A cost and meta-analysis of the flipped classroom in pharmacy education

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Introduction

• The flipped classroom (FC) is a newer method of classroom instruction [1];
• Instead of giving a lecture (TL) during class time, the lecture is “flipped” where the lecture occurs prior to class and students spend class time focusing on student mastery and application [1];
• Prior research has shown that faculty spend more time developing and delivering during FC [2];
• There is a paucity of research that has examined the labor cost of the FC;
• There is concern about the extensive faculty time required to develop and maintain a FC teaching model.

Objectives

1. Examine the published evidence of the effectiveness of the flipped classroom in pharmacy education;
2. Conduct a cost analysis of the flipped classroom in pharmacy education

Methods

• Databases included: PubMed, Education Resources Information Center (ERIC), and Google Scholar.
• Publications January 1, 2000 through February 1, 2016 included
• Studies were eligible for this review if:
  • The study compared FC vs. TL
  • At least one outcome measure was final course examination or course final grade.
• Studies that examine student outcomes for courses that were less than eight weeks were excluded
• The following search terms with Boolean operators were used to identify published studies: flipped classroom, pharmacy, and lecture
• Observational and experimental studies were included.
• Costs were measured as working-hours using 2015 AACP faculty salary data

Results

• A total of eight studies met the inclusion criteria [3-10];
• The average weighted effect size of FC was calculated to be 0.09 on final exam scores;
• Developing a TL course would cost approximately $12,930 while developing a new FC course would cost approximately $20,683;
• Approximate costs to maintain a TL course would be $7,500 annually while maintaining a FC course would be $12,000 annually;
• To implement FC curriculum-wide, schools would have to hire an additional 1.75 FTE dedicated to instruction to maintain current research and service requirements.

Discussion

• The FC has been shown to have a positive effect on student learning in pharmacy education;
• The FC effect size on pharmacy student learning is very small;
• Costs required to develop and maintain a FC course are substantial, in light of the small gains in pharmacy student learning;
• We did not separate analysis by pharmacy discipline, limiting the conclusions able to be reached;
• Future research should develop better methods to examine the cost-effectiveness of the FC in pharmacy education.

Disclosures

The authors report no conflict of interests.