computer literate. People have low computer literacy for myriad reasons, from low reading literacy to an aversion to, disinterest in, or lack of access to, computing technology. Many people with low reading and computing literacy have access to mobile telephones, even though they do not have access to desktop computers and computer networking. In many developing countries, there are currently more mobile than fixed phones, simply because fixed phone service and infrastructure has been under-funded by government for decades (ITU 1995-2004). In the US, over two-thirds of the adult population owns a cell phone with growing ownership among the elderly and lower socioeconomic groups (Rainie & Keeter, 2006). Periphery economic areas throughout the developed countries are often as underserved by Internet infrastructure and access as some developing countries.

We are investigating the hypothesis that mobile phones could act as a bridging (or scaffolding) technology in the computer learning process for several reasons, based on diffusion theory and social network theory, as follows: 1) People with low reading and computer literacy are more likely to own a mobile phone than a personal computer (Schement & Forbes, 2000; ITU, 1995-2004); 2) Members of the social networks of low literacy groups are likely to be able to reach and communicate with each other using a mobile phone; and 3) Members of the social networks of low literacy groups are likely to be able to assist each other with informal learning and help on how to use a mobile phone. Conversely, members of their social networks are not likely to have email or Internet access and skills.

Further, we draw upon mental model and metaphor theories of learning to illustrate how users can migrate fairly smoothly from a fixed telephone to a mobile phone, without much reading ability. With some experience and perhaps a lot of help from their social circle of friends and family members, new users of mobile phones learn simple computing tasks on their cell phones (e.g., storing and retrieving phone numbers, checking for missed calls, getting phone messages). In the long run, we argue, mobile phone users may be able to port these simple computing skills and practices to the domain of desktop computers. Being able to use a desktop computer might help them seek additional computer training opportunities, educational experiences and employment.

In the US, the demographics of the technologically underserved population bears a strong resemblance to at-risk adults served by reading literacy programs, such as, Literacy Volunteers of America. For this reason, we are conducting this investigation in collaboration with the local chapter of the Literacy Volunteers of America -- namely, Literacy Volunteers of the New River Valley (LVNRV). LV NRV works with adults of
all ages and their families through local organizations, such as the New River Valley Community Action Agencies, where they provide one-on-one and small group tutoring in reading literacy and in computer literacy. For example, the New River community Action office in Floyd County teaches basic computer skills to adults in classes designed only for adults who can’t read or who need help to read better and want to learn how to use a computer. Currently, the LV NRV serves approximately 135 adults with low reading literacy through regular tutoring and small group sessions.

We are working closely with the LV NRV staff and tutors to develop instruments and protocols to identify the needs and interests of their clientele (i.e., adults of all ages with low reading literacy) vis-à-vis mobile phones and desktop computing. With such a test instrument we will try to establish categories of participants, such as those who are not interested in computing, and for what reasons (e.g., they do not see the value as they get all their information and communication locally, they are overwhelmed by technology) and those who are interested, and for what reasons. We are further developing semi-structured interview protocols that will be conducted by the LV NRV tutors to inquire about the communication behavior and perceptions of their students. At the outset the tutors will not ask directly whether and how the students use technology, but rather they will ask about the student’s daily routine, social circle and interests of all kinds. In later semi-structured interviews, the literacy tutor will ask their students about the ways that they currently use their cell phone, if they have one, and how they are learning to use the more ‘computer-based’ tasks on their phones, such as storing or retrieving a phone number, changing the background or ring tone, sending text messages or taking photos. Through these interviews and the recorded observation of the adults in both their tutoring sessions and computer classes, we will seek to establish changes over time in their attitude and behavior toward computing, and, possibly, their motivations for improving their access and skills in either or both. We will also examine log sessions on the computers used by students to look for changes in the speed and accuracy with which students who have experience with mobile phones compare with those who do not.

Ultimately, mobile phone use could be very important in helping large segments of the world’s peripheral population gain computing skills that provide myriad advantages, including: 1) allowing them to access resources that are increasingly available online, 2) securing better employment opportunities that require some computing skills, and 3) helping them generally reap the benefits of a global information society and economy.