



Virtual 2020

EAFP

EUROPEAN ASSOCIATION OF FACULTIES OF PHARMACY

# EYE AND CLICK TRACKING TO EVALUATE ENGAGEMENT IN COMPUTER-BASED SIMULATION

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## INTRODUCTION

Student engagement represents the time, involvement and quality of effort students invest in productive learning activities and is closely linked to the cognitive aspects of learning. Computer-based simulation provides replicable, cost-effective learning approaches in safe environments. Student engagement with computer-based simulation may be challenging to assess. Eye tracking performance has been linked to engagement of attention and recent affordability of equipment such as Gazepoint® hardware and software allows for physiological engagement to be investigated.

## AIM/S

The aim of this study was to explore the feasibility of using eye and click tracking to evaluate engagement in computer-based simulation.

## METHOD - SIMULATION

A computer-based simulation was developed in the Wix® platform, based on a community pharmacy request for emergency contraception (EC). The simulation used digital avatars for the patient, pharmacist and doctor with audible questions and responses (Figure 1). Participants flexibly navigated the simulation and received feedback from the pharmacist avatar.



Fig. 1: Computer-Based Simulation for EC Request

## METHOD – GAZEPOINT

The feasibility study employed Gazepoint® gaze tracking equipment to determine physiological engagement during the simulation. The Gazepoint® video-based eye tracker (Figure 1) recorded eye tracking, mouse tracking and clicks which were post-analysed from the video recordings of each participant.

