The Effects of Poll Everywhere on Undergraduate Psychology Students' Lecture Experience: *A Small-Scale Intervention*

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i) Introduction

Lectures can be challenging in terms of interaction. Students can be reluctant to answer/ask questions, potentially due to being more anxious with a large cohort. This can lead to a 'sage on stage' experience and being less able to assess whether learning outcomes are being met. Qualitative feedback from students indicated that they would like greater interactivity and engagement during lectures.

According to Walklet et al (2016), the current social and financial climate has lead to larger student cohorts and higher expectations regarding teaching quality in higher education psychology. They argue that technology-enhanced learning can help address such challenges. In accordance, Brooks (2012) found that an active technology-enhanced learning classroom lead to greater peer and student–instructor interactions. Stowell and Nelson (2007) found that compared with other techniques, an electronic student response system (ESRS) was particularly useful in increasing student participation and positive emotion during lectures. Numerous other studies have reported increased engagement and interaction with the use of ESRSs (for a review, see Landrum, 2015). In relation to psychology students, Thapar-Olmos and Seeman (2018) piloted the use of an ESRS in those studying at master's and doctoral level. Findings showed that overall, participants' attitudes towards the technology were positive, with advantages including increased engagement and enjoyment of lectures.

A particular ESRS that has been rated positively by students is Poll Everywhere (PE; Shon and Smith, 2011; Walklet et al, 2016). This is said to be simple, convenient and inexpensive (Shon and Smith, 2011). This latter point is partly because it does not require dedicated transmitter/receiver devices – instead, it involves use of a personal mobile phone / tablet / laptop. This is ideal as research suggests that almost all university students own a mobile phone (99.8%; Hanley and Becker, 2008). In Shon and Smith's (2011) study, more than 80% of students stated that they would recommend PE and more than 90% felt it aided learning. The effects of PE on learning experience have also been investigated in undergraduate psychology students. For instance, Walklet et al (2016) found that this ESRS was generally positively received, with advantages including increased peer interaction, engagement and opportunities for formative feedback.

Consequently, a small-scale intervention project was conducted that aimed to explore the effects of PE on undergraduate psychology students' experience during lectures. It was predicted that this ESRS would have positive effects.

ii) Context and Methodological Steps

Design: This was mainly informed by student engagement (survey feedback, verbal feedback), colleague engagement (verbal suggestions), PGCert PAP course engagement and a literature review.

Participants: The intervention involved 154 Level 4 undergraduate students studying a British Psychological Society accredited BSc (Hons) Psychology degree at the University of West London. It was implemented during lectures of a mandatory module introducing research and theory in core areas. The lecturer was the present author.

Materials/Measures:

- **Poll Everywhere (PE)** – an online audience response tool that presents fixed-choice/open-ended questions then collates and displays responses made via text/internet using mobiles/laptops/tablets.
- **Online, mixed-methods module evaluation survey.** Used to assess general student experience. A quantitative item asked how much a student agrees with: "Overall, I am satisfied with the quality of the module". This was measured on a Likert scale where 1 = "strongly disagree"; 5 = "strongly agree". An open-ended qualitative question asked, "If there was one thing on the module you would keep, what would it be?"
- **Paper-based, qualitative module evaluation survey.** An open-ended qualitative question asked, "What do you enjoy most about this module?".

Procedure:

General: 1. Identify challenges/issues (pre-semester) → 2. Review interventions and select one (semester start) → 3. Implement action* (semester start–end) → 4. Evaluate action** (semester mid–end) → 5. Reflect; plan further (semester end) (e.g., as recommended by Arnold and Norton, 2018).

Stage 3: At the semester start, students were asked to bring a relevant device to lectures and encouraged to use it solely for learning. PE was implemented over one semester. It involved a combination of open-ended and fixed-choice questions *(see Figure 1)*. Questions were mainly formed to i) assess prior knowledge, ii) check understanding, iii) check retention and iv) stimulate discussion. The number and type of questions varied. Students responded anonymously. Students without a device could share another student's. Results were revealed once all responses were given and discussion was encouraged.

