The Use of Peer Psuedofacilitators & Revised Bloom's Hierarchy in Evaluating Course Material Confidence and Student Grades

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ABSTARCT & INTRODUCTION

Systemic physiology requires students to integrate information with real life applications. This type of learning requires students to access multiple levels of cognition. Studies showed that engagement with high levels of Bloom's taxonomy of cognitive learning objectives can positively affect students' learning. The population are students who are enrolled in Peer Assisted Learning (PAL), and Systemic Physiology. In this study, students are asked to create questions relevant to the unit which were scored, following the revised Bloom's taxonomy classifications. The questions are then scored on a point value, out of five. One is defined as "containing little to no critical thinking and understanding of that unit" to five "exceptional understanding and critical thinking of that unit." The point value system is to measure their critical thinking when generating questions on the course material. Students are then asked to "pseudo facilitate" to help gain their confidence in their ability to understand those concepts. The PAL student's test scores are then compared to each other and the class average. This research is intended to show a greater academic performance for those that scored a higher point value when measured according to the revised bloom's taxonomy classification hierarchy. Results have shown that there is no correlation to PAL student's question point value to their academic performance.

METHODOLOGY

Participating PAL classes were divided into six intervention groups and one control group. Beginning of the third week of classes, students in the intervention groups were tasked to write sample exam questions based on their current course material. Each student was required to write one question per week, and within the same week, students randomly chose one question to facilitate themselves. Throughout this process, facilitators were expected to be impartial as to not lead the students into designing questions in a particular way. At the end of the class session, all written questions were collected. Once cumulated, two facilitators categorized these questions using a point system and evaluated the complexity based on Bloom's Revised Taxonomy.

One point was given for questions that checked for understanding of concepts and ability to comprehend definitions and basic explanations. Three points were appointed for application questions, which requires a deeper understanding of the material and analysis of multiple physiology processes formed into a single question. Finally, five points were allocated for synthesis questions. This type of questions required students to build off compound concepts by generating their own scenarios. Each of the two facilitators graded the questions individually and compared the results afterwards between each other. If both facilitators do not have the same scores, a third facilitator's scoring will be accounted for, and average score will be taken. This is done so to remove any bias and to systemize the scoring method. Once the scores were tallied across all participating sections, exam scores of participating students were assessed and averaged. This average, also referred to as PAL Average, is then compared to the class average of each BIO 131 section (see Figure 1 and 2). In the final week of instruction, participating students are provided with a survey to assess their confidence in this activity.

RESULTS

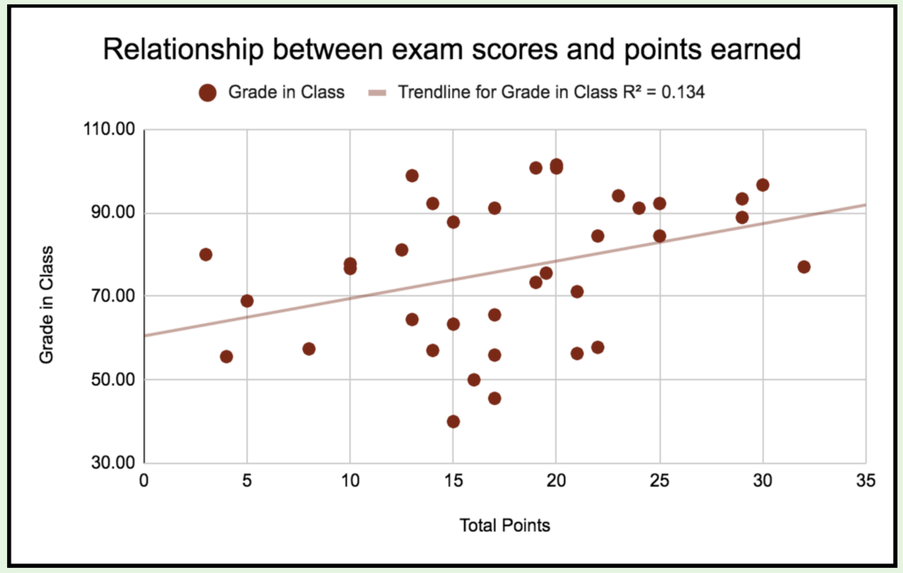

Figure 1. Relationship between scores and points earned based on revised Bloom's taxonomy. The graph shows that most students earned 13-22 points from their generated questions. Student's grades are obtained via the Canvas gradebook and comprise of Exams 1 and 2. Low R^2 value indicates high variability between the points students scored and their exam scores. n=39.

