Teaching Tips/Notes NACTA Journal

# Trusting the Tech: Using Eye-Tracking as a Teaching Tool

## Introduction

Photography and visual literacy are two skills relevant to various agricultural trades and remain pertinent subjects among agricultural, and life sciences, communication and journalism undergraduate education. Capturing visual stories as either stand alone or accompany journalistic stories, along with research reporting continues to be a valuable skill for graduates. Additionally, teaching effective photography skills increases in importance as consumer media consumption trends continues to shorten in length and shows increased value for visual communication elements. Therefore, it is even more vital for agricultural and life sciences communication educators to properly prepare students to be effective storytellers when wielding visual tools. This often involves teaching and enforcing photography rules and techniques to increase mutual viewer understanding and enhance storytelling.

Eye-tracking is a biometric measurement of visual behavior and responses that records eye movements while viewing an image. It records both the fixation duration and frequency of fixations on a point within an image. Recording eye-tracking of an image is an innovative and useful teaching tool because visual literacy skills are needed in any visually based communication course, and self-reported gaze behavior of images from students or viewers may be invalid or inaccurate. Therefore, to reinforce these photography rules, educators teaching an agricultural photojournalism course at [University] employed eye-tracking, and its results, to inform students on how consumers view their work.

## Procedure

First, undergraduate students submitted their photos as assignments, as per typical course procedure. Then, the faculty member and graduate teaching assistant chose one photo from each student and eye-tracked them with non-photographer volunteers, using Tobii Eye Tracking technology (Tobii Technology, Inc., Fairfax Station, VA, USA), to record their eye movements as they viewed each students' photos. From the software, we produced visual displays of biometric results in the form of "heat maps" and "gaze plot" video clips. The heat maps (Figure 1) are a still image that displays color over an image to indicate where, and for how long, viewers looked at the image. Similarly, the gaze plot videos (Figure 2) are short clips using colored dots and lines to display exact

points eyes gazed upon, and the movement between these points. These fixations and fixation duration visual tools were shown to the students. Students were able to see how others viewed their images, comparing a plain image to one that had been tracked and displayed heat mapping or gaze plot visual elements. Then, instructors conducted focus groups to make meaning of the learning experience, and gain student feedback.

**Figure 1**
*Heat Map Eye-Tracked Photo*


The heat maps displayed confirmation of photography rules such as: the rule of thirds, the attention to faces and other points of focus. Through this, students were able to see, not only the results of eye-tracking consumers on images, but these results on their very own images. Gathering this eye-tracking data consistently for students every semester is not always possible, however, the photos and their resulting eye-tracking heat maps remain as a teaching tool for future semesters.

**Figure 2**

*Gaze Plot Eye-Tracked Photo*


## Assessment

Agricultural photojournalism remains to be an extremely hands-on course, and the addition of this component brings an experiential nature to how students understand consumer viewership of their work, and of photography in general. The use of heat maps and gaze plot videos allows for a tangible assessment of how well students' photos adhere to core photography rules, such as the rule of thirds, leading lines, and focal points. By comparing their initial submissions to heat-mapped feedback, students can clearly see where their composition either succeeded or needs improvement. Students in the class reflected on this, stating they were able to see concepts of composition from course content clearly demonstrated in the heat maps and gaze plots; for the Figures 1 and 2, students witnessed evidence of photography viewers' attention driving toward faces in photos—a concept discussed in the course. Subsequent assignments show improved adherence to these photography rules, demonstrating measurable growth in visual literacy skills. The experiential nature of this assessment encourages students to actively participate in discussions about their work and its reception by audiences. This

reflection not only improves technical skills but also helps students understand the broader implications of visual storytelling for agricultural communications.

This innovative use of eye-tracking as an assessment tool can be adapted beyond photojournalism to other agricultural courses that rely on visual communication, such as marketing, advertising, or educational content creation. For instance, in agricultural marketing, students could apply the same eye-tracking principles to assess the effectiveness of visual campaigns or product photography, directly correlating to consumer behavior. Similarly, in agricultural education or agricultural extension, students could use eye-tracking data to evaluate the clarity and impact of infographics or other visuals used in educational outreach.

**Costs and Recommendations**

The Tobii Eyetrack Research Starter Kit costs $4,000 and includes both the hardware and software for eye-tracking. Cost may be considered a limitation of implementing this in the classroom. Gaining familiarity with the Tobii system may also pose a learning curve, however, Tobii technical help is very supportive. For this project, we chose to involve external viewers as the eye-tracked individuals, however, it is possible to have students view each other's work to eliminate logistical barriers. It is vital to note, many universities have access to Tobii eye-tracking software and hardware, and therefore we recommend collaborating with faculty who currently research and work using eye-tracking methods to eliminate costs, learning curves, and other barriers.

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