



by Don Tapscott

# Educating in

The baby boom's echo is louder than the original, totaling more than 88 million youngsters in Canada and the US. The youngest are just getting out of diapers and the oldest are 24. This is the largest generation ever, and it continues to put enormous stress on the education system.

But demographics don't fully explain the disruption these kids are causing. They are also the first generation to grow up in the digital era. Call them the Net Generation. Computers can be found in the home, school, factory, and office, and digital technologies such as cameras, video games, and CD-ROMs are commonplace. Increasingly the Internet, an expanding web of networks that attracts millions of new users monthly, connects these new media. Today's kids are so bathed in bits that they think it's all part of the natural landscape. To them the digital technology is no more intimidating than a VCR or a toaster.

For the first time in history, children are more comfortable, knowledgeable, and literate than their parents about an innovation central to society. And it is through the use of the digital media that the N-Generation will develop and superimpose its culture on the rest of society. Boomers stand back. Already these kids are learning, playing, communicating, working, and creating communities very differently than their parents. They are a force for social transformation.

For most of the Net Generation, time on computers and the Net is taken away

from time watching television. When they are online they are reading, analyzing, authenticating, contextualizing, sorting the digital wheat from the chaff, composing their thoughts, criticizing. My research indicates this is creating a generation of smart, media savvy, innovative, collaborative youngsters who learn through interacting. This generation is exceptionally curious, self-reliant, contrarian, focused, able to adapt, high in self-esteem, and globally oriented. These attributes, combined with N-Geners' ease with digital tools, spell trouble for the traditional educator and learning institution.

If teaching professionals frozen 300 years ago came alive today and looked at other professions - a physician in an operating theater, a pilot in a cockpit, an engineer designing an automobile in cyberspace - they would marvel at how technologies had transformed work. But if they walked into a classroom, they would no doubt be comforted that little had changed.

But now it must. The Net-Generation kids are beginning to process information and learn differently than their parents. New media tools offer great promise for a new model of learning - one based on discovery and participation. This com-

# a DIGITAL World

bination of a new generation and new digital tools will cause a rethinking of the nature of education - in both content and delivery. The shift from being a passive recipient in the broadcast model to an active participant in an interactive model is the cornerstone of the Net Generation. They are intent on being users - not just viewers or listeners.

The new model shifts from teacher-centered to learner-centered education - centering the learning experience on the individual rather than on the transmitter. In the past, education has tended to focus on the teacher, not the student. This is especially true in post-secondary education, where the specific interests and background of the teacher strongly influence the content. Much of the activity in the classroom involves the teacher speaking and the student listening.

By contrast, a learner-centered education begins with an evaluation of the abilities, learning style, social context, and other important characteristics of the student that affect learning. It makes extensive use of software programs that structure and tailor the learning experience. It is more active, with students discussing, debating, researching, and collaborating on projects.

The new model emphasizes learning how to navigate and how to learn and think, rather than simply absorbing materials. The new model is also highly customized. It enables students to be treated as individuals and have their learning experience shaped by their backgrounds, individual talents, age levels, cognitive styles, interpersonal preferences, and so on.


Needless to say, a whole generation of teachers needs to learn new tools, new approaches, and new skills. This will be an enormous challenge. But by exploiting the digital media, educators and students can shift to a new, more powerful and effective learning paradigm.

## Eight shifts of INTERACTIVE Learning

### 1. From linear to hypermedia learning

Traditional approaches to learning are linear. This dates back to the book as a learning tool, which is usually read from beginning to end. Stories, novels, and other narratives are linear. Most textbooks are written to be tackled from the beginning to end. TV shows and instructional videos are designed to be watched from beginning to end.

But N-Gen access to information is more interactive and non-sequential. Notice how a child channel surfs when watching television? I note that my kids go back and forth between various TV shows and video games when they're in the family room. No doubt this will be extended to surfing the Net as our TV becomes a Net appliance.



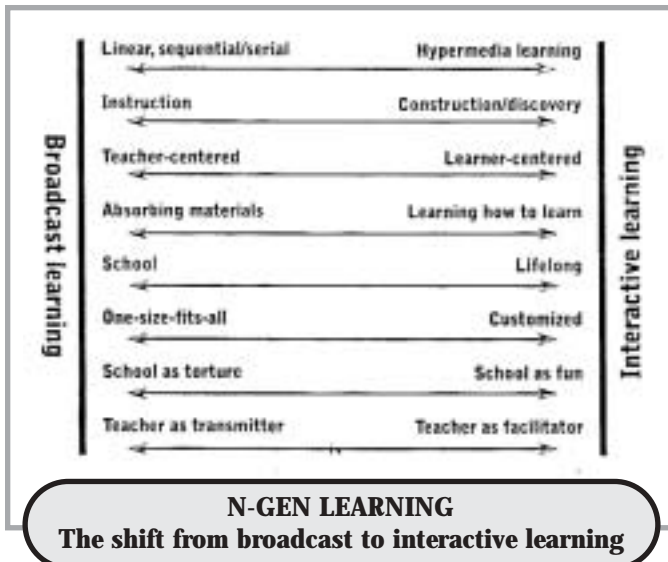
Today's kids are so bathed in bits that they think it's all part of the natural landscape.

