Technology-enhanced data collection in education: Considerations and cautions

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Key issues in the use of digital technologies for research in education

1. Overview of key themes from today’s talks
2. Some practical issues in using digital technologies in education research
3. Some ethical issues in using digital technologies in educational psychology
Key themes from today’s talks

1. Capturing academic emotions with experience sampling methods (Goetz)
2. Using smartphones to measure (and intervene in) daily life (Lathia)
3. Eye-tracking as measure of visual expertise (Gegenfurtner)
4. Connecting mental states and bodily events (Karvonen)
5. Capturing affect through mobile technology (Waters)
6. Joystick methods to observe teachers and students (Pennings)
Progression of data collection in education

2005

- Collect data in the field
- Data entry from forms to Excel

2015

- Collect data w/ tablet or phone
- Data is aggregated automatically

2025

- ?

In 2025, using paper-and-pencil questionnaires with a few hundred local college students would border on ‘scientific malpractice’ (Smartphone Psychology Manifesto; Miller, 2012)
Practical Issue #1 Technology may interfere with normal social interactions

They’ll hardly notice that I’m wearing my new mobile eye-tracker!
Practical issue #2
Technology and repeated measurements may exacerbate *observer effects*

- Stigler (1999): *What effect does (the camera/technology) have on what happens in the classroom?*
Monitoring can have paradoxical effects on performance

Becker & Marique (2015): Monitored performance can be lower than un-monitored performance (for simple tasks)
Practical issue #3 (Frequent) reporting may influence activation of emotions and motivation

**SO TELL ME,**

**WHAT ARE YOUR PROBLEMS?**
Does the *act of reporting* disrupt normal emotional response?

(If yes, what about multiple reports in ILD?)

The act of reporting may activate different neural systems than the actual emotions.

Comparison of rating vs. passive viewing of funny and sad movies:

Kassam & Mendes (2013) examined physiological changes resulting from emotion ratings in induced emotions.

1. Results showed that asking people about their emotions had a significant impact on their physiological responses, and that the impact may depend on the type of emotion experienced.

2. Rumination may be the explanation. Self-reports of emotional experience require introspection and an awareness that may change emotional processes.
Practical issue #4

We over-interpret behaviours and perceptual processes as cognition

In eye-tracking, we can easily measure...

- Duration of fixations (but what does ‘staring’ at an object mean?)
- Target of gaze (are we ‘tuning in’ or ‘tuning out’?)
- Reciprocated gaze (I love you; I hate you)
- Division of gaze target (What does gaze avoidance mean?)
- Duration and frequency of group scans (What does ignoring a group mean?)
- Change in gaze patterns of over time (familiarity breeds contempt)
But we **cannot** easily measure…

- Pragmatics or **intention** of gaze:
  - Why are you looking at me?
  - Why *aren’t* you looking at me?
  - What does gaze contact mean in different contexts?

- In teacher gaze research:
  - Gaze ≠ engagement or motivation
Ethical issue #1: Some forms of technology-inspired data collection are inherently ‘non-anonymous’ (even with masking)

(Derry et al. 2010)
Teacher-student gaze study:
Selective gaze
Ethical issue #2: Contexts of use for digital records are increasingly distant from the research project that produces them, making use less predictable.

References


