Original Research Article

Near-peer Facilitated Learning in a Dental School: A Student Reflection

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Abstract

Purpose: The purpose of this study was to examine the value of initial student near-peer directed study sessions for a dental school biomedical science core course.

Methods: A standardized pre-post questionnaire was administered prior to and immediately after the designated block of study sessions to collect subjective, experiential participant response to near-peer study sessions. Comparison analysis of participants' final grades in the course selected for coverage in near-peer study sessions was retrospectively performed.

Results: 17% of first year dental students voluntarily participated in the near-peer study sessions. Frequency of participation in the study sessions seemed inversely related to student confidence levels and grade achievement in the biomedical science core course.

Conclusions: Near-peer led study sessions in a dental school are valuable to students who enter dental school with low confidence in their pre-dental educational preparation. Survey instruments that gauge student confidence levels at baseline may be predictive of student need for near-peer or other additional learning opportunities.

Key Words: Basic sciences; Critical thinking; Dental school; Near-peer

Introduction

The transition to the academic rigors of professional school can be daunting for students. By nature and necessity, dental education today requires the acquisition of competence in both an ever-increasing body of scientific knowledge as well as technical patient-treatment skills. Overarching these often compartmentalized disciplines is the professional expectation of making connections within and across disciplines – our graduates must be critical thinkers and lifelong learners. As dental education moves pro-actively toward curricula that emphasizes higher-levels of learning to integrate the immense knowledge that must be acquired by our students, the challenge of transitioning to dental school is magnified for some.

The field of educational research has deeply investigated student-teacher relationships, the psychology of teaching, and other theories and principles in order to improve our education system. Peer assisted learning (PAL) has received attention in the literature in recent decades.[1] PAL can be generally defined as involving participants from similar social groups who are not professional teachers; these peers help each other in the learning process, a central component of which is teaching.[2] By extension, near-peer teachers are of similar social grouping as their target audience, but of a slightly more advanced academic/achievement standing.[3]

In response to the challenge facing new dental students, second-year dental students (as near-peer mentors) at the University of Texas School of Dentistry at Houston with an interest in teaching volunteered to establish unique weekly review sessions for first-year dental students. Significantly, although biomedical science curriculum was addressed in these sessions, the focus was not the content itself, but *how to learn* the content. This study was conducted to provide an initial impression of the value of near-peer led study sessions in a dental school biomedical science course. Thus, the following null hypotheses were tested with this study: 1) Students who participate in near-peer led study sessions will report no change in preparedness for didactic courses between pre- and post- questionnaire and 2) students who participate in near-peer led study sessions will not perform differently from students who do not participate in near-peer led study sessions.

Methods

Study population and recruitment: Institutional Review Board (IRB) approval from The University of Texas Health Science Center at Houston was received on August 30, 2013 (HSC-DB-13-0560). The entire first year DDS class (n=101) at the University of Texas School of Dentistry at Houston was presented the approved IRB invitation to voluntarily attend weekly near-peer led study sessions for the biomedical sciences core course. The primary aim of offering the near-peer study sessions was to assist interested dental students in the acquisition of core biomedical science knowledge. Because participation was drawn from a finite subject pool (first year DDS class) for these previously non-existent study sessions and was on a volunteer basis, it was not possible to predict a rate of participation. With this in mind, a more descriptive approach was taken to the study, and no power calculation was conducted to define a requisite sample size.

Near-peer study sessions: From September 9, 2013 through November 18, 2013 two-hour, near-peer led

study sessions were held on Thursday evenings (total of 10 sessions) at the School of Dentistry. Material from the biomedical sciences core course was the content focus for these sessions. Participants, who were first year DDS students and attending on a voluntary basis, were free to attend at whatever frequency they desired; a record of attendance was kept. Near-peer teachers (authors MHG and GDL) were second year dental students and maintained flexibility in the structure of proceedings for each session, but were intentional about emphasizing effective ways to learn the content (instead of simply the content itself). Generally speaking, first year DDS participants were clustered into groups of 2-3 and asked to engage in a variety of exercises related to the course content and their own level of understanding/confidence. Fluidity in approach to each session was essential, as the near-peer teachers relied heavily on participant feedback to guide activity.

