

# Meeting Teachers Where They Go and Where They Are

A New Form of Professional Development

Zandra de Araujo, Samuel Otten, Wenmin Zhao, & Sheunghyun Yeo  
*University of Missouri*

[www.TwoMinuteTeachersGuide.com](http://www.TwoMinuteTeachersGuide.com)

# Agenda

- ❏ Models of Change
- ❏ Our Observations
- ❏ Nudging
- ❏ Discussion
- ❏ Our Interpretation
- ❏ Questions and Answers

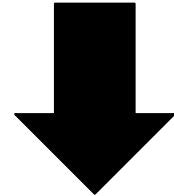


# Agenda

- ❏ **Models of Change**
- ❏ Our Observations
- ❏ Nudging
- ❏ Discussion
- ❏ Our Interpretation
- ❏ Questions and Answers

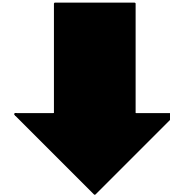


# Radical Change

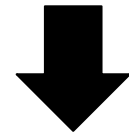
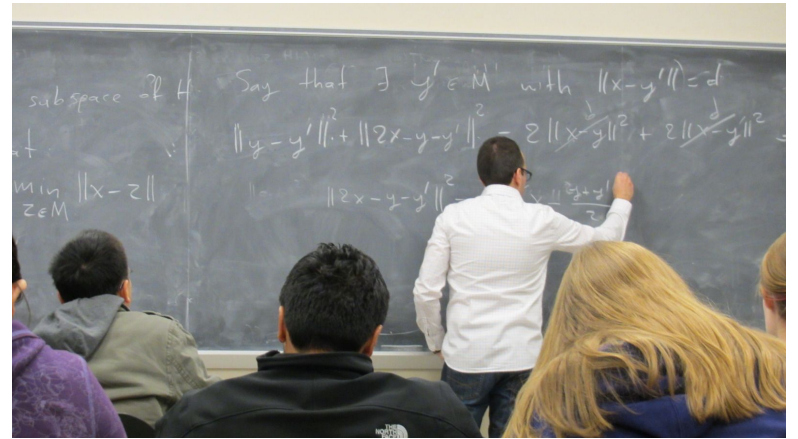


# Nudging

- Day 1 - Start with a healthy breakfast
- Day 2 - Make your lunch without animal products
- Day 3 - Eat an apple a day
- Day 4 - Add some flax to your life
- Day 5 - Trade out animal milk for plant-based versions
- ...
- Day 30 - You're a vegan



# Teacher Education



# Agenda

- ✓ Models of Change
- ☐ **Our Observations**
- ☐ Nudging
- ☐ Discussion
- ☐ Our Interpretation
- ☐ Questions and Answers







# Our Observations

- Teachers are overburdened and have limited preparation time
- Researchers have had limited success communicating with teachers (articles, books, etc.)
- **Radical change model for instruction seems to have limited success**



Log in via your institution

- > Shibboleth
- > OpenAthens

Log in to Taylor & Francis Online

Remember Me [Forgot password?](#)

