Birds of a feather flock together: the importance of seating location with active learning in the professional classroom

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Ask any professor to describe a “first-row student,” and you will likely hear a description of an engaged learner who pays attention during class, takes notes, and asks questions. A research study (3) from the 1980s has indicated that undergraduate students sitting in the front and center of the classroom score higher than other students. However, it is unclear whether this same trend would be seen among professional students. The rigorous admissions process for Schools of Dentistry, Graduate Studies, and Medicine selects only the highest-achieving students, possibly eliminating trends seen with classroom seating locations.

On the other hand, the recent incorporation of active learning in the professional classroom may make students more dependent on their classmates for success in courses. In the School of Dentistry at the University of Louisville, the Dental Physiology course is a basic science course for 120 first-year Doctor of Dental Medicine students. The course is taught using a systems-based approach with 11 different physiological systems. In a recent study (2), students were taught five of the physiological systems using traditional didactic lectures and six of the physiological systems using an engaging lecture format. In engaging lectures, also referred to as broken or interactive lectures, students are given short periods of lecture followed by “breaks” that may consist of minute papers, problem sets, brainstorming sessions, or open discussion. During these activities, students are encouraged to work in small groups to foster a collaborative learning environment. Students in a collaborative learning environment are dependent on classmates in their immediate vicinity; thus, any trends of classroom seating on achievement could have important effects.

Students in the Dental Physiology course voluntarily choose their seating locations in a classroom designated for all first-year dental school courses. The tables in the classroom are arranged in groups of four with stadium seating, as shown in Fig. 1. While there is no assigned seating, almost all students (indicated by circles in Fig. 1) choose to retain their seating locations throughout the semester. Students are assessed in the Dental Physiology course through daily quizzes, four unit exams, and a final comprehensive exam. Despite the rigor of the course, only two to three students typically fail the class each year. However, given the extremely high costs of graduate

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Fig. 1. Depiction of the classroom of the Dental Physiology course. Tables are indicated by rectangles, with each student location represented by a circle. Shaded circles represent students who failed the first exam of the course. The shaded circles with asterisks represent the student who failed the first exam and subsequently moved from group 32 to group 17. The shaded circles with Xs in group 32 represent students who failed the entire course.
education, it is still crucial to examine any potential causes of student failure. As described by Winston et al. (4), in professional programs, failure of the first exam in a course is highly predictive of failing the entire course. As shown in Fig. 1, all students who failed the first exam are indicated by the shaded circles. As supported by the previous literature, no students located in the front center of the classroom failed the first exam. While some failures were scattered throughout the classroom, interestingly, all students in group 32 failed the first exam. Given the classroom design, group 32 is highly isolated from the podium. After the first exam, one student in group 32 (represented by the center asterisk) voluntarily chose to move to the front of the classroom in group 17. The other members of group 32 chose to remain in their original seating locations.

At the conclusion of the course, all students successfully passed the course with a “C” grade or higher, with the exception of the two students marked by circles with Xs in group 32. This brings up interesting questions regarding the use of engaging lectures in professional classrooms. Students who are mutually struggling with the material may actually reinforce misunderstandings of the content with one another. This may be compounded by the fact that at-risk students may voluntarily choose to sit at locations that are isolated from interactions with the instructor. Students who failed the first exam but were surrounded by higher-performing students were all able to pass the class successfully. Thus, the collaborative nature of the engaging lectures may have allowed those students to correct their initial deficiencies or learn ways to more appropriately approach the material.

Perhaps one of the best indicators of the importance of seating location is the student who voluntarily moved from the back to the front of the classroom. Despite her failure on the first exam, she earned an overall “B” in the class. At the conclusion of the course, she nominated a student that sat next to her for an award, reporting the following:

Every morning of class, he would review content from the previous class with all the students who sat around him. He wanted all of us to believe we could do great in physiology and would review any topic with you that you may have been struggling with. He inspired me to do better in the class with his willingness to help me, and I can contribute a good portion of my comprehension of the content to him.

These statements strongly advocate the importance of peer mentoring in the professional classroom. A study (1) in the United Kingdom found that a peer-led teaching program for first-year medical students was positively evaluated by the students and resulted in small gains in overall student performance. It is worth noting that the School of Dentistry at the University of Louisville has a well-established academic support center, with free tutoring available for freshman students from upperclassmen. All students who failed the first physiology exam did participate in tutoring outside of the classroom throughout the semester. However, despite extensive tutoring sessions, the two students in the back of the classroom still ultimately failed the course. Thus, the present observations may suggest the importance of in-class peer mentoring with real-time application of the course material. Consequently, seating locations may play an important role with the use of engaging lectures in the professional classroom.

Although admission processes select the top students from a pool of applicants, there may still be “back-row” students who are considered at risk. Since students voluntarily choose their seating location on the first day of the course, this may indicate that back-row students begin the semester with a lack of initiative to interact or with a generalized lack of confidence in their abilities. While it may be difficult to ascertain the factors that entice at-risk students to sit in the back of a classroom, the present findings suggest a need for further examination and intervention. As the scope of the present study was limited to one class and a small sample of students, it would be useful to determine if similar trends are seen in other classes or in other professional programs who have adopted the use of engaging lectures. Since many medical, dental, and graduate programs are becoming increasingly reliant on active instructional techniques, this topic may become of vital importance to student success.

Future studies will focus on determining whether similar trends in classroom performance continue to exist over several years of the course as well as to evaluate the success of a professor-initiated intervention. The course director will rearrange seating locations after the first exam, with a primary intent to separate students from groups in which two or more of the members have failed the first exam. This intervention may be crucial for the success of back-row students who are reluctant to interact during the engaging lectures and expose any deficiencies in knowledge. Furthermore, it is understandable that these students would be hesitant to suddenly change seating locations on their own accord, as this could be interpreted as disrespect for their former group members and an infringement on the new group. With a professor-initiated change in seating locations, higher-performing students will have the opportunity to teach at-risk students, thus reinforcing their own content knowledge and comprehension of complex physiological phenomena. If the results of these interventions are positive, it is envisioned that a formalized, in-class peer mentoring system could be developed to help ensure the success of all students in the professional physiology classroom.

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No conflicts of interest, financial or otherwise, are declared by the author(s).

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REFERENCES