Setup for an Eye Gaze System

*"It is possible to grossly underestimate an individual's motor capabilities
if the individual is not properly positioned and supported." --Beukelman & Mirenda 1992*

Seating and Positioning

Stability and control are essential to the success of an Eye Gaze system and needs to be achieved before you introduce Eye Gaze technology. The way in which a student is positioned affects their ability to use volitional movements. A seating system should maintain stability, allow for voluntary movements (mobility) and be comfortable for a student. A catchphrase to remember is 'proximal stability, for distal mobility.' Achieving a stable, functional position should enhance performance and facilitate access to technology (ACE Centre North).

Understanding Eye Trackers

It is important to understand how eye trackers work, in order to position the device optimally to correspond to the student. Eye trackers are made up of three components: cameras, illuminators, and algorithms. The process is as follows:

1. The eye tracker projects near infrared light.
2. The light is reflected in the eyes.
3. The reflections are then tracked by the cameras.
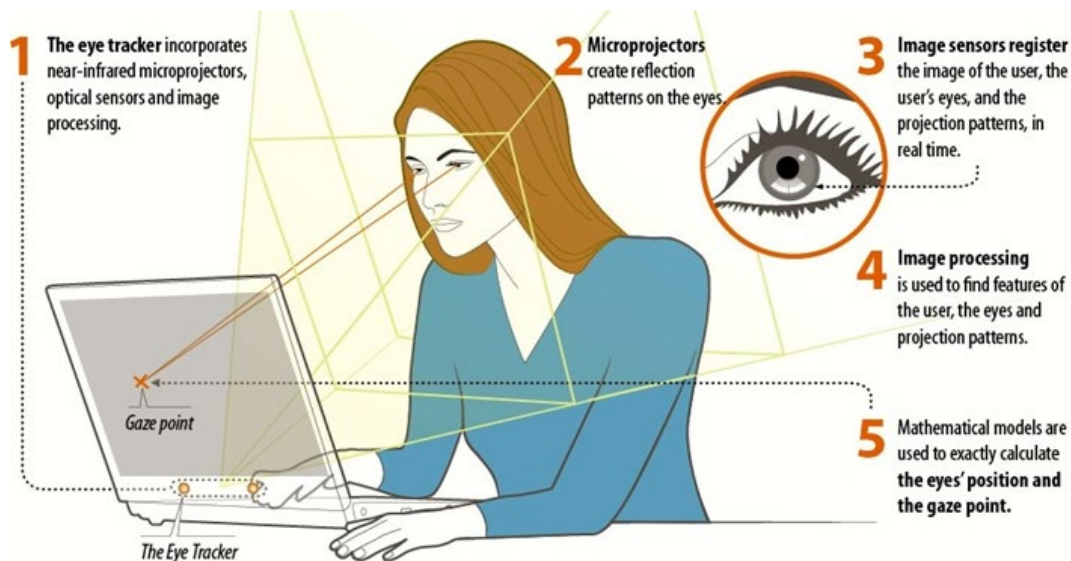4. Mathematical algorithms are performed, identifying where you are looking.

Image source: http://www.tobiipro.com/learn-and-support/learn/eye-tracking-essentials/how-do-tobii-eye-trackers-work/

Positioning for Eye Gaze

- Student needs enough head/neck support to achieve optimal eye movement
- The eye tracker needs to see the student's eye(s)
- Eye tracker should be 50-75 cm (20-29 inches) away from eyes
- Top of screen should be slightly above eye level
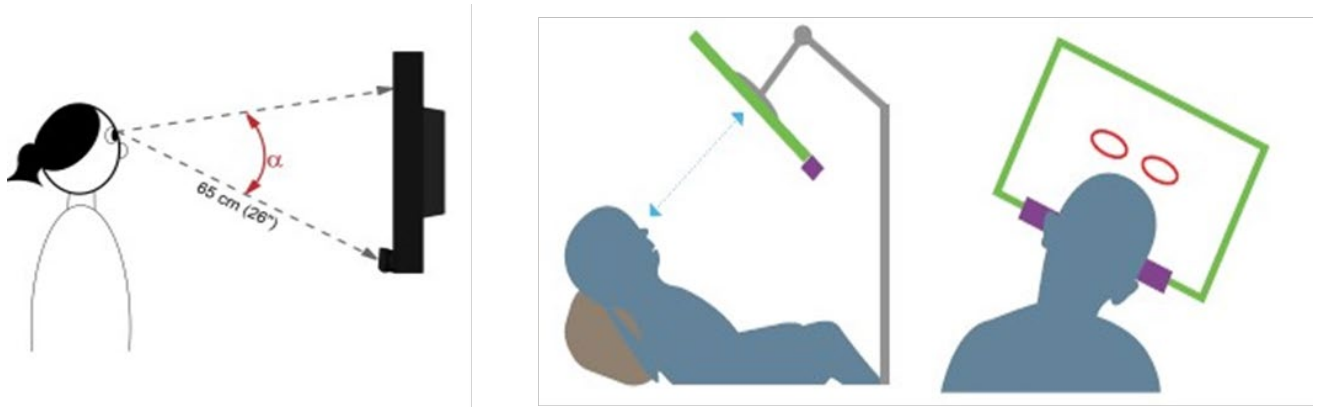- Device position might be angled and/or tilted depending on the user

Image sources: Tobii Pro., Your Essential Guide to Eye Gaze in the Classroom, Inclusive Technology, 2015.

Recognition of Eyes

The eye tracker camera must have unobstructed view of the person's pupils. Factors that may affect eye tracking:

- Eye physiology e.g., ptosis (drooping) eyelid, long eye lashes
- Eye movement e.g., nystagmus, alternating strabismus
- Visual acuity (corrected with glasses)
- Eye conditions e.g., cataracts
- Eye dominance
- Medication side effects (dry vs glossy eyes)
- Glasses/frames
- Lighting: reflection from glasses and screens
- Voluntary movement

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