Or purchase it \*

---

Issue Purchase

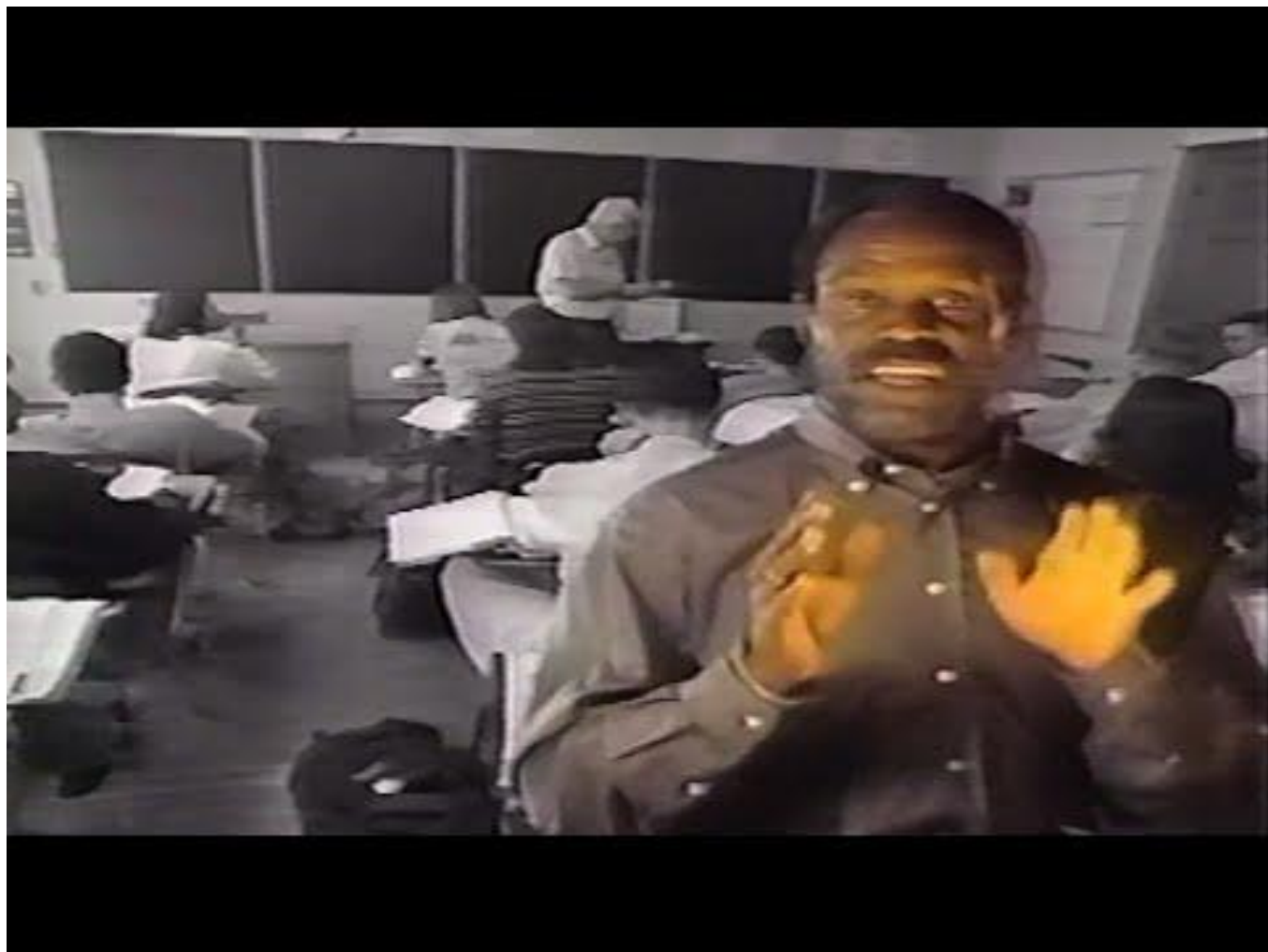
30 days access for USD 259.00

---

Article Purchase

24 hours access for USD 42.50

\* Local tax will be added as applicable



# Agenda

- ✓ Models of Change
- ✓ Our Observations
- ☐ **Nudging**
- ☐ Discussion
- ☐ Our Interpretation
- ☐ Questions and Answers



# Our Case for Nudging

## nudge

/nəj/ 

*verb*

1. prod (someone) gently, typically with one's elbow, in order to draw their attention to something.  
"people were nudging each other and pointing at me"  
*synonyms:* poke, elbow, dig, prod, jog, jab  
"he nudged Ben"

*noun*

1. a light touch or push.  
"he gave her shoulder a nudge"  
*synonyms:* poke, prod, jog, jab, push, dig (in the ribs)  
"Maggie gave him a nudge"

# Claim 1: Radical reform hasn't worked yet

- Reform Efforts
  - Inductive Method (1880s)
  - Progressive Education (1910s)
  - “New Math” (1960s)
  - Problem Solving (1980s)
  - NCTM Standards, NSF-Funded Curriculum (1990s)
  - NCTM Principles and Standards (2000s)
  - Common Core, Khan Academy (2010s)
- Yet if you walk into a math classroom next week, the instruction is likely to be similar to how it was 10, 20, 100 years ago.

# **Claim 1: Radical reform hasn't worked yet**

- Radical reform has produced clarity of vision and won over a minority of “true believers” but hasn't revolutionized mathematics instruction overall
- Why not?

**Claim 2: Radical reform efforts only reach a subset of teachers (and it's often the teachers who are already doing fairly well)**

**Claim 3: Radical reform efforts do not even convert many of the teachers they reach**

# Analogy for Claim 2: Nudging and the *Cash Allowance Rebate System*





# “Cash for Clunkers”




- Follow-up to 2009 stimulus package
- \$3 Billion in federal funding
- People got \$3500-4500 for trading in a vehicle (in working condition) with 17 MPG or less and purchasing a 22 MPG or better vehicle
  
- 22 MPG isn't great, so what was the rationale?



# “Cash for Clunkers”

**GOAL: Reduce the use of fossil fuels, reduce carbon emissions**




**SCENARIO: Assume you have to drive 180 miles per week**

	MPG	Fuel Used: original	Fuel Used: +5 MPG
	12	15 gal	
	24	7.5 gal	
	36	5 gal	

# “Cash for Clunkers”

**GOAL: Reduce the use of fossil fuels, reduce carbon emissions**

**SCENARIO: Assume you have to drive 180 miles per week**




	MPG	Fuel Used: original	Fuel Used: +5 MPG	Fuel Saved
	12	15 gal	11.6 gal	<b>4.4 gal</b>
	24	7.5 gal	6.2 gal	<b>1.3 gal</b>
	36	5 gal	4.4 gal	<b>0.6 gal</b>

*7x savings!*

# “Cash for Clunkers”

**GOAL: Reduce the use of fossil fuels, reduce carbon emissions**

**SCENARIO: Assume you have to drive 180 miles per week**

	MPG	Fuel Used: original	Fuel Used: +5 MPG	Fuel Saved	Fuel Used: +5% MPG	Fuel Saved
	12	15 gal	11.6 gal	4.4 gal	14.3 gal	0.7 gal
	24	7.5 gal	6.2 gal	1.3 gal	7.1 gal	0.4 gal
	36	5 gal	4.4 gal	0.6 gal	4.8 gal	0.2 gal

