

## Exploring interactions of race and discipline in teaching practices

Focusing on faculty of color in STEM

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Paper presented at the Annual Meeting of the Association for the Study of Higher Education, 2019

## Background and Conceptual Underpinnings

- Calls for re-examining pedagogies – particularly in STEM – to include more student-centered environments
  - Increasing cultural relevance and inclusion to improve minority student representation and engagement
- Despite common barriers, faculty of color have found ways to provide more supportive spaces in STEM environments
- Deep approaches – e.g., reflective and integrative learning – represent an opening for STEM disciplines to engage diverse students in a more culturally relevant way
- Active learning is well-suited to reflective and integrative learning
- This study seeks to better understand how faculty of color translate this into their teaching practices and how it differs in STEM and non-STEM disciplines

Conceptual Underpinnings

## Purpose and Research Questions

- Centering the experiences of faculty of color to better understand how faculty of color approach active and deep learning in different disciplines.

- 1 How does the level of importance faculty of color place on reflective and integrative learning relate to their usage of active learning?
- 2 How does the relationship between reflective and integrative learning and the usage of active learning vary across disciplines for faculty of color?

## Data and Respondents

**Faculty individual and course characteristics (%)**

	Asian	Black or African American	Hispanic or Latino/a	Multi-racial	Another identity
STEM disciplines	41.3	17.4	17.6	20.8	20.5
Women	40.5	56.3	50.1	53.2	45.1
Tenured	41.0	30.0	31.4	30.6	39.2
Teaching 4 years or less	22.3	18.5	19.6	20.9	13.0
Upper division courses	60.1	51.7	50.9	53.7	54.8
General Education courses	61.7	59.2	62.5	52.3	56.2
Small courses (20 students or less)	26.7	32.4	35.2	33.8	31.8

- 2014-2019 administrations
- 62,294 faculty at 442 institutions
- Final dataset include 9,866 faculty of color at 432 institutions

## Measures

**Reflective & Integrative Learning**

In your selected course section, how important is it to you that the typical student do the following?  
Response options: Very important, Important, Somewhat important, Not important

- Combine ideas from difference courses when completing assignments
- Connect their learning to societal problems or issues
- Include diverse perspectives (political, religious, racial/ethnic, gender, etc.) in course discussions
- Examine the strengths and weaknesses of their own views on a topic or issue
- Try to better understand someone else's views by imagining how an issue looks from their perspective
- Learn something that changes the way they understand an issue or concept
- Connect ideas from your course to their prior experiences and knowledge

**Active Learning**

In your selected course section, about what percent of class time is spent on the following?  
Response options: 0%, 1-9%, 10-15%, 20-29%, 30-35%, 40-49%, 50-74%, 75% or more

- Discussion
- Small-group activities
- Student presentations or performances
- Independent student work (writing, painting, designing, etc.)
- Experiential activities (labs, field work, clinical or field placements, etc.)

- RI and active learning standardized
- Control variables include individual and course characteristics: gender, tenure status, years of teaching experience, course size, course division, and whether the course counts toward a General Education requirement

## Analyses

- Five multilevel random slope models for faculty of color groups
- Random slope = proportion of active learning
- Chi-square Likelihood Ratio Tests and Wald Tests for parameter significance
- Posterior means - Empirical Bayes estimates for examining disciplinary differences

	Model 1 Asian	Model 2 Black or African American	Model 3 Hispanic or Latino/a	Model 4 Multi-racial	Model 5 Another identity
Faculty members (Level 1)	2,672	2,824	1,760	1,483	1,127
Faculty disciplines (Level 2)	129	129	126	124	121
Group size range	1 – 163	1 – 139	1 – 151	1 – 85	1 – 47
Group size mean	20.5	21.7	13.8	11.9	9.2
ICC (Discipline)	0.157	0.130	0.180	0.274	0.175
ICC (Institution)	0.038	0.009	0.052	0.016	0.005

### How does the level of importance faculty of color place on *reflective and integrative learning* relate to their *usage of active learning*?

