Academy of Educators
Community Conversations

September 24, 2018
sanofi-aventis Conference Room
NC Cancer Hospital
Updates from the President
Meet Your Council

- Gary Beck Dallaghan
- Jason Crowner
- Benny Joyner
- Susie Martinelli
- Christina Shenvi
- Lindsay Wilson
- Eric Zwemer
Committee Overview

• Scholarship Committee
  » Increase scholarly output
  » Improve the learning environment

• Programming Committee
  » Improve visibility and perceived value of the Academy through high yield programming

• **Sign the committee interest paper being circulated, or email aoe@med.unc.edu to express interest in joining one of these committees**
The Flipped Classroom in Medical Education

Susan M Martinelli, MD, FASA
Associate Professor of Anesthesiology
Susan_Martinelli@med.unc.edu
University of North Carolina
September 24, 2018
Disclosures

Foundation for Anesthesia Education and Research: Research in Education Grant 2014-2016
Objectives:

• Components of flipped classroom

• Evidence surrounding flipped classroom

• Implementing flipped classroom
TRADITIONAL CLASSROOM

1. Lecture

2. Homework

FLIPPED CLASSROOM

1. Lecture

2. In Class Session
Suggested benefits of FC

- Efficient
- Flexible
- Student autonomy
- Personalized learning strategies
- Engaging
- Promotes life-long learning

- Team work
- Assess understanding
- ↑ knowledge gain
- ↑ knowledge retention

Concerns with FC

• Time intensive
• Preclass align with in class/objectives
• Some in class techniques inefficient
• Students dominating in class session
• Facilitators must be good
• Students unable to ask questions immediately
• Students must be motivated

Pharmacy studies

• Wong et al
  • 3 sessions on cardiac arrhythmias
  • ↑knowledge gain (2 of 3)

• McLaughlin et al
  • Entire pharm course
  • ↑knowledge gain

• Pierce et al
  • 8 week renal pharm course
  • ↑knowledge gain
Systematic review of FC in Medical Education

• 46 articles
  • 11 GME
  • 9 controlled studies—none in GME

• Outcomes
  • ↑satisfaction with FC
  • Mixed results with knowledge/skill

Anesthesia Basic Board Preparation Experience

• 155 PGY-2s
• 8 institutions
  • Either TL or FC
• Multiple choice knowledge tests

• Preferred FC (p<.001)

Adjusted means of the percent correct on the knowledge test over time

<table>
<thead>
<tr>
<th>TIME</th>
<th>Pretest</th>
<th>Posttest</th>
<th>Retention</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC</td>
<td>61%</td>
<td>74%</td>
<td>77%</td>
</tr>
<tr>
<td>TL</td>
<td>63%</td>
<td>69%</td>
<td>71%</td>
</tr>
</tbody>
</table>
Graduate Medical Education

• **Internal Medicine**—Quality improvement\(^1\)
  - ↑knowledge gain
  - Preference for FC

• **Emergency Medicine**—ED complaints\(^2\)
  - Equivalent knowledge gain

• **Neurosurgery**—board prep\(^3\)
  - ↑board scores
  - Preference for FC

Would testing with OSCEs show a greater difference?

• OB GYN MS clerkship

**Multiple Choice Examination**

<table>
<thead>
<tr>
<th>Rotation 2</th>
<th>OB</th>
<th>Traditional</th>
<th>Flipped</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>52%</td>
<td>59%</td>
<td>0.03</td>
</tr>
<tr>
<td>Rotation 3</td>
<td>GYN</td>
<td>64%</td>
<td>67%</td>
<td>0.247</td>
</tr>
<tr>
<td>Rotation 2</td>
<td>GYN</td>
<td>58%</td>
<td>68%</td>
<td>0.0017</td>
</tr>
<tr>
<td>Rotation 3</td>
<td></td>
<td>75%</td>
<td>65%</td>
<td>0.00011</td>
</tr>
</tbody>
</table>

Gillispie. Using the flipped classroom to bridge the gap to generation Y. Ochsner Journal 2016 16:32-36.
**Would testing with OSCEs show a greater difference?**

• OB GYN MS clerkship

**OSCE Examination**

<table>
<thead>
<tr>
<th>Rotation</th>
<th>Subject</th>
<th>Traditional</th>
<th>Flipped</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rotation 2</td>
<td>OB</td>
<td>74%</td>
<td>82%</td>
<td>0.0198</td>
</tr>
<tr>
<td>Rotation 3</td>
<td></td>
<td>70%</td>
<td>82%</td>
<td>0.0076</td>
</tr>
<tr>
<td>Rotation 2</td>
<td>GYN</td>
<td>71%</td>
<td>84%</td>
<td>0.006</td>
</tr>
<tr>
<td>Rotation 3</td>
<td></td>
<td>67%</td>
<td>81%</td>
<td>0.0052</td>
</tr>
</tbody>
</table>

Gillispie. Using the flipped classroom to bridge the gap to generation Y. Ochsner Journal 2016 16:32-36.
HOW TO FLIP YOUR CLASSROOM

https://i.ytimg.com/vi/ZRvmjjeZ9CA/maxresdefault.jpg
Implementation of FC

1. Pre-session homework
2. In class session
Implementation of FC

1. Pre-session homework
   • Often video 15-20 min
   • Voice over slide based presentation
   • Ensure learners know expectations
Implementation of FC

1. Pre-session homework
   • Often video 15-20 min
   • Voice over slide based presentation
   • Ensure learners know expectations
Implementation of FC

1. Pre-session homework
   • Often video 15-20 min
   • Voice over slide based presentation
   • Ensure learners know expectations
Example of Pre-class “Homework”
Pacemakers and ICDs in the Operating Room

Susan M Martinelli, MD
Advanced Board Prep
Preclass Video
April 2017
Tips for Making Videos

• Words and pictures concurrently
• Follow learning objectives
• Minimize irrelevant information
• Keep short or break into short segments
• Use already made video
  • Quality
  • Credible source
• No consensus if lecturer should be seen

Implementation of FC

2. In class
   • Active learning
   • Problem solving
   • Function as facilitator/coach
Example of In Classroom Learning
• What device is this?
• Where are the leads going?
You are offsite doing colonoscopies. The next patient has a cardiac implantable electronic device. Cardiology is not available to reprogram the device. You:

A. Cancel the case and send them to the main OR
B. Do the case if it is a PM
C. Do the case if it is an ICD
D. Do the case regardless of the type of device
In Classroom: Active Learning
In Classroom: Active Learning

• Audience response questions
In Classroom: Active Learning

• Audience response questions
In Classroom: Active Learning

• Audience response questions
In Classroom: Active Learning

- Think pair share
In Classroom: Active Learning

- Case based learning
In Classroom: Active Learning

- Educational games
In Classroom: Active Learning

• Role play
What do the faculty think?
Faculty Survey Regarding FC

- 244 faculty
- 57% understood FC
  - 57% used FC in previous year

- Perceived barriers
  - Learners prepared
  - Learners participation
  - More comfortable with TL
  - Time to prepare
  - Technology

- 89% interested in faculty development

Conclusions

• Learners prefer FC
• Knowledge benefit
• Limited work in GME

• Barriers—improve with faculty development?

• Component of multi-modal curriculum

"Education is not the learning of facts, but the training of the mind to think."
-Albert Einstein
Closing Thoughts

Reminder to RSVP:

Frank Wilson Professionalism Forum
October 17, 2018

Workshop – 12:00 - 1:00PM
Bondurant 2020

Reception & Evening Lecture – 4:30 - 6:00PM
Bondurant G100