### 2. From instruction to construction and discovery

Seymour Papert says, "The scandal of education is that every time you teach something, you deprive a child of the pleasure and benefit of discovery."<sup>1</sup>

At the risk of sounding equally heretical, there is a shift away from pedagogy - the art, science, and profession of teaching - to the creation of learning partnerships and learning cultures. The school can become a place to learn, rather than a place to teach. This is not to say that learning environments or even curricula should not be designed. They can, however, be designed in partnership with the learners or by the learners themselves.

This approach is described by educators as the constructivist approach. Rather than assimilating the knowledge broadcast by an instructor, the learner constructs knowledge anew. Constructionism argues that people learn best by *doing* rather than simply being told: constructionism as opposed to instructionism. The evidence for constructionism is persuasive, but shouldn't be too surprising. The enthusiasm a youngster has for a fact or concept they "discovered" on their own is much more likely to be meaningful and retained than the same fact simply written out on the teacher's blackboard.



### 3. From teacher-centred to learner-centred education

The new media enables the learning process to be centered on the individual rather than on the transmitter. Further, it is clear that learner-centered education improves the child's motivation to learn. Learning and entertainment can then converge.

It is important to realize that shifting from teacher-centered to learner-centered education does not suggest the teacher is suddenly playing a less important role. A teacher is equally critical and valued in the learner-centered context and is essential for creating and structuring the learning experience.

As evidence of this teacher-centered approach, "You'll never find a classroom that spends the first week where the teacher actually learns about their students-what their skills are, what computers they have at home, what games they play, what they're good at, and have the kids share their talent with the whole classroom," notes Coco Conn. "So right from the beginning of the year there is little respect for the skills that children have." The new media provides a vehicle to center the learning process more on the student.

Learner-centered education begins with an evaluation of the abilities, learning style, social context, and other important characteristics of the student that affect learning. It makes extensive use of software programs which can structure and tailor the learning experience for the child. It is more active, with students discussing, debating, researching, and collaborating on projects.

### 4. From absorbing material to learning how to navigate and how to learn

This includes learning how to synthesize, not just analyze. N-Geners assess and analyze facts - a formidable and ever-present challenge in a data galaxy of easily accessible information sources. But more important, they synthesize. They engage with information sources and other people on the Net and then build or construct higher level structures and mental images.

## 5. From school to lifelong learning

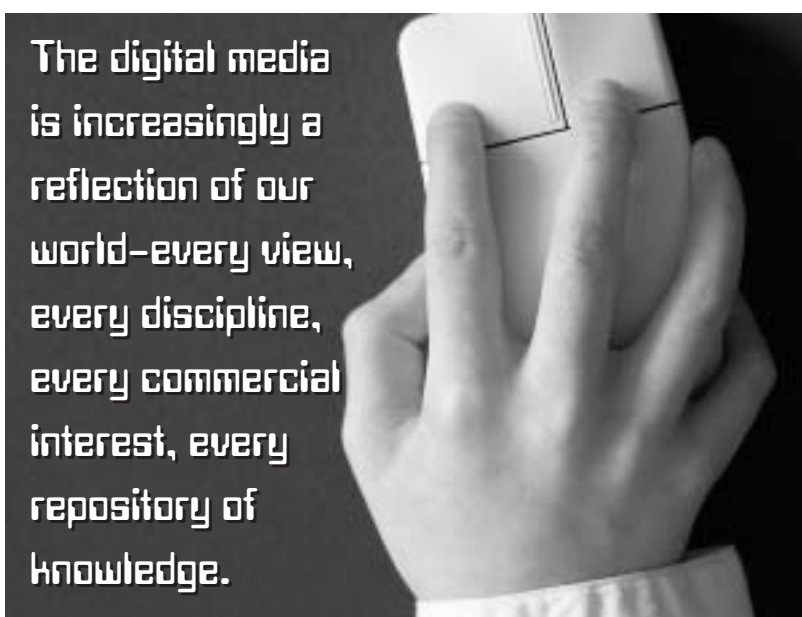
For the young boomers looking forward to the world of work, life was divided into the period when you learned and the period when you did. You went to school, and maybe university, and learned a competency - trade or profession - and for the rest of your life your challenge was simply to "keep up" with developments in your field. But things changed. Today many boomers can expect to reinvent their knowledge base constantly. Learning has become a continuous, lifelong process. The N-Gen is entering a world of lifelong learning from day one, and unlike the schools of the boomers, today's educational system can anticipate this.

## 6. From one-size-fits-all to customized learning

The digital media enables students to be treated as individuals - to have highly customized learning experiences based on their backgrounds, individual talents, age levels, cognitive styles, and interpersonal preferences.

