



2019 | Year 1

**Get The Facts Out
Annual Report**



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About Get the Facts Out

Get the Facts Out (GFO) is a five-year, NSF-funded partnership of the Colorado School of Mines and four national societies: the American Physical Society, the American Chemical Society, the American Association of Physics Teachers, and the Association of Mathematics Teacher Educators. GFO is a unique project designed to reach STEM majors in a large fraction of all U.S. mathematics, chemistry, and physics departments and has the potential to address teacher shortages in these high-need STEM disciplines significantly.

Repairing the Reputation of the Teaching Profession

To change the conversation around STEM teacher recruitment at institutions across the country, GFO produces research-based content and reports that faculty can use to help improve their teacher recruitment efforts. The resources are designed to celebrate the positives of teaching and to provide students and faculty with facts that address misinformation and common misperceptions about teaching. The GFO Project Team continually works to update and improve these resources as well as provide support to the faculty who use them.

These resources, and all other content in this report, are intended to be used broadly to change the conversation around STEM teaching careers. We encourage anyone to use and distribute these materials for their intended purpose, within the terms of the [Creative Commons license described here](#).



Any opinions, findings, conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation. NSF DUE #1821710 & 1821462.

Accomplishments

What are the major goals of the project?

Get the Facts Out is a national information campaign guided by behavioral change theory that promises to increase the number of well-prepared math and science teachers nationwide. In turn, this will increase the number and the diversity of HS graduates who have both the interest and the preparation to persist as STEM majors. *Get the Facts Out* is a cost-effective approach to recruiting that can be implemented by any IHE. It targets widespread negative perceptions that can be barriers to recruiting and promotes positive, accurate messaging about the teaching profession. This unique project is designed to reach STEM majors in a large fraction of all U.S. math, chemistry and physics departments and has potential to significantly address teacher shortages in these high-need STEM disciplines. For example, if every U.S. physics department recruited just one more teacher each year, the severe national shortage of qualified physics teachers would be largely addressed D. E. Meltzer, M. Plisch, and S. Vokos, Editors, *Transforming the Preparation of Physics Teachers: A Call to Action*. A Report by the Task Force on Teacher Education in Physics (T-TEP) (American Physical Society, College Park, MD, 2012).

To develop and implement a national campaign, a project team that includes leadership from professional societies in the mathematical and physical sciences, experts in behavioral change and teacher education was formed, and several IHEs were chosen to serve as study sites. During the project, the societies will leverage their connections with disciplinary departments to implement this national campaign, which will be sustained by the societies after project funding ends. The study sites will implement local *Get the Facts Out* campaigns and assist researchers in gathering quantitative and qualitative data to document impact and inform toolkit revisions.

The goals of the *Get the Facts Out* campaign are to:

- (1) change perceptions about the teaching profession by faculty, teachers, students, and parents,
- (2) increase the frequency of faculty engaging in practices in the *Get the Facts Out* toolkit, and
- (3) increase numbers of math, chemistry, and physics majors who enroll in a certification program.

Further, we seek to document the campaigns effectiveness.

The strategic plan for year 1 is as follows (the full strategic plan has been uploaded as a pdf):

Activity	Year 1
Toolkit development	<ul style="list-style-type: none">• Message testing completed• Toolkit completed and put on web• User interface tested
Society campaigns	<ul style="list-style-type: none">• Change agents recruited and trained• Local champions identified• Preparation for campaigns done
Research	<ul style="list-style-type: none">• Faculty Perceptions of Teaching as a Profession (FPTaP) instrument developed and validated.• Student Strategy Engagement (SSE) and the Faculty Strategy Implementation (FSI) questionnaires created• Perceptions of Teaching as a Profession (PTaP) survey data exploration tools coded onto PhysPort• Quantitative sites recruited, baseline data gathered• Site visits completed
Evaluation	<ul style="list-style-type: none">• Data on change agents gathered (observations, focus groups, surveys)• Evaluative feedback on campaign plans given
Project management	<ul style="list-style-type: none">• Project Management Team meetings• Project Area Teams meetings• Annual Project meeting

* What was accomplished under these goals (you must provide information for at least one of the 4 categories below)?