- Controlling for individual and course characteristics, and accounting for disciplinary grouping, **increases in active learning** usage relate to **significant, positive increases** in the importance all faculty of color groups place on **reflective and integrative learning**

	Model 1 Asian		Model 2 Black or African American		Model 3 Hispanic or Latina/o		Model 4 Multiracial		Model 5 Another Identity	
Fixed effects	Est.	Sig.	Est.	Sig.	Est.	Sig.	Est.	Sig.	Est.	Sig.
Intercept	-.20	**	.30	***	-.05		-.24	**	-.03	
Est. Proportion of Active Learning	.23	***	.17	***	.17	***	.13	***	.17	***

\*p<.05, \*\*p<.01, \*\*\*p<.001

### How does the relationship between reflective and integrative learning and the usage of active learning vary across disciplines for faculty of color?

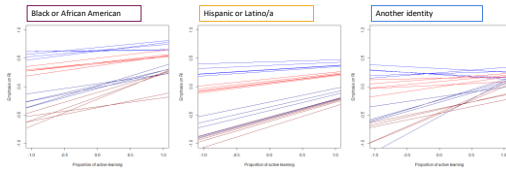
- For 3 faculty of color groups, **significant variance across disciplines** in how active learning usage relates to faculty views of the importance of reflective and integrative learning
- Increasing the use of active learning **minimizes disciplinary differences**

	Model 1 Asian		Model 2 Black or African American		Model 3 Hispanic or Latina/o		Model 4 Multiracial		Model 5 Another Identity	
Random effects	Var.	Cov.	Var.	Cov.	Var.	Cov.	Var.	Cov.	Var.	Cov.
Discipline (U <sub>i</sub> )	.11		.07		.10		.17		.08	
Est. Proportion of Active Learning (Y <sub>i</sub> )	.01	-.12	.03***	-.45	.01*	-1.00	.02	-.4	.05***	-.61
Fixed effects	Est.	Sig.	Est.	Sig.	Est.	Sig.	Est.	Sig.	Est.	Sig.
Intercept	-.20	**	.30	***	-.05		-.24	**	-.03	
Est. Proportion of Active Learning	.23	***	.17	***	.17	***	.13	***	.17	***

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### How does the relationship between reflective and integrative learning and the usage of active learning vary across disciplines for faculty of color?

- Considerable **overlap** in use of reflective and integrative learning **between STEM and non-STEM disciplines**



Selected discipline regression lines | STEM disciplines in red, non-STEM in blue

### Culturally Relevant Active Learning


- Reflective and integrative learning offers one way students can make **meaningful connections between their lived experiences and their learning**
- The more reflective and integrative learning students engage in, the better – potentially – they can **develop more culturally relevant knowledge**
- Active learning could be a valuable culturally relevant and inclusive set of pedagogical practices

### Leveling the Disciplinary Playing Field

- Increased active learning helps to **level the playing field across disciplines** in how some faculty of color view reflective and integrative learning
- The effect is **more pronounced** in disciplines where faculty of color tend to value reflective and integrative learning less
- Active learning use in these disciplines can be even more **valuable to increase cultural relevance and inclusion** through reflective and integrative learning

### Moving Beyond STEM vs. Non-STEM

- Some STEM disciplines show high importance among faculty of color of reflective and integrative learning, suggesting already **high capacity for cultural relevance and inclusion**, on par with plenty of non-STEM disciplines
- With STEM/non-STEM differences often small among some faculty of color, this framing **potentially obscures** more nuanced understandings
- For **non-STEM disciplines** with low importance on reflective and integrative learning, how do they (or don't they) promote cultural relevance and inclusion?
- For **STEM disciplines** with higher importance on reflective and integrative learning, what tools other than active learning do they use?



Thanks so much for joining us!

Find our slides and paper as well as other information about FSSE at [fse.indiana.edu](http://fse.indiana.edu)

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