3x

# Mathematics Instruction

**GOAL: Engage more students, reduce mindless procedures**

**SCENARIO: Assume you have to teach 180 days per year**

# Mathematics Instruction

**GOAL: Engage more students, reduce mindless procedures**

**SCENARIO: Assume you have to teach 180 days per year**

## Typical Forms of Reform PD

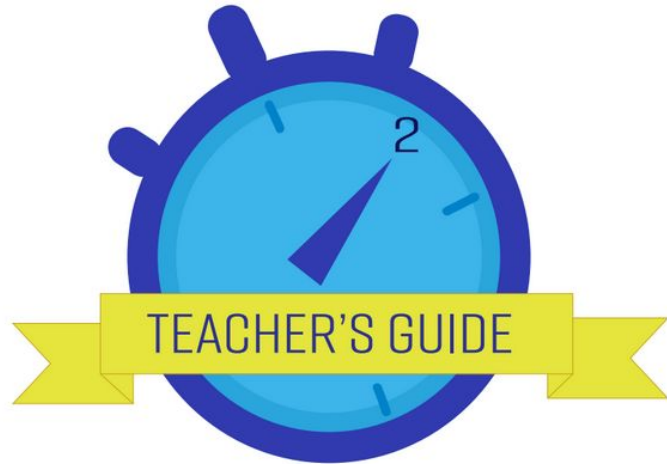
- Conferences/Workshops
- Articles/Books
- Funded Projects
- Etc.



# Mathematics Instruction - “Nudge”

**GOAL:** Engage more students, reduce mindless procedures

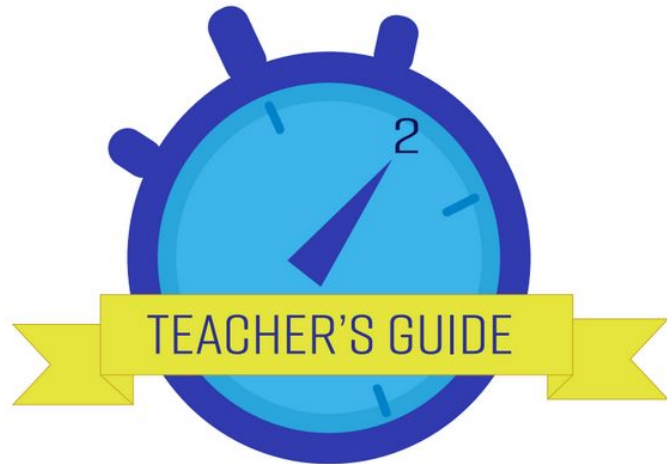
**SCENARIO:** Assume you have to teach 180 days per year



# Mathematics Instruction - “Nudge”

**GOAL:** Engage more students, reduce mindless procedures

**SCENARIO:** Assume you have to teach 180 days per year





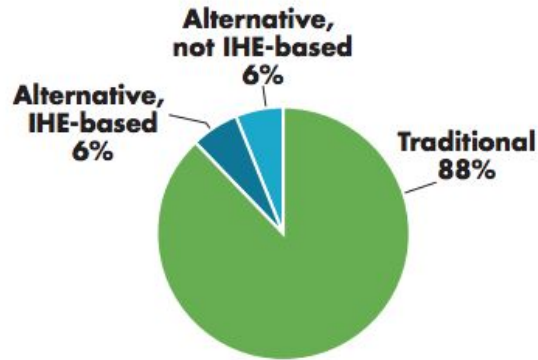
**Claim 2: Radical reform efforts only reach a subset of teachers (or prospective teachers)**

What about mathematics  
teacher preparation?

# Teacher Preparation

241,000 completers in 2009-2010

**Figure 1.3** Enrollment in teacher preparation programs by type of program:  
AY 2009-10



## F. LIST OF TEACHER PREPARATION PROGRAMS

**Table 5. Teacher preparation programs and enrollment by program type, Historically Black Colleges and Universities (HBCUs), Hispanic-Serving Institutions (HSIs), Asian American and Native American Pacific Islander-Serving Institutions (AANAPISIs), TEACH\*\*\* grant program-eligible (TG), or Teacher Quality Partnership (TQP) program grant recipients: AY 2009–10.**

IHE/Program name	Program type	Enroll.	HBCU	HSI	AANAPISI	TG	TQP
ABCTE	AN	649					
Avila University	T	159				●	
Baptist Bible College	T	50				●	
Central Methodist University	T	382					
College of the Ozarks	T	150					
Columbia College	TA	129					
Culver-Stockton College	T	66				●	
Drury University	TA	244				●	
Evangel University	T	181				●	
Fontbonne University	T	228				●	
Hannibal-LaGrange College	T	145					
Harris-Stowe State University	T	75	●			●	
Lincoln University	T	101	●				
Lindenwood University	T	503				●	
Maryville University	T	118				●	
Missouri Baptist University	T	331				●	
Missouri Southern State University	T	202					
Missouri State University	TA	1,799				●	

Program types: T – Traditional, AI – Alternative, IHE-based, AN – Alternative, not IHE-based, TA – Traditional and Alternative

