Use of Study Resources by Lecture-Based and Problem-Based Medical Students

CHRISTINE M. HUTAK, Ph.D.*, DONNA M. MCMAHON, D.O.*, and DAVID YENS, Ph.D. †
*NYITCOM OLD WESTBURY, NY 11568 †TOUROCOM MIDDLETOWN, NY 10940

Abstract
The purpose of this study was to determine which resources were most often used by students during their preclinical years of medical school, their perceived effectiveness and how these resources changed over time. The use of resources was compared between Lecture-Discussion-Based (LDB) and Problem-Based (PBL) learning tracks. Hypothesis 1, students who used textbooks to supplement the curriculum would self-report better academic performance than those who did not, was not supported. Hypothesis 2, the use of textbooks as a supplement to the curriculum increased through the first year of medical school, was not supported. A comparison of LDB students with PBL students did demonstrate that the PBL students used texts and online resources to a much greater extent than LDB students. The LDB students depended on handouts and videos with greater frequency. This finding clearly delineates the differences between the two educational approaches and may provide a basis for the sometimes found superiority of problem-based learning.

Purpose
Many studies have looked at the differences between PBL and other educational methods for training medical students, most with equivocal results1-4. Educational resources used by students who participate in varied instructional methodologies seem to be an area that has not been fully explored5-6. The purpose of this study was to determine which resources were most often used by students during their preclinical years of medical school, their perceived effectiveness, and how these resources changed over time. The use of resources was compared between LDB and PBL tracks.

Hypotheses
Hypothesis 1: Students who used textbooks to supplement the curriculum would self-report better academic performance than those who did not use textbooks.

Hypothesis 2: The use of textbooks as a supplement to the curriculum increases through the first year of medical school.

Methods
Data were obtained through an on-line survey of students at a large osteopathic medical school. SurveyMonkey was used to administer a survey to osteopathic medical students at the beginning of their 2nd year. Participation was voluntary and the responses were collected over a 3 month period. The study was approved by the institution’s IRB.

Results
Responses were received from 83 LDB students and 21 PBL students.

Hypothesis 1: Online text use was very low for the LDB courses with a composite result of 4 (5.3%) students using online texts for each course; Inking (interactive web-based textbooks) use was also low (n=7, 9.3%), with greater use for paper text that ranged from 9 (12%) to 11 (15%) uses for above average students, 2 (3%) to 4 (5%) uses for average students, and 1 (1%) to 4 (5%) uses for below average students. A comparison of proportions indicated no significant difference; the majority of students self-reported they were above average, resulting in little difference in the proportions.

A similar result was obtained for the PBL courses with 11 (53%) to 13 (62%) in the above average group reported use, 4 (19%) to 7 (33%) in the average group, and 4 (19%) in the below average group. No difference in proportions was found. A consistent 12 (above average,57%), 8 (average, 38%), and 1 (below average, 1%) were reported for the clinical sciences courses; although the differences are statistically significant, the single value in the “below average” category makes this less than meaningful.

This hypothesis was not supported based on these analyses. There does however seem to be a trend for above average students in the LDB classes to use supplementary text materials. These materials are required for the PBL classes and thus the only difference was the number of different materials used.

Hypothesis 2: The change over time in texts used by LDB students (online, Inking, and paper) was assessed by looking at the number of students who used these resources more than 50% of the time for each of the courses sequenced from Introduction to Osteopathic Medicine (IOM) through Hematology/Immunology. The results indicated that the usage frequency of >50% was consistent across all LDB courses: 4 students (5.3%) used online texts, 7 students (9.7%) used Inking, and 17 students (22.7%) used paper text. A similar analysis was run for the PBL students for each of the five courses throughout their academic year: IOM and Biopsychosocial Sciences & Clinical Sciences (Fall & Spring terms). The results indicated that the usage frequency of >50% was consistent across all PBL courses. Of the 21 respondents, 20 (95.2%) used online texts, 13 (61.9%) used Inking, and 15 (71.2%) used paper text.

These consistencies throughout the academic year did not support the hypothesis. LDB and PBL students did not increase their use of supplemental texts as the academic year progressed. A significant difference in proportions for all resources was elucidated with the comparison of the use of these resources between the LDB and the PBL students: Clearly, the PBL students utilized textbooks to a much greater extent than the LDB students, which is to be expected considering that these resources comprise the bulk of reading materials required for their program.

Discussion & Conclusion
Subsequent analyses demonstrated that the LDB students used faculty generated handouts (92% versus 0%) and video-streamed lectures (73.3% versus 23.8%) to a much greater extent than the PBL students. PBL students utilized review books (57.1% versus 26.7%), texts from the COM generated recommended reading list (66.7% versus 16%), and texts not on the recommended reading list (52.4% versus 6.7%) to a significantly greater extent than the LDB group.

The results illustrated the pedagogic differences between the LDB and PBL curricular tracks. PBL students used texts and online resources to a much greater extent than students in the LDB track. The LDB students depended on handouts and videos with greater frequency. This finding clearly delineates a major difference between the two educational approaches and may provide a basis for the sometimes found superiority of problem-based learning* &

Bibliography
4. Anteopolh W and Herzig S. “Problem-based learning versus lecture-based learning in a course of basic pharmacology: a controlled, randomized study.” Medical Education, 1999; 33: 106-113