

# Collaborative Research: Exploring the Impact of Noyce MTF Programs on Teacher Retention: The Role of Motivation, Leadership, and School-Work Environment

Adem Ekmekci

Mahtob Aqazade

Osvaldo Soto

Jamie Catanese

Rice University

Rice University

University of  
California  
San Diego

Rice University

Western Noyce Regional Conference

March 4-6, 2022

San Diego, CA

DUE #1950019 (Lead)



DUE #1949925



DUE #1949927



DUE #1949969



DUE #1949985



DUE #1950001



DUE #1950002



# Overview

Share our research (design and results so far) and stimulate discussions. Each section 5-10 min present 5-10 min Qs feedback, 10-15 min overall discussion

1. Project overview and design
2. Results from the pilot study survey
3. Preliminary results from the main study survey
4. Interviews

# 1. Project Overview

Goal: To study the retention and persistence of MTFs beyond their teaching commitment in comparison with non-MTFs and in relation to their:

- self-efficacy for teaching,
- leadership skills,
- diversity dispositions,
- school-work environment, and
- social networks.

# Research Questions

- How do MTFs and non-MTFs compare in terms of their self-efficacy for teaching, leadership skills, diversity dispositions, social networks, and school-work environment?
- To what extent do MTFs' and non-MTFs' self-efficacy for teaching, leadership skills, diversity dispositions, social networks, and school work-environment relate to their retention?

# Research Questions (cont.)

- What social network characteristics (both teaching and teacher leadership networks) affect teacher retention and persistence?
- What social network characteristics (both teaching and teacher leadership networks) affect leadership activities?
- How do Noyce MTFs' social networks differ from the networks of non-Noyce teachers?
- How do Noyce MTFs' teaching related networks differ from their leadership related networks?

# Project Activities

## Year 1

### Research Design & Recruitment

- Develop & refine research plan, timeline, and logistics
- Contact, reconnect with, and recruit former MTFs
- Identify and recruit comparable non-Noyce teachers
- Develop & refine instruments & data collection infrastructure

## Year 2

### Data Collection

- Survey – Fall 2021
- Interviews – Spring 2022

## Year 3

### Synthesis & Dissemination

### Data Analysis (Y2-Y3)

- Quantitative
- Qualitative
- Social network analysis

- External feedback (AB)
- Consultation

- Virtual group meetings
- Reporting

Completed

Ongoing

Future

# Recruitment for the Pilot Survey

- Rice University School Mathematics Project (RUSMP) teacher network
- Announced in May, closed mid-August
- Two-step: enrollment and survey
- Hiccup with spams due to incentives



# Recruitment

- Collection of demographic and professional background data completed spring 2021
  - 89 of 102 potential MTFs (87% success)
  - 175 potential comparison teachers (about 200 invited)
- Matching MTFs with non-MTFs completed Aug-Sep 2021
  - Based on experience, school-level, degrees, and demographics
- 87 comparison teachers were invited initially

