

The Future of ELearning

The future of learning has a tendency to sound like the storyline of a science fiction novel. The field is rapidly evolving and science fiction becomes science fact faster than what seems possible. Scientists at Universities from MIT to Oregon State are fascinated with how computers can become more user-friendly, intuitive and transparent and how learning can become an un-obtrusive part of a student's lifestyle. "We're talking intricate training environments that combine computer science, instructional design and hyper-real graphical interfaces that will greatly enhance our ability to learn more rapidly." Says Barry Minkin, futurist, global management consultant and author of *Future in Sight* (MacMillian, 1995). Some of the more radical areas of research are focused on shrinking and embedding wearable computers into clothing, developing systems that can think, making the computer-user interface transparent, infusing the body's neural network with digital technology and even harnessing the power of REM sleep for training purposes.

Thinking Computers

Andy Fagg, a faculty member of the computer science department at University of Massachusetts in Amherst is teaching computers how to "notice" a user's routines and offer useful information accordingly. Fagg is interested in how to get a computer to recognize, for example that if the wearer has entered a conference room at a particular time "it should figure out that I'm going to a meeting and pull out appropriate documents, including minutes of the last meeting, and notes from related discussions." (Luciano, 2000) He is also interested in getting the system to recognize daily routines and provide reminders to the user about tasks that need to be performed. The impact of this type of research on mobile learning can be far-reaching. Imagine prepping an official for a diplomacy meeting by sending all the documents to the wearer's LCD eyepiece or updating the wearer as breaking events happen. The system could also be used during training sessions as a personal coach to remind the wearer to complete tasks in sequence or in a particular way. It would allow one-on-one training to occur without the cost of a team of trainers.

Streamlining the Computer-Human Interaction

Making the user interface as transparent as possible consumes some wearable scientist and developers. The peripherals they develop run the gamut from the rather mundane (like a forehead sensor that can operate your computer at the blink of an eye)(Bass, 1998) to the more radical (like the US Airforce Human Engineering Division's work on a

brain-activated computer-control device that is triggered by reading brain waves) (Bass, 1998). Brain-wave reading input devices are not the stuff of science fantasy, however. Jennifer Healey at MIT's Media Lab has built an affective computer that can read the biometric signals of the user and play music to suit the user's mood and emotional state. (Bass, 1998) An affective system might be very effective for training aimed at changing engrained behaviors or altering unconscious reactions to stimuli that cause stress or fear. Researchers at the University of Rochester equipped with a virtual reality helmet that is able to recognize key brain signals (and while inside a virtual room), users can currently turn on appliances by just wishing it so. (Sherwood, 2000) While focused on providing physically challenged individuals independence with a virtual apartment, their research could have significant implications for other industries that need quick response times. Brain-computer interfaces are intent upon making telepathy a scientific reality and this type of technology implemented from a central office to a field site via an employee might result in more efficient communication and a decrease in employee error and misunderstanding.

Various research centers have expanded upon the concept of transparent computer-user interfaces and have explored how truly transparent systems could be ideal for training purposes. Research at Stanford University has demonstrated that while the dreamer's muscles become temporarily paralyzed by the REM cycle, the physical activity in a dream exhibits the same neural impulses in the brain that the user exhibits when awake. Interested in harnessing this dreamtime for training, the Lucidity Institute has invented a device called the NovaDreamer

(<http://www.lucidity.com/supernovadreamer.html>) that professes to send a subject into a REM state by alerting the subject's brain when he/she is dreaming. (Barbian, 2001) "Research on how to cultivate peak performance suggests that lucid dreaming may prove to be an ideal training ground, not only for athletics, but also for any area in which skill can be developed" Dr. Stephen LaBerge's Stanford University researcher writes in Exploring the World of Lucid Dreaming (Ballatine, 1998). Within REM sleep students would be able to rehearse and prepare for real-life experiences. Just imagine being able to conduct training sessions to a slumbering class of students –with "dream link technology" computer sensing devices that link an entire class over a "dream network". (Barbian, 2001)

Even more radical than utilizing lucid dreaming as a training ground is the research being conducted by the Artificial Life Team at British

Telecommunications in Ipswich, England. Their reports discuss the development of an "immortality chip" called the Soul Catcher that would be implanted somewhere behind the eye and interface with the user's neural network, creating a truly digitized environment. (Barbian, 2001) This type of a peripheral would be able to overcome the difficulties of power supply and the impact of adverse environmental conditions. This system would be able to record what the user thinks and sees and download that information to a mainframe computer making the user a human information machine with an unlimited memory and flawless recall -eliminating the need for a trainer entirely and ushering in a new world of true human/cyborg entities.

By combining wearable computing with transparent computer-user interfaces and "thinking computers" the future of workplace training may become an environment where training is an ongoing affair that is tailored to the individual through devices that will judge how and what to teach each individual by monitoring the student's movements and brainwaves. Trainers will appear holographically and students will be able to virtually touch them and other objects within a virtual training room. Employees in industries that require just in time learning will don LCD eyeglasses, microphones and other wearable peripherals along with their uniform each day and their instantaneous learning will be driven by the experience as suggested by a computer that is monitoring the user's movements or the supervisor in the control room half a world away. Or in the far distant future, employees will have embedded computers that are run off of the body's electrical current and will record everything the user reads, hears or sees. Recording a human experience requires a lot of processing and storage space - more than computers currently have. A human brain is estimated to have "the processing power of around one thousand million million operations per second (one petatops) and a memory of 10 terabytes. If current trends continue, computers could match those capabilities by 2047." (Bell, 1997) Experiences demonstrated in the popular movie, *The Matrix*, therefore are not so far fetched; and it is possible that in fifty years learners will simply plug in to upload new information or with current advancements in biotechnology, perhaps swallow a pill to learn how to navigate that new terrain, or speak in German, or fly a plane.

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Retrieved from the World Wide Web on November 28, 2001
Corporate website outlining their WetPC and other wearable technology.