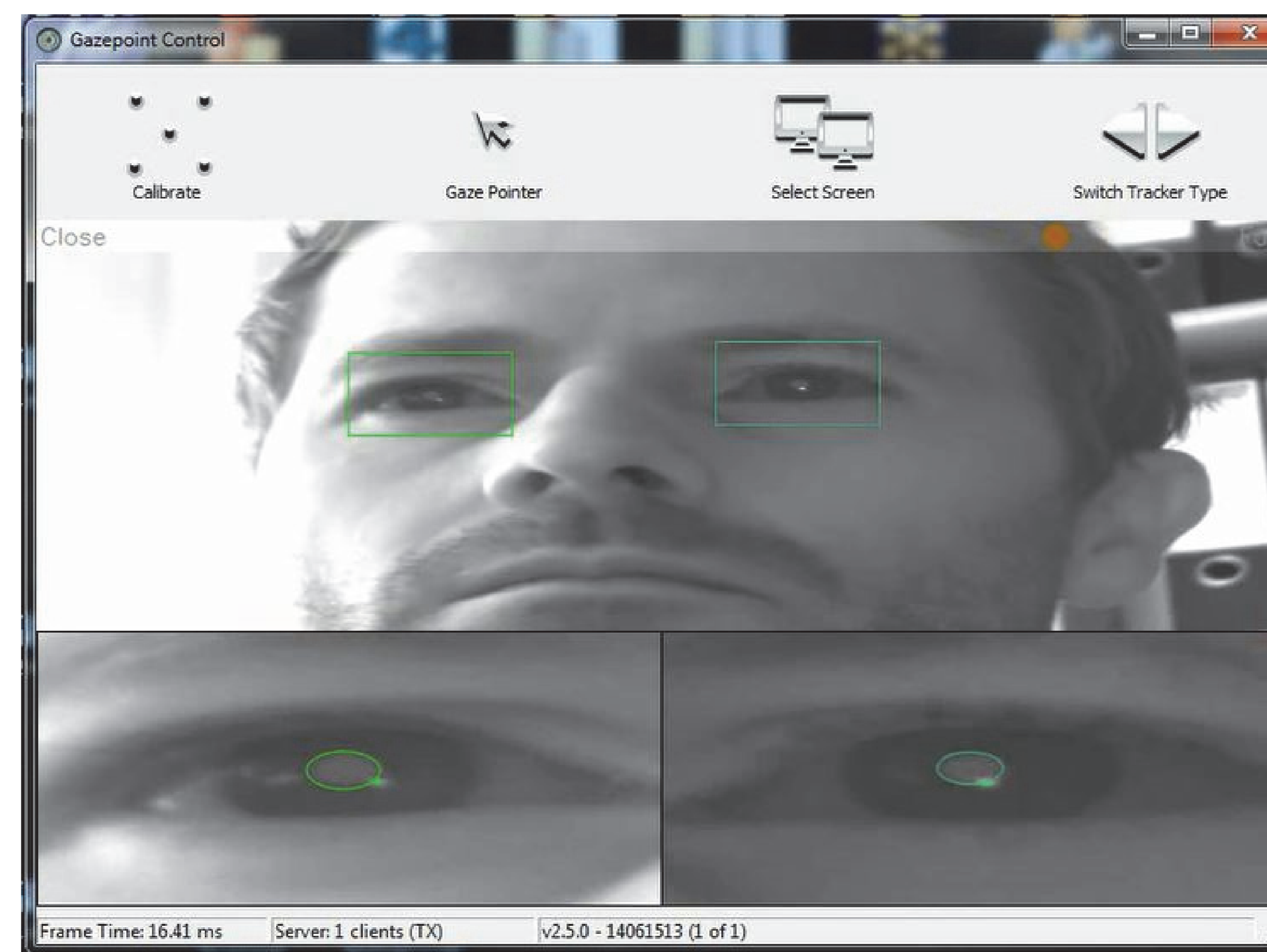


Fig. 2: Gazepoint® Eye Tracking Calibration

## RESULTS

Twelve third year pharmacy students participated. The Gazepoint® data recordings for the entire simulation were reviewed by two observers. Participants' eye tracks were displayed as heat maps (Figure 3) or fixation maps (Figure 4) and identified areas of interest and time spent on task. Most participants showed engagement with the simulation, with 83% focused on the patient avatar when speaking. Participants' navigation and directional choices in the simulation were accurately determined by observation of mouse movement and clicks. An outcome of this study is the suggestion that future simulation design might consider operation within a standardised screen to enable calibration in the timing of participants' gaze fixations.

