Technologically Observable Psychophysiological Correlates with Video-based Online Learning

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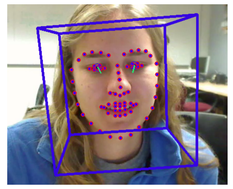
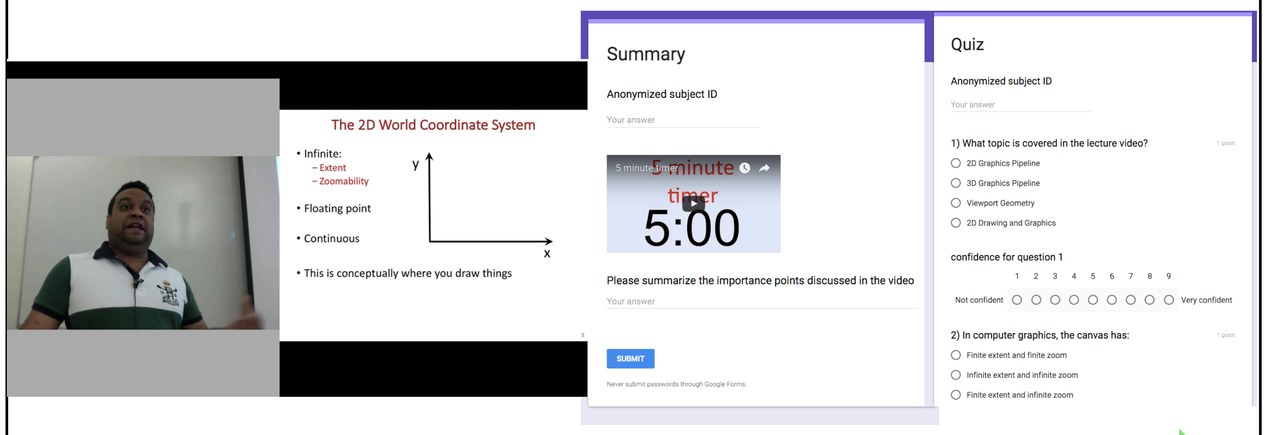
Motivation and Goals

- Online learning has gained increased popularity in recent years. However, with online learning, teacher observation and intervention is lost, creating a need for technologically observable characteristics that can compensate for this limitation.
- The present study used:
  - eye tracking
  - galvanic skin response
  - facial expression analysis
  - summary note-taking characteristics

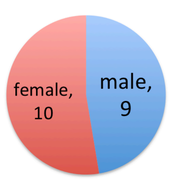


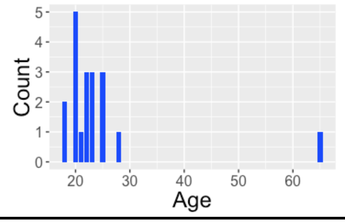
- Participants were monitored while watching and recalling an online video lecture.
- The link between these technologically observable psychophysiological responses and learning outcomes measured by quiz questions was investigated.

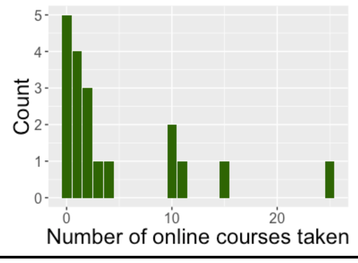
Method

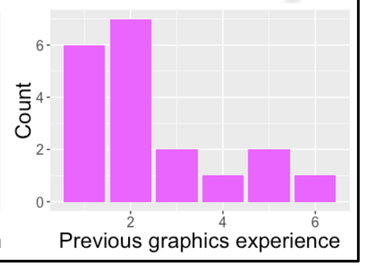


- Participant information:

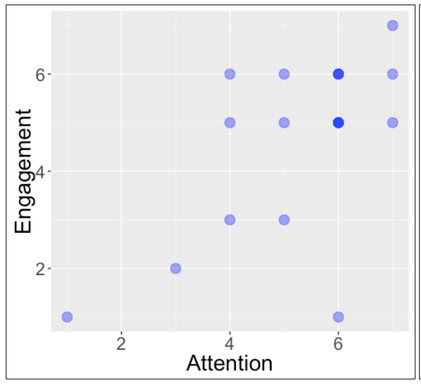


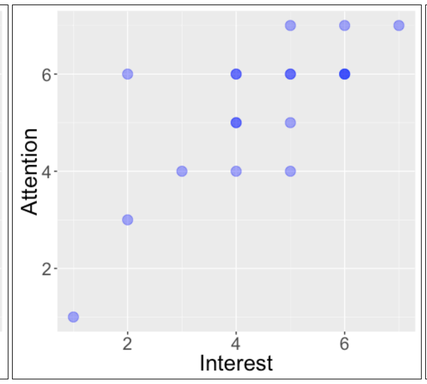


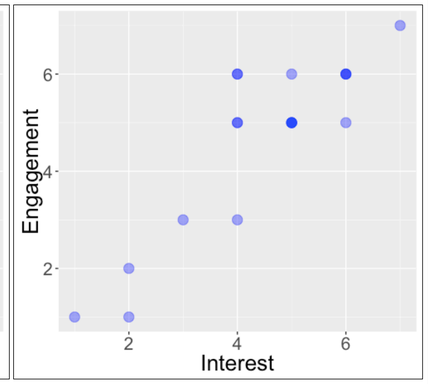




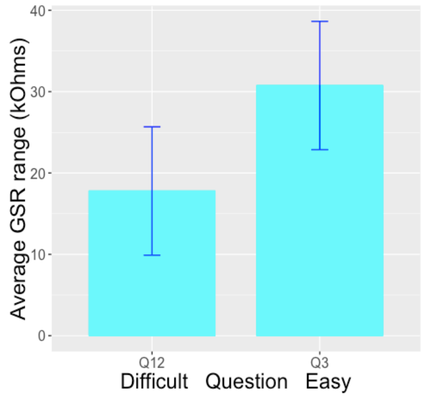
Results







- Self report of attention and engagement throughout the lecture were correlated (r=0.615)
- Self-reported interest in lecture material was correlated with self-reported attention (r=0.739) as well as self-reported engagement (r=0.876)
- GSR (range) for video section corresponding to the quiz question with most correct answers (easy material) was significantly higher ($p<0.05$) than for material corresponding to the question with the most incorrect answers (difficult material). This suggests higher cognitive load for the difficult material.



Discussion

Evolving Experimental Design

- Facial expression analysis revealed a lack of facial movement.
  - May be due to asking participants to keep still. To explore this, six additional participants were run with two changes to the methodology:
    1. Participants were not asked to keep still
    2. Researchers left the room during the lecture
       - These participants seemed generally more expressive

Conclusions

- Results indicated GSR to be the best indicator of content material challenge level.
- Although eye tracking and GSR provide valuable information, with current technology, they are not recommended for monitoring online learning as the requirement to remain still impacts natural behavior.

Acknowledgements

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