Stage 4: Student surveys were administered twice: the paper-based mid-module and the online at end-of-module. In addition, a peer teaching observation took place with written and verbal feedback obtained.

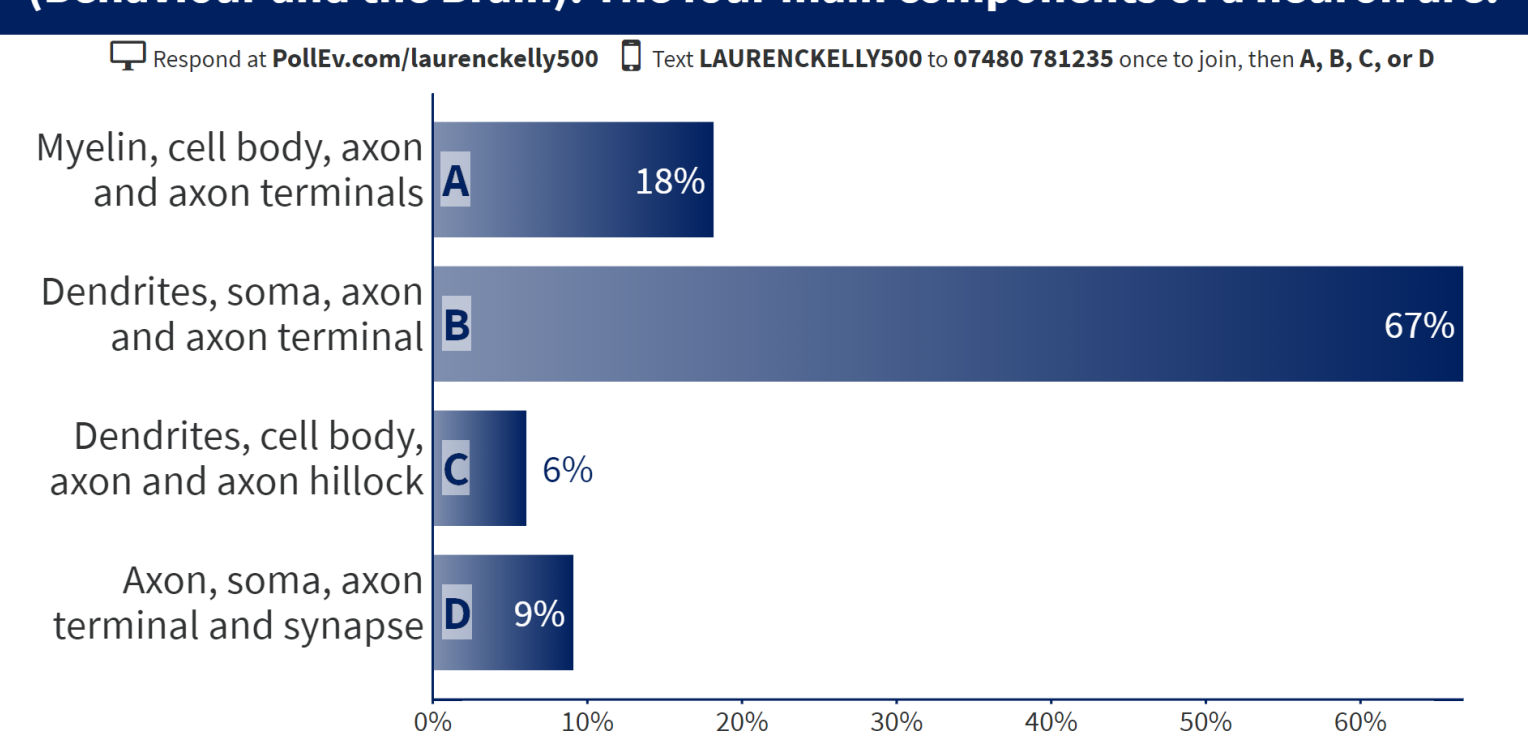**(Behaviour and the Brain). The four main components of a neuron are:**

