

Visual Learning with Universal Course Design

by Lance Hidy



NORTHERN ESSEX COMMUNITY COLLEGE, MARCH 25, 2010

[Note: The following slides and narration follow an eight-minute presentation on Universal Course Design given by Susan Martin, Associate Director of Learning Accommodations at Northern Essex Community College.]

Thank you, Sue!

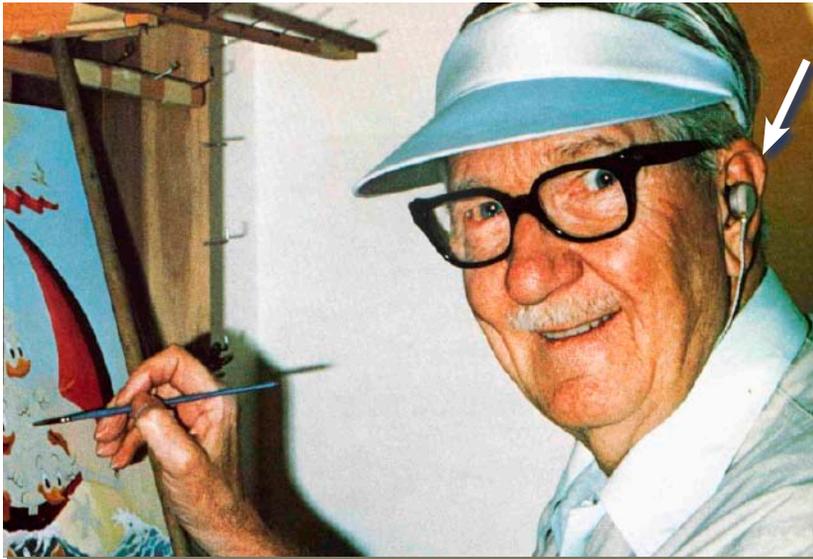
Sue has been the driving force in our SFIG, which has resulted in some important sharing of information and skills. I believe that over time, this interdisciplinary collaboration has the potential to make an important contribution to our students' success.



When I was about six years old, I loved Uncle Scrooge by Carl Barks—known as the Hans Christian Anderson of comic books. Even though I couldn't read yet, I could understand some of the story by studying every detail in the pictures. That is visual learning.

But more importantly, the pictures motivated me to sound out the words so I could get the little jokes, and understand the story better. Carl Barks made learning to read easy, and fun.

This was the beginning of my life-long fascination with visual communication.



CARL BARKS, 1901–2000

Barks had good reason to sympathize with students struggling to learn. Losing his hearing in a bout of childhood measles eventually caused him to drop out of school at age fifteen.

To compensate for his deafness he developed a sense of humor and keen skills of visual observation—just what he needed to become a great visual storyteller.



The flat-color, hard-edged shapes of comic book art taught me the value of visual simplicity. When I was about 31, I returned to my comic book roots, and developed a similar style based on reduction to bare essentials—as in this textbook illustration of the ramp outside the B Building.

Just as this wheelchair ramp is a familiar example of universal design in architecture, the elimination of extraneous details, as in my illustration, is a feature of universal course design.



2002

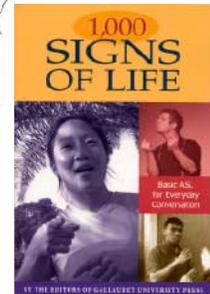
I used that style on my postage stamps for mentoring and for Special Olympics, projects that brought me into contact with communities that I had previously known little about.



2003



2003-04



This led to a collaboration with deaf studies professor Pax McCarthy. I taught this simplified style to my illustration students, whose instructional drawings were published in an American Sign Language dictionary.

These experiences led to my first experiments in Universal Course Design, although I had still not heard the term.



In the Fall of 2008, Kevin Hatch took my Photoshop course, where he made this postage stamp design. He uses a motorized wheelchair, and can use a keyboard and mouse. He told the class that his artwork was about the freedom that computers give him to work in multimedia.

The summer before Kevin entered my class, his case worker telephoned me to ask about my handouts.

twelve point
sixteen point

She explained that it would help Kevin if my course handouts could be set in sixteen point type.

I hadn't been happy with my old handout done in 12 point type, because my students were struggling too much. I agreed to enlarge the type, and while I was at it, I also added illustrations.

Before

Photograph tracing process
Digital Imaging, Lance Hidy, © 2009
Northern Iowa Community College

Select a photograph that has qualities such as these—

- a. Some significant emotional content for you.
- b. Clear, sharp details, especially any important areas such as face and hands.
- c. Good exposure, so you can see necessary details in highlights and shadow areas.
- d. For animals and people, choose expressive gestures.

