Interacting with the Screen:

The Evolution of Computer Drawing Applications in Art Education

June Julian, Ed.D.

International Society for Education Through Art

31st World Congress

August 19 —24, 2002

New York, NY

Interacting with the Screen:

The Evolution of Computer Drawing Applications in Art Education

June Julian, Ed.D.

International Society for Education Through Art

31st World Congress

August 19 —24, 2002

New York, NY

Abstract

This is a story about magical early influences on screen interactivity, a brief history of the evolution of the computer, with examples from contemporary applications in art and museum education. I believe it is important to know about the early days of drawing on the screen to get a sense of the continuum of ideas that has led us to our present technologies.

Within this glorious swirl of ideas, from the early computer innovators such as Ada Byron, Ivan Sutherland and Apple, to *Winky Dink and You,* and Miss Frances' *Ding Dong School*, this professor's ideas and my students' experiments, it is your inventive spirit at the front of the glass and behind it that keeps the screen an enchanted space.

Interacting with the Screen:

The Evolution of Computer Drawing Applications in Art Education

This is a story about magical early influences, a brief history of the evolution of the computer, with examples from contemporary applications in art education. I believe it is important to know about the early days of drawing on the screen to get a sense of the continuum of ideas that has led us to our present technologies.

The Screen

How can it be that we so readily surrender to a machine that will take us outside of ourselves into a realm of pure idea and illusion? With the computer, what separates us from a complex system of electronic circuitry and binary code is a mere glass surface. Yet what is displayed on that window has the power to engage and bewitch us. We readily suspend our disbelief and dive into an electronic world with abandon -- typing, talking, shopping, painting, drawing, and staring for hours on end, at the screen.

As an art educator and artist who uses computer technologies in my teaching and art making, I believe that my childhood exposure to early interactive TV programs, were a strong influence on my current work. Because we have been comfortable with screen technology since we were children, we can embrace its evolving shape and presence in our lives with trust and delight.

Classic children's TV programs, such as *Winky Dink and You*, provide early examples of viewers interacting with the screen and participating in educational content. Although the hardware and instructional methodology have become more sophisticated since then, examining these early shows can provide an historical perspective of the evolution of the TV screen as a surface for art making and teaching.

Long before the advent of the computer mouse and Wacom tablet, and all of the computer graphics software applications available now, children drew right on the screen with crayons on a plastic film, solving puzzles, participating in adventures, and creating worlds in various ways.

In other TV shows, like *Ding Dong School,* children participated in program content by sending in the art work they made at home, which was then displayed and discussed on the air. Also, they were encouraged to talk to the screen. This bridge between machines and us, or the place where ideas and people of all ages meet, is commonly called an interface.

In the November/December 1999 issue, the editors of MIT's *Technology Innovations Review* picked the following Top 10 Interfaces of the century. Along with our favorites, the Cathode Ray Tube and the Computer Mouse with Graphical User Interface, were listed the Loudspeaker, the Touch Tone Phone, the Steering Wheel, the Magnetic Stripe Card, the Traffic Light, the Remote Control, the Liquid Crystal Display and the Barcode Scanner. All represent our seamless and peaceful coexistence with the machine. "The best systems convey information so elegantly that we hardly think about the power they give us--boundaries dissolve and we become one with our technologies." (Kreuze, 1999)

A Very Condensed History

The evolution of the modern computer has a fascinating history: Ada Lovelace (Lord Byron's daughter and recognized as the first computer programmer) and Charles Babbage developed their "Analytical Engine" in 1833. In 1884 Herman Hollerith invented the computer punch card and later founded IBM. Alan Turing's computer tapes in 1936 were early visions of computer programming, In the late 1940's Grace Hopper developed the idea that we could communicate with computers using words as a programming language. Internet pioneers were Emmanuel Goldberg who with his "Statistical Machine" did microfilm searches in 1927, and Vannevar Bush who invented his "Memex" as a memory supplement in 1945. From 1957, J.C.R. Licklider worked on the development of ARPANET, the early Internet, which was finally realized in 1969. In 1971, Ray Tomlinson invented e-mail. And in 1990, the World Wide Web was born. (Keating and Hargitai, 1999)

Drawing on the Computer

The cathode-ray tube (CRT), our earlier TV and computer screens, was invented by German physicist Karl Ferdinand Braun in 1897, first as an oscilloscope. Its "killer app", which entered the American home in the 1950's, was television. Douglas Engelbart invented the mouse and graphical user interface (GUI) in the 1960's. (Kreuze, 1999)