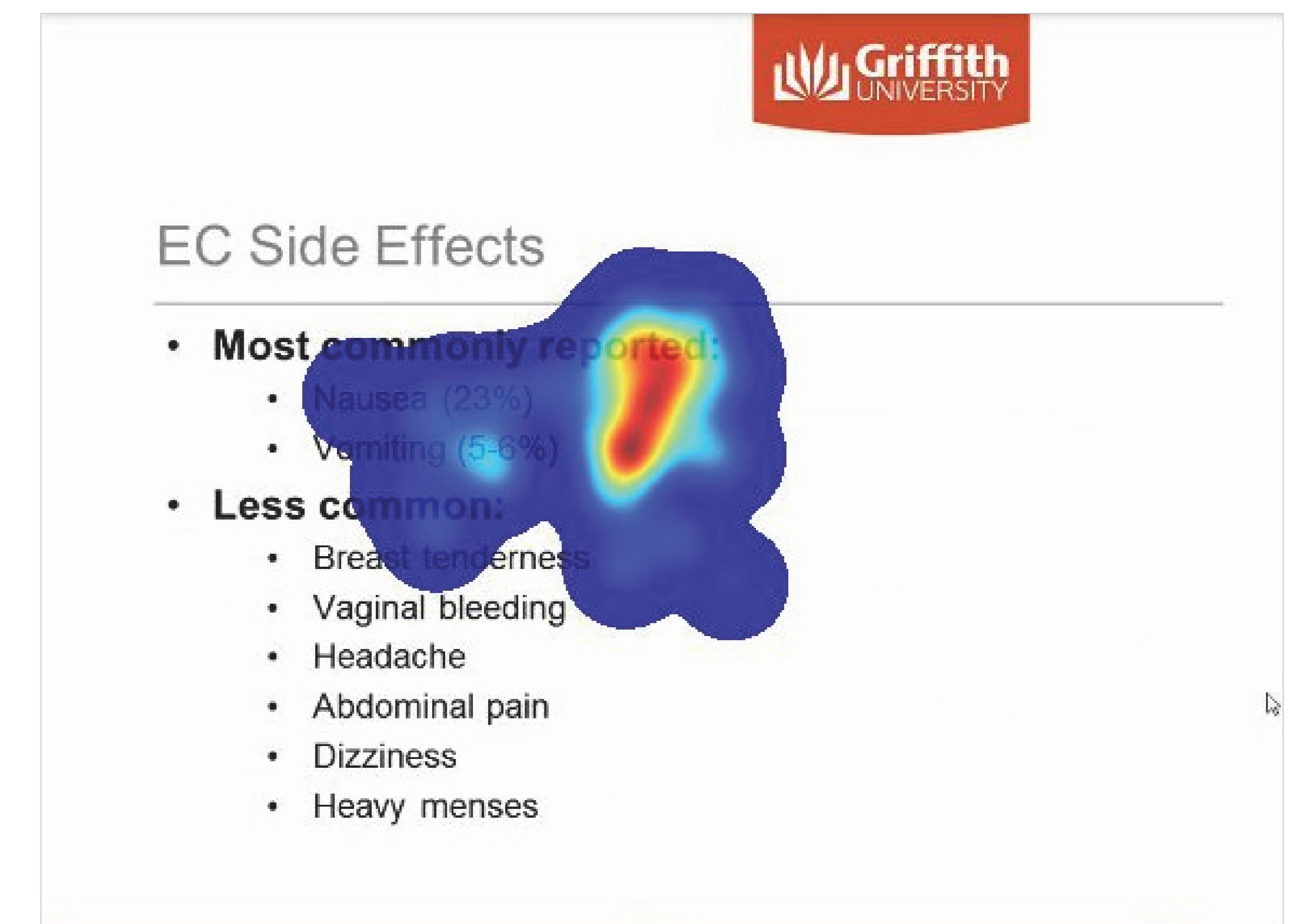


Fig. 3: Gazepoint® Exemplar Eye Tracking Heat Map

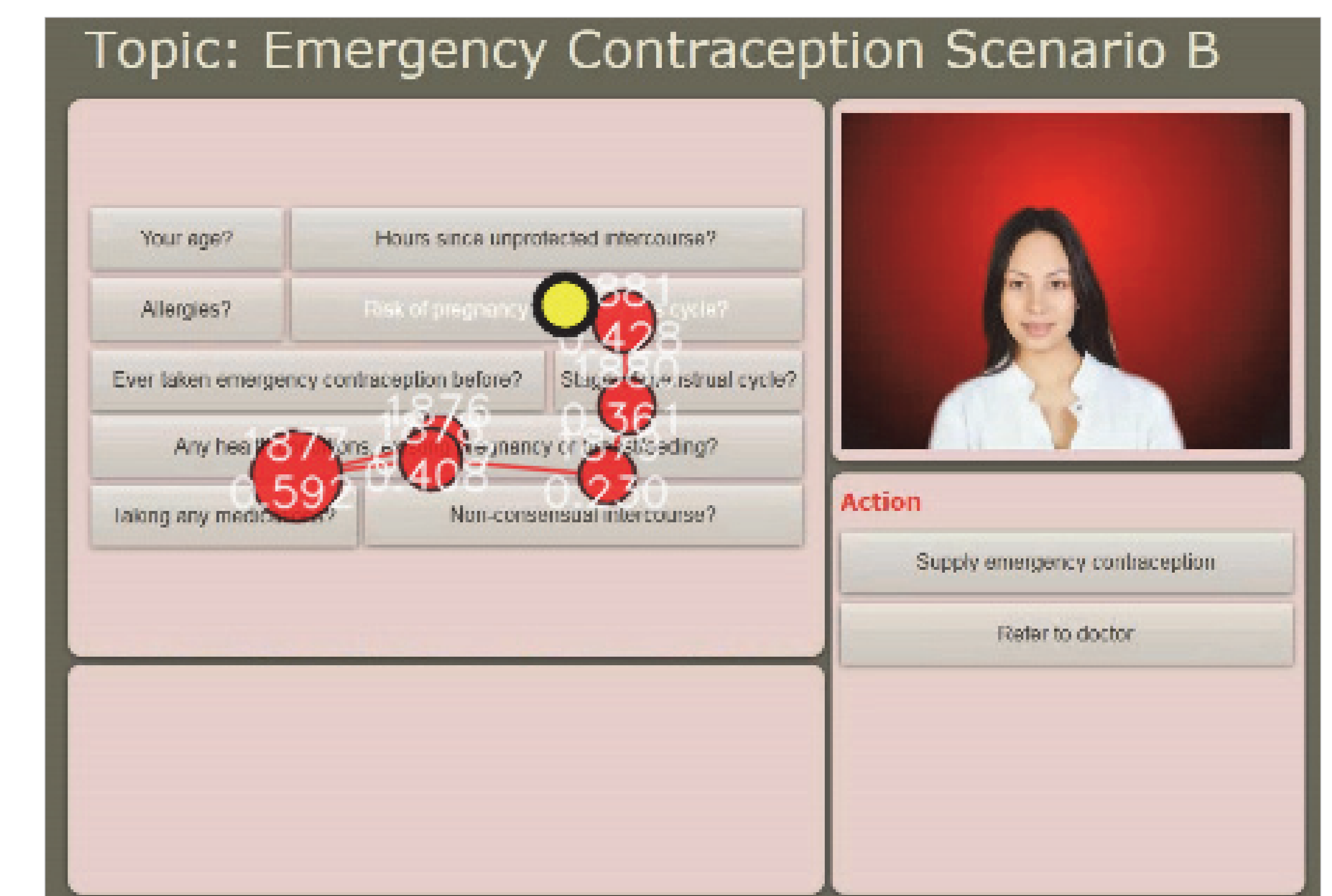


Fig. 4: Gazepoint® Exemplar Eye Tracking Fixation Map with Cursor

## CONCLUSION

Gazepoint® eye and click track recordings showed promise in identifying students' physiological engagement during computer-based simulation. Participants' navigational choices could inform future simulation development.