

# BARRIERS TO THE USE OF RESEARCH-BASED INSTRUCTIONAL STRATEGIES: THE INFLUENCE OF BOTH INDIVIDUAL AND SITUATIONAL CHARACTERISTICS

Melissa H. Dancy

Charles Henderson, Western Michigan University

## Abstract

- Many proven research-based instructional strategies have been developed for introductory college-level physics. Significant efforts to disseminate these strategies have focused on convincing individual instructors to give up their traditional practices in favor of particular research-based practices. Yet evidence suggests that the findings of educational research are, at best, only marginally incorporated into typical introductory physics courses. In this poster we present partial results of an interview study designed to generate new ideas about why proven strategies are slow to integrate in mainstream instruction. Specifically we describe the results of open-ended interviews with five physics instructors who represent likely users of educational research. We found that these instructors have conceptions about teaching and learning that are more compatible with educational research than with their self-described instructional practices. Instructors often blamed this discrepancy on situational factors that favor traditional instruction. A theoretical model is introduced to explain these findings.

## “Best Case” Faculty Project

- Interviews with five tenured physics faculty considered by peers to be dedicated and accomplished teachers.
  - In theory, this group should be highly likely to incorporate progressive methods.
  - All taught mostly traditionally.
- Asked about
  - Current practice.
  - Goals for instruction.
  - Beliefs.
  - Experiences with change.
  - Experiences with education research(ers).

## Findings: Myths Debunked

- Common explanations for low adoption rates not supported
  - *Faculty don't care about teaching and don't want to put in the time to make changes (because good teaching isn't rewarded).*
    - These faculty did care and put a lot of time and effort into their teaching.
  - *Faculty think they are teaching well and need to see data that shows them otherwise.*
    - These faculty recognized they needed to improve in ways that were consistent with research findings and they were willing to make changes.
  - *Faculty have beliefs consistent with traditional practice (e.g. that students learn well sitting in a lecture).*
    - These faculty generally held reform compatible beliefs.
  - *Faculty haven't heard about research-based teaching.*
    - These faculty were familiar with many results from education research.
- They still taught traditionally!

## Findings: Systemic Barriers

- Faculty generally had reform compatible beliefs but traditional instruction.
- For every faculty interviewed, beliefs were more alternative than practice.
- Self identified barriers to coordinating belief and practice were systemic.
  - *Student Resistance*
  - *Time Structure*
  - *Departmental Norms*
  - *Expectations of Content Coverage*
  - *Lack of Instructor Time*

## Self-Identified Systemic Resistive Forces

- **Student Resistance**
  - “What I want to do is to turn the class into a real working session. Where it’s just not possible for them to come there and sleep. That may turn off students and decrease enrollment, they may switch courses. I’m a little worried about attrition.” - Harry
- **Departmental Norms**
  - “I am more comfortable with being more interactive and, of course, since we’ve started [a grant supported departmental reform]. I’m much more comfortable having them do group work in class, and feeling that that’s a valid way of spending time in class. And I’m more comfortable asking conceptual type questions instead of just problem solving type questions because you know there’s that extra validation of having a group of people doing this and that it is a grant and it’s a research project.”- Mary

## Self-Identified Systemic Resistive Forces

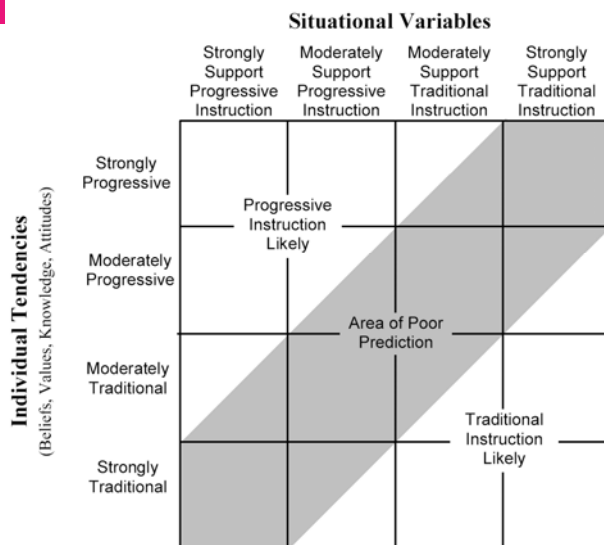
### □ Expectations of Content Coverage

- “I’d think gee if I don’t cover fluids and the next instructor is expecting it I’m really crippling these students, handicapping them. .... And so the pace was so much quicker that to take a whole class period and potentially have them be a little floundering with group work was just so big of a risk.”– Mary

### □ Lack of Instructor Time

- “It kinda depends on how lazy I am, I will try to write those [test questions that students have not seen before] as much as possible. If I’m in a hurry then I will tend to pick more from the old questions.” - Gary

## Role of Systemic Forces: When Practice and Belief Diverge



•Supportive beliefs are not enough, the situation must also be supportive of progressive practice.

•Instructor attributes do not appear to be the dominant factor preventing adoption of research-based methods.

*Model for predicting behavior based on beliefs and context. (Adapted from Warner et. al. p. 168.)*

If the model is correct, systemic changes should lead to changes in practice.

### “Mary”

- Consistent progressive beliefs
- Past practice was generally traditional
- Systemic Changes
  - Department got a grant to do innovative teaching
  - Department decided to reduce content coverage expectations
  - Many faculty began to experiment with new methods
- Mary’s practice is now much more consistent with progressive practice.
  - *“I would say that it’s not just one thing. There’ve got to be at least three things. It was the release of time so that I had more flexibility in how to cover a lesser amount of material more in depth. Two that there is a group here doing it. And three that I was exposed to more research on how [cooperative learning] works.”*  
- Mary

## Conclusions

- Dissemination aimed solely at changing individual instructors is unlikely to be successful.
- Adoption of reforms likely to be improved when
  - Dissemination includes helping individuals recognize and confront situational barriers.
  - Policy efforts are made to alter the environment to be more supportive of reform.