Major Activities:

This list of activities is organized to align with the Strategic Plan year 1 (SPy1) contained in Question 1 above.

Toolkit Development – The *Get the Facts Out* Toolkit is a set of tested resources and strategies for recruiting STEM teachers. It contains both faculty/staff and student presentations, posters/brochures/flyers, a listing of potential venues for engaging students, surveys, and other resources. This work is being led by PI Adams in collaboration with several other personnel on the project depending on the resource. In the proposed SPy1 we planned to complete message development and testing, complete the toolkit and post on the web, and have tested the website user- interface. In practice we have done much more and determined that all three of the above items (messaging, toolkit, and website) will continue to grow and evolve over the next year. The following Toolkit development activities were completed during year 1:

- **Message Testing:** See Research activities section.
- **Booklet:** *Get the Facts Out: A user-friendly Toolkit for changing the conversation around STEM teaching*, completed fall 2018.

Contains all project resources as well as background information on misperceptions and research supporting the resource development and testing.

- **Website:** GettheFactsOut.org. PI Adams, the APS Communications Department and staff, and physics education researchers (including those experienced in online outreach to faculty) all lent their expertise to the website's design. The site includes the GFO resources, facts and data, motivation and avenues for engagement, and other components. While the current website is easily usable, additional content will be added over the next several months (including a page specifically for students, an archive of GFO newsletters, updated resources, and an expanded facts and data section).
- **Poster:** *Blow Minds! Teach Science*. Math, Physics, Chemistry, and general Science versions of the student-facing poster were created and editable versions made available Fall 2018.
- **Brochure:** *Thinking about teaching...?*. Math, Physics, Chemistry, and general Science versions of the student-facing brochure were created and editable versions made available Fall 2018.
- **Brochure:** *GFO resources*. Developed and tested at the PhysTEC National conference Spring, 2019. This brochure was developed because our marketing expert indicated that the Booklet listed above was not an efficient way to share the resources with faculty. The recommendation was to create a short brochure with a high-level overview of the resources.
- **Workshop:** *How to build a local GFO campaign* (local and national versions). Developed and delivered at seven locations.
- **Workshop:** *Faculty MythBusters aka Teaching: The best kept secret*. Delivered 24 times. Version 2.0 created based on feedback over the year and research on faculty perceptions.
- **Presentation:** *Student MythBusters aka Busting myths about the teaching profession*, Delivered 22 times. Version 3.0 created based on feedback and results this past year.
- **Flyer:** *Local Program Flyer template*. Updated and editable versions made available
- **Handout:** *Did you know... Teachers in the United States rate their lives better than all other occupation groups, trailing only physicians*. Provides evidence from the Gallup-Healthways study of over 170,000 workers in 14 different types of professions.
- **Data mining:** We are continually asked to debunk claims about the profession found in articles or heard via word of mouth. Over the year we have identified many new surveys and resources related to the STEM teaching professions that we are incorporating into the Toolkit resources.

Society Campaigns – In SPY1 we planned to recruit and train Change Agents (CAs), identify local champions and prepare for campaigns. The bulk of this work was completed at a 1 ½ day GFO National Kick Off held in Golden, CO where CA's learned about the resources and worked with society staff to brainstorm how to share these with their respective communities. To prepare for their national campaigns in Year 2 Change Agents engaged in local and some national campaign efforts throughout this year.

Research – In the proposed SPY1 we planned to develop and validate the Faculty Perceptions of Teaching as a Profession (FPTaP) instrument, build the Student Strategy Engagement (SSE) and the Faculty Strategy Implementation (FSI) questionnaires, code PhysPort Data explorer to handle the Perceptions of the Teaching Profession (PTaP) instrument, and collect baseline data from both our qualitative and quantitative sites. During Year 1 we engaged in all the above activities as well as took on a major role in the message development.