Respond at PollEv.com/laurenckelly500   Text LAURENCKELLY500 to 07480 781235 once to join, then **A, B, C, or D**

- Myelin, cell body, axon and axon terminals — A — 18%
- Dendrites, soma, axon and axon terminal — B — 67%
- Dendrites, cell body, axon and axon hillock — C — 6%
- Axon, soma, axon terminal and synapse — D — 9%

Figure 1. *Example of Poll Everywhere used during lectures. This particular interface is shown once all students have responded and results are revealed.*

iii) Evaluation

Quantitative: **Post**-intervention, **88%** of students that responded (*N* = 76 – 49.4% response rate) either **agreed** or **strongly agreed** that they were **satisfied with the module quality** overall. **Pre**-intervention, **62.5%** of respondents (*N* = 80 - 59.3%) either **agreed** or **strongly agreed** with this *(see Figure 2)*. Also see the below table:

"Overall, I am satisfied with the quality of the module"		Post-Intervention	Pre-Intervention
	Strongly agree	33.3%	15%
	Agree	54.7%	47.5%
	Unsure	8%	21.3%
	Disagree	4%	12.5%
	Strongly disagree	0%	3.7%

Qualitative: For instance, when asked, "If there was one thing on the module you would keep, what would it be?", some students responded: "Lectures are interesting"; "The way it was presented"; "The way it is taught to us".

Peer: "Great use of Poll Everywhere to check learning". "Great opportunity to evaluate the participation… An inclusive approach".

Self-Evaluation: I found the use of Poll Everywhere to be intuitive and convenient. Many students took part in answering/asking questions, and it generally resulted in greater student-lecturer and peer interaction. Students appeared to be more engaged and positive.
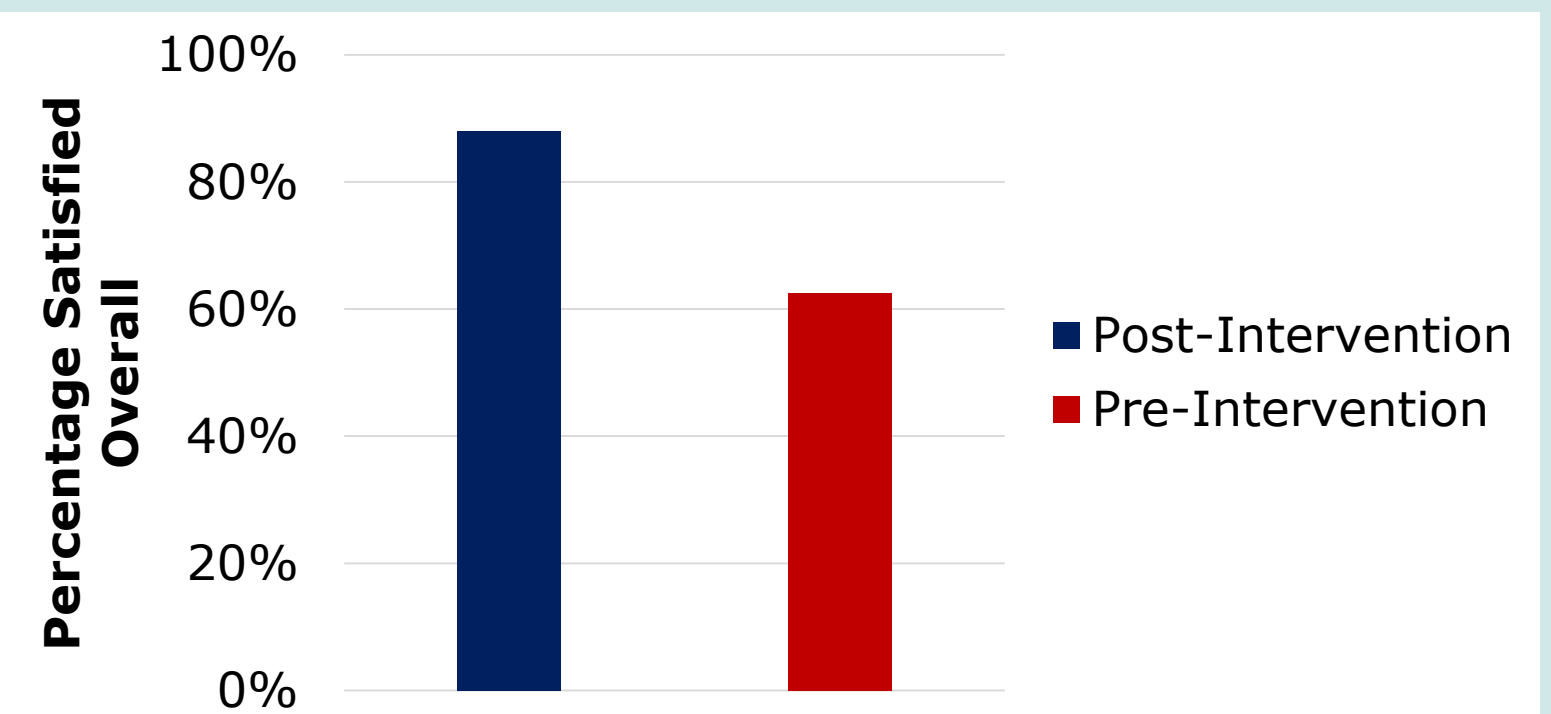

