Get the Facts Out: Changing the Conversation around STEM Teacher Recruitment

Wendy K. Adams
Colorado School of Mines
Outline

• Motivation
• Partnership
• Get The Facts Out Resources
  • Get the Facts Out Booklet
  • Messaging
  • Brochure, Poster, Program flyer template
  • Student and Faculty MythBusters w/ Informational Handouts

• How can we mobilize the campaign?
  • National Change Agents
  • Professional Messaging
  • Study and Iterate
Relative Demand by Field

Considerable shortage (5.00 – 4.21)

• Physics 4.52 -> 4.53
• Spec. Ed. – Severe/Profound Disability 4.36 -> 4.61
• Spec. Ed. – Visually Impaired 4.33 -> 4.59
• Mathematics 4.23 -> 4.42
• Chemistry 4.21 -> 4.42

2014 & 2016 AAEE (American Association of Employment in Education) Educator Supply and Demand in the United States Reports
Interest in Teaching

2017 POPA report – Recruiting teachers in high needs....
Interest in Teaching

• Colorado School of Mines
  • Survey of interest from Calculus I, II, III and Diff-Eq
  • Engineering, math and science majors
  • N=1,015
  • 46.5% indicated they would pursue a minor to teach math or science if offered.

• Similar results in Intro Physics
Rest of the Story

*STEM majors are interested, but not pursuing teaching.*

- Recent studies have found students and faculty have many misperceptions and a lack of knowledge about the teaching profession
  - Live in poverty
  - Won’t be able to retire
  - Unhappy and leaving the profession in droves
  - ...
Rest of the Story

• Interviews and student events have found that misconceptions and facts about the profession must be addressed before students will “hear” what we have to say about
  • scholarships
  • streamlined degree plans
Recent Research

POPA Report
A Survey of majors and recent STEM graduates

PTaP
Research-based instrument to measure perceptions of teaching as a profession

Additional Data Mining
Other national research/surveys; local salary schedules and retirement plans

Communications Science and Marketing Expertise
Fields of expertise that inform change efforts
Recent Research

POPA Report

Recent Research

• PTaP – Perceptions of Teaching as a Profession

  • Adams, Plisch, Callan, Plantt, Taffe
  • ~50 statement Likert instrument which measures students perceptions
  • 2000 students from over 15 institutions
  • 30+ student interviews

Adams, W. K., (2017) A new survey uncovers strong misperceptions about the teaching profession. What can we do to get the facts out? Forum on Education Newsletter, Fall 2017
Partnership

• Last Spring formed a partnership between four national societies, two universities, two non-profit STEM teacher prep organizations - facilitated by 100Kin10
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  • Study and Iterate
Get the Facts Out

- Get the Facts Out Booklet
- Messaging
- Poster
- Program Flyer Template
- PTaP Survey
- Student and Faculty MythBusters w/ Informational Handouts
- Next Steps

Get the Facts Out:

A user-friendly guide to engaging people in discussion about careers in secondary math and science teaching
Get the Facts Out Booklet

• For anyone interested in recruiting science and math teachers
  • Describes research base
  • Provides Resources
    • Share
    • Use and Adapt
    • Development and Testing
13 positive messages about the profession:

Did you know….

• that there are student loan forgiveness programs and scholarships for math and science teachers?

• most teaching jobs have better retirement benefits than private industry?

• You can get a job almost anywhere as a science or math teacher?

• most people underestimate teachers’ salaries by $10,000-$30,000?

