

Glorianna
Davenport
MIT Media Lab

Curious Learning, Cultural Bias, and the Learning Curve

In his essay “Useless Knowledge,” Bertrand Russell complains that in our society knowledge is increasingly valued not for its ability to create a broad, humane outlook but for its ability to “contribute to technical efficiency.” Russell goes on to argue that wisdom most readily springs from large perceptions combined with impersonal emotion. What methods can we use to better access and communicate these large perceptions?

In the human world, learning encompasses both physical and social forces. The desire to understand what motivates human action drives us to ask fundamental questions: “How does this work?” “How does this affect me?” “How can I affect this situation?” Over the past 20 years, Seymour Papert—the author of *Mindstorms: Children, Computers, and Powerful Ideas* (Basic Books, New York, 1980) and *The Connected Family: Bridging the Digital Generation Gap* (Longstreet Press, Atlanta, 1996)—has ceaselessly promoted the idea that “learning works best when the learner is a willing and conscious participant.”

During a recess break at the Hennigan school in 1987, amidst children engaged in playful activities—jumping rope, braiding each others’ hair, talking—Ricki Goldman-Segall, video camera at her hip, engages a few of the girls in a conversation about Logo.

“Can you make a circle?” Ricki asks.

“That’s hard,” answers one, while another student uses a staccato rhythm to walk in a circle: forward one, right a few degrees, forward one.

“Do you have to walk around to make a circle?” Ricki asks.

The girl thinks for a few seconds, “Not if you make a very small circle!” she replies.

While the children puzzled about how to scale a circle to a point, Goldman-Segall mulled over issues related to the meaning of observation. In our intellectual thinking about observations, we distinguish between those made in the service of science and those made in the service of telling stories about human situations. In articulation of his “uncertainty principle” Werner Heisenberg grappled with the problem of point-of-view: our observations are prescribed by the objective function of our observation. In her recent book, *Points of Viewing Children’s Thinking—A Digital Ethnographer’s Journey* (Lawrence Erlbaum Associates, Hillsdale, New Jersey, 1997), Goldman-Segall wrestled with the fuzzy boundaries of anthropological observation. In research, she asserted, we can overcome the limitations of single-camera recording by inviting the research community to articulate their various interpretations of a recorded event (see <http://www.pointsofviewing.com>).

Cultural bias and language

Every time you learn something, you learn two things: what you think you are learning and a method of learning.

Gregory Bateson

Our lives are filled with complexity and choice. “Curious learning” provides a method that helps us make one of many right choices. Lectures and training might offer us information, but true, deep learning arises from our direct personal interactions with the world. Later, we reflect on our experience and share our observations with others—usually in the form of stories. As we build our personal library of stories, we also gain experience indirectly through the stories of others.

Stories are the basic archetypal method by which we formulate hypotheses about the world,

articulate knowledge, and communicate self-constructed meaning to others. The power of other rhetorical forms and constructs pales in comparison. Certainly, structuring a story today is no simpler than in the past—in fact, it may well be more complex. In the digital medium, pictures, sounds, and text are of equal value, equally manipulable as files. How then should we communicate the skill to construct stories across these media?

Convinced that interesting storytelling is instructive and emerges through a personal relationship with the subject, I recently organized two workshops in digital photography and journalism for young learners. My passage through these workshops has encouraged me to reflect on the relationship between curious learning, language, and cultural bias.

The first workshop was designed as an integral activity of the Bank of the West Woman's Tennis Classic, held in July 1997. Five afternoon sessions were held at the Taube Family Center located under the new tennis stadium on the Stanford University campus. The 16 participants—mostly Spanish-speaking scholarship students from East Palo Alto—had previously participated in a tennis camp. They were tennis “fans” first and digital journalism students by chance. On the first day of the workshop, Conchita Martinez agreed to be interviewed by one of the four student teams. These students, who had just been introduced to the basics of the digital camera, found themselves sitting in the bleachers talking to a nationally ranked tennis champion. Within minutes of the meeting, Conchita broke into her native language, Spanish.

From that moment forward, this group of young learners was on a roll. Who was Conchita Martinez? What story could they tell which had not yet been told? In the days that followed, they pondered these questions. By the third day, the students had focused on a theme: What real difficulties had Conchita faced in her journey to success? Conchita loved it and generously played to their story. One girl learned how to use the video camera to better capture the nuances of Conchita's success and ultimate failure to attain top championship status. As the confidence and ambition of this group of three girls and one boy soared, their relationship with the technology became transparent, although not invisible.