# Survey

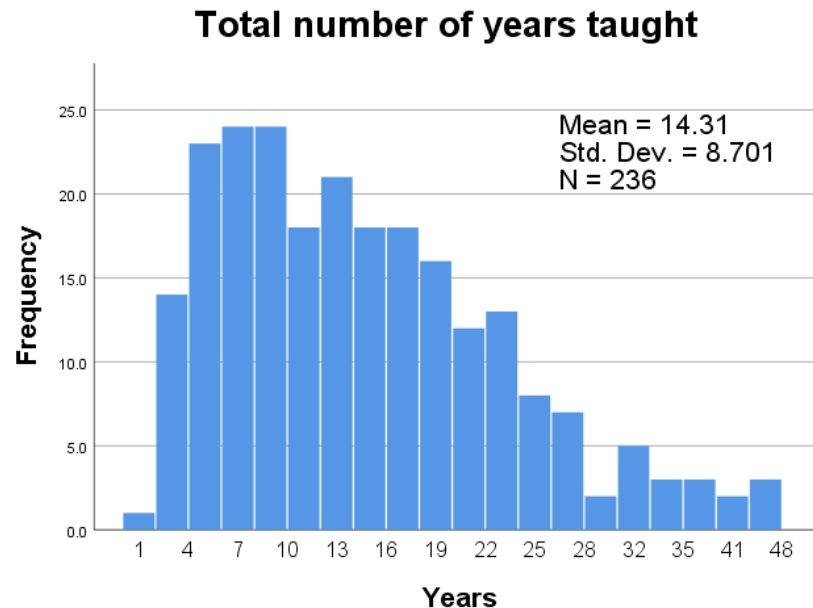
- Three main parts:
  1. Demographic and professional background
  2. Teaching and leadership
  3. Social networks
- Long survey! (45-min to 1 hour)
  - Encouraged multi-sessions
- Incentives:
  - Pilot - \$15 for everyone and seven big prizes totaling to \$1,000
  - Main study - \$175 for everyone

# Q&A and Discussion (Part I)

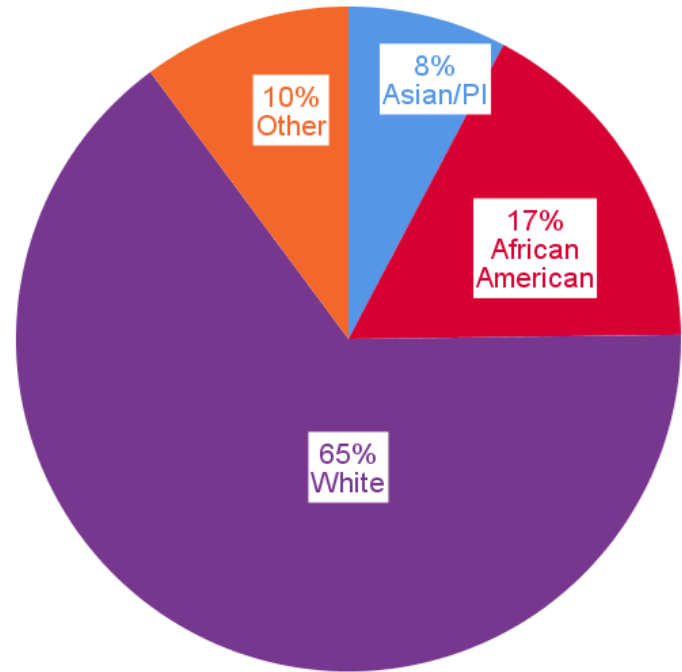
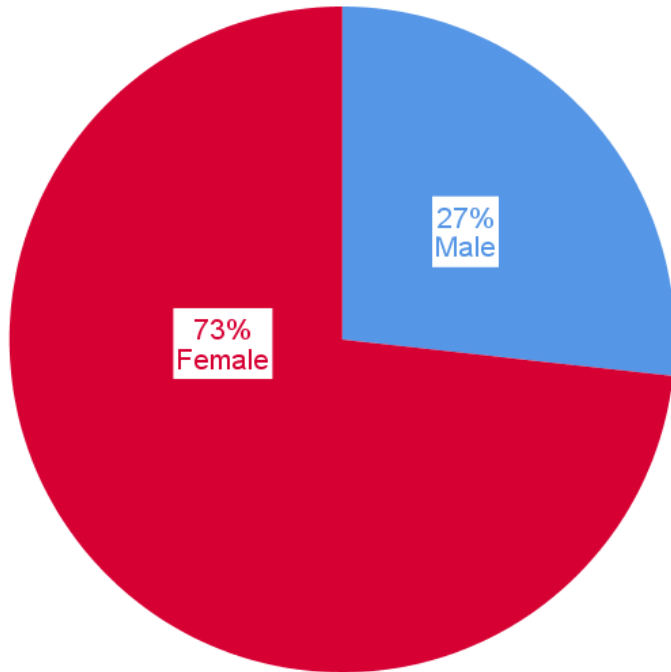
- Questions? Feedback?
- Share your experiences in survey studies with teachers
  - Challenges, tips, etc.
- Discuss advantages and challenges for open-to-public surveys vs. by-invitation surveys
- Discuss different types of questions in surveys (e.g., Likert-scale, open-ended, standardized-response)

