

# Utilizing Proximity for Increasing Student Knowledge Retention: A Near-Peer Tutoring Program Needs Study

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## Abstract

**The purpose** of this study was to demonstrate the desire and need for peer-to-peer tutoring programs at Division 1 Dell Medical School at the University of Texas.

**Materials and Methods.** Two sets of surveys were created and sent to students at the Dell Medical School, University of Texas, USA. One survey asking about the need or desire to engage with a peer tutor was sent to first-year students, and another one asking about the desire to provide these services to underclassmen as a potential leadership course option was sent to third-year students.

**Results.** For the first-year student survey, 52.9% of respondents disagreed or strongly disagreed of being aware of near-peer tutoring and 70.5% of respondents either agreed or strongly agreed that it would be an option utilized by students. For the third-year student survey, 75% of students either disagreed or felt neutral in being aware of near-peer tutoring as an option to serve underclassmen, whereas 65% of upperclassmen either agreed or strongly agreed that if near-peer tutoring had been offered, they would have chosen this leadership course option in the effort to teach their underclassmen peers.

**Conclusions.** Numerous studies have demonstrated peer-to-peer tutorial options to be of high utility to students in the medical education space. This particular paper obtained results demonstrating students' desire to engage in peer tutoring voluntarily for their own course success goals and upperclassmen's desire to participate as near-peer tutors for the benefit of underclassmen.

## Keywords

Peer-to-Peer Tutoring; Near-Peer Tutoring; Tutorial; Medical Education; Quality Improvement Project

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## Introduction

Over the four years of undergraduate medical education, students often struggle with understanding, learning, and retaining the material. This particular problem often grows as missed material leads to larger gaps in the educational foundation that the Doctor of Medicine provides for later medical practice. This can be seen with the increased number of fatalities directly linked to lack of education on fluid management [1] – a fundamental concept in medicine that is rarely directly taught [2]. Throughout the years of medical education, several interventions have been designed and implemented, from flipped classrooms to self-directed learning and supplemental video and flashcard materials. Nevertheless, these pale in comparison to the tried-and-true practice of peer-to-peer education summed up in the classical (or at some institutions, infamous) medical school motto,

“see one, do one, teach one” [3–8]. Numerous studies have demonstrated the utility and effectiveness of peer-to-peer tutorial sessions and the ability they have to improve learning of both the tutor and those who are being tutored [3–12]. Peer tutoring has been utilized at several academic centers and in numerous programs around the globe [3–12]. As defined by the article by Shenoy and Petersen [15] and the article by Olausson A *et al.* [16], the program proposed for use here would be a near-peer tutoring (NPT) endeavor, in which, for our study in particular, senior medical students removed from having taken the courses would act as near-peer tutors for students. The rationale for using this method is social benefit [15], psychological benefit [18], and increased student access to individuals who have recently learned the same material. This particular program is hoped, after implementation, to improve near-peer tutors'

performance, helping them in overall learning the material necessary to practice clinically, as seen with the NPT program at the Technical University of Munich [17].

At the Dell Medical School, third-year students are required to spend a minimum of 20 hours acting as a teacher's assistant in the anatomy laboratory, as facilitators in the problem-based learning course for first-year students, and/or class facilitators for the interprofessional experience course. This particular paper looks to demonstrate students' desire for peer-to-peer education through such NPT program at Division 1 Dell Medical School in Austin, Texas, specifically by establishing a peer tutoring option for third-year students.

## Materials and Methods

This study was developed utilizing well-accepted methodologies for the creation of cross-sectional surveys for population data as detailed in the study by Setia M [14].

### Study Design

The study was a cross-sectional survey given to first- and third-year students at the Dell Medical School (over the first week of March 2022) to see their desire to participate in a peer tutoring program as students being tutored during the first year of medical school or as peer tutors during the third year of medical school. Questions were designed around knowledge of such programs, the desire to interact with peers in such a manner, and a perception of need by the different student populations. Two different surveys were created, one for first-year students and another for third-year students. The students were given the opportunity to anonymously respond to the survey questionnaire over the period of one week.

