Online pre-laboratory exercises enhance student preparedness for first year biology practical classes

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Introduction
Without effective preparation for practical classes, students are at risk of "information overload" as they attempt to simultaneously come to terms with novel technical or manipulative tasks as well as learning new concepts. Design of learning activities must take account of students' preferred learning styles.

Pre-laboratory preparation is one effective way to reduce cognitive load and to increase meaningful learning during laboratory classes.

We designed on-line multi-media pre-laboratory exercises (Pre-labs) to support dissection-based practicals in a first year biology unit.

Student comments about Pre-Labs
• "The pre-labs made me able to know what I was looking for even before I came to the lab. This meant that looking at the prelab for 30 mins saved me an hour in the lab.'"
• "It made me feel more confident in what I was expected to do and how to do it".
• "Gave me better understanding of how to start and finish the prac appropriately".
• "It was very good to see what we would be looking at before we came to class, so we could prepare and know what the real specimens look like."
• "......really help to orientate before lab classes".
• "I found printing them out and referring to them in class was even better".
• "...could see if yours was not looking right!"

BEFORE the pre-labs
• only 15% of students reported that they did a substantial amount of preparation for practical classes (4 or 5 on a Likert scale of 0-5)
• only 22.4% felt very well prepared for that prac class
• most prefer to see or be shown what to do

More students reporting feeling well-prepared for practical activities increased after (black) compared with before (white) the introduction of Pre-Labs

% Use of on-line resources over entire semester

Pre-lab. Exercises indicated by ☀