## 2. Pilot Survey

- Revalidation of the survey questions and structure for the main study
- Math and science teachers from both elementary and secondary schools in the Greater Houston area

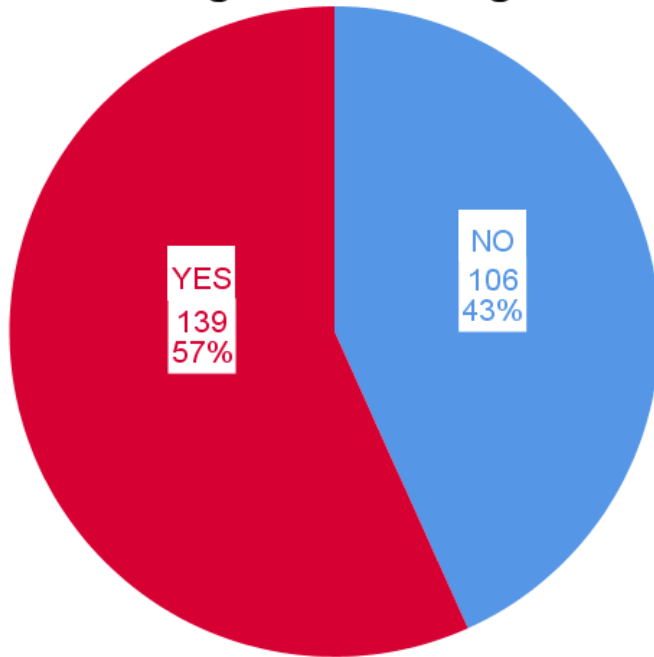


# Demographics

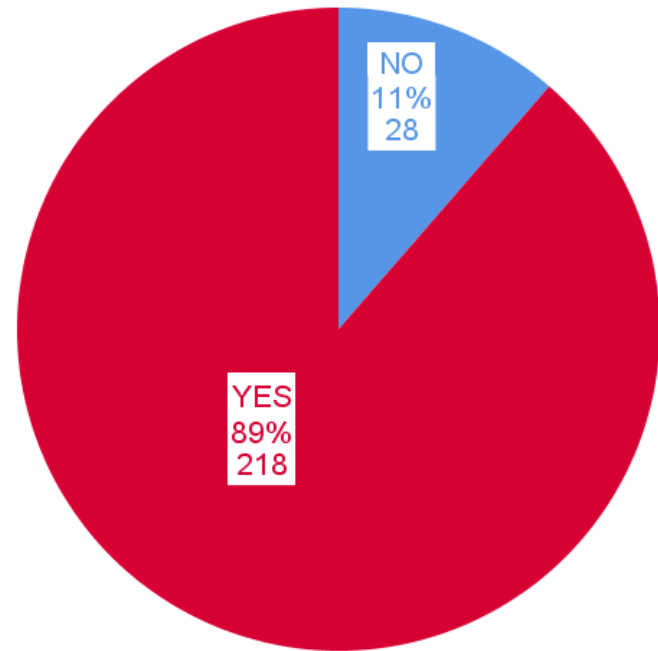


# Professional Background

**Degree in teaching**



**Standard certification**



# Retention

- Stayer: remaining in teaching
- Shifter: accepting a role in education outside of teaching
- Leaver: changing to a non-educational career