### Study Population

The study population was made up of the sum total of forty-seven first-year students and the sum total of forty-nine third-year students. Because of the small nature of the student population at the Dell Medical School, the entire student population within each of the classes was solicited for involvement in the study.

### Survey and Data Collection

For this particular study, the survey on the need and desire for a peer-to-peer educational service created using Google Forms was distributed via email and Slack® (an app-based messaging system) to forty-seven first-year medical students at Division 1 medical school (Survey 1). The survey asked questions about incorporating a peer tutor as a part of leadership course requirements at the medical school. These surveys were sent around the midpoint of the second semester to give students time to reflect on the year-to-date and what they would have liked to change about their third-year service experience and first-year educational experience.

Survey 1 questions were framed as statements, with respondents using a 5-point Likert scale ("Strongly Agree", "Agree", "Neutral", "Disagree", "Strongly Disagree"). Questions on the students' desires for using upperclassmen peers

to provide tutorial services either in one-on-one sessions or in large group sessions were provided. Questions included in the survey were as follows:

- Access – "I am aware of peer tutoring options in case I want academic support from an upperclassman";
- Desire – "If peer tutoring was offered, I would use it";
- Success of similar peer tutoring processes – "Upperclassmen anatomy lab peer mentors were helpful for my learning".

An additional question geared at understanding the attitudes of those responding to the survey was also included. These qualitative data were collected by inquiring "Please share any additional thoughts or concerns you have on adding a "Peer Tutor" option to the leadership course below."

Secondarily, another survey on the desire to assist in peer tutoring services (Survey 2) as a teacher's assistant in the anatomy laboratory (minimum of 20 hours, acting as facilitators in the problem-based learning course for first-year students, and/or class facilitators for the interprofessional experience course) was sent to third-year medical students. Questions were designed to reflect the survey distributed to first-year students, inquiring about:

- Access – "I am aware of peer tutoring options in case I want to volunteer to tutor underclassmen";
- Desire – "If peer tutoring had been offered as an option for the leadership course, I would have chosen it";
- Availability – "I found it easy to obtain the required 20 service hours for the leadership course".

An additional question geared at understanding the attitudes of those responding to the survey was also included. These qualitative data were collected by inquiring "Please share any additional thoughts or concerns you have on adding a "Peer Tutor" option to the leadership course below." Additionally, third-year students were asked which of the different major courses (the Anatomy Laboratory course, the DOCS – Doctoral Skills course, or the PIL-LARS – Case-Based Learning course) they had worked in as volunteer mentors.

### Inclusion and Exclusion Criteria

Students' responses were included in the study only if the study participant filled out the Google form and completed the appropriate form for their respective year (first or third year of medical school). There were no incomplete forms, students of the respective classes indicated that they were in their respective classes (first or third year) and, therefore, none of the collected data was excluded from the analysis.

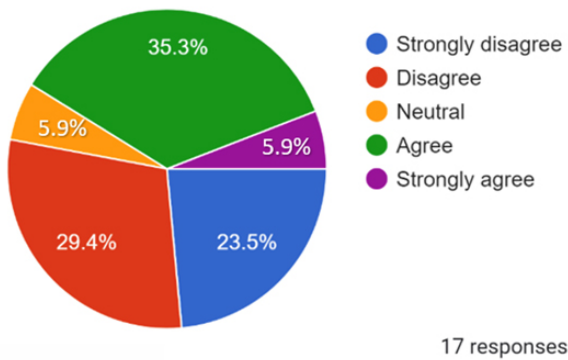
### Data Analysis

After obtaining the completed Google Forms, the data collected were presented in the form of pie charts and a bar graph to best portray the student percentage per question response; the parallel coordinate charts were used to reflect the interrelations of answers. No further statistical testing was performed as this was deemed unnecessary for the scope of the project.