• teaching is one of the best ways to work abroad, teaching science or math in an American school?
Messaging

Development

• Crafted from misperceptions or little known benefits revealed during PTaP interviews.
• Supported by data mining of existing research/surveys, salary schedules and retirement plans
• Student interviews
• Student survey (STEM undergrads and grads)
  • "This adds to my opinion of teaching"
  • "Neutral" or
  • "This subtracts from my opinion of teaching“
• Retained those with <5% subtracts & majority adds
Tag Lines

• Blow minds. Teach Science.
• Teaching: Worth it in more ways than you may think.
• Those who can inspire, teach!
• Be happy. Teach science.
• Those who can, do. Those who can also inspire, teach!
• Want to be in demand? Teach math or science.
• Teachers have better work stories.
• Thinking about teaching science?
Brochure

• For students (and their parents)
• Incorporates messaging
• Designed to be customized

Modify this cover to place branding for your own discipline and teaching programs.
TEACHING: WORTH IT IN MORE WAYS THAN YOU MAY THINK

IT PAYS TO TEACH...

1. MOST PEOPLE UNDERESTIMATE TEACHERS’ SALARIES BY $10-$30K.*

2. MOST TEACHING JOBS HAVE BETTER RETIREMENT BENEFITS THAN PRIVATE INDUSTRY.

3. THERE ARE STUDENT LOAN FORGIVENESS PROGRAMS AND SCHOLARSHIPS FOR MATH AND SCIENCE TEACHERS. •

Most teaching jobs have salary scales with generous annual and predictable education-based increases, and often provide good pension or retirement plans. With loan forgiveness programs, NOYCE scholarships and TEACH grants, it can pay to become a physics education major!

BE HAPPY. TEACH PHYSICS.

If you haven’t seriously considered K-12 teaching, you should! A recent report from the American Physical Society (https://goo.gl/5f5GHl) uncovered some interesting facts about science teaching:

4. SCIENCE TEACHERS REPORT HAVING HIGHER JOB SATISFACTION THAN OTHER STEM PROFESSIONALS. •

5. SCIENCE TEACHERS REPORT HIGHER INTELLECTUAL CHALLENGE IN THEIR JOBS THAN OTHER STEM PROFESSIONALS. •

6. ABOUT HALF OF ALL PHYSICS MAJORS REPORT AN INTEREST IN BECOMING A TEACHER.

Science teaching is highly valued by most undergraduate science majors. If you are interested in teaching, don’t delay! In many universities, it is possible to earn a teaching license alongside a degree in your field of study.

WANT TO BE IN DEMAND? TEACH PHYSICS

Classroom teachers of physics are in high demand around the nation (and worldwide). While interacting with students is one of the best parts of teaching, there are also many opportunities that allow science teachers to stand out and have state-wide, nation-wide, and even international impact.

7. SCIENCE TEACHERS ARE IN INCREDIBLY HIGH DEMAND.

8. YOU CAN GET A JOB ALMOST ANYWHERE AS A PHYSICS TEACHER, EVEN OUTSIDE THE U.S.

9. OVER 78% OF MIDDLE AND HIGH SCHOOL SCIENCE TEACHERS ARE STILL IN THE CLASSROOM AFTER 5 YEARS OF TEACHING.

10. TEACHERS ARE 6X MORE LIKELY TO SAY THAT THEY MAKE A DIFFERENCE IN PEOPLE’S LIVES THAN OTHER STEM PROFESSIONALS.

* See PoPA report https://goo.gl/5f5GHl
• See studentaid.ed.gov
• See AIP data at https://www.aip.org/statistics/highschool/teachers
• See https://nces.ed.gov/pubs2015/2015337.pdf

BLOW MINDS. TEACH PHYSICS.

By committing to physics teaching while still in school, you can benefit from thousands of dollars worth of grants, scholarships, and loan forgiveness.

Visit http://aapt.org/K12/Thinking.cfm to learn more about physics teaching.
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♦ See studentaid.ed.gov
♦ See AIP data at https://www.aip.org/statistics/highschool/teachers

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Student MythBusters

• Interactive presentation w/ Peer Instruction
• 15 – 25 minute versions
• Measurable impact  
  – increasing # of correct responses
• Increased numbers of students follow up
  • eg. 12/30 Physics majors asked to be contacted
**Student MythBusters**

### Starting salaries
Which is closest to the typical starting salary for K-12 teachers in Colorado?
- A. $25,000
- B. $30,000
- C. $38,000
- D. $47,000
- E. $60,000

### 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

### 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%

### Retention and Job Satisfaction
- 78% of secondary teachers continue into year 5.  
- 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.  