By Friday, each of the four groups had produced lively, interesting stories about some aspect of their experience during the workshop. Even the youngest boy, who worked alone, produced a wonderful play on a portrait using three pictures he took of my for-

Structuring a story today is no simpler than in the past—in fact, it may well be more complex.

mer student and workshop collaborator, Natasha Tsarkova. The story of Conchita provided a theme for the whole: “Have you ever wondered?” As they presented their stories, I sensed that each student had experienced a true transformation in self-confidence and expression (see http://ic.www.media.mit.edu/tennis/epat_01.html).

Another voyage of discovery

In March 1998, I traveled with two graduate students to Chiang Rai, Thailand to teach another workshop in digital photography and journalism. This time the participants were 18 teenage girls from the Akah hill tribe who were staying at the New Life Center in Chiang Rai to continue their nonformal education. The workshop was held under the auspices of Project Lighthouse (a grand collaboration between Seymour Papert's group at the Media Lab, the Suksapattana Foundation, and five nonformal education centers in Thailand).

Building on the model of my earlier experience, this workshop encompassed some challenging cultural twists. Three, rather than two, languages were constantly in play. All but one of the girls spoke what sounded to us like fluent Thai. But, on their own, the girls preferred to converse in their native Akah language. Our translator had good command of Thai and English, but Akah eluded him, so the girls had a secure and effective back-channel for their own private communications. In addition, one of my students had already spent a couple of months in Thailand and was quick to use his dictionary as needed. This was a big help in the overall communication.

On the first afternoon, we went to visit the girls at their lodgings in the New Life Center. From the start, we enjoyed the spirit of these girls—laughing, playing, touching—as they learned together. After introducing them to the digital cameras, we divided them into groups and suggested that each group take a series of images focusing on a different aspect of their house and their daily activities.

The following day, they spent the morning at the Computer Center selecting and sequencing their images.

Later that afternoon, we watched as the girls rehearsed a dance they were preparing on HIV and AIDS—they were getting ready to perform this dance in their villages in the following week. During this time, I explored potential opportunities for a field trip. As the idea of visiting a village that housed HIV/AIDS patients evolved into reality, we discussed the girls’ knowledge of the disease. Despite the lectures they were given on a regular basis, it quickly became clear that only five girls felt that they might know or have known someone who carried the disease. Even these stories were fraught with “I think, maybe, I might have. . .”

The girls approached the trip with tempered enthusiasm. For all they had been told, they were still unsure about how the disease spreads. Following a morning lecture in formal Thai style, we set off. The goal of this session was to provide the girls with the spirit of journalistic inquiry. Arriving at the village, we split up into four groups; each group visited with a victim. The girls took full advantage of this opportunity, asking many questions and taking pictures of their new acquaintance.

The next and final morning, the girls worked in the lab to select and sequence a set of four or five images and write the captions that would accompany their story. During this process, the girls spoke energetically in Akah. From their selections and from help sessions, we could sometimes discern the focus of their current concerns: point of view, content, or aesthetics.

Watching the intensity with which the girls worked on these early publications, I revisited the mysterious and profoundly elusive nature of the editor’s knowledge. What makes a good story? How does an author learn to step outside of the first person “I was there” to allow the audience to be present? Only one group of girls could weave a story with a threaded perspective.

One of the strongest connections the girls formed in their journey into the lives of their subjects came through a photograph they had taken of the woman showing them her wedding album. Somehow this activity, more than

all the other stories the girls had collected, provided them with a story element that was clear and distinct from the contemporary moments of their visit (see <http://ic.www.media.mit.edu/lighthouse>).

First person imperfect?

Most designers of cyber worlds remain committed to creating first-person experiences, which immerse the participant in an unknown world of authored action and consequence, despite the limited success of this form.

The Interactive Cinema Group at the MIT Media Lab recently constructed a very distributed story environment known as the Dream Machine. Ultimately, this project will combine constructionist and interactive fictional experiences, both in public spaces and on the World Wide Web. As we design our scenarios, we ask, How do the experiences of constructionism and role playing differ? How can the two modes of interaction complement each other?

When we experience a constructionist activity—be it making a picture-story or creating a Lego creature—we understand our actions within the category of free will. We’re at the center of the activity. We’re rewarded emotionally when the creation “works,” whether or not it perfectly matches our intentions.

In contrast, story worlds engage us in moral choice. First-person story spaces assume we will take action—as we do in real life—based on our comprehension of and empathy with the author-created story. If the installation artist or interactive narrative maker is committed to creating a first-person experience, she must wrestle with how her interface and her story world—presented in 2D or 3D—can provide the participant with a comprehensible, morally compelling, and believable sense of choice.