## Results and Discussion

For the survey distributed to the first-year medical school class (age range from 21 to 31 years, with 64% of students being women), 17 out of a total of 47 possible responses were received. Of these 17 responses, a total of 52.9% of students either disagreed or strongly disagreed of being aware of peer tutoring as an option for academic support at this institution (Fig. 1). In comparison, 70.5% of respondents either agreed or strongly agreed that if peer tutoring was offered, it would be an option utilized by students (Fig. 2). Lastly, 100% of respondents reported that upperclassmen anatomy lab mentors were helpful for their learning to some degree, with 76.5% of students strongly agreeing and 24.5% of students only agreeing (Fig. 3). Further examination of the data demonstrated that first-year students reported increasingly positive attitudes to both utilizing the NPT program and previous experiences with upperclassman mentorship in different courses (Fig. 4).

*I am aware of peer tutoring in case I want academic support from an upperclassman*

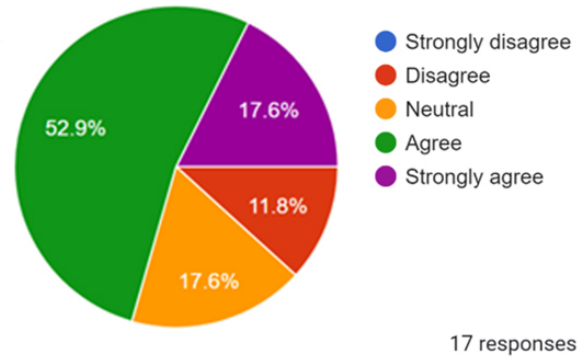


**Figure 1.** Students’ responses to the statement “I am aware of peer tutoring in case I want academic support from an upperclassman”. Over 50% of respondents reported that they were unaware of peer tutoring as an option available for students.

For the survey distributed to the third-year medical school class (age range from 20 to 36 years, with 58% of students being females), 20 out of a total of 49 possible responses were received. Of these 20 responses, a total of 75% of these students either disagreed or felt neutral in being aware of peer tutoring as an option to serve underclassmen (Fig. 5). In comparison, 65% of upperclassmen either agreed or strongly agreed that if peer tutoring had been offered, they would have chosen this leadership course option in the effort to teach their underclassmen peers (Fig. 6).

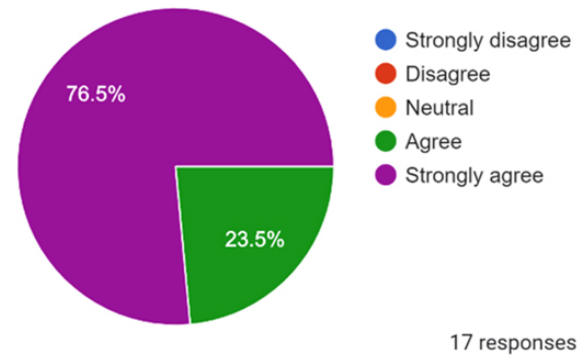
Additional open-ended questions in either survey explored the first- and third-year students’ attitudes towards the Medical School current one-on-one or small group leadership course options, including positions such as anatomy lab mentors, clinical skills course mentors, case-based learning course facilitators, and finally, other mentorship positions. These results indicated that 100% of first-year

*If peer tutoring was offered, I would use it*



**Figure 2.** Percentage of students’ responses to the statement “If peer tutoring was offered, I would use it”. Over 50% of respondents demonstrated a willingness to explore peer tutoring as an option for their individual academic support needs.