Scan the photograph

- a. Make a preview scan.
- b. Click and drag a cropping marquee around the part of the photograph you need.
- c. Adjust the resolution of the RGB scan so that you obtain a file size in the range of five to ten MB.
- d. Keep a permanent copy of your untraced scan in case you need to refer to it in the future.

Make a version of the image for tracing

- a. In the Hue/Saturation (command-H) choose colorize.
- b. Change Hue and Saturation to obtain a bright, pure blue.
- c. Increase Lightness to roughly 40 to eliminate the dark blues without losing important highlight details.
- d. Using Print with Preview make the image to fit the white page and send it to the color printer.

Trace

- a. Using the Ultra-Fine Sharpen pass, slowly, SLOWLY, trace the important contours.
- b. Use medium-light, even pressure to create a clear line of uniform thickness.
- c. Make a single line, like a thin wire, for the whole outline—no double, rough lines.
- d. Make sure the lines that enclose an area to be filled with color have no breaks, or leaks.

Scan the tracing

- a. This will be your final document, so set the resolution to obtain an RGB file size of five to fifteen MB.
- b. In Image/Adjustments/Threshold move the pointer so that you eliminate the blue tones and are left only with a clear black line. (Check this at each, or every dozen, or the very end here a clear, solid black line.)
- c. If your tracing did not scan well, then you may find it is faster to start over and make a new tracing than trying to doctor it up in Photoshop.
- d. Check the outlines again for leaks.
- e. To repair leaks, choose a pencil (not brush) the same thickness as your outlines, and fill in the gaps.
- f. It is important that the lines be sharp, neat, stopped, and solid black for the entire project.
- g. Go to Preferences/General and change Image Interpretation to nearest highlight.
- h. Whenever using Paint Bucket and Magic Wand, be certain, CERTAIN, that you TURN OFF ANTI-ALIASING at the top of the window. This prevents the hard edges from becoming blurred.
- i. Use Magic Wand one and often, no contiguous click on the black line. You may need to point to be sure you are actually on the line, and not the white background.
- j. In Select menu choose Save Selection, and title the selection Outline. This will create a new channel that appears in the Channel palette. If your outlines become damaged during the work, you can restore them using this channel mask. It is your safety net.
- k. Backup.
- l. Keep a duplicate of your scan and artwork on the classroom workstation, and on your home computer.

Prepare the photograph

Start with a photograph that has good detail—and if possible, expressive gestures.



After

Tracing process in Photoshop
Lance Hidy

Next, open the Hue/Saturation palette (DE-L). Click the Colorize option. Move the Hue slider to the middle value of 180, and the Saturation slider to the middle value of 50. You can also move the Lightness slider to the right, to about +25.



Open the Levels palette (DE-L). Use the Output Levels slider to lighten shadows. You do this by moving the black pointer to the right, to a numeric value of roughly 100, plus or minus 30.



Tracing

Next, print this in color, making sure to select Scale to Fit. Also, choose vertical or horizontal, whichever matches your image. Choose Save As (File Menu) (Shift-B-E). Add the word Blue to the file name before the period.



Susan Martin

Kirsten Behling

UCD
Universal Course Design

The larger type and the illustrations expanded the handout from one page to four—but what a difference! While this assignment had taken four lab sessions to learn in the past, the whole class mastered it in two sessions with this new handout.

It was Judith Kamber who, hearing of my growing interest in learning accommodations, suggested that I meet Sue.

At our first meeting Sue told me about Universal Design. She invited me to Kirsten Behling's guest seminar on Universal Course Design—a specialty within the larger field of UD.

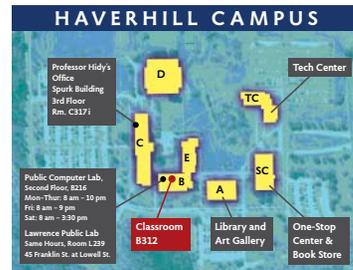
Some of what Kirsten described was similar to what I was teaching my graphic design students—how to mix words and images together for maximum comprehension. Thanks to Sue and Kirsten, I now make sure that all of my students understand what Universal Design is, and why it is important.

Digital Imaging: Photoshop

Spring 2010, GRA 210-1 CRN: 1298
1:00–2:50, Wed & Fri, Room B312
Northern Essex Community College
Haverhill Campus



Professor Lance Hidy
lance@lancehid.com
lhidy@nec.mass.edu
978-346-0075—978-270-0439 mobile
Office Hours: Wed & Fri, 12–1
and by appointment



ABOVE: Important campus locations for this course.