# Pilot Results

| <b>Retention</b>                 |  | <b>B</b>     | <b>S.E</b>  | <b>Exp(B)</b>  |
|----------------------------------|--|--------------|-------------|----------------|
| <i>Shifter</i>                   |  |              |             |                |
| Intercept                        |  | -5.27        | 5.80        |                |
| Male                             |  | -19.85       | 0.00        | 0.00           |
| URM                              |  | 0.13         | 0.79        | 1.14           |
| Standard certification           |  | 0.95         | 1.29        | 2.58           |
| Degree in teaching subject       |  | -0.88        | 0.76        | 0.41           |
| <b>Secondary</b>                 |  | <b>1.80</b>  | <b>0.87</b> | <b>6.02*</b>   |
| Teaching self-efficacy           |  | 0.75         | 0.76        | 2.11           |
| <b>Teacher leadership skills</b> |  | <b>2.30</b>  | <b>0.77</b> | <b>10.02**</b> |
| <b>Person-organization fit</b>   |  | <b>-1.38</b> | <b>0.62</b> | <b>0.25*</b>   |
| Principal autonomy support       |  | 0.06         | 0.38        | 1.06           |
| Diversity dispositions           |  | -0.78        | 1.33        | 0.46           |
| Community connectedness          |  | 0.09         | 0.50        | 1.09           |
| Social network                   |  |              |             |                |
| Size                             |  | 0.01         | 0.09        | 1.01           |
| <i>Leaver</i>                    |  |              |             |                |
| Intercept                        |  | -5.90        | 5.44        |                |
| Male                             |  | -0.12        | 0.68        | 0.89           |
| URM                              |  | -1.03        | 0.90        | 0.36           |
| Standard certification           |  | -0.68        | 1.01        | 0.51           |
| Degree in teaching subject       |  | -0.79        | 0.62        | 0.46           |
| Secondary                        |  | 0.96         | 0.74        | 2.62           |
| <b>Teaching self-efficacy</b>    |  | <b>2.52</b>  | <b>0.78</b> | <b>12.37**</b> |
| Teaching leadership skills       |  | -0.44        | 0.59        | 0.65           |
| Person-organization fit          |  | -0.38        | 0.46        | 0.68           |
| Principal autonomy support       |  | -0.26        | 0.32        | 0.77           |
| Diversity dispositions           |  | -0.75        | 1.21        | 0.47           |
| Community connectedness          |  | 0.15         | 0.40        | 1.17           |
| Social network                   |  |              |             |                |
| Size                             |  | 0.02         | 0.09        | 1.02           |

a The reference category is: Stayer or Mover.

## **Regression results**

- Secondary teachers more likely to shift to a non-teaching position
- Higher levels of teacher leadership skills associated with shifting to a non-teaching position
- Lower degrees of professional fit within schools associated with shifting
- Higher levels of teaching self-efficacy observed in leavers compared to stayers

## **Reasons for shifting**

- Burnout  
*"I was seeking positions outside of the classroom because of [demanding] teaching."*
- Better pay
- Greater impact  
*"I felt I could better support students by supporting teachers."*

## **Reasons for leaving**

- Pandemic, retirement, family, stress, burnout, *"caustic atmosphere"* of school districts



# Q&A and Discussion (Part II)

- Shifting to a non-teaching position
  - Secondary teachers
  - Leadership skills
  - Teacher-school fit
- Reasons for shifting
- Reasons for leaving
- Questions? Feedback?

# 3. Main Survey

- Background questionnaire administered early spring 2021
- Main survey administered October-December, 2021
  - Follow-up background questionnaires
  - Scales for teaching and leadership
  - Social networks
    - Teaching network
    - Teacher leadership network