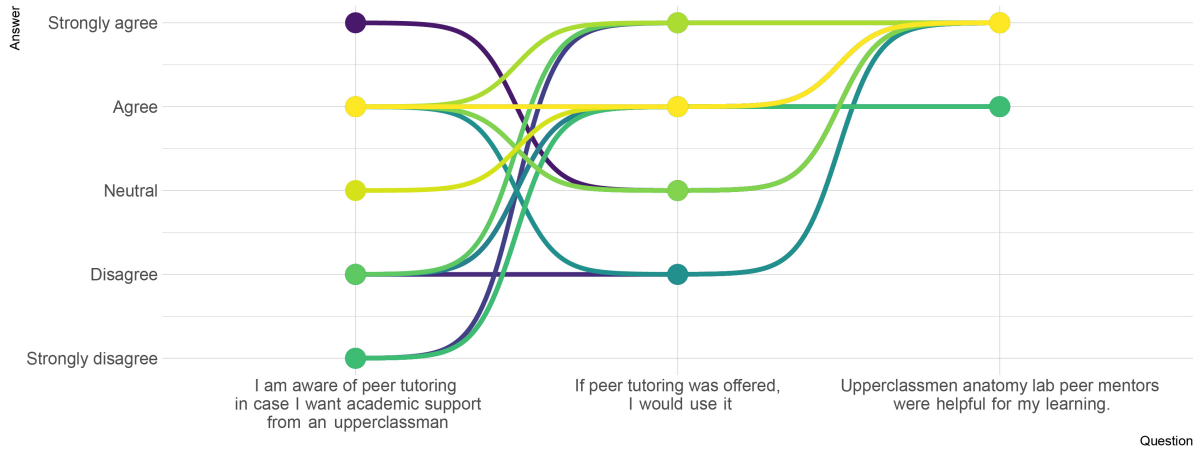
*Upperclassmen anatomy lab peer mentors were helpful for my learning*



**Figure 3.** Percentage of students’ responses to the statement, “Upperclassmen anatomy lab peer mentors were helpful for my learning”. All (100%) the respondents reported that upperclassmen anatomy lab mentors were helpful for their learning to some degree, with 76.5% of students strongly agreeing and 23.5% of students only agreeing.

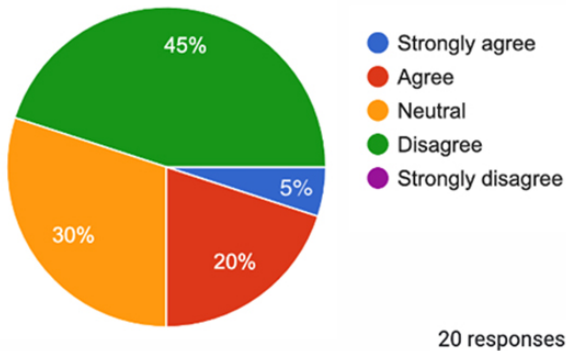
respondents agreed to interact with anatomy lab mentors as compared to third-year students in other leadership positions (Fig. 7). As with the survey of first-year students, further examination of the data showed that third-year students demonstrated some positive attitudes to acting as a near-peer tutor to underclassmen and a split in their attitudes towards being able to find enough service opportunities to fulfill the required 20 hours of service for their leadership credit (Fig. 8).

Across both the first- and third-year student surveys, qualitative results demonstrated overly positive feedback towards the future possibility of adding peer tutoring as an option to the third-year leadership course curriculum.



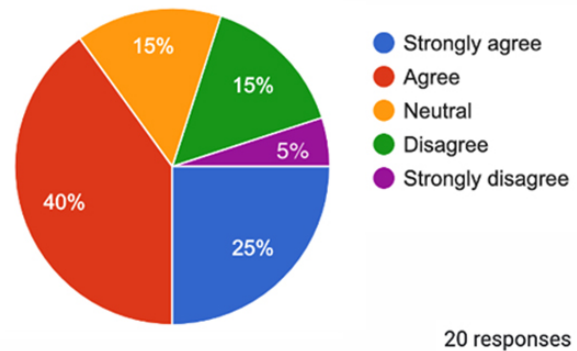
**Figure 4.** Attitudes of individual students answering questions as they progressed through the survey. It is worth mentioning that first-year students reported positive attitudes to both utilizing the NPT program and previous experience with upperclassman mentorship in different courses.

