Abstract Topic Category: Teaching

Making a Case for Using Simple, Non-technical Language and Analogies When Using Technology to Teach Physiologic Concepts

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Introduction: The use of technological innovations in teaching physiology has increased dramatically in the past few decades, and many of the same technologies used for physiology teaching are a part of the clinical standard of care. For this reason, pre-health students in physiology programs need a comprehensive understanding of the technology, the physiological principles behind it, and its clinical relevance. However many students, especially at the undergraduate level, might not have had the courses necessary to understand the underlying principles of the technology prior to being introduced to it. This is especially true in cardiovascular physiology in relation to the electrocardiogram (ECG). Students are often tasked with reading ECG's and diagnosing a clinical condition without having a baseline understanding of electrical theory necessary to truly understand the ECG. Providing a non-technical analogy to improve understanding of the underlying principles could help students grasp the necessary concepts.

Objective: To determine if the use of a simple, non-technical lesson related to the concepts underlying ECG technology, instead of a lesson using the technical jargon and specifics of the ECG, would improve undergraduate student understanding of its clinical use.

Material and Methods: Three separate anatomy and physiology laboratory sections were taught the basics of cardiovascular physiology. The individual lab sections were then taught by an instructor who introduced the concepts of the ECG using one of three conditions; non-technical, simple analogies about photography and baseball to teach principles of ECG (n = 17); technical aspects of electrical theory underlying ECG (n = 19), or textbook provided lecture material (n = 17). Following these ECG introductions, the students partook in standard ECG laboratory activities including electrode placement and identification of basic waveforms. Following the laboratory, students were given a written quiz on their understanding of ECG theory.

Results: Results of the quiz suggested that the students who were first introduced to analogies about baseball and photography that were seemingly unrelated to ECGs, understood ECG theory and could identify waveforms and basic ECG concepts equally as well as students who had learned the technical aspects of electrical theory relating to ECG. Interestingly however, post laboratory follow-up indicated that students who had been taught using the non-technical language indicated that they enjoyed the laboratory more and felt they better understood ECG theory than those who had learned the technical aspects prior to the lab.

Conclusions: These results suggest that well-crafted, non-technical teaching styles that students enjoy can be equally effective in teaching complex technological concepts in physiology.

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