- **FPTaP** – *Faculty Perceptions of Teaching as a Profession*. Developed and validated via two iterations which included 30 faculty interviews at 7 institutions and large- scale data collection from over 180 faculty at institutions in 30 separate states for v 1.0 and over 400 faculty in 57 departments for v 2.0. This summer we will complete the final factor analysis and the scoring rubric.
- **PhysPort Data Explorer** – We worked with PhysPort staff to build a data explorer module for the PTaP
- **Site visits** – We conducted five site visits that each included a faculty focus group and a student focus group to evaluate the perceptions of the teaching profession. We also conducted a *How to build a GFO Local Campaign* workshop at each site. Additional meetings included a meeting with Deans and other administrators and a meeting with faculty champions. To prepare for each visit we mined local data on teacher salaries and retirement.
- **SSI and FSE** - *Student Strategy Engagement (SSE)* and the *Faculty Strategy Implementation (FSI)* questionnaires. The research team worked with the external evaluator to create the SSI and FSE which are included with the PTaP and FPTaP respectively during online data collection. These questionnaires ask about GFO resource engagement and other experiences related to the perceptions of the teaching profession.
- **Quantitative sites** – We have collected baseline faculty and student perceptions data from 22 chemistry, 19 math, and 21 physics departments this spring. We are aiming for 25 of each.
- **Messaging** – Drafted and iterated messages for both students and faculty. Tested via four student and five faculty focus groups held at three and four institutions respectively (Colorado School of Mines, California State University Long Beach, and Chicago State University and (faculty only) West Virginia University)

Evaluation – The external evaluator is taking a developmental evaluation approach to support the emerging innovation in a dynamic and complex environment where multiple pathways forward exist. This work has influenced and supported the project throughout Y1.

Reports created:

- 2018 Change Agent Interviews
- 2018 PI Interviews
- 2018 Kickoff Meeting Evaluation
- 2019 Workshop Evaluation
- 2019 Mini-Evaluation of Persuasion Techniques
- 2019 Annual Evaluation Report (see supplementary material)

Instruments created:

- Change Agent activity tracking form (with public results display).
- Faculty-facing workshop survey.
- Student-facing workshop survey.
- Project Responses to Evaluation Feedback document.
- Implementation questions for end of FPTaP and PTaP (FSI, SSE surveys).

Other measures:

- Feedback on website design and personas.
- Participation in PMT meetings.
- Fidelity of Implementation critical features list (draft).

Project Management – Overall project management is being led by PI Adams collaborating closely with co-PI Plisch (45 meetings). Oversight is being supplied by the Project Management Team (PMT) (14 meetings). Meetings of the PMT as well as Project Area Teams (PAT) for the Toolkit Development, Research and National Campaigns were described in SPy1. These activities have occurred as expected and, in most cases expanded due to the scope of the project.

Specific Objectives: Nothing to report

Significant Results:

Faculty Perceptions of the Teaching Profession

Through our engagement with faculty during the development and validation of the FPTaP, site visits, and many presentations we have learned two important new aspects about faculty views. 1. Faculty have a somewhat different set of misperceptions and stronger feelings about the profession compared to students. This makes sense when you consider their additional work and life experiences. This implies that we need slightly different resources – workshops, posters, brochures – for faculty than students; and 2. Our preliminary data suggests that faculty may hold one of the most negative views of the profession compared to the general public, students, and parents. Psychologically this makes sense since faculty are also teachers and have made a specific career choice to teach at the college level which is now part of their identity; however, it is unfortunate given the influence of faculty on students during a critical period in their lives when they are making career choices.

Always speak positive about the teaching profession

From our focus groups and interviews we have received a clear and strong signal that it is important to always be positive, which translates into, do not state the myths or remind people of common negative stereotypes. As an example, “Those who can, do. Those who can *inspire* teach!” For many this brought the common negative saying to mind and increased negative feeling towards the profession. This is an important finding as we had received advice that stating and then directly combatting misperceptions was an effective tactic. The evidence to the contrary is strong enough that we are removing any direct statements of misperceptions from all materials.

