

# TEAM-UP

## TEACHER EDUCATION ALLIANCE MINES - UNC PARTNERSHIP

# MINES · UNC

COLORADO SCHOOL OF MINES | UNIVERSITY OF NORTHERN COLORADO



## TEAM-UP: Evolution and Activities

*Kristine Callan*  
*Wendy Adams*



Improving the Education of  
Future Physics Teachers



# Acknowledgments



UNIVERSITY OF  
NORTHERN  
COLORADO

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# Our Mission

Passion for STEM + Drive to Teach = Impact



*Those who can, do.  
Those who can also **inspire**, teach.*

# Overview

- Evolution of TEAM-UP
- Program recruitment/improvement activities
- Challenges to overcome

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# Mutual Benefit



UNIVERSITY OF  
NORTHERN  
COLORADO

- 6,000 math, science, and engineering students
- Want more HS students interested in STEM and well-prepared
- Want to retain Mines students who decide not to become engineers
- Began as normal school
- 12,000 students – no engineering
- Want to produce more highly-qualified STEM teachers

Conversations started Fall 2013

First students started Fall 2015

# Student quote

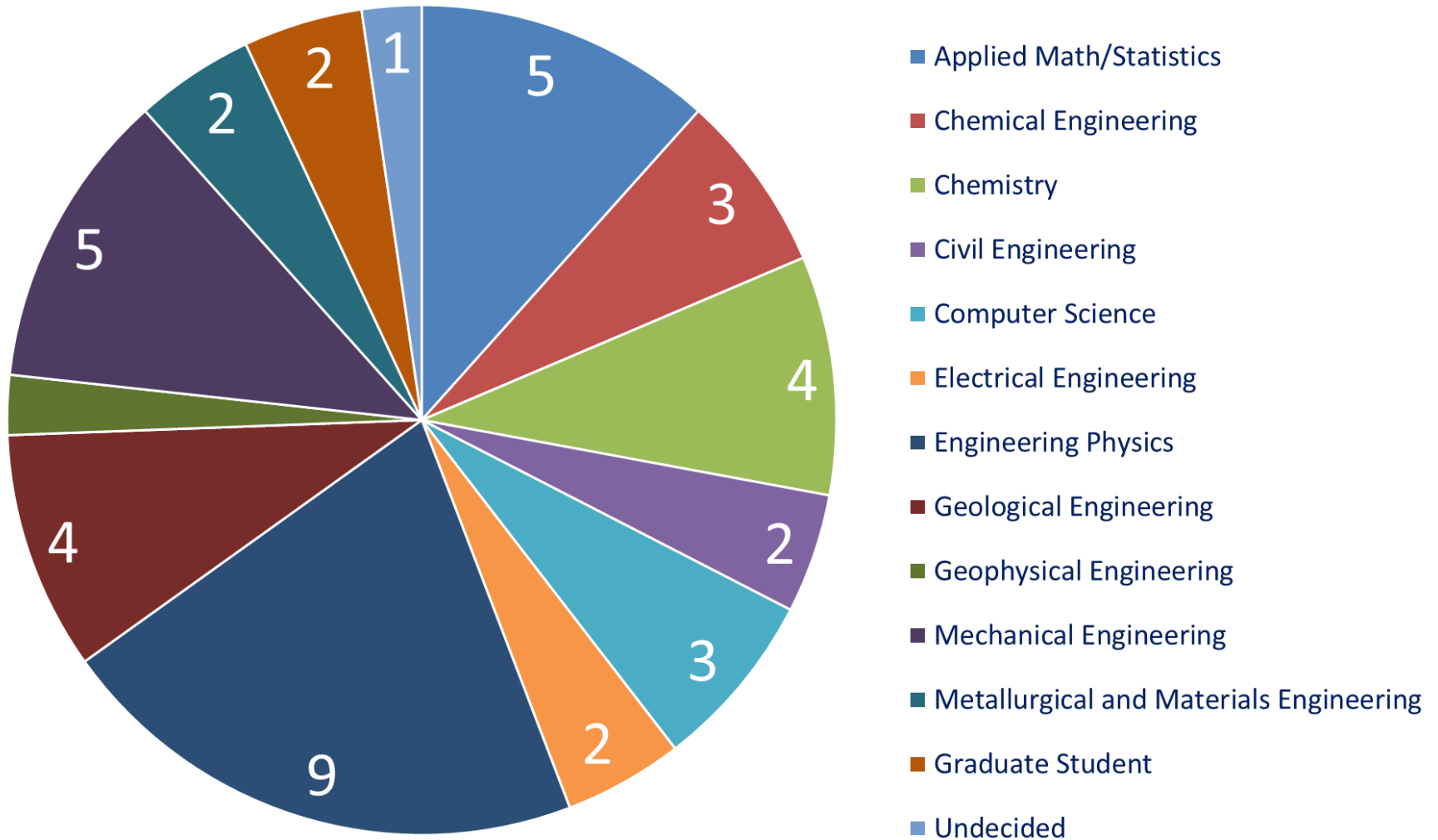
*When deciding what school to go to, I couldn't make up my mind if I should go to CSM to pursue an engineering degree or go to CU or UNC to pursue a degree in education. I love the way engineering challenges me and I also really enjoy teaching kids of all ages in STEM related fields.*

