

## Teaching Critical Color Concepts Through an Online Learning Module

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An online teaching module for a sophomore level course titled Computer Aided Textile Design and Color Studio was developed. Students who take the course are studying Textile Design or Fashion Design, though the teaching module is much more broadly applicable to any area of fashion and textiles. In the course, students build on a fundamental understanding of color theory from their first-year studios to learn about using color in designing textiles. Understanding color and how to use it effectively is extremely important for textile designers, in fact for all designers. Color is a powerful design element and can easily be the determining factor in the success of a textile design, or the difference between a mediocre and an exceptional design.

The course is a blended format utilizing numerous online activities and resources along with formal studio meetings each week. During studio meetings, students execute assignments and projects using proprietary CAD software. Bringing studio courses totally online is not currently viable due to required proprietary resources being available only on campus and also to the importance of the collaborative environment of the physical studio.

To introduce the teaching unit, a conversation about key color concepts is used. Concepts covered include that color we see is a function of the specific wavelengths of light reflected from the surface, which remains constant – the same wavelengths of light are always reflected by the surface. (Cooperman, 2013) Also that despite this, the perceived color of an object varies according to how the reflected wavelengths are perceived, which is influenced not only by the wavelengths present in the illuminant but also the viewer. Viewer influences include color vision and the brain, which ultimately interprets the wavelengths of light detected by the eye's photoreceptors as colors. (Cooperman, 2013; Feisner & Reed, 2013) A few examples of color illusions are shared – just enough to illustrate that color perception is variable. In the process, I search color illusions online, showing students how to conduct their own, expanded investigation by offering a few search terms. It is important to enable the students in a studio major to discover relevant information and to take responsibility for expanding their understanding of introduced concepts. Thus, lecture type deliveries are kept to a minimum and students are encouraged to expand with their own research to discover terms for specific effects and information about why and how color illusions work, positioning them well to create their own color illusions. The teaching module that follows the introduction requires students to first engage with interactive online resources and then create color illusions. Creating color illusions demonstrates the ability to use learned concepts in creating original works and elevates the activity to the highest level of learning as described in Bloom's taxonomy. (Vanderbilt, n.d.)

Students' first online challenge requires them to identify the color that is different in a series of examples at the site <https://www.igame.com/eye-test/>. The interactive activity allows students to advance to increasingly complex color challenges by choosing the mismatched color in an arrangement within 15 seconds. When they can no longer complete the challenge, they see a

score. It is enticing to attempt a higher score, so typically students see many examples before they disengage from the challenge. A bonus is that in the advanced levels, students begin to see examples of a color phenomenon where flashing dots seem to blink in the white spaces between color blocks making it very hard to identify the mismatched color. This supports the introductory information as students discover how the effect is created with the use of color and spacing.

Next, students move to an online color vision test. They complete the online color challenge at <http://www.xrite.com/online-color-test-challenge> and upload to a course website their own score and a report of how their score compared with others. As they work with arranging color chips in the vision test, students quickly see that the appearance of each chip varies greatly as it is shifted in the arrangement of other color chips. Students also read a section which helps them understand the influences on their color perception.

Following these activities, students create a set of their own color illusions using learned concepts and according to the parameters described below.

1. Create 2 variations of geometric images with 5 - 6 bright colors - one version should make the colors more vibrant, the other to tone them down some.
2. Create an image where two different colors appear nearly the same.
3. Create an image where the same color appears different.

When due, a sampling of selected color illusions was presented to the class as a prompt for discussion, and the presenters explained how the concepts they studied were reflected in their solutions. The discussions and conversation provide a wonderful segue into the next topic which is attributes of color including hue, value and intensity. It also provides opportunity to introduce terminology for the concept of Chevreul's Law of Simultaneous Contrast which indicates that colors will look as dissimilar as possible when viewed simultaneously. (Cooperman, 35) This has a dramatic impact on perceived color in compositions including textile designs.

The module including the color vision test has been included in the course once and the other components several times. Moving forward, I plan to integrate a physical, more complex color vision test to enhance students understanding and to provide them with a baseline of their own color vision. Also, I am consider integrating a TED talk as a way to introduce the unit as an enhancement to the introductory conversation. The addition of the TED talk may be a more intriguing and stimulating way to introduce color perception.

The module was quite effective in helping students to learn about color perception. If students made a diligent effort and could verbalize reasons for their choices in developing illusions, they received full points for successful completion. There was variability in the caliber of the illusions created, but students who had challenges were able to explain what they were attempting and why they anticipated it would work indicating the concepts were clearly communicated. No disadvantages were noted in using this approach. The advantages include adding variety to the learning environment and effectiveness in teaching the content. Most importantly, all of the students understood clearly that colors may not work together as expected when combined in a textile design, and how they could adjust the colors to enhance a desired effect.

References

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