



Understanding the design and analysis of biology experiments: A study with third-year undergraduates.

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Abstract

Biology undergraduate students need to participate actively in laboratory research and projects. To prepare them for this, it is important to give them a strong foundation in how to read research papers, how to design experiments, perform data analysis, critically assess published data, and present research seminars. This poster explores how we incorporated these into the laboratory component of a third-year Developmental Biology course. Students were first assigned a practice paper, instructed on the structure of a research article, and provided discussion questions to guide their reading, and assigned open-ended challenge questions to have them explore and design follow-up experiments. The students were then split up into groups and assigned different research papers related to the lab experiments which they had to read and present. Students were also given structured guidelines and sample slides showing how to design a research presentation, which they used to create their own presentations. Student surveys showed that this lab-related activity greatly helped them to understand the nuances of lab work, learn about a broad range of experimental methods, design experiments, interpret scientific data, and appreciate the overall process of scientific research and dissemination.

Keywords: scientific literacy, critical reading, presentation skills

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