*I am aware of peer tutoring options in case I want to volunteer to tutor first- or second-year students*



**Figure 5.** Percentage of students’ responses to the statement “I am aware of peer tutoring options in case I want to volunteer to tutor first- or second-year students”. In total, 75% of respondents were unaware of peer tutoring as an option available for students.

*If peer tutoring had been offered as a leadership course option, I would have chosen it*



**Figure 6.** Students’ responses to the statement “If peer tutoring had been offered as a leadership course option, I would have chosen it”. A total of 65% of respondents demonstrated willingness to explore peer tutoring as an option for academic support for underclassmen.

Such a program has had success at a number of different institutions as listed and described by Shenoy and Petersen [15] in their literature review. The implementation of this particular option for students is to ensure that individual students are able to access a near-to-peer mentor which will help reduce anxiety [18], improve connectivity within the institution [15, 16], and improve learning the material for those in the courses [17]. Other social benefits can include the creation of long-lasting bonds with the individuals receiving tutoring, increased retention of the material by both parties, the subjective feeling of a more supportive environment, and, finally, practice in teaching for those providing tutoring [15]. Several students provided enthusiastic support of peer tutoring at the institutional level, highlighting the importance of developing leadership skills,

as well as teaching ability as tenets of medical professionalism [19, 20].

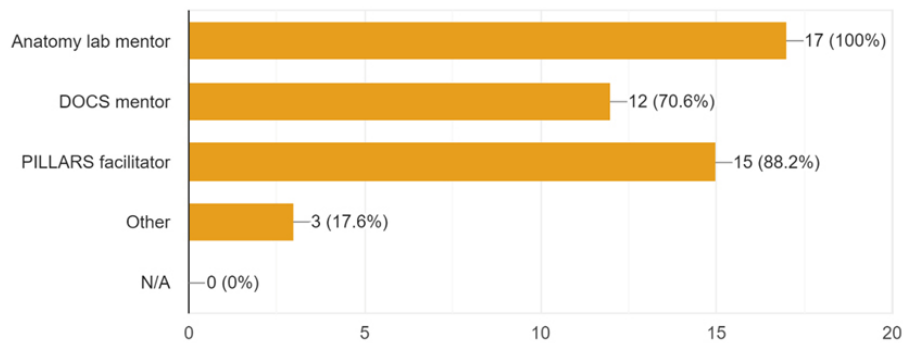
### Limitations

This study is limited by the number of possible participants (47 eligible first-year students, and 49 eligible third-year students), and the non-response rate (for survey 1 – 63.8%; for survey 2 – 60%). Thus, this study is limited by non-response bias, as only those students who are most interested in a peer tutoring program may be motivated to participate. Furthermore, interest in a program indicated via survey is not always predictive of actual student participation in a given program.