Data collection and analysis: To collect subjective feedback regarding learning preferences, attitudes, and levels of confidence, a standardized questionnaire was created for participants. On each participant's first day of attendance in the study sessions, a pre-questionnaire was completed. And after the semester of study sessions was completed, all participants were followed up for a post-questionnaire. The pre-questionnaire and post-questionnaire were identical (Fig. 1).

For a more numerical comparison, final course grades for the participants in the biomedical science core course were compared in aggregate with the overall class average for the same course. All participant data was de-identified and stored by one investigator (RLQ) in a secure location. Descriptive statistics were used to analyze the aggregated questionnaire and course grade data.

Results

17 out 101 students in the first year DDS class attended at least one near-peer led study session. For data analysis, these 17 students were subdivided into three groups based upon number of study sessions attended: one session (n = 11), two or three sessions (n = 3), and four or more sessions (n = 3). On average, all groups reported an increased perception of their pre-dental school preparation and grasp of dental school curriculum when comparing pre- versus post-questionnaire responses (Tables 1-4); the students attending only one near-peer led study session reported a higher level of confidence in dental school readiness than those attending multiple sessions. With regard to numerical course average, study session participants on average achieved a lower biomedical core grade point (85.94/100.00) when compared with the class as a whole (87.69/100.00). Students who attended only one near-peer led study session out-performed the class average (89.27/100.00), while students attending four or more study sessions performed below the class average (79.33/100.00).
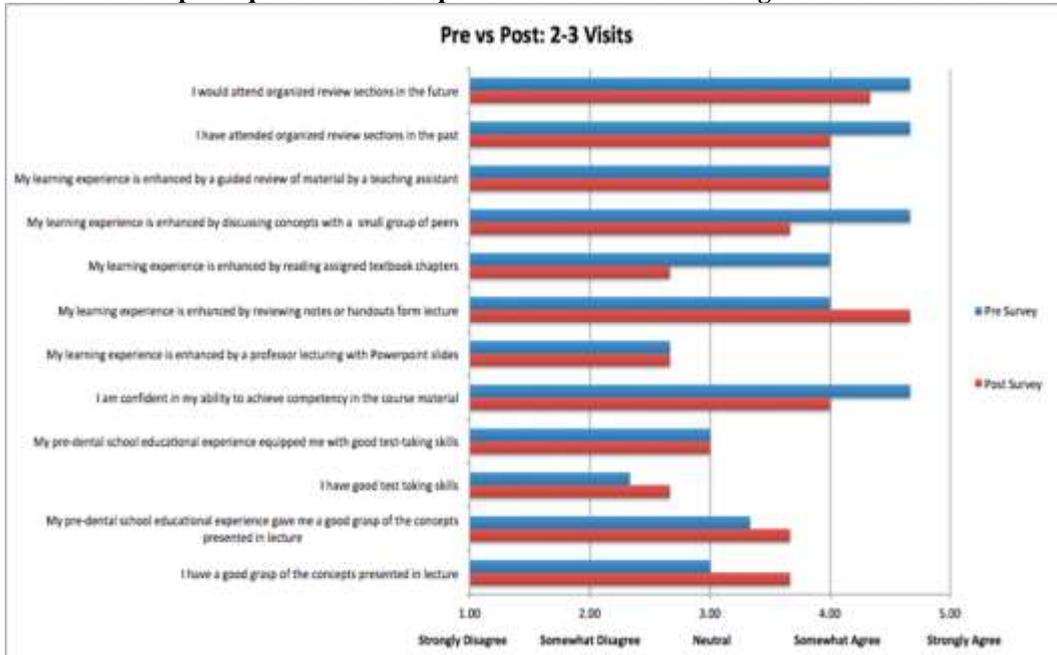
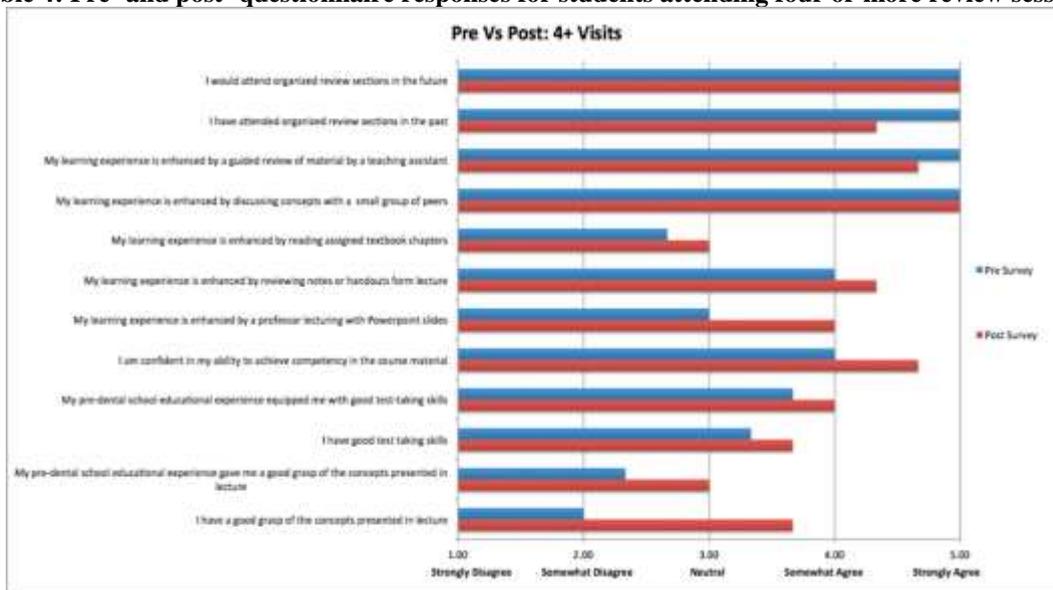**Table 1: Pre- and post- questionnaire responses for all participants**
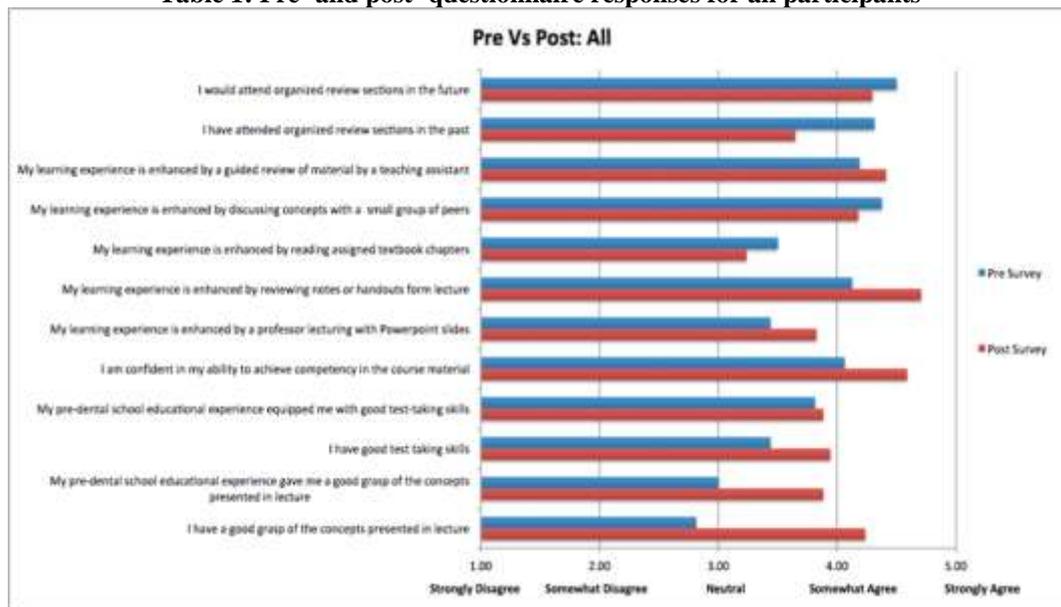
Table 2: Pre- and post- questionnaire responses for students attending one review session
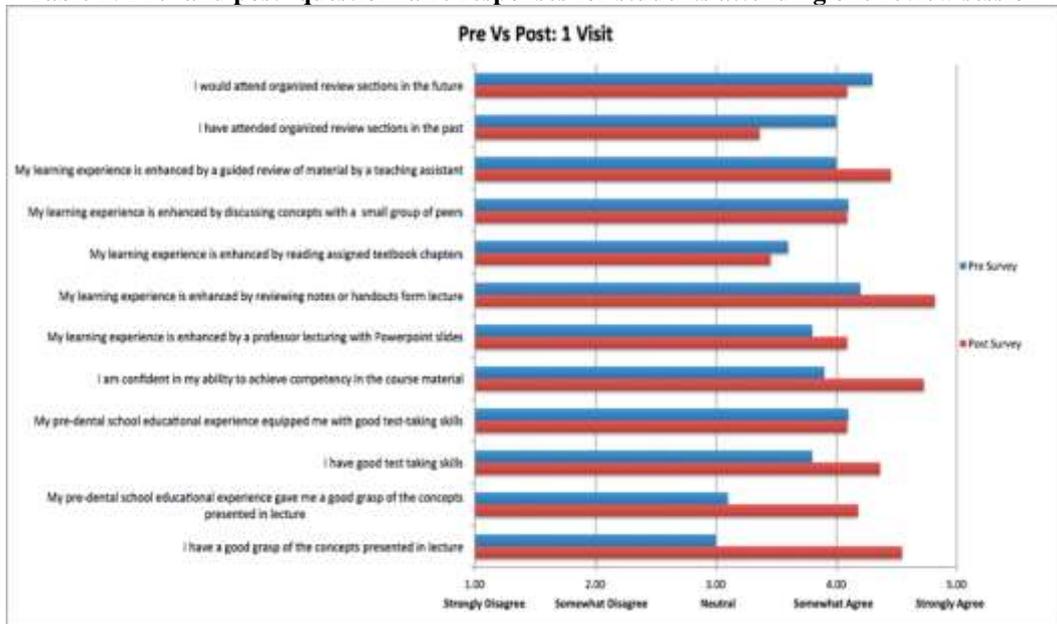
Table 3: Pre- and post- questionnaire responses for students attending two or three review sessions