# The Program

- Bachelor's from Mines: content preparation
- Teacher licensure from UNC:
  - Secondary (7-12) Science &/or Mathematics
  - Classes taught on Mines' campus or online
  - 30 credits total
    - 21 credits of education coursework (before or after Mines graduation)
    - 9 credits of student teaching (after Mines graduation)
  - Up to 21 credits can count toward Mines degree
    - 2 courses count as required humanities electives



# Number of Students by Major



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# Lowering Energy Barriers

- Classes held at Mines or online
- Tuition agreement
- Streamlined registration process
- Automatic course transfer

# Providing Energy Boosts



- \$1.2M Noyce Grant (Track 1, Phase 1)
- Paid internships for students wanting to try out teaching
  - \$11.25/hr for ~5 students/semester
  - + **Work Study Students!**
  - Early Field Experience Course
- Scholarships for teacher candidates who want to work in high needs districts
  - \$10k/semester
  - 64 student semesters available

# Building community

- TEAM-UP house
- Individual advising
- Student club (TEA)
- Orientation and other events
- Face-to-face classes



# Increasing Visibility

- Student-facing (20 events in 16/17 AY)
  - Admissions events for perspective students
  - Presentations to student groups/clubs
  - Information sessions prior to registration week
  - Student club meetings
  - Targeted student email blasts
- Faculty/staff-facing (7 events in 16/17 AY)
  - Departmental meetings/colloquia
  - Mines Board of Trustees meeting
- Community-facing (6 events in 16/17 AY)
  - Teacher Advisory Group (TAG)

# Leveraging Our Teacher Advisory Group (TAG)

- Teacher, state, and industry representation
- Stakeholders provide feedback on program
- Funded by PhysTEC and 100Kin10 Collaboration Grants
- Examples of topics:
  - Perceptions of the teaching profession
  - Purposeful teacher candidate placement
  - Expectations of teacher candidates and cooperating teachers
  - Brainstorming ideal teacher preparation and induction programs



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# Utilizing Teachers in Residence

- Cherie Bornhorst
  - Physics teacher at Thompson High School
  - Runs TAG
  - Starting Denver Area Physics Teachers TEAM-UP
- Stephan Graham
  - Physics and Chemistry teacher at Arrupe Jesuit
  - Teaches Early Field Experience Seminar
- Trish Loeblein (Yr 1), Stephanie Fanselow (Yr 2), Lacy Cleveland (Yr 3)
  - Build partnerships with local schools
  - Teach Methods and Practicum
  - LC writing paper on TAG and purposeful teacher placement



# Perceptions of Teaching as a Profession (PTaP)

- Research project to develop an instrument to measure student perceptions
  - Partnership with PhysTEC
- Perception gap – underestimate teacher salaries and overestimate private sector salaries
- Believe teacher attrition is twice what it actually is
- Don't think teachers can retire comfortably
- Think teaching would be boring after a year or two



# Combating Perceptions

- Compiled local and national data on
  - Secondary vs. college teaching salaries
  - Hidden teaching benefits (retirement, student loan forgiveness)
  - STEM majors salaries
  - Job satisfaction of industry vs. teaching
- Presented data and had conversations with TAG, students, and faculty *before* telling them about our program

# Example

## Starting salaries

Which is closest to the typical starting salary for K-12 teachers in Colorado?

- A. \$23,000
- B. \$30,000
- C. \$38,000
- D. \$47,000
- E. \$60,000

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## Mid-career salaries

After 15 years of teaching and earning a master's degree, which is closest to the typical Colorado K-12 teacher salary?