Ivan Sutherland's *SketchPad* was the early precursor to *MacPaint* and *PhotoShop.* In this very first interactive computer graphics system, in 1963, Sutherland drew directly on the CRT with a lightpen. (Sutherland, 1997)

Although the GUI (Graphical User Interface) was being developed at Xerox Palo Alto lab during the 70's, most notably by Alan Kay, and although the Apple II debuted in 1977, it was only until Apple's Steve Jobs and his team launched the Macintosh in 1984 that the now ubiquitous desktop GUI became usable by everybody. With its folders, icons, trashcan and windows, the interface has become a medium. (Johnson, 1997)

The early GUI's were not available to everyone. I remember that back in the early 1970's at Penn State the only way that I could use the computer to draw was with was with the *Cal Comp Plotter,* at that time a messy device that tracked lines across paper with colored ink pens.

Early Interactive TV Programs

As art educators using computers in classroom and museum settings, we can learn about actively engaging children with the current emerging technology by examining the spirit and method of these pioneering efforts. Tapes of early interactive and participatory children's shows can be obtained from The Museum of Television and Radio in New York or Los Angeles. We can look to these early examples of interactive television for inspiration for creating electronic educational media, such as interactive video, participatory Web projects, and graphics applications in school and community settings. *Winky Dink and You* was TV's first interactive show! This ingenious children's series ran on CBS from 1953 - 1957. I was able to obtain a tape, *Classic TV from the*

50's & 60's with excerpts of *Winky Dink and You* and *Ding Dong School,* published by Video Resources, New York, Inc.

When I viewed the tape, it was as if time had stood still! *Winky Dink* and host Jack Barry were just as exciting and wonderful as when I was a child. *Winky* is a little cartoon character who I always thought of as a sort of person-shaped star of the twinkling variety. He was always full of mischief and had friends like *Dusty Dan* and *Mike McBean* who had many marvelous adventures.

In order to participate in the fun by solving riddles and helping *Winky's* friends out of jams, young viewers had to actually draw on the screen with the *Winky Dink Kit.* This kit consisted of a sheet of plastic that stuck on the TV screen by sheer magic, and included a set of magic crayons. Lucky children could order the kit by sending fifty cents to *Winky Dink*, Box 5, New York 19, NY. I seem to remember that some children couldn't wait for the kit and just drew right on their TV screens, anyway! It was a very exciting time.

Another interactive show for children, from the same time period was *Ding Dong School* with Miss Frances. Compared to *Winky*, Miss Frances was rather low-tech, but nonetheless, she was able to engage young viewers to actually talk to the screen! Miss Frances Horwich asked children questions and waited for them to answer her back from their living rooms!

She had the children draw pictures at home and send them in to the show. The children's drawings were hung on the wall and she identified each child and talked about their pictures on the air. The children's' drawings became part of the program. How could this miracle have happened to me?! But it truly did!

I believe that these pioneering shows had a tremendous influence on how we relate to the screen, and how we might. What they show us, too, is an attitude of imagination and wonder in making one's mark, not only on paper as usual, but on the TV screen!

With today's participatory Web sites, like *A World Community of Old Trees*. children around the world can e-mail their art work to a collaborative project. Their work becomes part of a global digital gallery. Indeed, they can send in text files of their stories and poems, and sound files of their songs. (Julian, 1996)

Miss Francis was on the right track. It just took the technology fifty years to do her interactive educational method justice. Nowadays children are able to blissfully draw on the screen with computer paint and draw programs, and no longer require the *Winky Dink Kit*. What lessons do those early shows teach us? How can we as educators, effectively engage battalions of screen drawers in learning situations?

Museum Art Education

The Cone of Learning, developed by Edgar Dale, shows that doing the real thing is the most effective way to learn and that simulated experience is second best. We know that performance simulations are used in all sorts of learning, from aviation to medicine, to drivers' ed. In art education, in museum and classroom settings, we certainly do use real drawing on paper. We can also utilize various computer drawing applications for children to draw on the screen. A new avenue might be for young museum audience members to have a simulated experience of virtually touching and manipulating museum pieces on the computer.