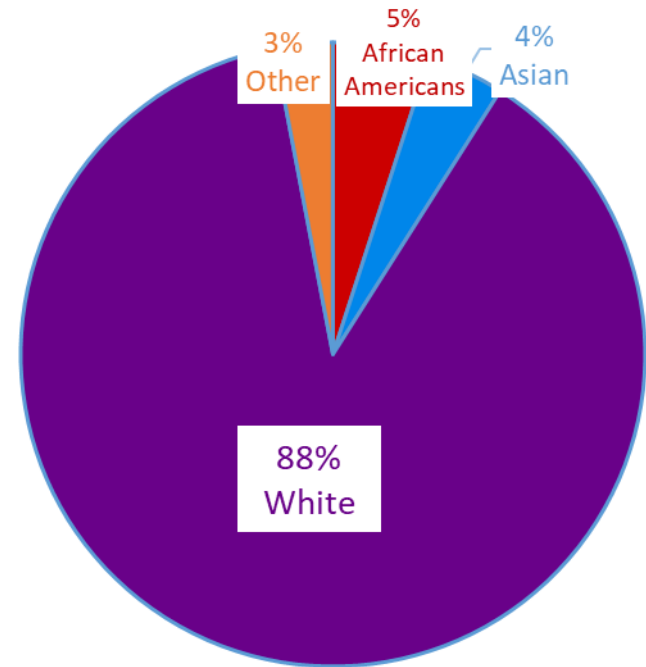
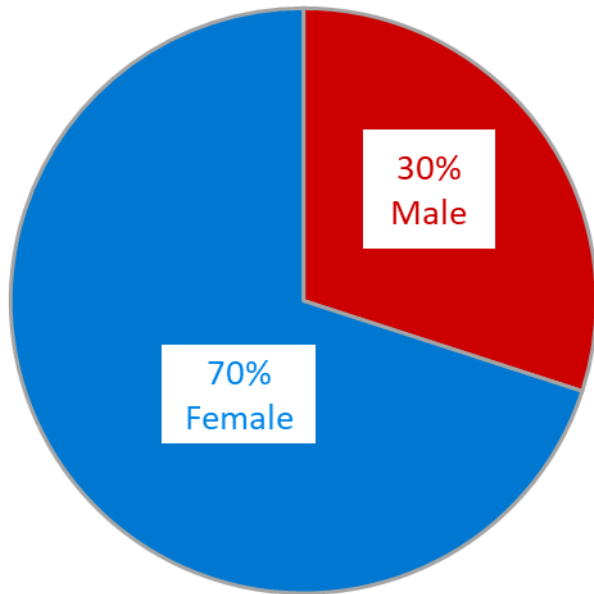
# Survey Completion

- Administered October-December
- 84 out of 87 MTFs completed (out of 102 original sample; 82% success rate)
- 83 out of 107 total invited comparison teachers completed (78% success rate)