Table 4: Pre- and post- questionnaire responses for students attending four or more review sessions

Discussion

This study reflects upon outcomes of voluntary participation in near-peer led study sessions for the biomedical sciences core course at a dental school. Because study subjects were drawn from a finite pool of 101 first year dental students, the participation rate of 17 was not enough to yield statistically significant results. As such, a limited approach to the study null hypotheses will be taken. The first null hypothesis, that students who participate in near-peer led study sessions will report no change in preparedness for didactic courses between pre- and post- questionnaire, is cautiously rejected – students on average reported an improvement in preparedness from pre- to post-questionnaire. And the second null hypothesis, that students who participate in near-peer led study sessions will not perform differently from students who do not participate in near-peer led study sessions, is also cautiously rejected – participants on average achieved a lower grade point for the biomedical core course than the class as a whole.

In assessing this study, and the near-peer led study sessions that it sought to evaluate, the relatively low participation rate was certainly a limitation. Because participation in the study sessions was strictly on a voluntary basis (from a maximum pool of 101 first year dental students), there might not have been much more that could have been done to increase the participation rate. However, it would have been beneficial to collect pre- post- questionnaire responses from the entire first year dental class, regardless of participation in the study sessions, in order to compare participant responses with non-participant responses.

Although there were limitations in this study, the results and experiences were still of value for future initiatives. To begin, it is noteworthy that the students who participated in the most near-peer study sessions (four or more sessions), while as a group performed the lowest in average grade point (79.33/100.00) for the biomedical sciences core course, also reported the lowest baseline confidence levels. When asked on the pre-questionnaire whether their pre-dental experience gave them a good grasp of content presented in the biomedical core course, as well as if they assessed that they had a good grasp of the material, this group on average responded "somewhat disagree" (2.0 out of 5.0) to both questions. Contrast these responses with those of the group of students who participated in the study sessions the least (one session only): this group outperformed the class average for the biomedical sciences core course (89.27/100.00) and reported a "neutral" (3.0 out of 5.0) assessment of pre-dental preparation and current grasp of content. The results of this study seem to indicate that near-peer led study sessions are most attractive to students with lower baseline confidence in their pre-professional preparation and/or their current grasp of the material.