These issues resurfaced at Rotterdam’s 27th

International Film Festival (<http://www.iffrotterdam.nl/>). The IFFR has changed considerably in the two years since I last exhibited there. The new director, Simon Field, has steered the festival into becoming more “mainstream” and, as a result, attendance has swelled to a robust 275,000 admissions. In

When we experience a constructionist activity we understand our actions within the category of free will.

previous years, the festival was a decentralized affair, scattered among several small theaters in the downtown area. Today, the heart of the festival lies in the giant, ultramodern Sony Pathe Cineplex with its textured metallic exterior and its huge, Calderesque, interactively controlled lighting booms.

Despite severe budget constraints, the intrepid Femke Woltling found sponsorship for her avant garde program, “Exploding Cinema.” Four contemporary art makers were invited to exhibit large-scale works at Rotterdam as follows:

- Elizabeth Diller and Ricardo Scofidio’s superbly provocative “Pageant,” which was neither interactive nor first person, was the most politically controversial of the exhibited works. A continuous stream of outrageous logos representing giant multinational corporations was projected onto the Cineplex’s exterior walls. At first glance, they appeared to be a credit roll of the festival’s corporate sponsors. Only in time did you realize the logos were drastic transformations of corporate identity.

- Michael Naimark’s monumental contraption, “Be Now Here,” (http://web.interval.com/projects/be_now_here/) invited participants—wearing the requisite stereo glasses—onto a rotating platform (see Figure 1) for a virtual journey to four exotic, endangered cities: Dubrovnik, Timbuktu, Angkor, and Jerusalem. I sensed a real fragility in the interactive nature of this experience. When the platform was full (as on opening night), viewers tried to jockey to a better view, moving toward the fore as the platform rotated. At the center, the interactive control invited someone on the platform to switch between monumental views and so compare miniscule details within parallel frames of place and time. The most dramatic experience was encapsulated in the Antonioniesque parade of camels that mosey through the square at Timbuktu (which as Naimark explained, he hired to simulate a common scene that had been subverted due to a camel boycott of sorts into the town.) It was in experiencing these at once simple and profound vistas that I began to seriously revisit the problems of first-person narrative. Could success lie in the perfect execution of continuous setting?

- The long-awaited premiere of Toni Dove’s “Artificial Changelings” (<http://www.funnygarbage.com/dove/>) further focused my thoughts and concerns. Interacting with this work immerses the participant in a “heist caper” (see Figure 2). By stepping on an array of floor mats, the participant chooses point-of-view (first-, second-, third-person, and time travel). The pace of the characters’ thoughts may be augmented and their point/gaze vectors altered through gesture. Here, the prickly issue of first-person/third-person narrative remains unresolved: the first-person viewpoint loses meaning as soon as the participant steps back to a more distant experience. As a partic-



Figure 1. Michael Naimark’s “Be Now Here” spins a substantial audience on a rotating platform to provide time-lapsed panoramic views of endangered cities.

funnygarbage.com/dove/) further focused my thoughts and concerns. Interacting with this work immerses the participant in a “heist caper” (see Figure 2). By stepping on an array of floor mats, the participant chooses point-of-view (first-, second-, third-person, and time travel). The pace of the characters’ thoughts may be augmented and their point/gaze vectors altered through gesture. Here, the prickly issue of first-person/third-person narrative remains unresolved: the first-person viewpoint loses meaning as soon as the participant steps back to a more distant experience. As a partic-

Figure 2. Toni Dove’s “Artificial Changelings” uses an array of floor mats to let you choose the scope of your involvement with the characters.



Image courtesy of Toni Dove

ipant, do we empathize with the ennui of the kleptomaniac (“I’m bored,” “I’m tired of reading”) or do we connect with the disengaged voyeurism of the surrogate novelist (“The rail placed Paris on her doorstep. . .”)? Can we tap into enough of the moment-to-moment sensory perceptions, mental context, and idiosyncratic look-ahead of a synthetic character to effectively enter her skin? Can the control apparatus ever become sufficiently “transparent” to avoid a long, cumbersome learning curve? Watching the installation over the course of several days, I noticed that the worrisome confusion over who the participant was supposed to be was somewhat mitigated by the presence of a guide—sometimes Toni Dove herself, sometimes an aficionado—who explained the interface in a typical demo style.