Recommended books (Not Required):
Photoshop CS3 Studio Techniques.
Ben Willmore,
Adobe, ISBN: 978-0-321-51046-4



Photoshop CS3/CS4 Wow! Book, 8th Ed.
By Linnea Dayton, Cristen Gillespie
Peachpit Press. Part of the WOW! series.
(Avail. in March, 2010)
ISBN-10: 0-321-51495-5
ISBN-13: 978-0-321-51495-0

Supplies:

- USB flash drive; or other portable USB digital storage device. (Firewire connection possible too.)
- Sharpie Ultra-Fine point pen
- **Very Important—Binder for protecting finished work.**
- Optional: Any kind of digital camera.

Teaching method

We will meet in the computer lab for every class. Classes will consist of: critiques of homework; lecture/demonstrations of new material; lab time to work on the current assignment. **Practice outside of class is necessary.** If you cannot get access to a computer outside of class, talk to me. It is fine to practice on a Windows version of Photoshop, since those same files can easily be opened on a Mac. The textbook is used only for you

HAVERHILL CAMPUS



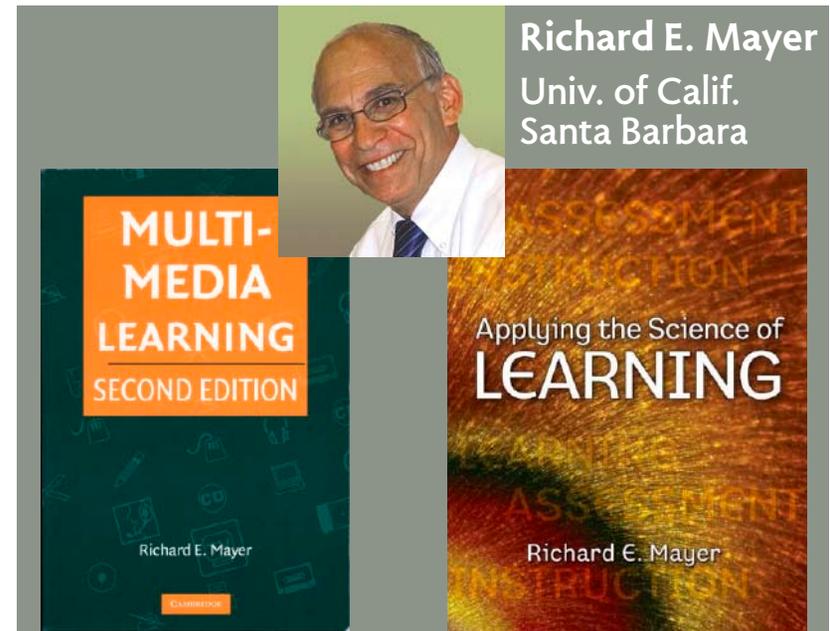
I also adopted one of the UCD strategies shown by Kirsten—the illustrated syllabus—using a portrait, map, jpegs of textbook covers, and a few other images.

I knew from experience that my students did not know where my office was, and some couldn't even locate the public computer labs.

Here I have also added the address of the computer lab at the Lawrence campus, with hours of operation.



Now that our campus is loaded with smart classrooms, and all the faculty, and most students, have computers, there are no physical barriers to our using images in our course materials—only mental barriers.



Cognitive psychologists such as Richard E. Mayer at UC Santa Barbara, are helping to remove these mental barriers. They are proving scientifically that people learn better from images and words together than from words alone.

Here you see the culmination of his twenty years of research: *Multimedia Learning*, and *Applying the Science of Learning*.



By multimedia, Mayer simply means the combination of words and pictures.

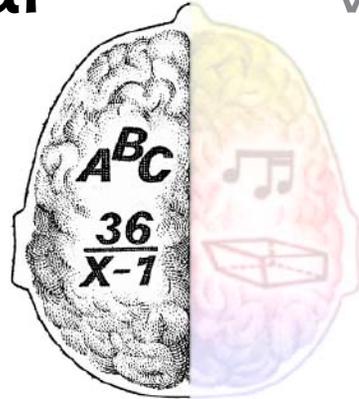


This statement, "People learn better from words and pictures than from words alone," appears often in Mayer's books.

He gives scientific credibility to what graphic designers have always known from experience.

