

**CENTER FOR TEACHING
AND LEARNING (CTL)**

**FLIPPED
CLASSROOM
FLIPPED**

THE FLIPPED CLASSROOM

Turning Traditional Education on Its Head

Many educators are experimenting with the idea of a flipped classroom model. So what is it and why is everyone talking about it?

The Flipped Classroom

DURING



Students practice applying key concepts with feedback

IN CLASS

GOAL

Students prepare to participate in class activities

BEFORE



GOAL

Students check their understanding and extend their learning

AFTER



GOAL

OUT OF CLASS

AGENDA

- 1) Welcome and Introductions
Professor Marilyn Pelosi – Director, CTL
- 2) The Flipped Classroom – Motivation, Results, Challenges and Changes
Professor Alex Wurm – Department of Physical and Biological Sciences
- 3) The Flipped Classroom - First time Challenges
Professor Burt Rosenman
Department of Physical and Biological Sciences
- 4) The Flipped Classroom – The view from a Department Chair
Professor John Coulter - Department of Accounting and Finance
- 5) Upcoming Events Sponsored by the Center for Teaching and Learning



WELCOME

GETTING BETTER ALL THE
TIME



**THE FLIPPED CLASSROOM
MOTIVATION, RESULTS,
CHALLENGES AND CHANGES
PROFESSOR ALEX WURM**



Flipping an Introductory Physics Course

Alexander Wurm

Associate Professor of Physics and Chair
Department of Physical and Biological Sciences

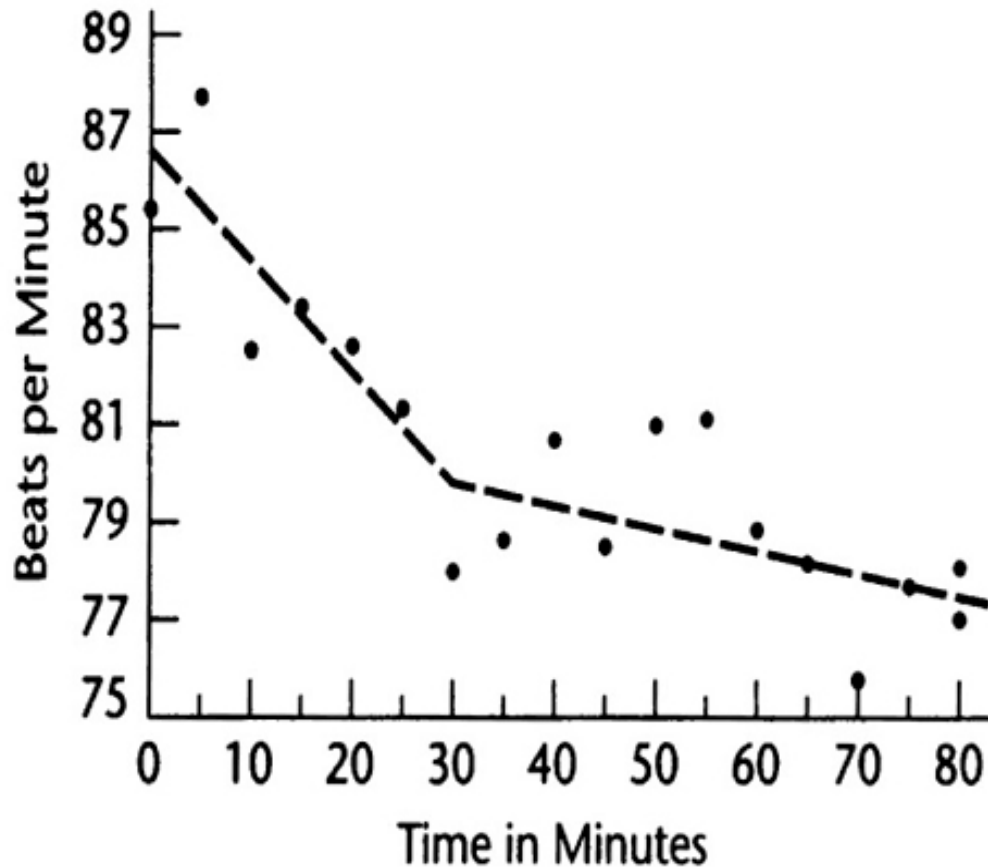
PHYS-123: Physics of the Life Sciences I

- Three lecture hours + one three-hour lab per week
- Prerequisite: One semester of Calculus
- Covers Mechanics, Elasticity, Fluids, Thermal physics
- Students taking PHYS-123 (no first-year students):
 - Pre-pharmacy (about half of the students)
 - Biology
 - Forensic Chemistry
 - Forensic Biology
 - Health Sciences
 - Pre-Physician Assistant

Motivation – Why flip?