**Table 5. Teacher preparation programs and enrollment  
by program type: AY 2009–10** (continued)

IHE/Program name	Program type	Enroll.	HBCU	HSI	AANAPISI	TG	TQP
Missouri University of Science and Technology	T	30					
Missouri Valley College	T	93					
Missouri Western State University	TA	305				•	
Northwest Missouri State University	TA	462				•	
Park University	TA	109				•	
Rockhurst University	TA	415				•	
Saint Louis University	TA	139				•	
Southeast Missouri State University	TA	644				•	
Southwest Baptist University	T	209					
Stephens College	T	20					
Temporary Authorization	AN	937					
Truman State University	T	308				•	
University of Central Missouri	TA	1,474				•	
University of Missouri–Columbia	TA	649				•	
University of Missouri–Kansas City	TA	498					
University of Missouri–St. Louis	TA	1,266				•	
University of Phoenix–Missouri	T	24					
Washington University	T	49					
Webster University	T	423				•	
Westminster College	T	139				•	
William Jewell College	T	96				•	
William Woods University	T	42					

**4.7% of total  
=649 from ABCTE**

Program types: T – Traditional, AI – Alternative, IHE-based, AN – Alternative, not IHE-based, TA – Traditional and Alternative

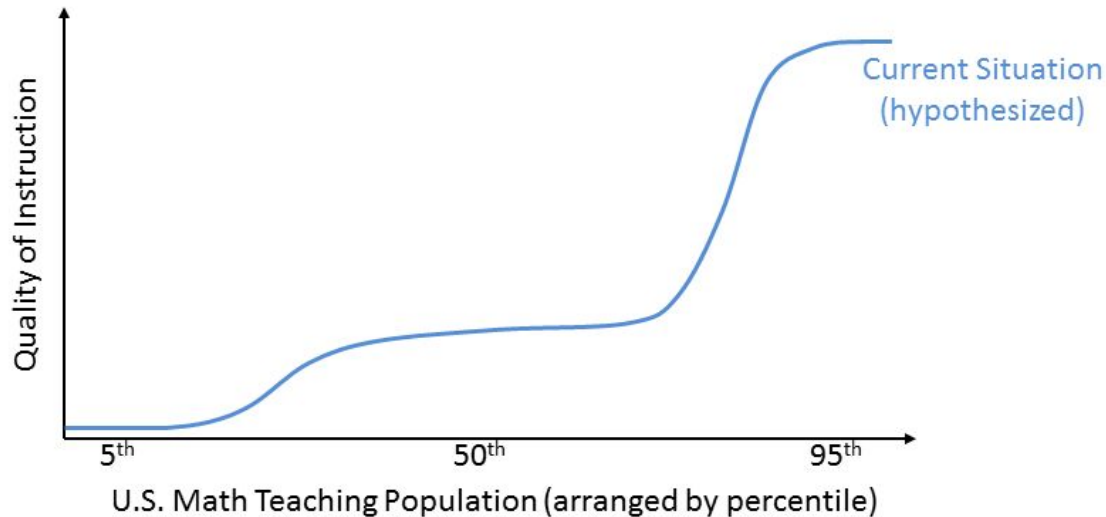
**Claim 2: Radical reform efforts only reach a subset of teachers (and it's often the teachers who are already doing fairly well)**

**Claim 3: Radical reform efforts do not even convert many of the teachers (or prospective teachers) they reach**

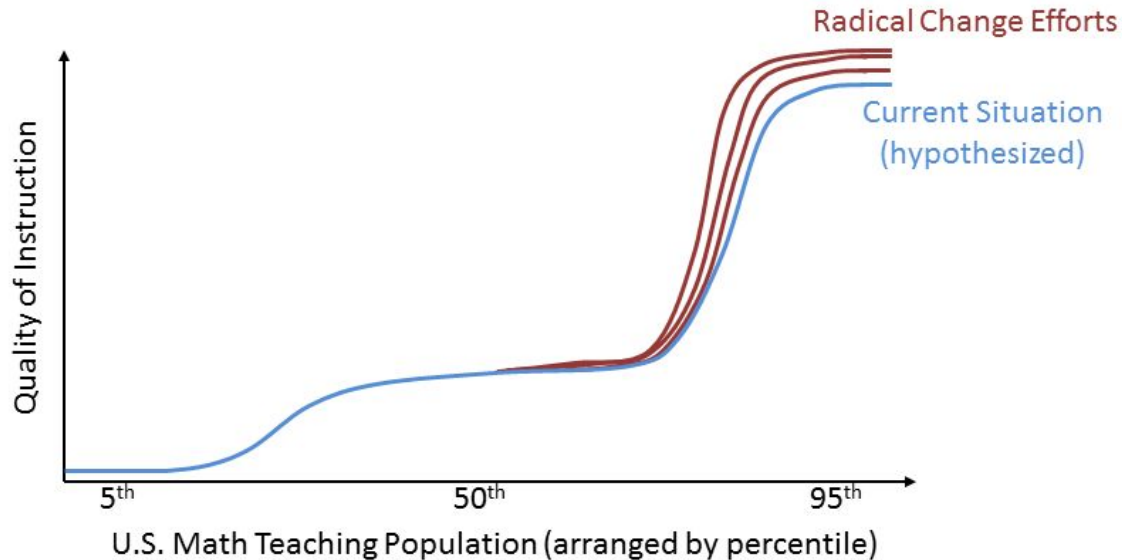
# Claim 3: Radical Reform Doesn't Always Stick

- Apprenticeship of Observation is powerful (Lortie, 1975)
- Reform-oriented teaching is very hard (Lampert et al., 2013)
- Mathematics teacher education often focuses on knowledge and beliefs rather than teaching practices (Sleeter, 2014) but knowledge and beliefs are not necessarily enough to change practice (Borko et al., 1992)
- Personally, at the University of Missouri, we have noticed many of our graduates desire to teach in a reform style but find themselves back into traditional habits relatively quickly.