While the notion that a student with lower confidence would be attracted to near-peer led study sessions may seem intuitive,[4] this study additionally suggests that a questionnaire given at baseline to assess confidence in academic preparation may be a helpful tool for identifying students that would benefit from such sessions (or other aids). Indeed, the students with the lowest baseline confidence in this study were also the lowest academic performers amongst the participants. This group attended the most study sessions (four or more). When asked if they had a good grasp of the material presented in the biomedical sciences core course, their pre-questionnaire response was "somewhat disagree" (2.0 out of 5.0). By the time of the post-questionnaire, this group's average response had changed dramatically to "somewhat agree" (3.6 out of 5.0). It would be reasonable to suggest that for these

students, the study sessions were very beneficial. Not surprisingly, when asked if they would attend organized review sessions in the future, their response was unanimously "strongly agree" (5.0 out of 5.0) on both the pre- and post- questionnaires. A baseline survey instrument, like the questionnaire used in this study, might be helpful for identifying low-confidence/low-performing students who would benefit from near-peer led review sessions.

Also of value in this study were questionnaire responses regarding classroom learning preferences. When asked on the pre-questionnaire if the learning experience is enhanced by a traditional lecture by the professor, the average response for all participants was between "neutral" and "somewhat agree" (3.5 out of 5.0). By contrast, when asked if the learning experience is enhanced by a review of the material by a teaching assistant, the average response for all participants was solidly "somewhat agree" (4.2 out of 5.0). This finding seems to support the concept of social and cognitive congruence.[5] The basic premise is that learners will be more interactive with a teacher/facilitator whom they perceive to be more "akin" to in social structure and level of intellectual attainment.[5] Thus, the students in this study might not have felt as congruent with the faculty course director for the biomedical sciences core because of differences socially (dental student versus professor) and cognitively (novice learner versus expert in the field).[6] However, the student participants likely felt more congruent with their near-peer review leaders, who themselves were dental students – the participants were more likely to ask questions in study sessions that they might not feel comfortable asking in a lecture scenario with faculty. The very nature of the participants' better congruence with the near-peer leaders, versus the faculty for the biomedical core course, opened the door for more interactive learning.[7]

Desire for interactive learning was another key trend in the participants' questionnaire responses. With regard to the question of whether the learning experience was enhanced by discussing concepts with a small group of peers, participants responded "somewhat agree" (4.2 out of 5.0) on average. It has been noted that learning is enhanced when learners have an active, collaborative relationship,[8-9] and this study seems to affirm the realization of this concept by participating students. With this in mind, weekly near-peer led review sessions were purposely interactive. Near-peer facilitators, instead of standing before participants and lecturing on content, chose instead to create exercises for students to ask questions and arrive at answers/conclusions collaboratively in small groups.[10] Especially of interest to near-peer review session leaders was emphasis on critical thinking in learning, as described in various learning taxonomies.[11-13] Thus, near-peer review leaders utilized active learning strategies with an emphasis on critical thinking – the

aim was to teach the participants *how* to learn (versus simply "spoon-feeding" them course content).

Finally, a possibly unforeseen benefit of this study was reflected in the near-peer review leaders themselves. As dentists-in-training, these future professionals had an opportunity to get a glimpse into two aspects of faculty life – teaching and scholarship. Given the ongoing challenge of faculty shortages in academic dentistry,[14-16] this initiative may serve as a pipeline for future dental scholars. The near-peer leaders had an interest joining the faculty ranks in the future prior to this study, and the opportunity to engage in interactive teaching and educational research allowed these students to confirm their continuing interest in some type of academic post during their career.

Conclusions

Near-peer led study sessions in a dental school are valuable to students who enter dental school with low confidence in their pre-dental educational preparation, and survey instruments that gauge student confidence levels at baseline may be predictive of student need for near-peer or other additional learning opportunities. There seems to be a preference amongst the dental students surveyed in this study for interactive learning opportunities facilitated by peers with a high level of congruence.

Acknowledgements

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