### Relative Demand by Field
Considerable shortage (5.00 – 4.21)
- Physics 4.52
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- Spec. Ed. – Visually Impaired 4.33
- Mathematics 4.23
- Chemistry 4.21

### Teacher Salaries
9 month ($40K annualized: $53K, $75K to $100K)
- MA yr 1: $37,280
- BA yr 1: $43,132
- MA yr 2: $47,819
- MA yr 3: $51,188
- MA yr 4: $56,033
- MA yr 5: $59,321
- MA yr 6: $61,934

### Loan Forgiveness
- Direct or FFEL program: $117,500
- 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: 15% yr
  - Yr 3, 4: 10% yr
  - Yr 5: 0%

### 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%

### 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?
Informational Handouts

Teacher Benefits Information
Updated 5/5/2016

Colorado Retirement
Colorado schools offer PERA Retirement benefits:
- Your eligibility for retirement is based on years teaching + age
- For example, if you began teaching when you are 22 years old, you are eligible to retire after teaching 34 years

PERA calculator shows that a person who does this will earn 87.5% of their highest 5 years.

To explore pension amounts based on age and years of experience, try out this calculator:
https://www.wcopera.org/resources/calculators/pera-monthly-retirement-benefit

Federal Student Loan Forgiveness for Teachers

Direct Subsidized and Unsubsidized Loans
- Up to $17,500 if you are a highly qualified math or science teacher
- Can only apply after completion of the 5 years.

Cancellation of up to 100% of Perkins Loans
- 15% year Years 1 and 2 (includes interest accrued during the period)
- 20% Year Years 3 and 4
- 30% Year 5

Qualify for deferment of Perkins Loans while teaching full time.

Plus Loans – no forgiveness

Salary Increase By Major

<table>
<thead>
<tr>
<th>Undergraduate Major</th>
<th>BA yr 1</th>
<th>BA yr 5</th>
<th>MA yr 5</th>
<th>MA yr 15</th>
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</table>

*Inflation has been added to the chart to show the actual salary increase.

Teacher Salaries
Updated 10/25/2017

<table>
<thead>
<tr>
<th>School Type</th>
<th>BA yr 1</th>
<th>BA yr 5</th>
<th>MA yr 5</th>
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<td>$48,032</td>
<td>$61,907</td>
<td>$58,349 - 59,673</td>
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</table>

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More data: Salaries for College by Type | Salaries for College by Regions | Salaries for College by Degrees That Pay You Back | Related articles: pay less required to get a degree | Starting Pay
Faculty MythBusters

• Benefits compared to industry and college teaching
• Interactive presentation with intensive data mining
• 50 minutes
• Developed through interactions with our Teacher Advisory Group
  • High School teachers, administrators, Industry, and State Department of Ed and Higher Ed
• Closes with: “I would feel comfortable with my favorite student becoming a 7-12th grade teacher”
  • all participants have agreed or strongly agreed
Data Mining


• Local School Salary Schedules

• College/University Salaries

• National Data on Salary by Major

• State Retirement System

• Retention Research: 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, 2015.
Data Mining

Teacher Benefits

Colorado Retirement
Colorado schools offer PERA Retirement benefits:
- Your eligibility for retirement is based on years teaching.
- For example, if you begin teaching when you are 22 years old, your retirement eligibility begins at age 49.
- PERA calculator shows that a person who does this will receive a retirement benefit of $50,000.