As Papert puts it: "What I see as the real contribution of digital media to education is a flexibility that could allow every individual to discover their own personal paths to learning. This will make it possible for the dream of every progressive educator to come true: In the learning environment of the future, every learner will be 'special.'"<sup>2</sup>

In fact, Papert says of the one-age classroom-fits-all model "community of learning" shared by students and teachers: "Socialization is not best done by segregating children into classrooms with kids of the same age. The computer is a medium in which what you make lends itself to be modified and shared. When kids get together on a project, there is abundant discussion; they show it to other kids, other kids want to see it, kids learn to share knowledge with other people much more than in the classroom."<sup>3</sup>





## 7. From learning as torture as learning as fun

Maybe torture is an exaggeration, but for many kids class is not exactly the highlight of their day. Some educators have decried the fact that a generation schooled on *Sesame Street* expects to be entertained at school - to enjoy the learning experience. They argue that the learning and entertainment should be clearly separated.

Why shouldn't learning be entertaining? *Webster's Ninth College Dictionary* gives the third and fourth definition of the verb "to entertain" as "to keep, hold, or maintain in the mind," and "to receive and take into consideration." In other words, entertainment has always been a profound part of the learning process and teachers have, throughout history, been asked to convince their students to entertain ideas. From this perspective, the best teachers were the entertainers. Using the new media, the learner becomes the entertainer and in doing so builds enjoyment, motivation, and responsibility for learning.

## 8. From the teacher as transmitter to the teacher as facilitator

**Learning is becoming a social activity, facilitated by a new generation of educators.**

The topic is salt-water fish. The teacher divides the grade 6 class into teams, asking each to prepare a presentation on a fish of their choice covering the topics of history, breathing, propulsion, reproduction, diet, predators, and "cool facts." The students have access to the Web and are allowed to use any resources they want. Questions should be addressed to others in their team or to others in the class, not the teacher.

Two weeks later Melissa's group is up first. They have created a shark project home page with hot links for each of the topics. The presentation is projected onto a screen at the front of the class as the girls talk. They have video clips of different types of sharks and also a clip from Jacques Cousteau discussing the shark as an endangered species. They then they go live to Aquarius-an underwater Web site located off the Florida keys. The class can ask questions of the Aquarius staff but most inquiries are directed at the project team. One of the big discussions is about the dangers posed by sharks versus the dangers to sharks posed by humans.

The class decides to hold an on-line forum on this and invite kids from their sister classes in other countries to participate. The team invites the classes to browse through their project at any time, from any location as it will be "up" for the rest of the school year. In fact the team decides that they are going to maintain the site, adding new links and fresh information throughout the year. It becomes a living project. Other learners from other countries find the shark home page helpful in their projects and built links to it. The team had to resource the information, tools, and materials they needed.

The teacher acts as a resource and consultant to the teams. He is also a youth worker-as one of the students was having considerable problems at home and was not motivated to par-

### EN BREF

Les enfants de la génération Internet savent traiter l'information et apprennent d'une façon autre que leurs parents. La technologie numérique est de plus en plus le miroir de notre monde : elle reflète sa diversité de regards, de disciplines, d'intérêts commerciaux et de banques de savoir. Grâce à elle, éducateurs et élèves sont en voie d'adopter un nouveau modèle d'apprentissage, plus puissant et efficace, qui centre l'expérience d'apprentissage sur l'individu plutôt que sur l'enseignant et qui met l'accent sur la capacité de naviguer, d'apprendre et de réfléchir, plutôt que sur l'aptitude à absorber des connaissances.

ticipate in his team. Although the teacher can't solve such problems, he takes them into account and also refers the student to the guidance counselor. The teacher also facilitates the learning process, among other things participating as a technical consultant on the new media. He learns much from members of Melissa's group, who actually know more about sharks than he does (his background is art and literature, not science.) The teacher doesn't compete with Jacques Cousteau, but rather is supported by him.

Moving to this new philosophy of education will be a challenge-not just because of resistance to change by some teachers-but also because of the current atmosphere of cut-backs, low teacher morale, lack of time due to the pressures of increased workloads, and reduced retraining budgets.

The digital media is increasingly a reflection of our world - every view, every discipline, every commercial interest, every repository of knowledge. Because it is distributed, interactive, malleable, and lacking central control, it is a vehicle for revolutionary change in every discipline, attitude, and social structure. Never has there been a time of greater promise or peril. The challenge of achieving that promise and in so doing saving our fragile planet will rest with the Net Generation. Our responsibilities are to them - to give them the tools and opportunity to fulfill their destiny. 🌐

1. Seymour Papert, *the connected family: bridging the digital generation gap*, Marietta, GA: Longstreet Press, 1996.
2. Ibid.
3. Christian Science Monitor, 21 April 1997.

This article is drawn from *Growing Up Digital: The Rise of the Net Generation*, published by McGraw-Hill, 1998

**Don Tapscott** is Chair of Digital 4Sight, a Toronto-based business strategy consulting firm. He is a prolific author and an internationally sought consultant, speaker, and authority on information technology in business. He is also involved extensively in the transformation of education, working with many universities, school boards and Educational Secretaries and Ministers around the world. He is the Chair of the Trent University Capital Fundraising Campaign. Mr. Tapscott holds a B.Sc. in Psychology and Statistics and a M.Ed. specializing in Research Methodology. dtapscott@digital4sight.com.