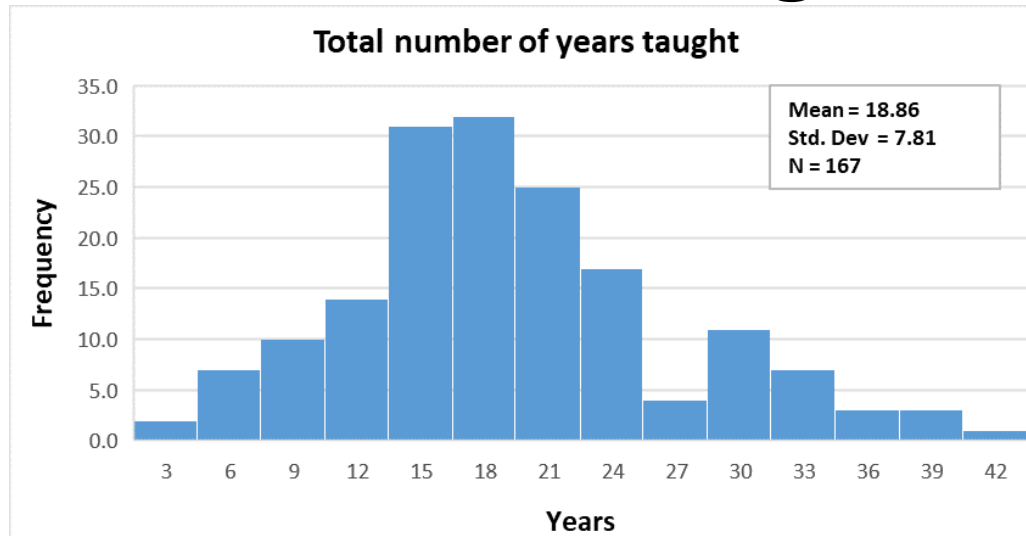
## Role \* retention Crosstabulation

| Count |            | retention |       |         |        | Total |
|-------|------------|-----------|-------|---------|--------|-------|
|       |            | stayer    | mover | shifter | leaver |       |
| Role  | Comparison | 62        | 5     | 13      | 3      | 83    |
|       | MTF        | 42        | 9     | 24      | 9      | 84    |
| Total |            | 104       | 14    | 37      | 12     | 167   |

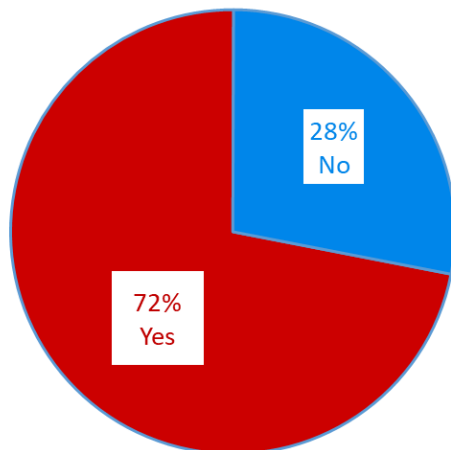
# Demographics



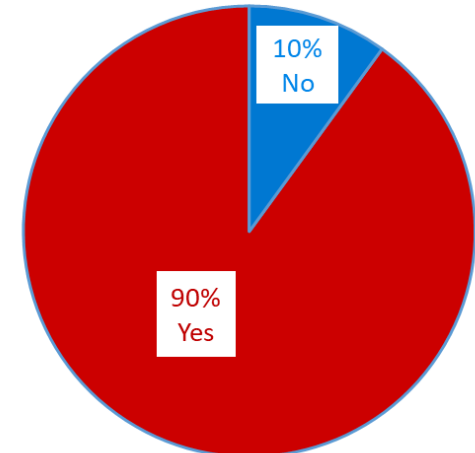
# Professional Background



**DEGREE IN TEACHING**



**STANDARD CERTIFICATION**



# Retention

- Stayer: remaining in teaching
- Mover: changed schools recently
- Shifter: accepting a role in education outside of teaching
- Leaver: changing to a non-educational career

