Development and validation of a new survey: Perceptions of Teaching as a Profession PTaP

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Physics Teacher Education Coalition

Improving the Education of Future Physics Teachers

UNIVERSITY OF NORTHERN COLORADO

COLORADO SCHOOL OF MINES

Introduction

- Purpose
- Instrument format
- Development and Validation
- Preliminary Results

Purpose

- Grade 7-12 science and math teaching
- Climate of the department as perceived by the students
  - See institutional differences
- Perceptions of the career
  - Intellectual fulfillment, Pay, benefits, high need
- Early identification of potential candidates
- Every student can learn (aka Growth vs. Fixed Mindset)

Research questions

- What differences in department culture and student perceptions about teaching exist among institutions that are more or less successful in preparing large numbers of physics teachers?
- What is the impact of PhysTEC support, measured by longitudinal changes in student attitudes?

Research questions

- What measurable characteristics differentiate students who become teachers from those who do not?
- Do specific interventions, including providing more accurate information about teaching as a profession or participating in an early teaching experience, increase students' interest in becoming a teacher?

PTaP Format

- Likert scale, suitable for online delivery
- 58 statements plus demographic questions
- 11 empirical categories
- <9 minutes

"My department would be proud if I became a Grade 7-12 teacher."

"Grade 7-12 teachers can retire comfortably before age 60."

Development and Validation

- Expert feedback on valuable topics
- Student Interviews
- Large scale data collection Summer 16
- Statistical Analyses
  - Item analysis
  - Factor analysis
- Expert responses collected
- Expert feedback on data, statement revision/deletion and factor naming

Development and Validation

REPEAT!

- Student Interviews on new statements
- Large scale data collection Spring 17
- Statistical Analyses
  - Item analysis
  - Factor analysis
- Expert responses collected
- Expert feedback on data and factor naming

Development and Validation

Experts

- PhysTEC Advisory Board (11 faculty and 9 TIRs)

Student Interviews

- 13 UNC students
- 18 Mines students (1 DU, 1 Rice)
- Challenging to draw out negative thoughts about profession

Development and Validation

Large scale data collection

- Summer 2016
  - ~1,000 STEM students from ~15 institutions
- Spring 2017
  - ~800 STEM students from ~12 institutions
- Negative thoughts more freely shared

Item Analysis

- V1 Deleted statements: correlation > 0.5, 90% agreement, no category or differentiation between populations

Development and Validation

Factor Analysis

- Reduced-basis factor analysis
  - Principle Components – initially Direct Oblimin rotation
  - Analyze one category at a time
- V1 - 9 very strong empirical categories.
- V2 – 11 categories
- Categories nearly orthogonal
- More robust than CLASS categories

PTaP Results -Version 2

I want to become a grade 7-12 teacher	Neutral	No	Yes
N = 777	156	481	140
Overall (53)		39.4	66.8
Personal Enjoyment		12.2	87
As a Career Choice		37.1	75.8
Support by Others		48.1	69
Department Values & Encourages Teaching		35.5	59.7
Department Supports Me Teaching		47.2	64.1
Employee Benefits and Security		29.4	48.4
Teaching Is Scientific		50.1	80.7
Nurturer		33	86.5
Back up Plan		42.1	49.2

PTaP Results - Version 2

I want to become a grade 7-12 teacher.	Neutral	No	Yes
N = 777	156	481	140
All Students Can Learn		59%	80%
Pursue Teaching Cert at my Institution		5	85
Pursue Teaching Cert other route		18	16
I would if…		179	45

PTaP Results – Version 2

- Underestimate teacher salaries by ~$10K+
- Overestimate private sector salaries by $10K - $40K
- Don’t think teachers can retire comfortably
- Think teaching would be boring after a year or two

Need to get the facts out!

Category Names – Version 2

- Personal Enjoyment
- As a Career Choice
- Support By Others
- Employee Benefits and Stability
- Teaching Is Scientific
- Nurturer
- All Students Can Learn

- I would if…

- **Department Values and Encourages Teaching**
- **My Department Supports Me Teaching**
- **Back Up Plan**

Conclusion

- PTaP is a new instrument that measures perceptions of teaching as a profession
  - 11 strong categories of student perceptions of the profession
- PTaP finds measurable differences between
  - students who want to become secondary teachers and those who do not
  - institutions
- Identified a major obstacle to recruiting teachers.
  - Inaccurate information about the profession.

Messaging Design

- As a Team we identified a range of misperceptions that we wanted to tackle
- Searched for existing research/surveys/data to support facts countering each misperception.
- Developed a correct statement to counter each misperception. “Did you know…”

Messaging Testing

- Conducted 5 student interviews
- Survey Monkey completed by STEM undergrads and grads and UNC and Mines

1. Did you know… most teaching jobs have better retirement benefits than private industry?
    - This adds to my opinion of teaching.
    - Neutral
    - This subtracts from my opinion of teaching.

Messaging Testing

- Conducted 5 student interviews
- Survey Monkey completed by STEM undergrads and grads and UNC and Mines
  - Adds or subtracts from opinion of teaching
  - Rank messages

Tagline Development

- Compiled taglines from previous projects and existing society resources
- During student interviews for messaging, solicited tagline ideas
- On the end of the messaging Survey Monkey "Suggest a tagline:"

Tagline Testing

- 5 student interviews
- Thumbs up for each tagline

1. Those who can, do. Those who can also inspire, teach!
   - 1, 2 or 3 thumbs up
   - plus a text box for comment.

Tagline Testing

- 5 student interviews
- Thumbs up for each tagline
- Choose your favorite tagline (drop down)
- Choose your second favorite
- Choose your third favorite

Messaging Results

- **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?**
  - **science teachers report having higher overall job satisfaction than other STEM professionals?**
  - **teaching is one of the best ways to work abroad, teaching science or math in an American school?**

Messaging Results

- **Did you know...**
  - **teachers are six times more likely to say that they make a difference in people's lives than other STEM professionals?**
  - science teachers report similar or greater levels of intellectual challenge in their jobs compared to other STEM professionals?
  - **math and science teachers are in high demand?**
  - most people underestimate teachers' salaries by $10,000-$30,000? Did you know... over 78% of high school science teachers are still in the classroom after 5 years of teaching?

Messaging Results

- **Did you know…**
  - as a teacher you have opportunities to attend conferences and keep learning?
  - **teachers have the option to make $6-$8K each year for coaching, clubs, after school tutoring etc…?**
  - about half of all science and math majors report an interest in becoming a teacher?

Taglines

- 2.26 Blow minds. Teach Science
- 2.11 Teaching: Worth it in more ways than you may think.
- 2.03 Those who can inspire, teach!
- 1.9 Be happy. Teach science.
- 1.88 Those who can, do. Those who can also inspire, teach!
- 1.86 What's stopping you from teaching the next generation?
- 1.84 Want to be in demand? Teach math or science.

 # is average number of thumbs up

Taglines

- 1.7 Teachers have better work stories
- 1.63 Thinking about teaching science?
- 1.48 It pays to teach!
- 1.4 Teaching is a solid job worth looking at.
- 1.36 Teach now!
- 1.31 Why wait? It pays to teach!

 # is average number of thumbs up