External Evaluator Summary

Get the Facts Out is an ambitious project, aiming to address a complex, systemic problem (the lack of qualified K-12 STEM teachers) through a tested marketing campaign which addresses most levels of the educational system. The project is in the early phases, setting up structures, norms, and identifying needs to achieve its vision. Even in this early stage, the project has many successes, including engagement of many partners across disciplines, establishing communication mechanisms and decision-making structures, and holding many discussions and meetings. The accomplishment of this element of the project should not be underestimated, as this is a *much* more complex project than is the norm in educational reform, with multiple stakeholders and diverse project strands.

The strengths of this project are:

1. **The interdisciplinary focus,**
2. **The engagement of multiple stakeholders** (including highly motivated Change Agents) around issues about which they care,
3. **A multifaceted approach** to change which includes resources, communication, project activities, and research, and
4. **An evidence-based approach** to change which includes audience-tested materials and data to help stakeholders make informed

opinions.

These elements all have strong potential to lead to real change in the number of students choosing to pursue teaching as a career. The very strengths of this project are also its biggest challenges, and the leadership has struggled in some key areas which directly arise from this rich project, including:

1. **Operationalizing the common vision**, including norms for the quality of data on teaching as a profession, and what counts as “success” for the project.
2. **Communication mechanisms**, including horizontal and vertical communication across many layers of leadership and audience.
3. **Managing multiple project strands**, including the rich but overwhelming stream of information and feedback coming from multiple stakeholders, needs that have naturally emerged from a developing project (such as communication mechanisms, working groups, and additional meetings), and a crushing research site visit schedule.

The project leadership (both PI Adams and the disciplinary PI team) has remained flexible and adaptable to the emerging project needs and is in the process of operationalizing many of the communication structures which are needed. The leadership team is doing an excellent job and attending to many critical issues across a complex project, including responding directly to the majority of evaluation recommendations. The evaluator cautions the team against *scope creep*, as it will be easy to over-extend the project beyond the resources of time and money that are available. In retrospect, a softer roll-out of the project (e.g., in one discipline) may have been warranted to make the first few years of the project more manageable, with fewer unexpected needs.

Based on the broad look across the project, this evaluator makes the following recommendations.

1. **Strategy** Use strong, flexible leadership to support collective action. Leadership is a strength, but additional structures, such as an annual Strategic Plan, operationalizing the project vision, avoiding scope creep, and balancing the project research and process, will be helpful.
2. **Communication** While communication processes are being put in place, I suggest a working group focused on strategic communication across the project as a whole (including horizontal *and* vertical communication) which ensures easy sharing without overload.
3. **Propagation** Based on the research on persuasion, effective dissemination, and behavior change, several recommendations are made to further support the adoption of GFO-relevant attitudes and practices- such as creating a propagation plan, focusing on the impact on students, clearly suggesting action steps, ensuring active data processing by participants, and scaffolding effective campaigns.
4. **Feedback** With many stakeholders arises much feedback. To ensure a user- centered design, curating and interpreting this feedback and its impact for action steps for the project is needed. I recommend sifting this feedback out to the working groups.
5. **Data** Use the new Toolkit working group to carefully curate the career data that is collected, including providing norms for high-quality valid data which can be used and creating high-quality visualizations to enable cognitive processing.

Attention to these recommendations as appropriate may help the project achieve greater, longer-lasting impacts on the number and quality of future STEM teachers.

* What opportunities for training and professional development has the project provided?

Post-Doctorial Researchers

The project has hired two post-docs with 1.0 FTE between the two of them, who work with PI Adams at the Colorado School of Mines. Both have terminal degrees in an area of physics outside of Physics Education Research (PER) but have a strong interest in moving into PER. Adams, a seasoned physics education researcher, is leading their training in PER through both regular project research activities and a separate PER reading group which dives into the field’s seminal literature.

Additionally, Adams is supporting their growth as research professionals providing training related to all aspects of project management

Professional Development for faculty

The key mechanism by which this project hopes to accomplish its goals is to work with faculty to increase their knowledge of the teaching profession. This is being done predominantly through workshops conducted by and ongoing support from the disciplinary Change Agents who have been trained by PI Adams. These interactions are supported by a range of print and media research-based and user-tested resources developed by the project.