- Increase student preparation for class
- Online lectures to support reading assignments
- Spend more class time on actively engaging students
- Compensate for lack of problem sessions (no graduate students -> no TA's) by spending more time on problems in class without sacrificing content coverage
- Increase emphasis on conceptual understanding
- Provide students with more study materials

**FIGURE 3.6. STUDENTS' HEART RATES
IN UNINTERRUPTED LECTURES.**



Bligh, 2000, *What's the Use of Lectures?* 2000, p.51; Hartley & Davies, 1978, *Programmed Learning and Educational Technology*:15:207-224.

Elements of the Flipped Classroom

- Online pre-lectures
- Reading assignments
- Practice quizzes (with answers)
- In-class quizzes
- Class time
- Online homework assignments
- Exams (3 midterm + 1 final)
- Laboratory (“standard” intro physics lab)

Pre-lectures and Reading Assignments

- Have to be completed before coming to class
- Pre-lectures:
 - Voice-over PowerPoint presentations (created by me)
 - Converted to wmv-file and posted on ECHO360
 - 20–30 minutes long
 - Presentation of the material, including derivations of equations
 - Sample problems worked and discussed in detail
 - Slides posted in PDF format for students to take notes on
- Reading Assignments:
 - sections of chapters of textbook directly related to topic of pre-lecture

In-class Quizzes and Practice Quizzes

- In-class quizzes:
 - Six questions, multiple choice
 - Check conceptual understanding of material covered in pre-lecture
 - Students that have finished quiz start working on worksheet/problems of the day
 - Results are discussed right after everybody is finished
- Practice quizzes:
 - About 10 questions, multiple choice with answers
 - Similar in style to in-class quizzes and covering the same topics, but not the same questions

Class time

- Start with answering questions about pre-lecture and practice quiz
- In-class quiz
- Discussion of quiz
- Sometimes: Lecture demonstration and discussion
- Problem solving in groups and/or on board
- Rarely: mini-lecture (10-15 min)

Homework Assignments

- Online homework using Mastering Physics
- About 15 problems per week
 - A couple of conceptual problems
 - Tutorials and standard end-of-chapter problems
 - Homework split into two parts: one due Wed. , one Fri.

Results (from Fall 2013)

- Student evaluations indicated that some students did not like the flipped classroom model:
 - “felt like I was teaching myself”
 - “can learn much better from standard lecture”
- Exam averages seem to be better than in years past, but no statistical analysis has been attempted
 - One reason: exams have larger emphasis on conceptual understanding (about 1/3 of exam)
 - > difficult to compare to previous years

Challenges in Fall 2013

- Enormous amount of work first time around (previously used chalk and blackboard, no PPT)
- Listening to instructor vs. seeing instructor
- Negative attitudes of students (especially Pre-Pharm) towards flipped classroom model
 - Flipped courses had never been taught at WNE in the Sciences
 - Students had preconceived notions of what a science course should look like (e.g. standard lecture, memorization)
 - Some students did not watch the pre-lectures or only some of them
 - **Usual problems encountered when learning physics were now blamed on flipped classroom model**

Challenges (cont.)

- Student in-class behavior:
 - Reluctance to actively engage
 - Instead of focusing on problems, some students used group work time for chatting or drifting off
 - Students did not see the value of solving problems with instructor present to help and give guidance

Changes for Fall 2014

- Did not assign pre-lecture for first class meeting, instead used part of first class meeting to discuss idea of flipped classroom model in more detail
- Introduced participation points for watching pre-lectures and actively participating in in-class group work
- Working on including more life science related examples to emphasize relevance to students' majors
- Comparison study with Dr. Niestemski of flipped vs. not flipped PHYS-123 (pre-test/post-test assessment)

THE FLIPPED CLASSROOM FIRST TIME CHALLENGES

PROFESSOR BURT ROSENMAN



A VIEW FROM THE
DEPARTMENT CHAIR

PROFESSOR JOHN COULTER



A Department Chair's Perspective

A Student's Perspective

An interview with Mr. Holden Canty

BSBA- Class of 2014



UPCOMING EVENTS

SAVE THE DATE – Next Event

November 19th @ 4pm

Taste of Active Collaborative Learning /Problem Based Learning/Entrepreneurially Minded Learning: Learning Tools That You Can Use Now

Professor Rob Gettens, College of Engineering
Professor Harlan Spotts, College of Business.

This session will present a taste of the content which will be delivered in two workshops that will be offered over the next two summers at WNE.

SAVE THE DATE

Wellen Davison Seminar

January 8, 2015

Center for Teaching and Learning Web Site

- Reference Materials
- New Technologies
- Interesting Articles
- Upcoming Events
- Forum for Sharing Ideas

QUESTIONS?

THANK YOU!