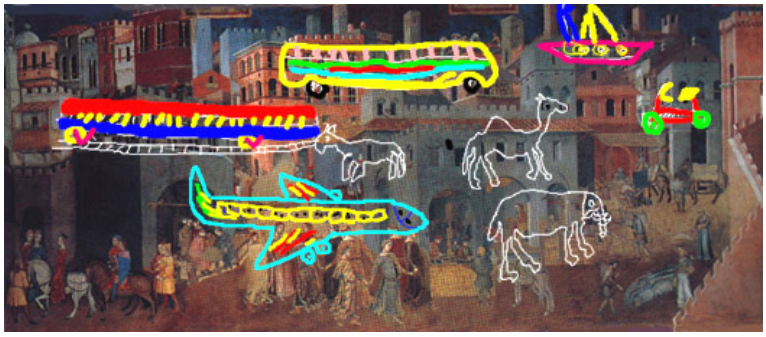
A few years ago, when I was visiting at Ohio University, I asked my graduate students in Museum Education to design an educational activity for children, based on constructivist theory, that featured actual drawing on the screen. After participating in the *Winky Dink* video program, they worked on a class project I called *Collaborative Mysteries*. After drawing a simple scene on a sheet of paper, they covered it with a transparent plastic overlay, copying only selected lines. Then, as in the *Winky* method, they invited their audience of classmates to solve the mystery by connecting the clues provided.

In the computer lab, my Ohio University students designed museum education lessons for elementary school students with the same idea, using basic *PhotoShop*. Their challenge was to

design an interactive learning activity that could be implemented on a classroom computer or on a kiosk in an exhibition gallery. As a means of having children personally touch and explore the art piece and to collaborate in image making with the original maker in ways that would be prohibitive in real life, they invited the children to draw over the art reproductions first on Xerox prints, and then on the computer screen.

Famous Paintings

One student based his lesson plan on *Peaceful City*, a painting by Ambrogio Lorenzotti. The theme of transportation seemed appropriate for elementary age children who study it in their general curriculum. With *PhotoShop*, children were invited to draw forms of transportation that they knew: animals, airplanes, cars and trains, etc., directly over the *Peaceful City* painting on the screen, comparing them to those represented in the 16th century painting.



Student Drawings over *Peaceful City*

Archaeological Artifact Assignment

The second assignment was to create a museum education interactive computer activity that would allow young museum goers to create their own meaning from an archaeological artifact. We scanned an actual pottery sherd into *PhotoShop*.

Using the rim sherd as a clue, students drew around it to create their version of it might have looked in its original state. It was interesting to view the various interpretations.

Student Drawing over an Archaeological Sherd Artifact

Middle School "Mysteries"

My graduate art education students at the School of Visual Arts, (SVA) in New York City created standards-based lesson plans on the "Collaborative Mysteries" idea in my course, *Teaching Art in the Middle Schools: Computers*, this year. They investigated ways of allowing young artists to create meaning and explore art history through guided exercises using *PhotoShop*.

One student introduced Cubism by cutting out ten different elements, e.g., hat, neck, dress, face, etc., from Picasso's *Woman in a Hat* and distributing each one to middle school students to use as a clue from which to begin building their own image in *PhotoShop*.

As part of the assessment component, they compared their finished works with the Picasso original below.

Pablo Picasso, Girl in a Hat

Another SVA student combined writing, reading and art making into her *Collaborative Mysteries* lesson plan. Taking turns as clue writers and computer artists, Middle School students each created a secret imaginary scene in *PhotoShop*. Then they wrote clues to describe it to their partner, e.g., orange ovals, green vertical shapes, a blue background, etc. Each student tried to re-create the image on the computer from the verbal description that they were given. Then, all the originals and the interpretations, were hung side by side for a group discussion.

Conclusion

Within this glorious swirl of ideas, from the early computer innovators such as Ada Byron, Ivan Sutherland and Apple, to *Winky* and Miss Frances, this professor's ideas and my students' experiments, it is your inventive spirit at the front of the glass and behind it that keeps the screen an enchanted space.

References

Johnson, Steven. (1997). *Interface Culture: How New Technology Transforms the Way We Create and Communicate*. HarperEdge.

Julian, June. (1996*) A World Community of Old Trees*. http://www.nyu.edu/projects/julian

Keating, Ann B. and Joseph Hargitai. (1997). *The Wired Professor*. New York University Press.

Ingram, Billy and You. *Winky Dink!* http://www.tvparty.com/requested2.html

Levy, Steven. (2000). *Insanely Great: The Life and Times of Macintosh, the Computer That Changed Everything*. Penguin Putnam, Inc.

Kreuze, Deborah. *Interfaces: The Industries Top 10.* MIT Technology Review. http://www.technologyreview.com/magazine/nov99/kreuze.asp