

Flipping the Classroom to Improve Learning in Epidemiology and Biostatistics Courses



Lynette S. Phillips
 Kent State University College of Public Health, Kent, Ohio, United States of America

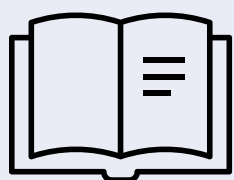
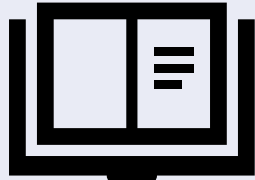
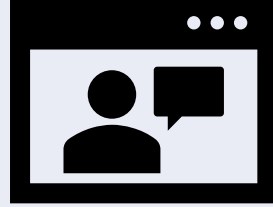
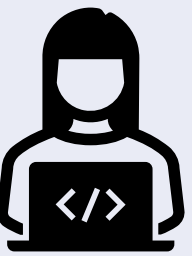
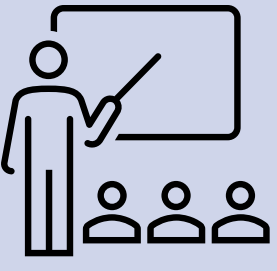

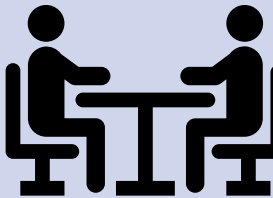
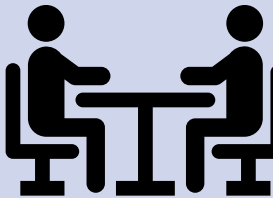



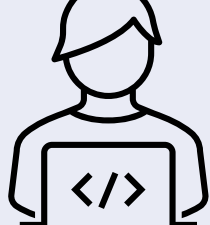
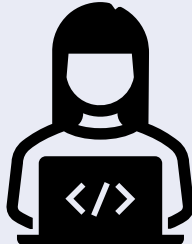
For courses that require methods application, flipping the classroom design through practice-based learning *improves student preparedness, performance, and confidence.*

BACKGROUND

- Traditional university class format with in-class lecture and outside application limits effective learning in practice-based courses
- A flipped classroom design has students watch narrated lecture videos and complete readings before attending class and using class time to clarify and reinforce concepts and apply learning to practical activities.

METHODS

Table. Activity and timing differences between traditional and flipped classroom formats, epidemiology and biostatistics graduate courses

ACTIVITY		
Timing	Traditional Classroom	Flipped Classroom
Before class	Complete assigned readings 	Complete assigned readings  Watch recorded lectures  Take knowledge assessment on materials  <i>Low stakes, can take twice to improve score</i>
During class	Instructor-led lecture  Students take notes, ask questions	Review knowledge assessment  Short lecture focusing on key points and methods  Practice activity and/or discussion  Work on assignments with instructor present for assistance 
After class	Students complete assignments at home   	If needed, students complete assignments at home 

RESULTS

- Data from three (3) semesters of traditional format and three (3) semesters of flipped format core epidemiology and biostatistics graduate level courses
- Students in flipped classroom complete assigned readings and video lectures before class begins
- Average overall class grade **increased** by from 90.6% to 92.3% (p=0.24)

Quotes from student survey after flipped classroom:

- “I liked the reverse classroom style. We spent more time practicing and asking questions as opposed to just writing lectures.”
- “I liked that we did the knowledge assessments before class that week then were able to come in with questions.”
- “Having a flipped classroom was amazing.”
- “The knowledge assessments helped me understand the readings.”

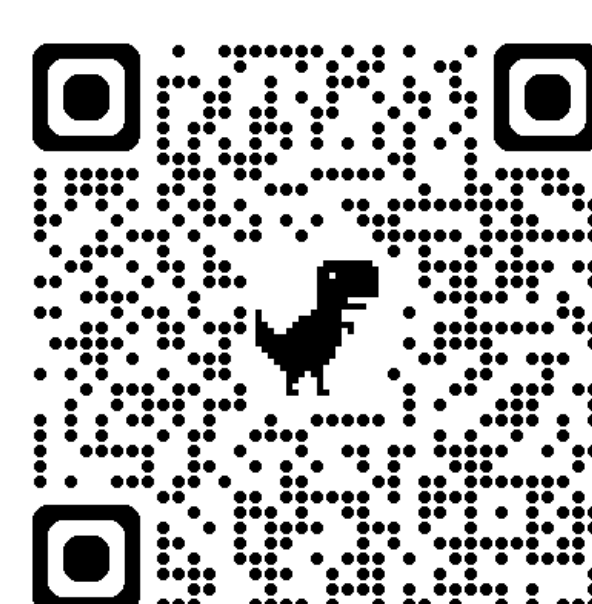
CONCLUSIONS

- Students in the flipped classroom were better prepared at the start of class than those in the traditional format.
- Overall course grades and perception improved in classes with a flipped format.
- Instructors for classes that require learners to practice employing methods to summarize and analyze data should consider a flipped approach

ADDITIONAL KEY INFORMATION

Author Contact Information

Lynette Phillips, PhD, MSPH (*she/her*)
 Professor and Program Coordinator – Epidemiology & Biostatistics
lphil20@kent.edu
 +1 330-672-6324



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