# Claim 4: Reform doesn't stick because it leaves in place the foundation of its undoing



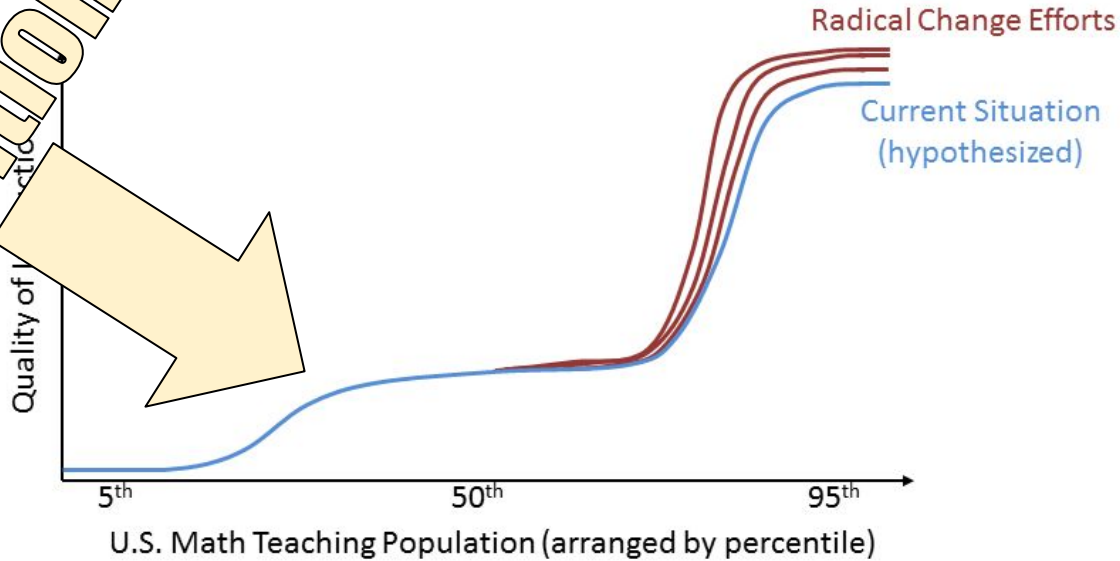
# Claim 4: Reform doesn't stick because it leaves in place the foundation of its undoing