To explore pension amounts based on age and years of experience, try the PERA calculator at:
https://www.wcopera.org/resources/calculators/pera-monthly-retirement

Federal Student Loan Forgiveness for Teachers

https://studentaid.ed.gov

Salary Increase By Major

<table>
<thead>
<tr>
<th>Major</th>
<th>Starting Median Salary</th>
<th>Median Graduated Salary</th>
<th>Median 10-Year Salary</th>
<th>Median 20-Year Salary</th>
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Douglas County Schools
https://www.dcs.k12.co.us/sites/default/files/hr/humanresources/Comp_Compensation.pdf

Managers, 17, 19, 19.pdf

The Wall Street Journal

DIRECT SUBSIDIZATIONS

- Up to 17,520
- Teaching
- Can only apply to non-tenure

CANCELLATION OF UP TO 15,000

- 15% Annual Growth
- 20% Annual Engagement
- 30% Yearly Service

QUALIFIED FOR PLUS LOANS - NO FEE
**MythBusters**

**Development**

- Crafted from misperceptions or little known benefits revealed during PTaP interviews
- Supported by data mining of existing research, surveys, salary schedules, & retirement plans
- TAG provided the high school teacher vs. industry perspective
- Iterated through multiple student & faculty events
  - 9 Student MythBusters
    - 2 institutions
  - 10 Faculty MythBusters
    - 3 High School Teachers
    - 4 National meetings
Get the Facts Out

- Get the Facts Out Booklet
- Messaging
- Poster
- Brochure
- Program Flyer Template
- PTaP Survey
- Student and Faculty MythBusters w/ Informational Handouts
- Next Steps

Get the Facts Out: A user-friendly guide to engaging people in discussion about careers in secondary math and science teaching.
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  • *Get the Facts Out* Booklet
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  • Brochure, Poster, Program flyer template
  • Student and Faculty MythBusters w/ Informational Handouts

• **How can we mobilize the campaign?**
  • National Change Agents
  • Professional Messaging
  • Study and Iterate
How can we mobilize the campaign?

• Key to sustained adoption is *interactive dissemination* rather than passive

• Communications Science: Diffusion and Dissemination, opinion leaders...

• Professional Messaging

• Study and iterate over five years

• Sustained by societies


Interactive Dissemination

• National Change Agents

• Each change agent offers
  • 2 workshops per year, X 10 faculty from different institutions
  • 5 change agents will reach 100 faculty per year = 500 faculty over 5 years
  • 500 institutions = ~2/3 physics departments, ~2/3 of chemistry departments, and ~1/2 math departments in U.S.

• Follow up with workshop attendees to offer support
Communications Science

• Dissemination
  • Messages are delivered to a target audience
    • Booklet, posters, brochures, flyers, presentations

• Diffusion
  • Ideas are communicated among members of a social system over time on the basis of influence
    • How can we get opinion leaders to share their ideas?
    • Who are the opinion leaders?
Major Influence

Where do students go to get valued advice on what to study?

- Family (42%)
- College Counselor (28%)
- Friend (23%)
- College staff non-advisor (18%)
- High School Teacher (15%)
- High School Counselor (11%)
- Person with experience in the field (10%)
- Internet (6%)
- Print media (2%)

Major Influence

• Which sources are helpful?
  • Person with experience in the field (84%)
  • Employer or co-worker (82%)
  • College staff non-advisor (79%)
  • High School Teacher (78%)
  • Family (75%)
  • Friend (71%)
  • Print media (69%)
  • Internet (68%)
  • College Counselor (66%)
  • High School Counselor (61%)

Professional Messaging Development

• Westen Strategies will develop
  • Words and phrases within messages
  • Accordion-like messages of roughly 60 seconds
    • can be expanded or contracted in a conversation depending on interest
  • Change *networks of associations* – interconnected thoughts, feelings, images, memories, and values activated when people think about teaching science and their close cousins, engineering and technology as a career
  • Different neural circuits regulate positive and negative feelings, and those feelings are what motivate most behavior
Changing the Conversation

• Partnership
• *Get the Facts Out* Resources
• Plan to mobilize the campaign (if funded)