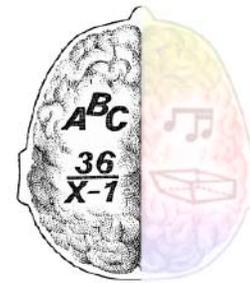
Verbal

Visual

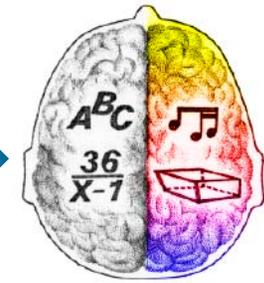
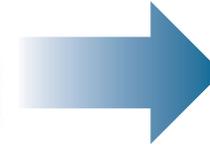


The Human Brain

Neuroscience also backs up the use of images and words together. We know that verbal thinking is mostly in the left hemisphere of the brain.

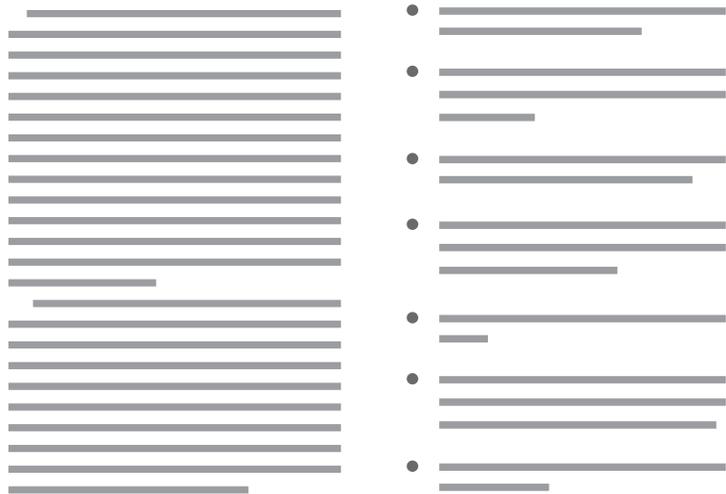


Words



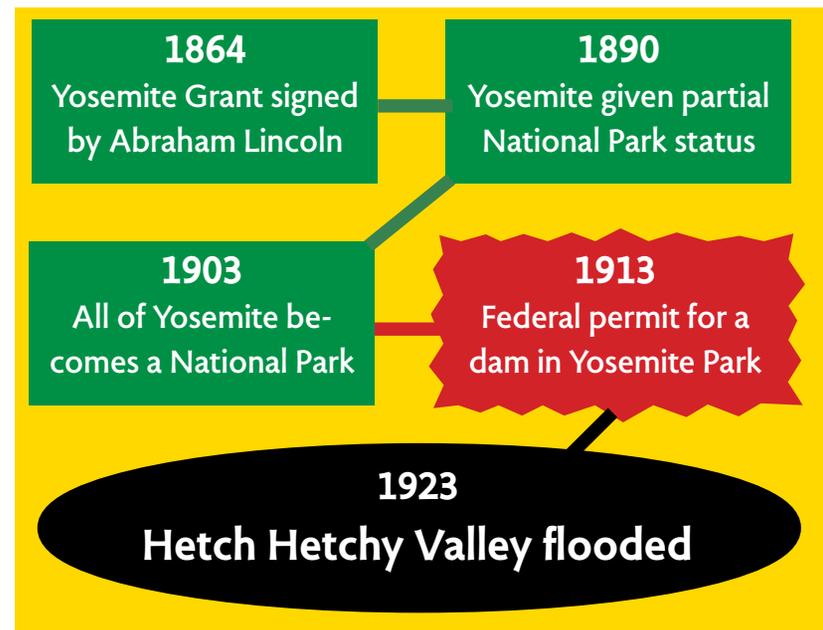
Words + Pictures

Visual thinking is in the right hemisphere. Let's exercise both sides of our student's brains. Half-brained learning can be a thing of the past, thanks to digital technology.



However, the prospect of using pictures can be quite daunting to teachers whose skills are primarily in writing. Until you are ready to take the step of building an image archive to use in your courses, there are things you can do to the text itself, in addition to using larger type.

One common strategy is to use a bullet list to break the text into chunks.



A more technically complicated approach is to use separate text frames for each point, distinguished by color and special shapes.

Here is a chronology of the history of Hetch Hetchy Valley inside Yosemite National Park—the site of one of the most bitter environmental battles in American history.

While this framing technique can be helpful, there are still no visual clues about what the topic may be, or why it was such a big deal.



