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The Impact of a Flipped Classroom Compared to Lecture-Based Teaching on Achieving Course Outcomes

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The Impact of a Flipped Classroom Compared to Lecture-Based Teaching on Achieving Course Outcomes

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Statement of Problem

Background
- Passive Learning is based on lecturing while Active Learning involves student participation.1
- Team-Based Learning (TBL) uses a small-group structure as a method of active learning to engage students.2
- Flipped classroom is a form of active learning that requires student preparation prior to class and an assessment at the beginning of class.3
- This project examines the effect of the change from a hybrid model of passive learning with TBL to a flipped classroom model on course outcomes in a Medicinal Biochemistry class taught at the Cedarville University School of Pharmacy.

Significance of the Problem
- To address the gap in research concerning the efficacy of complete active learning with a flipped classroom compared to a hybrid of active and passive learning.

Objectives and Hypotheses

- To determine the efficacy of flipped classroom with TBL on the learning outcomes of students in a graduate level biochemistry course.
  - H1 - The implementation of flipped classroom with TBL will not have an effect on student performance on course objectives in a graduate level biochemistry course.
  - H2 - The implementation of flipped classroom with TBL will have an effect on student performance on course objectives in a graduate level biochemistry course.

Methods

- Study Design
  - Case control – Control group is passive learning cohort and the case cohort undergoes active learning via flipped classroom
  - Alpha=0.05
- Sample
  - Medicinal Biochemistry students fall of 2013-2016
  - 48 students in 2013
  - 35 students in 2014
  - 41 students in 2015
  - ~50 students in 2016
- Data Collection and Storage
  - Data entered into SPSS Statistics and Microsoft Excel spreadsheets
- Survey development and administration via Qualtrics
- Measurement
  - SPSS will be used for calculations
- Utilize a survey to assess demographic information for each student
- Survey
  - Sent to all students via email
  - Developed by the investigators to assess correlations or identify confounding factors in the findings from the exam score data

Analysis

- Independent t-test to compare mean results between the combined 2013 and 2014 class versus the combined 2015 and 2016 class
- Two-way ANOVA for comparison of multiple factors for mean differences among the dependent variable (exam and assessment scores)
- ANCOVA to study the independent variable with and without covariates
- Descriptive statistics will be used to easily sort, organize, and filter exam and RAT results
- Point Biserial – some questions were removed
- Exam 2 from 2015 class – confounding due to aberrant testing conditions

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References