Digital Literacy: Different Age Groups Have Different Skills

Research has shown that some changes in digital thinking skills, such as photo-visual and lateral thinking, are the result of experience and not the age of the participants. According to Prof. Yoram Eshet, "You **can** *teach an old dog new tricks."*

It's commonly assumed that younger people, who have grown up with computers, are more digitally literate than older people, who became acquainted with this relatively new technology at a later age. But do they remain more digitally literate or do older people catch up and even surpass them in some aspects? And can we determine whether age or experience has the broadest influence on digital literacy?

In a recent research, Prof. Yoram Eshet, head of the Chais Research Center for the Integration of Technology in Education at the Open University and Dr. Eran Chajut, of OUI's Department of Education and Psychology and the Chais Center, compared younger and older people in 2002 and the same people again five years later, in order to determine how each group compared to the other and to a control group, in terms of facility with different cognitive and emotional constituents of digital literacy. Their results showed, among other things, that the older subjects improved markedly in their performance of several aspects

of computer literacy over the five year period. Presented at the 2007 Chais Conference on Instructional Technologies Research at the Open University, this study may help us understand how the digital era has affected our thinking skills.

According to Prof. Eshet, "Digital literacy is the ability of users to operate digital environments (such as the computer, digital camera, modern car) intuitively. The problem that these environments pose for the naïve user is that unlike non-digital machines, the digital environments are based on complex processes and the naïve user usually doesn't understand or see the connection between their actions and the outcomes. It's like a soft drink machine compared to a mechanical hole-puncher. When you press a button on the soft drink machine, you see the results, but you have no idea how it works. Unlike the hole-puncher, whose mechanism is obvious, the workings of the soft drink machine are like hocus-pocus. These ambiguities can create anxiety among digital users and make them insecure about their work. The question is how this familiarity affects digital literacy."

Prof. Eshet has published a conceptual model for digital literacy, which consists of six different cognitive and emotional thinking skills that users employ in their work with digital environments. These include photo-visual skills (deciphering user graphical communication in

interfaces); reproduction skills (creating new entities by reproduction and rearrangement of pre-existing elements); non-linear skills (the ability to create knowledge from bits and pieces of information, which were collected Through a non-linear navigation in the cyberspace); information skills (the ability to think critically in evaluating information); socio-emotional skills (the ability to perform effectively in virtual communication environments, such as chat rooms); and real-time thinking (the ability to perform several operations simultaneously under time pressure, such as in computer games.)

In a previous study, the performance of subjects from different age groups was tested in specific tasks that required the utilization of these specific skills. The three groups were 20 high school students aged 15-16; 20 university students aged from 20-28; and 20 adults aged 30-40, who had B.A. degrees. They were asked, for example, to decipher software they had never seen before, in a test of photo-visual skills and to critically evaluate the same piece of news that was published in a number of different Internet news sources in a test of information literacy.

Results indicate that digital literacy is not equally shared among all age groups. Though the young participants performed better in the photo-visual and lateral tasks, they were much worse than the adults in the more cognitively demanding tasks of reproduction and information thinking skills. This left

open many questions. Is the young mind wired differently or do young people just have more experience with computers? Is digital literacy age-dependent or experience-dependent? What is the nature of change in digital literacy over time?

These questions had never been researched before on the same people, over a period of time. In 2007, therefore, Prof. Eshet and Dr. Chajut conducted a follow-up research on the same people tested in the previous study, who were now five years older. About 80% of the original subjects were identified and tested again with similar tasks, along with control groups of high school students, university students and adults who were the age that the original participants had been five years previously.

Results show that the adults group improved the most during the last five years and they slowly "closed the gap" with the high schoolers in photo-visual and lateral thinking. On the other hand, the high schoolers' performance became worse in the cognitively demanding tasks of reproduction and information thinking. These findings are alarming signs of young people's ability to cope wisely (as opposed to technically) with modern digital changes.

"As we become more experienced with information, we become less critical," said Prof. Eshet. "We are bombarded with information and become less selective. We think in a shallower way."

Results from the control group indicate that the above changes in digital thinking skills are the result of experience and not the age of the participants, or as phrased by Prof. Eshet, "You *can* teach an old dog new tricks."

Learning in the Technological Era

2008 Chais Conference - Instructional Technologies Research

Keynote speaker, Prof. Barbara Tversky, of Stanford University, addresses The Chais Conference.

Research on instructional and learning technologies has gained much momentum in recent years and affects the assimilation of these technologies as pedagogic methods. For the third year, the Chais Research Center for the Integration of Technology in Education of the Open University, initiated a national conference for researchers and professionals, to serve as a meeting place for discussion, presentation of research and an exchange of opinions between researchers and other experts in this field. This conference is the most prestigious in its field in the country, with speakers and participants from all of Israel's major academic institutions as well as from abroad.

Some 500 people attended the 2008 Chais Conference, which offered some 100 lectures, posters and workshops in parallel sessions. Two academic programs on informational technology even sent all their students to the conference. The number of papers submitted was double that accepted and two judges chose the most outstanding to be presented. They were printed in a book, which was sent to participants and to academic libraries.

Keynote speakers were Cognitive Psychologist Prof. Barbara Tversky from Stanford University and hi-tech industrialist Dr. Giora Yaron, Chairman of Yissum – the Technology Transfer company of the Hebrew University, formerly President of Indigo and Corporate Vice-President of National Semiconductor.