

Announcing the Final Examination of Matthew Wilcox for the degree of Doctor of Philosophy in Physics

Date: June 28, 2018

Time: 9:30 a.m.

Room: PSB 445

Dissertation title: Undergraduate Student Agreement with Reformed Introductory Physics Classes

Abstract:

In this study, I investigate student “buy-in”, defined as students’ proper understanding of and agreement with the class format, for introductory studio physics classes that incorporate lectures, labs, and group problem-solving activities into one interactive environment. I also investigate the ways in which instructors try to gain student buy-in to their class. Research has shown that student resistance to reformed instruction is a barrier to an instructor’s use of research-based instructional strategies that are common to the studio class. Expectancy value theory suggests that by gaining student buy-in to the reformed class format, student resistance would decrease thus allowing for a more effective class. I created a survey to measure student agreement with their class and another survey to determine the strategies that instructors use to gain student buy-in. I describe the responses to the surveys and use hierarchical models to determine if student agreement predicts their performance in the class and if the instructor strategies have an effect on student agreement. To triangulate these findings, I also interviewed instructors and students. From the surveys, I found that students disagree with the time spent lecturing and the importance and time spent reading outside of class. This is important because student agreement with the time spent in class predicts favorable attitudes about physics and their agreement with the time spent outside of class predicts a higher expected final grade. From the interviews, I discovered that both instructors and students believe that using evidence to justify the class format would be an effective strategy to gain agreement. However, few instructors used evidence due to a lack of prepared materials. Future work should develop materials to support instructors in presenting evidence about studio’s effectiveness and investigate the impact on student buy-in and other outcomes.

Outline of Studies:

Major: Physics

Educational Career:

M. S. University of Central Florida, 2016

B. S. University of Maryland Baltimore County, 2014

Committee in Charge:

Dr. Jacquelyn Chini (Chair)

Dr. Enrique Del Barco

Dr. Erin Saitta (External Committee Member)

Dr. Stephen Sivo (External Committee Member)

Approved for distribution by Dr. Jacquelyn Chini, Committee Chair, on June 13, 2018.

The public is welcome to attend.