- A. \$30,000
- B. \$45,000
- C. \$60,000
- D. \$70,000
- E. \$85,000

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## Teacher Salaries

9 month (\$40K annualized): \$53K, \$75k:\$100K)

	BA yr 1	BA yr 5	MA yr 5	MA yr 15
Weld County School District 6	\$37,260	\$43,172	\$47,839	\$69,131 - \$78,136
Jefferson County Schools	\$38,000	\$44,943	\$49,839	\$66,904 - \$73,103
Boulder Valley Schools	\$43,591	\$46,724	\$55,037	\$66,487 - \$96,958
Denver Public Schools	\$39,850	\$41,078	\$47,948	\$64,841 - \$78,760

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## Loan Forgiveness

- Direct or FFEL program
  - \$17,500
  - Full time Highly Qualified math or science teacher in Low income school
  - 5 consecutive years
- Perkins
  - Full time math or science teacher
  - Yr 1 & 2 cancel 15%/yr
  - Yr 3 & 4 cancel 20%/yr
  - Yr 5 cancel 30%

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## Teacher Retention

What fraction of grade 7-12 teachers remain in the profession at year 5?

- A. 28%
- B. 41%
- C. 59%
- D. 78%
- E. 90%

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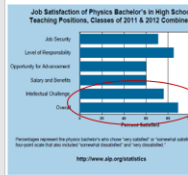
## Retention and Job Satisfaction

- 78% of secondary teachers continue into year 5.<sup>†</sup>
- Five out of six science teachers said they would choose the same career again.
- 27.8% of Teach For America Teachers remain in the profession after 5 years.<sup>‡</sup>

<sup>†</sup>2015 U.S. Dept. of Ed. Public School Teacher Attrition and Mobility in the First Five Years: Results From the First Through Fifth Waves of the 2007–08 Beginning Teacher Longitudinal Study  
<sup>‡</sup>Donaldson & Johnson. "Teach For America teachers: How long do they teach? Why do they leave?." *Phi Delta Kappan* 93.2 (2011): 47-51.

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## High School Teacher

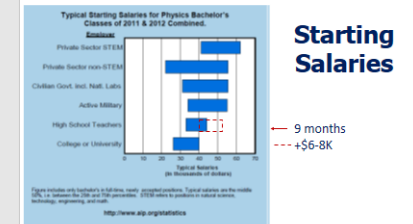


## Private Sector STEM Positions



Intellectual challenge and satisfaction rated higher than private sector STEM careers

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## Physics Teachers

What fraction of physics teachers have a major in physics or physics education?

- A. 17%
- B. 32%
- C. 51%
- D. 64%
- E. 88%

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## Relative Demand by Field

Considerable shortage (5.00 – 4.21)

- **Physics 4.52**
- Spec. Ed. – Severe/Profound Disability 4.36
- Spec. Ed. – Visually Impaired 4.33
- **Mathematics 4.23**
- **Chemistry 4.21**

2014 AAEE (American Association of Educator Supply and Demand in the United States Report

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## Large scale surveys of STEM students

- PtAP – Perceptions of Teaching as a Profession
- POPA Survey – APS Panel on Public Affairs
- Underestimate teacher salaries by ~\$10K+
- Overestimate private sector salaries by \$10K - \$40K
- The starting salary they would want to go into teaching is a little less than average starting teaching salaries
- Don't think teachers can retire comfortably
- Think teaching would be boring after a year or two

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## Turn and talk

- What did you already know?
- What surprised you?
- What questions do you still have?
- What would you think if one of your best classmates decided to become a high school physics teacher?

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# PTaP Project

- Workshops at conferences
  - PhysTEC, Noyce
  - 5:00 High School Teachers Lounge
- 100Kin10 Project Team
  - Joint effort between APS, AAPT, ACS, TEACH.ORG, Woodrow Wilson Foundation, Breakthrough Collaborative, West Virginia University
  - Developing teacher recruitment messaging

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# Challenges

- Visibility of a new program
  - Not in Mines' catalog
- Students heavily recruited into engineering jobs (including 3 aspiring Noyce Scholars)
- Curriculum is a moving target
- Two Institutions
  - Support
  - Communication
  - MOU
- Turf wars between colleges of education and sciences amplified rather than alleviated

# Future Plans & Possibilities

- Improve awareness and perceptions
  - Information for faculty
  - Information for parents
- Integrate with Mines curriculum
  - Minor in Education
  - STEM Ed Focus Area in BSE
  - Non-thesis Master's





# TEAM-UP

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# Questions?

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