Mindtools: Interpretive & Expressive Visualization

Mindtools are generalized computer tools that smooth the progress of cognitive processing. Therefore, they are cognitive tools and are both mental and computational devices. The devices support, steer, and expand the thinking processes of the user. They do not necessarily make the task easier, or reduce information processing; rather the mental effort of the learners is made useful.

Mindtools are for the learners to rely on what they know, not mimic what someone else tells them. When Mindtools are being used, knowledge is constructed by the learner, not provided by the teacher. Students cannot use Mindtools without thinking deeply about the subject matter. They think harder about the subject. Mindtools are for involving the mind.

Visualization tools are physical software or other art preparation tools that help the user create or edit art. They are software packages that contain sophisticated tools that automate some of the manual processes for creating images. They enable us to draw and paint electronically. Visualization tools are task and domain specific. They mimic the ways in which representations must be interpreted to make sense of the ideas.

Visualization tools help unskilled artists reason and represent ideas visually without the need of artistic skill necessary to create original illustrations. They help visualize geography, chemistry, meteorology, and physics, and therefore simplify subject matter.

Visualization tools have two major uses, interpretive and expressive. Interpretive visualization tools help the learner view and manipulate visuals to extract meaning from the information being

visualized. Interpretive illustrations clarify difficult to understand text and abstract concepts. They scaffold or support some form of expression beyond paint and draw programs (powerful expressive tools, such as crayons and paper or paint and draw). They help learners visualize ideas that make the ideas easy to understand for other users.

Expressive visualization helps learners to convey meaning to communicate a set of beliefs. Paint and draw and crayon and paper are potent tools that learners use to express themselves visually, or expressive visualization. The tools depend on a user's graphic talent.

Objects that behave and interact that learners need to be enabled to reason about are explained by visualizations providing reasoning-congruent representations, such as mathematicians have been doing for years. For example, computer programming code that displays graphics by computer can clarify misconceptions. Learners view global and local representations, the instructor can switch back and forth is an example.

How visualization tools can promote understanding in my subject matter is they help the learner explore settings that improve the quality of images and also produce other images as a result. Because color is a frisky, not very exact phenomenon when correcting images using visualization tools, it leads

to thinking deeper about color theory such as the modifications produced by the proximity of colors blending together. The modifications are the new colors created by the mutual proximity of complementary colors. Chevreul's chromatic diagram and classification of colors can also help this interesting and deeper thought. It is possible to stop the phenomenon on the head of a

pin or the fleck of a ray of light and wonder where it leads. Although the color system in use today is a very useful and of course necessary phenomenon, I think a deeper concept centered on exposure tools that change the brightness and darkness of images. Photoshop image tools are not only light centric changing, but these tools also produce primary and secondary chromatic images making the pixels adjust to the image quality.

The settings in Photoshop's "Image" > "Adjustment" > "Exposure" can be fooled around with to a better quality further than "Image" > "Auto Color".

Another visualization tool I just love is the "Healing Brush" tool. For example, when I was moving, while I was packing and the house was emptied, I came across the piece of paper on which I drew my beloved grandmother. I had no good way of carrying it, so I folded it up and placed it in my pocket. Needless to say, when I arrived to my destination, rumpled and tired, the drawing was also rumpled. Not only that, it had fold creases on it and looked awful! This was the same drawing as the one above after visualization tools corrected it. The PS healing brush tool was not a very hard tool to learn and the drawing looks great again.

When the *learning environment* facilitates the problem solving and is therefore knowledge construction produced with the colors of the spectrum, the value is learning to blend the paint with only two or three colors. It is a meaningful and realistically operational task, and therefore constructivism. However, in order to adapt the original plan to cognitive learning theory, a pretest on basic HTML should be given. This is what they possibly do know and to make sure they know. With the new objective established the web presentation of the student's web color theory assignment is the language of "behaviorism". It works comfortably and can be stimulus and reinforcement when assignments based on this presentation are completed and turned in.

Hence, with the constructivism, the newer assignment, which is to locate and turn in the code

for the color strip made in task one, you see blended learning theory. Given the proper HTML, the students receive reinforcement and the additional benefit of learning to create a basic web page in any text. (The representation must be made for their color progression strip to be recreated in text to be for the hex color lesson web display. Once the research assignment is turned in, the students put their page on display at a web site for the class and parents to view.) The cognitive adaptation interactivity and production of illustrative examples accomplished, what to do is to reinforce learning by displaying the correct HTML format. Also suggesting groovy font faces from www.dafont.com along with the color codes is fun and sequentiallyeffective.

The learner must be able to retrieve relevant rules and information in other problem- solving dialogs. A bilingual lesson is the more familiar sort of constructivism one might remember is cultural for learning language. However, in the art field, language is getting to be more than the materials and art movements realm of language. Art language has more daily operational territory since computing and digital art arrived. Digital art comes with its own vocabulary and this is added to the art environment. It is important for students to invest in this new experience. When this lesson is successful, it should mean the students extract the invested information more easily. A constructivism inspired lesson, such as the unit of instruction I have prepared on color theory, illustrates the hands-on research project environment. The students will look up the necessary material and, based on their previous assignment, find the matching codes. They will gain experience in new color theory, building a web page, and uploading it to a web site.