# Main Study Results

| <b>Retention</b> |                                  | <b>B</b>     | <b>S.E</b>  | <b>Exp(B)</b> |
|------------------|----------------------------------|--------------|-------------|---------------|
| <i>Mover</i>     |                                  |              |             |               |
|                  | Intercept                        | -1.44        | 6.53        |               |
|                  | Teaching self-efficacy           | 0.38         | 0.63        | 1.46          |
|                  | Teacher leadership skills        | -0.69        | 0.53        | 0.50          |
|                  | Person-organization fit          | -0.21        | 0.44        | 0.81          |
|                  | Principal autonomy support       | -0.24        | 0.34        | 0.78          |
|                  | Diversity dispositions           | 0.13         | 1.70        | 1.14          |
|                  | Community connectedness          | 0.04         | 0.45        | 1.04          |
|                  | Social network size              |              |             |               |
|                  | Teacher leadership               | -0.07        | 0.10        | 0.93          |
|                  | Teaching                         | 0.10         | 0.08        | 1.10          |
| <i>Shifter</i>   |                                  |              |             |               |
|                  | Intercept                        | -1.09        | 5.74        |               |
|                  | Teaching self-efficacy           | 0.43         | 0.53        | 1.54          |
|                  | <b>Teacher leadership skills</b> | <b>1.74</b>  | <b>0.52</b> | <b>5.72**</b> |
|                  | <b>Person-organization fit</b>   | <b>-0.77</b> | <b>0.36</b> | <b>0.46*</b>  |
|                  | Principal autonomy support       | 0.28         | 0.30        | 1.32          |
|                  | Diversity dispositions           | -1.07        | 1.38        | 0.34          |
|                  | Community connectedness          | -0.05        | 0.38        | 0.95          |
|                  | Social network size              |              |             |               |
|                  | Teacher leadership               | 0.10         | 0.07        | 1.11          |
|                  | Teaching                         | 0.01         | 0.06        | 1.01          |
| <i>Leaver</i>    |                                  |              |             |               |
|                  | Intercept                        | 3.60         | 9.70        |               |
|                  | Teaching self-efficacy           | 1.98         | 1.06        | 7.24          |
|                  | Teacher leadership skills        | 1.02         | 0.74        | 2.77          |
|                  | Person-organization fit          | -0.46        | 0.53        | 0.63          |
|                  | Principal autonomy support       | -0.65        | 0.38        | 0.52          |
|                  | Diversity dispositions           | -3.53        | 2.56        | 0.03          |
|                  | Community connectedness          | 1.13         | 0.66        | 3.09          |
|                  | Social network size              |              |             |               |
|                  | Teacher leadership               | 0.19         | 0.12        | 1.21          |
|                  | Teaching                         | -0.17        | 0.12        | 0.84          |

a The reference category is: Stayer.

## *Regression results*

- Movers did not differ from stayers
- Higher levels of teacher leadership skills associated with shifting to a non-teaching position<sup>^</sup>
- Lower degrees of professional fit within schools associated with shifting<sup>^</sup>
- Leavers did not differ from stayers

## *Reasons for shifting*

- Support other teachers  
“To support teachers in reference to curriculum and materials to utilize for instructional purposes.”
- Greater impact<sup>^</sup>
- Evaluations and challenges in teaching  
“Tired of the evaluation procedure as an educator; took too much time from actual teaching.”
- Professional growth

## *Reasons for leaving*

- Family<sup>^</sup>, retirement<sup>^</sup>, pursuing graduate degrees, budget cut, broadening scope of their work “curriculum developer for a non-profit textbook publisher”

<sup>^</sup> similar to pilot results

# Q&A and Discussion (Part III)

- Shifting to a non-teaching position
  - Leadership skills
  - Teacher-school fit
- Reasons for shifting
- Reasons for leaving
- Questions? Feedback?



## 4. Interviews

- Protocols developed in Fall 2021
- Four versions based on retention status
  - Protocol A – Stayer
  - Protocol B – Mover
  - Protocol C – Shifter
  - Protocol D – Leaver
- Two sets of questions based on MTF status
  - Protocol M – MTF
  - Protocol N – Non-MTF

# Pilot Interviews

- Eight pilot interviews conducted in December and January for each possible scenario (4x2, retention-status by MTF-status) with Houston-area teachers except for an MTF-leaver
- Interviews took more than 1 hour
- Protocols revised
  - Some redundant questions eliminated
  - Some questions did not directly relate to research questions
  - Re-ordering of questions (smoother intro and flow)

# Main Interviews

- Interview training completed in early February
- Interviewee selection completed
  - About 40% of survey takers (66 teachers)
  - Selected considering retention-status and MTF-status
- Interviews ongoing: March through May

# Q&A and Discussion (Part IV)

- After the interviews:
  - Transcription (software etc.)
  - Coding
- Future studies
- What do you do after the Noyce MTF grant? (e.g., keeping connections, MTF network, supporting retention)

# Session Feedback

Please take a minute to give us feedback on this session!  
All presenters will be getting feedback from their session

<https://tinyurl.com/wrna22>

Please leave your name at the end to be included in the raffle.

Raffle prizes include Amazon gift cards, STEM Education books, t-shirts, and more