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LETTER

Evaluating the Transformative Impact of Online Education on Medical Student Learning Outcomes [Letter]

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Dear editor

Upon reviewing Alshammari et al[1] study with great interest, we would like to commend the authors for addressing a critical issue— exploring the quality and effectiveness of medical education during the unprecedented shift to online learning. This study compared the effectiveness of online versus on-campus learning, finding that while online learning initially produces comparable outcomes, it struggles to maintain student engagement and comprehension over time.

The authors employed a randomised experimental design focused on early years medical students. This method not only minimises bias but also provides strong control over key variables such as lecture content, delivery, and timing of assessments. Using a mixed methods approach did allow the authors to get a richer data set, being holistic of the factors affecting online education.

The study's statistical rigor demonstrated through tools like the Mann–Whitney and Shapiro–Wilk tests, strengthens the validity of its findings.[2,3] Another strength is the decision to administer the tests without prior notice, which eliminates preparation biases and offers a more accurate reflection of lecture-based retention.

We were particularly intrigued by the impact of online education on higher-order thinking, especially in relation to the deductive reasoning questions. If expanded or replicated, this research could offer valuable insights about the ability of online platforms to cultivate clinical competencies including critical thinking and complex problem-solving skills—elements essential in medical education. Given that this study primarily focused on early-year students, it is unclear how these findings would translate to clinical years, where hands-on skills and patient interaction become increasingly important.

The use of SPSS-22 is appropriate for the randomised experimental study as it allows the comparison of two independent control groups and supports advanced statistical analysis of these. The study conducted a 10 question multiple-choice test proportionally covering each section of the lecture. One concern to note is the small number of questions used in the test which may not be sensitive enough to effectively differentiate differences in student's knowledge. This could increase the type II error risk, which may not detect variation in knowledge that does exist. Improvements can be made by testing end of year exam question numbers to ensure that they are at an appropriate level and assess longer term retention.

Another concern, which the authors have acknowledged is the potential for the Hawthorne effect. The impact has been reported in a meta-analysis where an individual's performance on a neuropsychological test was significantly diminished when being observed.[4] More longer-term objective measures should also be used such as end of year exam results. Accounting for different learning styles can also with engagement – a study by Sabagh et al found a significant difference in engagement scores compared to the control group.[5]

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One potential direction for future studies could be the integration of a blended learning approach, which may help address the attention and retention challenges observed in online learning. We sincerely thank the authors for their insightful study on the impact of online education in medical training.

Disclosure

The authors report no conflicts of interest in this communication.

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