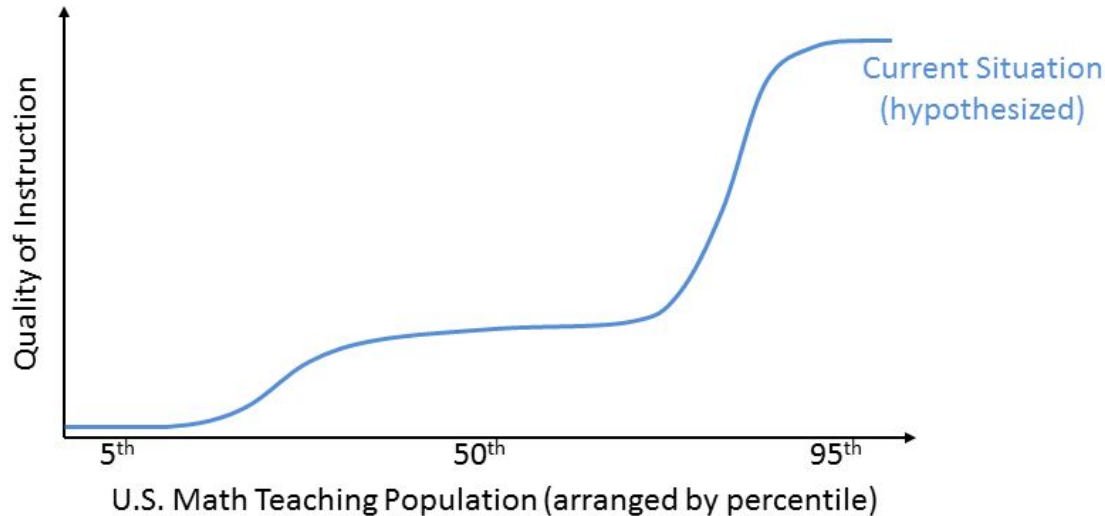


# Claim 4: Reform doesn't stick because it leaves in place the foundation of its undoing

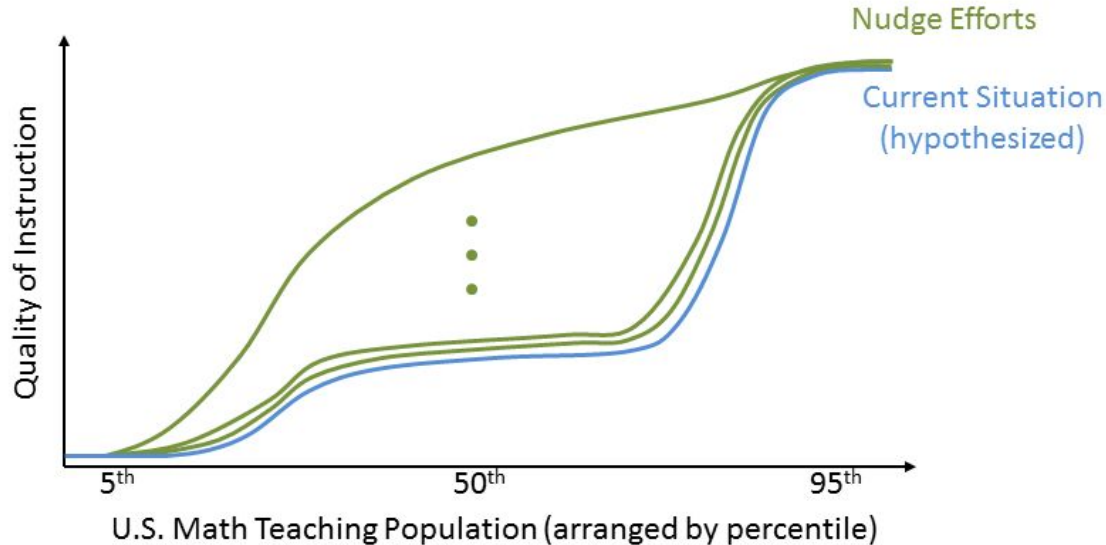
**Inertia of Tradition**



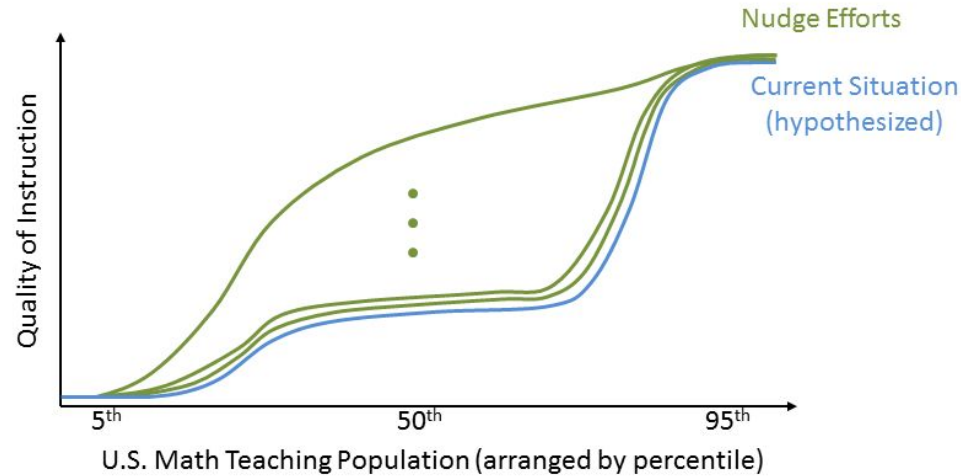
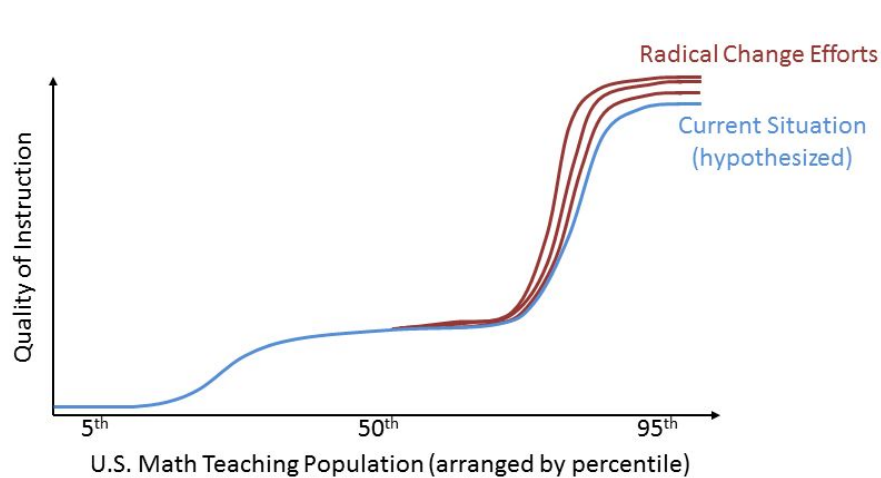
# Claim 5: Nudging seems modest but over time it can fundamentally reshape the curve



# Claim 5: Nudging seems modest but over time it can fundamentally reshape the curve



# Claim 5: Nudging seems modest but over time it can fundamentally reshape the curve



# Our Case for Nudging

1. Radical reform hasn't worked yet (for widespread change).
2. Radical reform only reaches a subset of teachers (and PSTs).
3. Radical reform doesn't stick, even for many people who are exposed to it.
4. Because radical reform has limited reach, it leaves in place the substantial "inertia of tradition," which assures that radical reform will continue to have limited reach.
5. Nudging, because it can reach many more teachers (and PSTs) and is more likely to stick, can eventually lead to a radical reshaping of instructional quality.

# Agenda

- ✓ Models of Change
- ✓ Our Observations
- ✓ Nudging
- ☐ **Discussion**
- ☐ Our Interpretation
- ☐ Questions and Answers



# Discussion

Thoughts on Nudging vs. Radical Change?

What do we nudge when?

How do we know if it works?