Figure 2. *Bar graph showing percentage of students satisfied with module quality overall, both post- and pre-intervention*

iv) Final Considerations

Current preliminary findings show that overall, students were more satisfied with module quality following the Poll Everywhere (PE) intervention. Students made positive statements concerning lecture/module delivery. Peer feedback praised the use of PE. In addition, reflection was positive.

Findings support the prediction and previous research demonstrating positive effects of electronic student response systems (ESRSs; see Landrum, 2015 for a review). Of particular relevance, findings agree with Thapar-Olmos and Seeman (2018), who revealed that an ESRS lead to greater engagement and lecture enjoyment. Additionally, they agree with Walklet et al (2016), who found that PE was positively received and lead to several advantages including greater interaction and engagement.

In the current project, technological malfunctions and set-up/delivery time were sometimes a problem, which could have negatively affected students' attitudes (Thapar-Olmos and Seeman, 2018). Previous studies have also highlighted such problems and the need to be trained as well as prepared for software failures (Campbell and Monk, 2015; Walklet et al, 2016).

Time and resource constraints meant that only a small-scale intervention was feasible. The balance of the current project was more 'action' focused with 'research' being limited by the type and amount of data collected – for instance, students were not directly asked about the use of PE and its effects on interaction etc. In future, a more direct assessment should be undertaken, which can involve a mixture of more in-depth and targeted quantitative (e.g., 'Attitudes towards clicker use' items implemented by Thapar-Olmos and Seema, 2018) and qualitative (e.g., focus groups) research methods.

A general and frequent critique of ESRSs is that they may only increase interaction etc. due to novelty, rather than there being a positive effect of the ESRSs themselves (Thapar-Olmos and Seeman, 2018). Over time, this novelty could diminish (e.g., Landrum, 2015), and thus, beneficial effects may no longer be found. Measures can be implemented in future research to investigate this.

In summary, overall findings suggest that PE had positive effects on undergraduate psychology students' experience in lectures. Thus, such ESRSs should be considered for use in this context. However, it must be noted that this is a limited small-scale intervention project. It has still provided valuable professional development and will now help inform future pedagogical action research. Further research is required in general (e.g., as recommended by Landrum, 2015).

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