Project Management Professional Development

Both co-PI Plisch and external evaluator Chasteen have extensive experience in managing projects of this scope and are serving as

mentors for PI Adams in this area.

Training of Undergraduate Researchers

Two undergraduate researchers are currently working on the project assisting with data mining and survey analysis. These undergraduates are being trained and supported by PI Adams and both post-docs.

*** How have the results been disseminated to communities of interest?**

The project disseminates its results and reaches out to the chemistry, math, physics and STEM teacher preparation communities in a variety of ways, including newsletters, brochures, websites, articles, and activities at national meetings. The research team has shared research results and conducted workshops at several national and regional meetings including

- Noyce Summit 2018 in Washington, D.C.
- American Association of Physics Teachers (AAPT) SM 2018 in Washington, D.C.
- AAPT Winter 2019 meeting in Houston, TX
- Western Noyce Regional Conference in Tucson, AZ
- PhysTEC 2019 National Conference in Boston, MA
- AAPT Colorado/Wyoming Section Meeting in Golden, CO

The research team has also shared the resources directly with the six qualitative sites through workshops during the site visits. Finally, an invited editorial article was published in the American Journal of Physics for members of the AJP audience who have an interest in teaching as a profession urging them to consider high school teaching.

The American Physical Society is engaging in the initial stages of their national campaign. Through these efforts they have shared GFO resources with faculty at the following national and regional conferences:

- AAPT Colorado/Wyoming Section Meeting in Golden, CO
- UTeach Annual Meeting in Austin, TX
- PhysTEC 2019 National Conference in Boston, MA

APS has also engaged in a direct mailing campaign to recruit GFO quantitative sites. Additionally, Change Agents have shared the GFO resources with students and colleagues at their own institutions.

The American Chemical Society has broadly shared this new project with their members. They recognize that the use of GFO resources will be a function of faculty knowledge and participation. A number of electronic mechanisms were employed to disseminate information on GFO:

- Content entries in the ACS Faculty Newsletter (Audience: more than 10K chemistry faculty members)
- An article in the Fall 2018 newsletter of the Committee on Professional Training (Audience: almost 1K chemistry department chairs)
- Content entry in ACS Matters, the weekly newsletter sent to all members of ACS.

These communications were leveraged to recruit approximately 20 GFO quantitative sites; these communications also provided opportunities to enhance visibility of the project's activities and to identify speakers for a GFO symposium in August 2019 at the ACS National Meeting in San Diego. Chemistry Change Agents have also shared GFO resources with faculty and students at their local institutions as well as the ACS National Meeting.

The Mathematical Association of America is engaging in the initial stages of their national campaign. Through these efforts they have shared GFO resources nationally and regionally at the following conferences and venues:

- National Inquiry-Based Learning and Teaching Conference, Denver, CO
- LA/MS Section of the MAA meeting, Jackson, MS
- Pennsylvania Association of Mathematics Teacher Educators Annual Symposium, Shippensburg, PA

MAA has also engaged in a direct email campaign to recruit quantitative sites. Additionally, Mathematics Change Agents have shared the GFO resources with students and colleagues at their own institutions.

*** What do you plan to do during the next reporting period to accomplish the goals?**

Toolkit

- Continue development of the resources based on user-feedback, results of data mining, research, and evaluation.

Society Campaigns

- Change Agents will expand the number of faculty champions by facilitating national workshops and supporting participants

throughout the year as they develop their own local campaigns.

- Messaging will be sent to target audiences via existing society networks.
- Webinars will be offered for faculty champions who cannot travel to a national

Research

- Analyze the baseline data collected from the quantitative sites and provide reports to each institution.
- Conduct the second round of site visits.
- Collect the second year of survey and enrollment data from the quantitative sites.
- Complete the statistical analyses of the FPTaP version 2.0.
- Ongoing copy write development and testing.
- User-testing of the GettheFactsOut.org website.
- User-testing of any modified or new GFO resources.
- F-PTaP survey development paper published.

Evaluation

- Continue to provide support through a developmental evaluation approach. • Collect data on champions and change agents.
- Provided an evaluative lens on the research done.