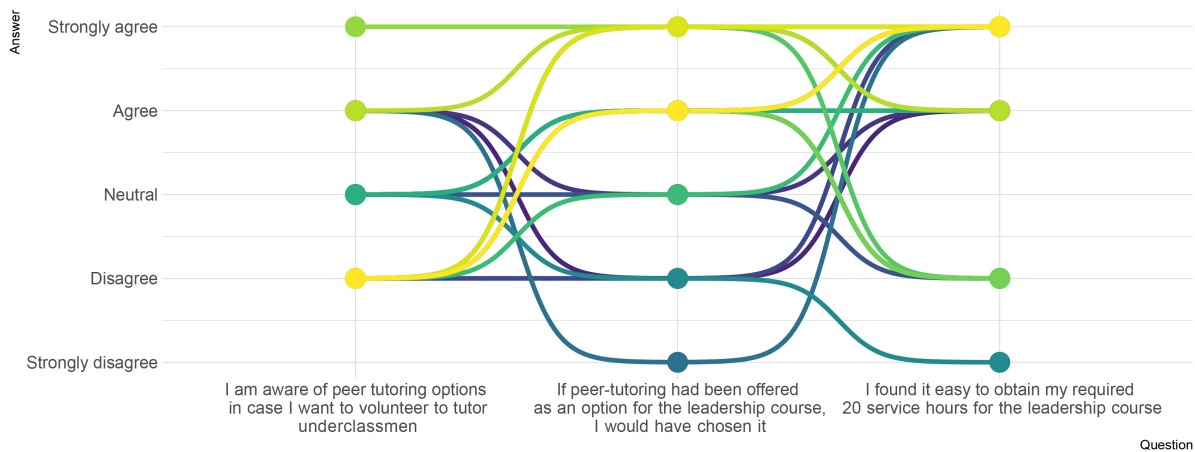


*I have interacted with the following upperclassmen mentors in:*

17 responses



**Figure 7.** Percentages of first-year medical students who previously interacted with third-year medical students being in leadership mentor positions. The options allowed multiple responses to record the interactions in the Anatomy Laboratory course, the DOCS – Doctoral Skills course, or the PILLARS – Case-Based Learning course. The anatomy lab mentor was the only position that received 100% prior to one-on-one or small group interaction.



**Figure 8.** Mixed attitudes of third-year medical students towards service as a near-peer tutor for underclassmen and the relative difficulty in performing the required 20 hours of service for medical school leadership credit. The responses of the individuals were taken and mapped as students completed the survey questions.

### Future Directions

A formalized, institutionally supported peer tutoring program was proposed to the Undergraduate Medical Education Subcommittee of the Scientific Foundations Committee of the Medical School. If approved and implemented, the program is projected to begin in the 2022-2023 academic year. The piloting peer tutors of the program and first-year students (peer tutored) will be offered follow-up surveys to assess the success of the program on six key dimensions:

1. comparison studies on the effectiveness of the program on student success;
2. perceived and actual effect on upperclassmen performance on board examinations and perceived teaching abilities;
3. perceived effect on upperclassmen professional development;

4. perceived and actual effect on underclassmen performance on first-year test scores;
5. perceived effect on inter-class dynamics;
6. percentage of students participated in the program.

### Conclusions

Peer-to-peer tutorial options have been demonstrated in numerous studies to be of high utility to students in the medical education space. This paper demonstrated students' desire to engage in peer tutoring voluntarily for their own course success goals and upperclassmen's desire to participate as peer tutors for the benefit of underclassmen. It is the strongest recommendation of the authorial team that this type of work be replicated and pushed forward in other academic institutions to improve the resources available for students to achieve their academic success goals. Only through providing all the necessary resources

these students can begin the work of moving away from memorization and only multiple choice-based approach to memorizing content and beginning the work of actual learning the materials as was initially intended by the work of Sir William Osler and Dr. Abraham Flexner.

### Ethical Statement & Informed Consent

Informed consent for participation in this survey was gained from all the students. All student responses were collected anonymously, and no identifying data were retained by the collection form to ensure the anonymity of the respondents. No further ethical clearance was determined to be necessary by the Undergraduate Medical Education Subcommittee as the survey was not made mandatory, students were allowed to leave at any time, and only perceptions of need or desire to help were garnered. No information relating to the students' identification including name, age, gender, ethnicity, or sexual orientation was collected.

### Acknowledgments

The authorial team wants to acknowledge Zachary Merhavy, Cheney Merhavy, and Jack Ding for their push towards the creation of programs and curriculum to help students. Their dedication and love of teaching inspires us to “see one, do one, and teach one” also.

### Conflict of Interest

Johnathon S. Lueck: Nothing to disclose.

Thomas C. Varkey: is an Adjunct Professor at Grand Canyon University and receives payment for his teaching and grading; he is a resident physician at the University of Arizona at Phoenix; he is the Resident Representative of the MS section of the AAN; he serves on the board of editors for ProClinS Cardiology and Current Medicine.

Daniel Ramirez: Nothing to disclose.

### Financial Disclosure

The authors declared no financial support.

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