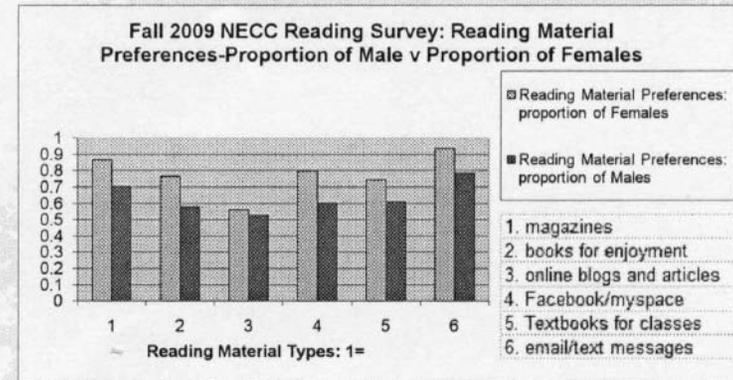
Yosemite's
Hetch Hetchy
Valley—

dammed in 1923



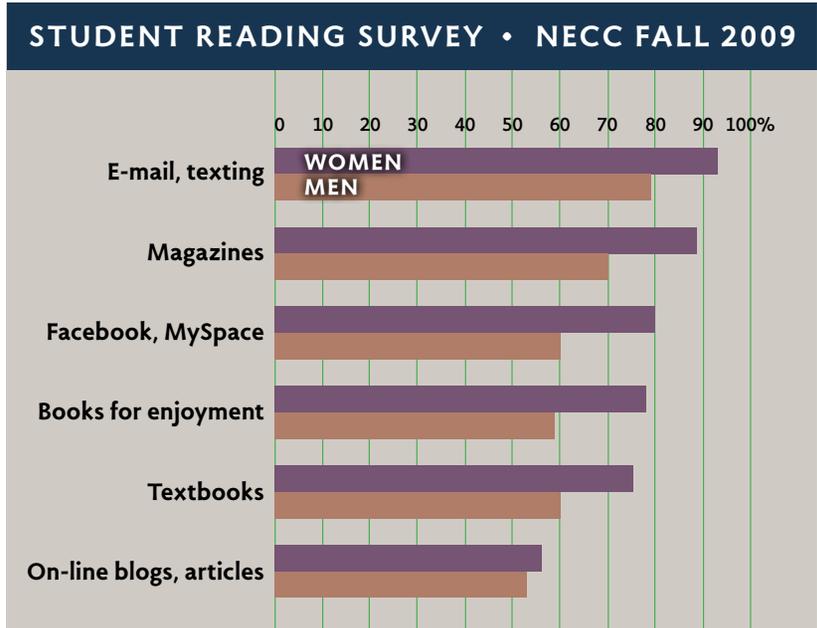
But wait. A Google search turns up a wealth of images. When you show them, your students will have one of those “Aha!” moments, as they see with their own eyes why the dam was so controversial.

More Data from our survey: Even when students don't think of themselves as readers, they are reading—but what are they reading?



Another kind of visual learning happens through graphs and charts.

In this slide you can see how visual complexity can work against learning.



Here is the same graph reduced to bare essentials. The simplicity of universal design enables you to read the graph without distraction.



Leading corporations have been quick to apply universal design, because it is good for business. Smart phones like the iPhone use image icons on a touch pad that even a child can quickly learn to navigate.



At the recent launch of Apple's iPad, the New York Times showed links combining words and pictures—exactly what the cognitive scientists are recommending.



Faculty are likewise starting to collect icons to mark each new section, or new assignments, in their course materials. Here is one of the pages from Steve Russell's U.S. History course.



Building an image database can be slow at first. In addition to Google Images, royalty-free databases are available on-line.

And of course you can use a scanner or camera to capture images.

The Road to Discovery

Roseann Regan



Jackson, N.H.

It was June of 1976 when I graduated from my small town high school in Wolfeboro, N.H. My life up until then consisted of feeding the pigs, collecting eggs from the chicken

Each week after his show, I would take out my maps and prepare for my own journey across the United States. So when graduation day arrived that spring I was more than ready. I had met some friends who taught school and traveled every summer. Needless to say, my bags were packed two days after graduation. We packed up the blue Chevy pick up and off we went.

We headed west on interstate 90, driving straight through Ohio, Indiana and Illinois, which were mostly industrial areas. Our first stop was in the Badlands where I seemed to be confronted with a curtain of despair. I couldn't understand why, until later

We can also encourage students to add images to their papers. This can increase their engagement with the subject, while exercising their visual literacy and technical fluencies.

Lance Hidy—Professional Development Workshops

For Faculty

Designing Course Materials

Monday April 12, 2–3, Spurk C104

For Staff & Administrators

Designing Slide Presentations

Tuesday April 13, 2–3, or

Thursday April 15, 2–3, Spurk C104

If you are eager to use more Universal Design, the staff in CIT are there to help. In addition, I will be giving three, one-hour workshops in April. Please go to the Professional Development website for details.

Also, let Sue or me know if you are interested to participate in our SFIG. Everyone is welcome.

Thank you!