Effective Teaching Practices: Engineering Faculty's Motivation to Adopt Them

Kenyon M. Richardson, Cynthia J. Finelli, & Shanna R. Daly
Center for Research on Learning and Teaching in Engineering, University of Michigan

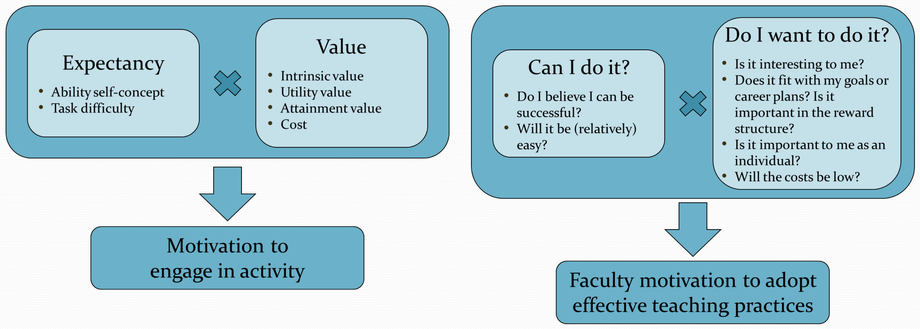
Introduction

- Ample research identifies effective teaching practices
  - Use of these practices is low, both nationally and at our institution
    - At U-M, less than half of our engineering classes feature active learning
    - When studied in 5-minute segments, only ¼ had even one student question
- We are designing a change plan, grounded in theory, to bridge the research-to-practice gap

Research Question

What factors motivate our faculty to use effective teaching practices?

Expectancy Value Theory of Motivation



Gender	
Male	22
Female	4
Rank	
Lecturer or Adjunct Professor	6
Assistant Professor	8
Associate Professor	5
Professor	7
Department	
Aerospace Eng.	2
Atmospheric, Oceanic, & Space Sciences	2
Biomedical Eng.	0
Civil & Environmental Eng.	2
Chemical Eng.	1
Electrical Eng. & Computer Science	4
Industrial & Operations Eng.	2
Mechanical Eng.	5
Materials Science & Eng.	2
Naval Architecture & Marine Eng.	3
Nuclear Eng. & Radiologic Sciences	1
Technical Communication	2
Total	**26**

Faculty Focus Groups

- Four, 90-min focus groups
- EVT-based protocol
  - Described EVT framework
  - Presented 3 teaching practices
  - Probed faculty's expectancy and value about applying them
- Participant diversity regarding gender, rank, discipline, and teaching experience

Methods of Analysis

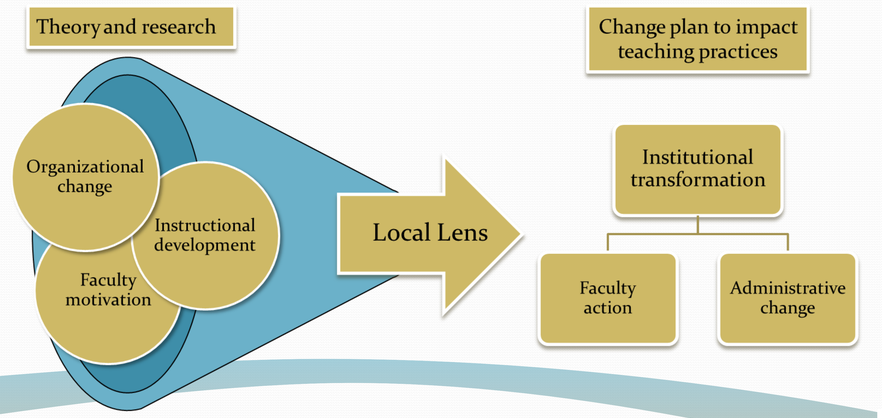
- Inductive coding via constant comparative analysis
- Definition of themes and categories
- Deductive analysis
  - Aligned themes with EVT factors

Category	Theme	# references	EVT factor	Sample quote
Infrastructure and Culture (103)	Teaching evaluations	26	U	*The reality is, what's important in the casebook is the external letters about what an eminent scholar you are. There really is not an effective way to give us equal credit for becoming effective teachers and I think …whatever the rules are, then that's what the game turns out to be.*
	Incentives and rewards	19	U	
	College teaching policies	17	U	
	Didactic teaching tradition	17	U	
	Tenure criteria	15	U	
	Institutional emphasis on research	9	n/a	
Knowledge and Skills of Effective Teaching (72)	Access to information	37	E	*If I really understood that there was a particular approach or technique that would be effective in my classes, I don't think I would have any trouble investing the time to learn it.*
	Credible research evidence	18	E, A	
	Personalized support	17	E	
Student Experience (53)	Student reaction (real or perceived)	14	A	*I guess the thing is, if faculty had a clear sense of what the outcomes, what the positive outcomes are of doing this—that you see students who have a higher level of understanding or, you know, more investment in the class or something like that—that might be a strong motivator.*
	Student learning outcomes	14	A	
	Responsiveness to student feedback	12	A	
	Student attentiveness and participation	11	A	
	Rapport	2	A	
Time (35)	Time (general)	19	C	*I also don't have the time to go through the literature for the newest teaching…or research-based efforts or teaching methods myself.*
	Time to restructure a course	8	C	
	Time to learn about effective teaching	5	C	
	Preparation time for class sessions	3	C	
Classroom and Curriculum (28)	Curriculum flexibility	17	E	*The course I teach in mechanical engineering is a fairly well-defined, tight schedule. I can't even keep up with the schedule. I usually don't get everything done I'm supposed to.*
	Physical classroom layout	8	E	
	Class size	3	E	
Personal Disposition (27)	Passion for teaching	16	I	*I really like teaching also, so that's…that's a big motivation… it really doesn't matter to me if it fits in the reward structure … but I really like teaching and want to improve on my teaching.*
	Confidence in teaching ability	7	E	
	Comfort with role change	4	A	
Networking & Community (17)	Collegial discussions	13	E, I, A	*I've found that talking to peers is a lot more motivating and a lot more enlightening than hearing an expert talking about the research.*
	Openness of classroom	4	E, I, A	

Categories, themes, number of references, related EVT factor (E = expectancy; I = intrinsic value; U = utility value; A = attainment value; C = cost), and sample quotes.

Future Work

- Integrate findings about faculty motivation with other theory and research
  - Organizational change
  - Instructional development
- Apply lens of local context to identify current teaching practices, student perceptions, and other factors related to faculty motivation
- Design two-part change plan to impact teaching practices



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