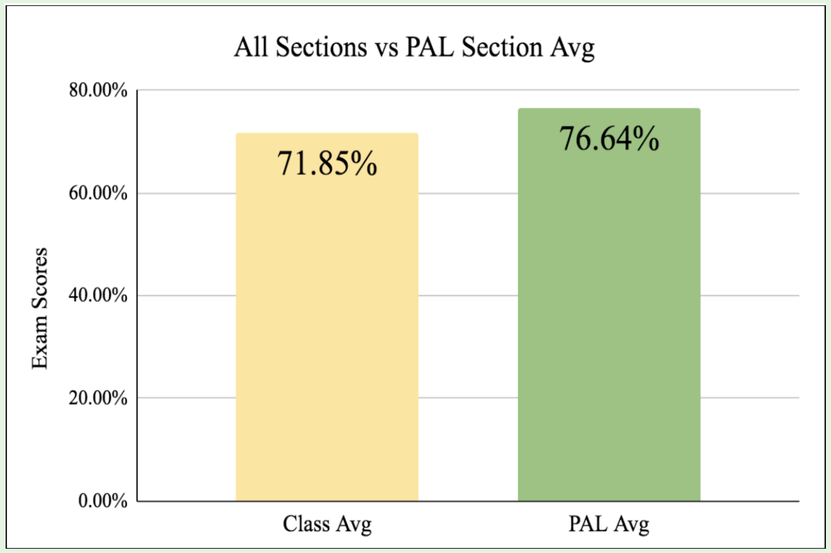

Figure 2. Exam averages vs PAL averages in all Bio 131 sections. PAL students on average showed an 11.6% increase in exam scores, which correlates to the academic success that PAL data shows. Results are based on Exams 1 and 2. n=39.

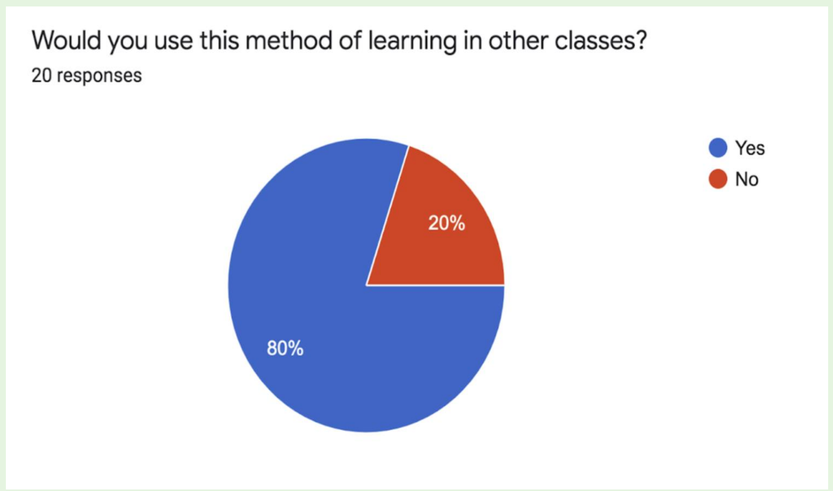

Figure 3. Feedback from Bio 131 students indicating that they would use the Pseudofacilitator method for learning in future courses.

DISCUSSION & CONCLUSION

There are several limitations in the study. Since the sample size of our data is limited due to low PAL class attendance, it's unknown if the grades of students whose attendance was inconsistent would have benefited. This is the first in person semester that students have experienced after two years being in a virtual learning due to the COVID - 19. It was expected that as the semester progressed, students would experience burn out, which would result in less motivation to participate in PAL learning, activities, or attendance. The last major limitation to this study is the authenticity of questions that students had written. Since this study was conducted in an environment that does not assign any outside work, students felt less compelled to put in time to write well thought out questions for the activity. Though many of these limitations were anticipated, there is no way to test the true outcome of what a student's grade may have been if lack of attendance, decreased motivation, and authenticity were not an influencing factor.

In conclusion, we report that repeated engagement with high levels of Bloom's taxonomy of cognitive learning objectives, and students' participation in pseudo-facilitation, have little to no effects on students' grades than those who did not take part in the experiment (Fig. 1). It was found the exam averages vs PAL averages in the Bio 131 course were a slight lead difference (Fig. 2). The PAL averages on exam scores are greater compared to the class averages (Fig. 2). Correlation of scores by following the Bloom taxonomy classifications, and the students' grades in the class is not related. It was found that there were mixed results. Looking at Fig. 1. some students in PAL who have achieved a high-grade score, have scored worse on the total points accumulated from the questions that were collected and vice versa. However, in Fig. 3, majority of the students that were conducted have indicate that pseudo facilitating would incorporate for future studying

AKNOWLEDGEMENTS

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