- “Dream Weaver,” the Interactive Cinema offering, suffered from similar ambiguities. Installed beside the lobby entrance to Cinema 7, this work invited the participant to “step, stomp, or dance” on the Cinemat, a “sensor carpet” interface that measures the energy and position of the participant’s footsteps (see Figure 3). The carpet was divided into three zones, each reflecting a particular thematic thread. Each step would result in an immediate cinematic “cut” to another video clip in the appropriate thread; a heavy “stomp” summoned a new trio of themes. Our intention for this festival was to make a stand-alone installation that let participants discover

the carpet’s mapping to content and use this knowledge to “cut” a meaningful story through body motion. Every participant immediately grasped the concept that a step resulted in a “cut,” and they seemed to enjoy the video. However, only a few appeared to successfully deduce the larger organization of the material, which suggests that most of the audience did not consciously engage in building the story.

The social instinct

In early April 1998, we took a new and improved Cinemat (the original “Dream Weaver” plus two new scenarios) to Espacio 98, a student-oriented conference and trade show produced by Televisa, the Mexican communications giant (<http://www.espacio98.com.mx>). In Mexico City, our presentation was entirely different from the stand-alone, do-it-yourself philosophy of Rotterdam. Everything about this event focused on “showtime” and reflected the sociability of the Mexican culture.

A 100-seat amphitheater faced the exhibit—audience participation was also public performance. Shows were given every hour on the hour, strongly driven by a personable young master of ceremonies whose running commentary minimized—but did not eliminate—the audience’s learning curve. The audience seemed to enjoy the fast pace of the collective encounter: their cheers, jeers, and shouted suggestions wrapped an extra layer of social context around the participants’ engagement.

In a delightful extension of the “Dream

Figure 3. Designed by Stefan Agamanolis, Barbara Barry, and Glorianna Davenport, the “Dream Weaver” empowers the participant audience to “cut” a movie by moving through space on the Cinemat.



Weaver” piece, the emcee pulled two volunteers from the crowd: one worked the sensor carpet while the other improvised a stream-of-consciousness narration based on the video clips appearing on the screen. More than one ad-hoc storyteller identified the person on the carpet as a protagonist in the story space: “Her boyfriend has left for the aquarium where he is meeting another. . .,” “As a young girl, she (pointing to the person on the carpet) loved the seaside. . .,” and so on. The audience responded dynamically to the intimacy of these reflections.

In this configuration, the participants were aided and abetted by the attendant audience. For instance, in “Endless Pursuit,” the audience offered constant advice to the participant, who is offered a sandwich. As soon as this sandwich is snatched by a thief, the participant viewer breaks into a run. Endless running on the carpet allows this chase to continue through the MIT plant—the more intricate the invitation the more participatory the crowd. The more intricate the invitation, the more participatory the crowd. In “Not Without Risk,” the participant acts as a nonhero: a voyeur who must learn to sneak silently up a creaky staircase and peep through a keyhole (see Figure 4). In this scenario, the pleasure of discovery is intimately bound up with curious learning about manipulation, and agency is rendered in creaks on the staircase and the mask of a keyhole view.

When technology serves as the mediator of story experience, the audience’s desires and responses must be gleaned, filtered, and remapped through sensors, special-purpose interfaces, “user models,” and computer programs. Because of this, the objective function of “taking control” varies depending on the specific task at hand and whatever affordances are provided to touch that task. Control is split among the primary authors, audience, and delivery system.

Looking ahead

Today’s interactive installations are characterized by simplistic feedback mechanisms, limited underlying databases of content, and very little autonomous intelligence. Yet even these rudimentary systems provide great opportunities for “curious learning,” surprise, and serendipitous discovery. They also serve as a social nexus. The interpersonal, back-channel communications and ancillary activities of the audience, which cur-



rently remain largely unsensed and unprocessed, can be just as important as the primary authored experience.

Soon, today’s dominant “one person, one box” paradigm of interaction will yield to the multi-person, networked co-construction of narrative meaning. Feedback and communications from the participant audience will command more bandwidth than the system’s preauthored content. For example, large-scale, sensor-rich social spaces mix theater with theme park; networked communications bring audiences together without requiring them to be present in the same room simultaneously; and constructionist environments empower the audience to grow a body of content much larger than that devised by the system’s original authors.

The key to accessing and communicating “larger perceptions” in the digital age may well lie in the collective social activities that occur within the context of shared narratives. The exchanges and experiences of group exploration and discovery—communal “curious learning”—promises rewards far beyond the mere enjoyment of story and the instant gratifications of an individual’s remote control. MM

Contact Davenport at the MIT Media Lab, 20 Ames St., Cambridge, MA 02139, e-mail gid@media-lab.media.mit.edu.

Figure 4. In the “*Dream Machine: Cinemat*,” the “*Stair Walk*” scenario designed by Brian Bradley invites the hopeful voyeur to sneak up a creaky stairway before she can peek through a revealing keyhole.