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Designing Effective E-learning Modules: Exploring Best Practices in Module Navigation

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Purpose

Knowledge transfer from coursework to clinical practice can be challenging for healthcare students.¹ Many of today's healthcare students are part of Generation Z (individuals born after the mid-1990s) and often Gen Z students prefer self-paced, engaging learning methods that supplement lecture content.² E-learning can be an effective tool for enhancing both student application and confidence.^{1,3} For example, medical students who used e-modules to learn to read EKG reports showed greater effectiveness in short-term memory consolidation than traditional lectures.⁴ While it is widely accepted that e-modules are a valuable teaching tool for healthcare students, little evidence exists to show what design features are the most effective for students and faculty.⁴

The purpose of this study was to determine if controlling how students navigate through an e-learning module impacts learning.

Number of Subjects

A convenience sample of 62 students enrolled in a neuromuscular physical therapy course.

Materials and Methods

An e-learning module was designed to aid students learning of the Rancho Los Amigos Cognitive Scale for brain injury rehabilitation. Two versions of the e-module were created with differing navigation through the module. In the first version (v1), students learned all ten levels of the scale, followed by learning intervention strategies for all levels. A second version (v2) was developed in which students learned a few levels (lower, middle, or upper), followed by an immediate introduction to appropriate interventions for individuals within each category.

Second year entry-level DPT students were randomized to either v1 or v2. Students received the same quiz at the conclusion of either version of the module as well as the identical questions on a unit exam. An independent sample t-test was used to compare the mean scores between the module groups for both the quiz and the exam to assess immediate understanding and long-term retention. A p-value of <0.05 was considered statistically significant.

Results

There is no statistically significant difference in the mean quiz score between students who completed v1 and students who completed v2 ($p=0.82$). Mean quiz score for v1 was 95% compared to 96% for v2. Similarly, there is no statistically significant difference in exam scores between groups. Mean exam scores for v1 were 93.3% compared to v2 which was 91.9% ($p = 0.47$).

Conclusions

While current evidence supports that Gen Z students prefers to learn through self-paced, interactive methods and often report a preference for e-modules compared to classroom learning; it is still not known what the best practices are for module development to maximize understanding and retention.¹ Based on this study, it is evident that the organization of the content, or navigation through the module, does not seem to impact student learning, either immediate understanding as assessed through the module quiz, nor retention as assessed through the unit exam.

Clinical Relevance

Faculty consistently work to determine best practices for educating students. Since it seems as though navigation style is not a critical element in design, perhaps allowing student-directed navigation may be a more relevant consideration during module development.

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