# Agenda

- ✓ Models of Change
- ✓ Our Observations
- ✓ Nudging
- ✓ Discussion
- ☐ **Our Interpretation**
- ☐ Questions and Answers





# Teacher Education

## Pragmatic Concerns

- A problem of scale
- Expensive
- Inconvenient
- Time-intensive
- Teacher's guides often ignored
- Rigid (hard to make changes promptly)

# Teacher Education

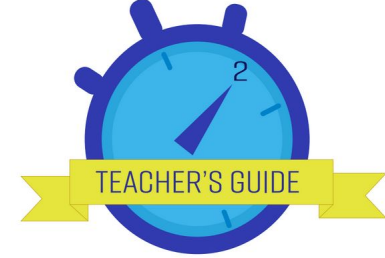
## Pragmatic Concerns

- A problem of scale
- Expensive
- Inconvenient
- Time-intensive
- Teacher's guides often ignored
- Rigid (hard to make changes promptly)

## Our Format Design

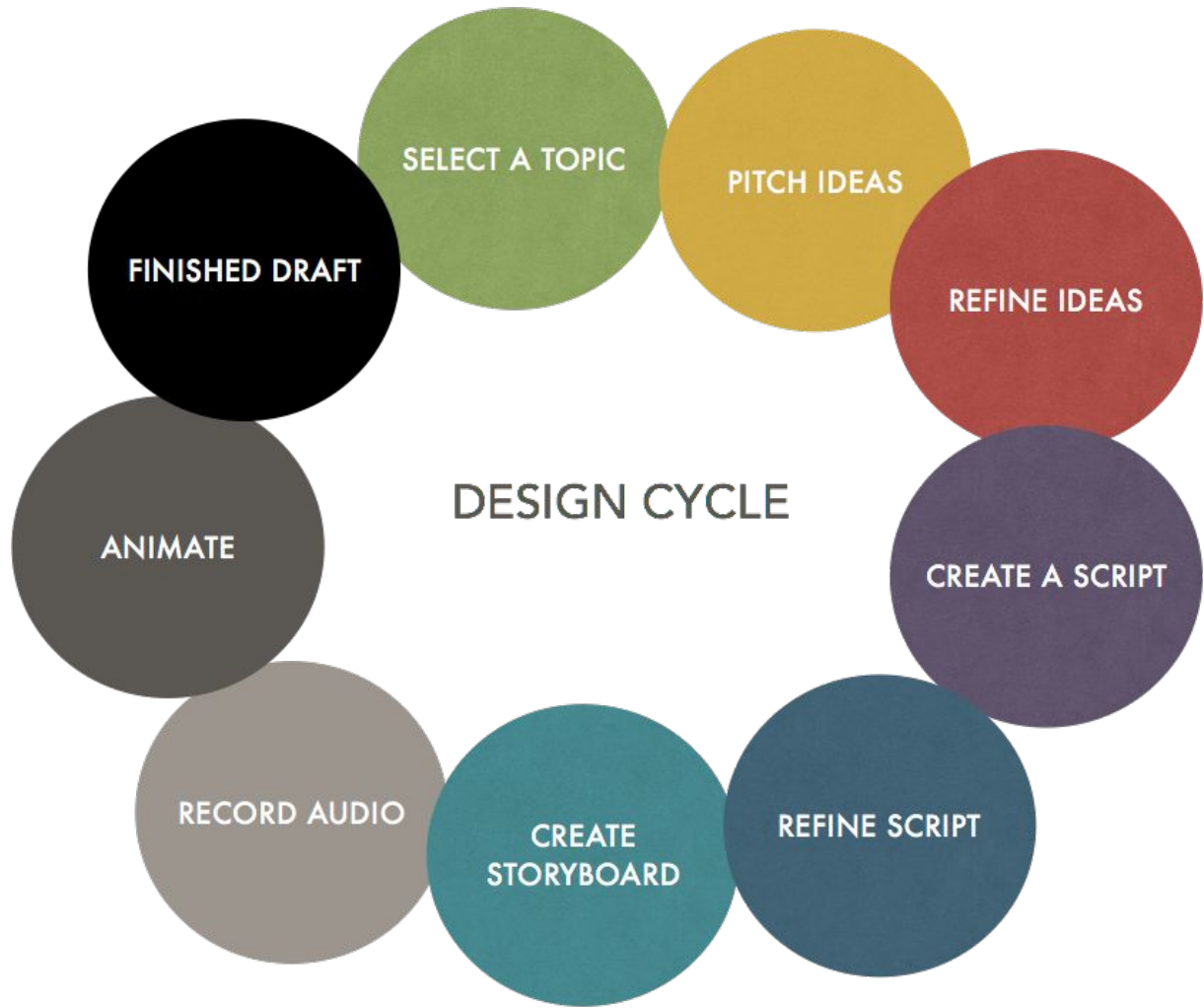
- Open-access
- Platform already in use
- Curriculum independent
- Fit into teachers' schedule
- Fit into teachers' existing practice
- Flexible and responsive

# Two-Minute Teacher's Guide



Create videos (with accompanying support materials) that are...

- Freely accessible via familiar platforms (e.g., YouTube)
- Connected to the teachers' curriculum (e.g., conventional textbooks) and recognizable topics
- Short (less than 3 minutes)
- Focused on 2–3 research-inspired ideas (Student Stumbles, Key Questions, Accommodating Learners, etc.)
- Supportive of an incremental approach to instructional improvement (NUDGE!)



