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Research

Student perception and academic performance after implementation of a blended learning approach to a drug information and literature evaluation course

Katie J. Suda, PharmD, MS^{a,*},¹, Jana M. Sterling, BA, PharmD^b,
Alexander B. Guirguis, PharmD, BCPS^{c,2}, Sunil K. Mathur, PhD^d

^a Department of Veterans Affairs, Center of Innovation for Complex Chronic Healthcare, Chicago, IL

^b Department of Clinical Pharmacy, University of Tennessee Health Science Center, Memphis, TN

^c Department of Pharmacy, VA Connecticut Healthcare System, West Haven, CT

^d Division of Epidemiology, Biostatistics, and Environmental Health, University of Memphis School of Public Health, Memphis, TN

Abstract

Objectives: The objective of this study was to evaluate student pharmacist experience and academic performance in the first offering of a drug information and literature evaluation course utilizing a blended learning approach.

Methods: An anonymous online survey, course grades, and evaluations were compared with the traditional offering (composed of live lectures and occasional recitations).

Results: The blended learning strategy doubled the time spent in recitation; 96% of students reported them as “helpful.” Students preferred viewing lectures online and viewed most lectures on time. Students reported that online lectures in this course provided an equal educational value compared with “live” lectures. Compared to the traditional course, there was no difference in examination scores or course evaluations. Course grades and student perception of achieving course objectives were improved with the blended learning course.

Implications: The blended learning strategy allowed for an increase in active learning sessions, higher course grades, and improvement in components of the course evaluations.

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Keywords: Blended learning; Pharmacy students; Online lectures; Active learning; Team-based learning

Introduction

The current generation of learners has matured in a technology-driven society. Technology is being

implemented in most aspects of primary and secondary education,¹ and the importance of this has been acknowledged by the U.S. Department of Education.¹ A meta-analysis completed by the Department of Education found that students performed better in online learning courses versus face-to-face learning in K-12 education.¹ Several examples^{2–4} from undergraduate education showcase successful blending of online and face-to-face strategies as a method for increasing student satisfaction and critical thinking opportunities.

Select institutions currently instruct students simultaneously across multiple campuses using distance learning technology. Several investigations by pharmacy programs have found conflicting data if distance education was

* Corresponding author: Katie J. Suda, PharmD, MS, Center of Innovation for Complex Chronic Healthcare (151H), 5000 S. 5th Ave, Hines, IL 60141.

E-mail: katiesuda@gmail.com

¹At the time of project initiation and writing, Dr. Suda was Association Professor, Department of Clinical Pharmacy, University of Tennessee Health Science Center, Memphis, TN.

²At the time of project initiation, Dr. Guirguis was an Assistant Professor, Department of Clinical Pharmacy, University of Tennessee Health Science Center, Knoxville, TN.

beneficial, detrimental, or no different.^{5–7} Another method to incorporate technology into learning is to implement a blended learning style into courses. The definition of blended learning can be vague and open to interpretation by each institution.^{8,9} These definitions vary from combining electronic tools¹⁰ or online activities⁸ with in-person learning. The definitions also differ if electronic or online learning should replace an amount of classroom time⁸ or have no impact on the time spent learning in-person.¹⁰ The Sloan Consortium quantifies a blended course when 30–79% of the material is delivered online with the remainder presented in live meetings.¹¹

Several nursing programs have implemented blended learning methods throughout their curricula.⁹ Students enrolled in a Master of Science in Nursing Practitioner program received significantly higher course grades and reported more personal satisfaction in a pharmacotherapeutics course with the blended learning method than the students in the traditional course.¹² With the exception of nursing education, the literature on blended learning is limited in health sciences. In the pharmacy education literature, online lectures combined with active learning were used in a drug information course by Freeman et al.¹³ All course lectures were available to view online at any time during the course. More than half of respondents to a post-course survey indicated that they did not benefit from the online lectures and one-third felt they did not adequately learn the material.¹³ However, students responded positively to the ability to review the lectures on their own time and that the recordings were helpful in reviewing for quizzes. Another publication reported the combined use of online tutorials and active learning on literature search assignments produced lower grades, but improved student evaluations, as compared to a lecture-based course.¹⁴

While there are a number of publications about blended learning in higher education, there is limited literature on pharmacy students' preference and performance in a blended learning course. The purpose of this study was to assess student compliance, preference, and academic performance after implementing a blended learning approach to a drug information and literature evaluation course.

Materials and methods

In the Fall semester of 2011, the University of Tennessee College of Pharmacy implemented a blended learning strategy in a third-year drug information and literature evaluation course. This three-credit hour course consisted of pre-recorded video lectures made available online using Mediasite[®], a webcasting platform used throughout the College. Classroom time was used for active learning activities using team-based learning. All recorded lectures were available for viewing from the beginning of the semester until a specific weekly expiration date, corresponding to classroom time used for recitation sessions. At this time, lectures were made

unavailable. This was done to ensure student preparedness for the recitation sessions. In accordance with the team-based learning format, multiple-choice quizzes were administered at the beginning of class as individual readiness assurance tests (IRATs), and team readiness assurance tests (TRATs) were administered as formal assessments of students' basic understanding of the subject material from corresponding online lectures and required reading materials. A session facilitator was present on each campus during synchronous recitation sessions. After students independently completed the IRAT, assigned groups worked on a TRAT. After the TRATs, students remained within their assigned teams to complete an application-based team assignment, that was subsequently reviewed by the session facilitator with the entire class. Students' knowledge and understanding of the material was evaluated with a midterm and final exam, both of which were paper-based, multiple-choice examinations administered in class. With the exception of minor grammatical changes and question renumbering, exams were identical to those utilized in the traditional course the previous year. All lectures were re-posted for viewing one week prior to each examination to provide students the ability to review the material.

For purposes of this study, blended learning is defined as a course composed of online lectures and in-class active learning sessions. Lectures that were viewed using Mediasite[®] technology were considered as online lectures. Live lectures were defined as a faculty member delivering instructional content in-person synchronously from one of two campuses regardless of the student location. We compared exam and overall course grades from the blended learning course to the grades in the traditional course (live lectures with active learning recitations). Similarly, we compared the results of anonymously submitted 23-question course evaluations. Course evaluations were separated into achievement of course objectives and course elements (e.g., exams were consistent with course objectives; course was well coordinated; assignments, recitations, and readings enhanced learning; and content was consistent with course objectives). Both course offerings were taught using synchronous distance learning technology. The traditional course allowed for student review of recorded lectures originally delivered live online using the Mediasite[®] software. (The University of Tennessee College of Pharmacy routinely records all lectures as a back-up as well as an optional supplemental resource for all courses.) Students were asked to complete an anonymous, self-administered online survey at the conclusion of the semester. The multiple-choice survey instrument was available for student response for 14 days.

SPSS 20 (IBM, Chicago, IL) was used for statistical analysis. Chi square and *t*-tests were used for categorical and continuous data, respectively. Odds ratios and confidence intervals were calculated. A *p* value ≤ 0.05 was considered statistically significant. The investigational review board granted exempt approval for this project.

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