# PD Design and Educative Materials

- Design Principles for Educative Materials (Davis et al., 2017)
  - Anticipate curriculum adaptations
  - Include representations of practice
  - Highlight the important content (“big ideas”)
  - Provide rationales and clarify how suggestions differ from current practice
  - Support teachers in promoting communication and argumentation
  - Support easy-to-enact practices and move incrementally toward more ambitious teaching
- “Studies have not untangled which ideas teachers take up from specific kinds of educative features.” (p. 297)

# PD Design and Educative Materials

- Characteristics of Effective PD (Desimone, 2009)
  - Focus on content
  - Opportunities for active teacher learning
  - Coherence with teacher' backgrounds and local context
  - Extended duration

# Videos & Accompanying Blog

[www.twominuteteachersguide.com](http://www.twominuteteachersguide.com)

**TWO-MINUTE TEACHER'S GUIDE**

[Home](#)

[About](#)

[Contact](#)



UNCATEGORIZED

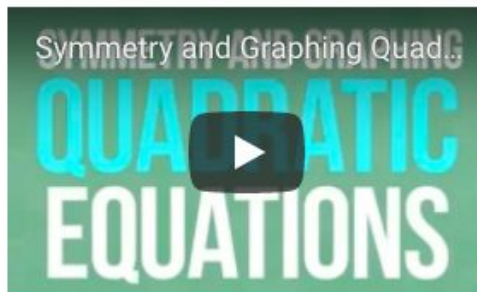
[LEAVE A COMMENT](#)



**What is the Two-Minute Teacher's Guide?**

UNCATEGORIZED

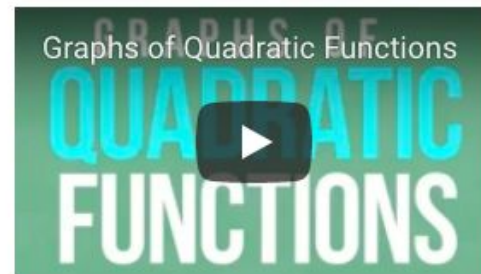
[LEAVE A COMMENT](#)



**Symmetry and Graphing Functions**

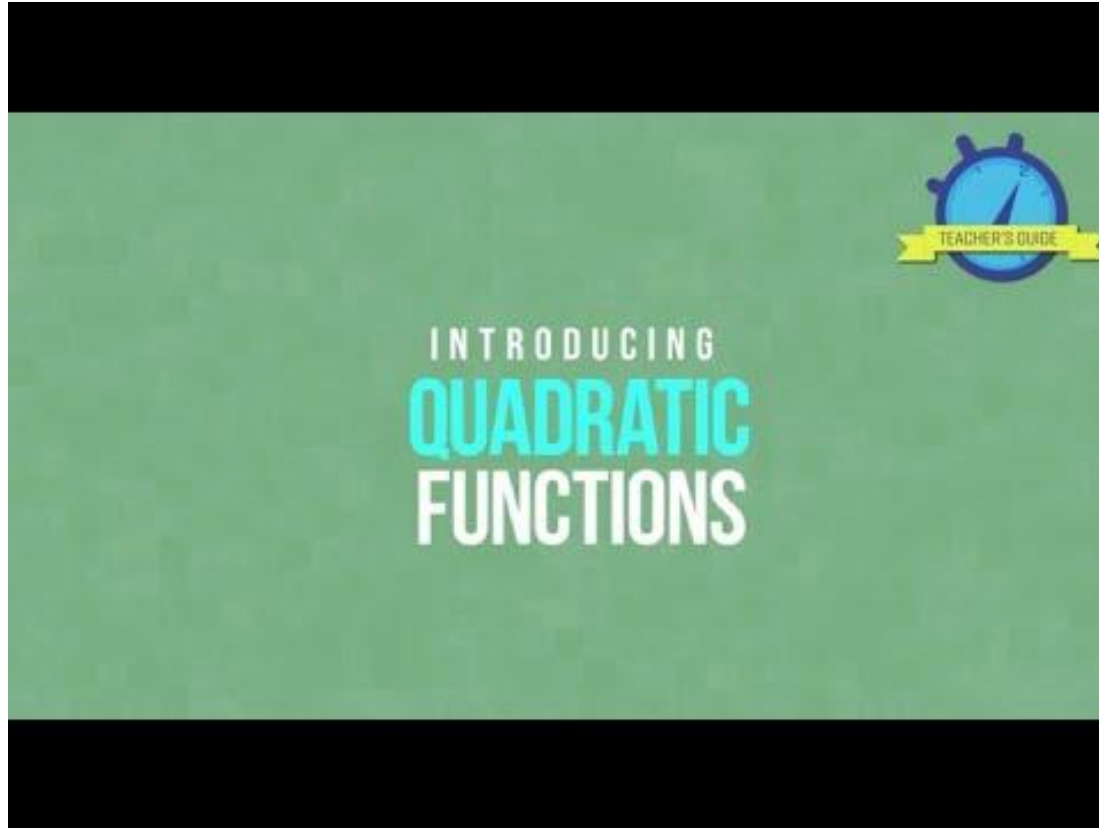
UNCATEGORIZED

[LEAVE A COMMENT](#)



**Graphs of Quadratic Functions**

# Sample Video





# Agenda

- ✓ Models of Change
- ✓ Our Observations
- ✓ Nudging
- ✓ Discussion
- ✓ Our Interpretation
- 📄 **Questions and Answers**



# Thank You

[www.twominuteteachersguide.com](http://www.twominuteteachersguide.com)