Project Management

- The Overall project management and the PMT will meet regularly to provide guidance to the project. Other PATs/Working groups will meet as needed to facilitate their objectives.
- Convene the first virtual meeting of the National Advisory Board (NAB)
- Convene the Annual in person Project meeting with champions from the qualitative sites, members of the PMT, the NAB, and if funding secured, disciplinary Change Agents.

Supporting Files

1. External Evaluator's Year 1 Annual Report - [GFO - 2019 Annual Evaluation Report-060719- submitted.pdf](#)
2. GFO Five year Strategic Plan from original proposal

Activity	Year 1	Years 2-4	Year 5	Sustainability
Toolkit development	<ul style="list-style-type: none"> • Message testing completed • Toolkit completed and put on web • User interface tested 	<ul style="list-style-type: none"> • Toolkit revised based on user feedback, research and evaluation 	<ul style="list-style-type: none"> • Toolkit revised based on user feedback, research and evaluation 	<ul style="list-style-type: none"> • Toolkit maintained online by societies
Society campaigns	<ul style="list-style-type: none"> • Change agents recruited and trained • Local champions identified • Preparation for campaigns done 	<ul style="list-style-type: none"> • Messaging sent to target audiences • Workshops and webinars offered • User groups facilitated 	<ul style="list-style-type: none"> • Messaging sent to target audiences • Workshops and webinars offered • User groups facilitated 	<ul style="list-style-type: none"> • Effective campaign activities are maintained by societies
Research	<ul style="list-style-type: none"> • F-PTaP, FSI, SSE surveys created • PTaP survey data exploration tools on PhysPort • Quantitative sites recruited, baseline data gathered • Site visits completed 	<ul style="list-style-type: none"> • Survey & enrollment data gathered from both types of sites • Site visits completed • F-PTaP survey development paper published 	<ul style="list-style-type: none"> • Survey & enrollment data gathered from both types of sites • Site visits completed • All data analyses complete • Toolkit intervention paper published • Perceptions correlations paper done 	<ul style="list-style-type: none"> • PTaP survey data exploration tools maintained on PhysPort by AAPT
Evaluation	<ul style="list-style-type: none"> • Data on change agents gathered (observations, focus groups, surveys) • Evaluative feedback on campaign plans given 	<ul style="list-style-type: none"> • Data on champions and change agents gathered • Evaluative feedback on motivation and preparation given • Evaluative lens on research done 	<ul style="list-style-type: none"> • Comparison of enrollment changes with campaign efforts, strategies, demographics, discipline done • Evaluative lens on research done 	
Project management	<ul style="list-style-type: none"> • PMT, PAT meetings • Project meeting 	<ul style="list-style-type: none"> • PMT, PAT meetings • Project meeting 	<ul style="list-style-type: none"> • PMT, PAT meetings • Project meeting 	<ul style="list-style-type: none"> • Societies meet annually

Products

Books

R. Vieyra, Wendy K. Adams, Kristine E. Callan (2018). *Get the Facts Out: A user-friendly toolkit for Changing the Conversation Around STEM Teaching*. 100Kin10. 100Kin10. Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

Book Chapters

Inventions

Journals or Juried Conference Papers

View all journal publications currently available in the [NSF Public Access Repository](#) for this award.

The results in the NSF Public Access Repository will include a comprehensive listing of all journal publications recorded to date that are associated with this award.

Adams, W. K. and Plisch, M. and Plantt, T.. (2019). Have a passion for teaching? Consider high school teaching. *American Journal of Physics*. 87 (5) 328 to 329. Status = Deposited in NSF-PAR [doi:10.1119/1.5094433](https://doi.org/10.1119/1.5094433) ; Federal Government's License = Acknowledged. (Completed by Adams, Wendy on 06/23/2019) [Full text](#) [Citation details](#)

Licenses

Other Conference Presentations / Papers

Savannah Logan, Richard L. Pearson III, Wendy K. Adams (2019). *A New Survey: Faculty Perceptions of Teaching as a Profession*. American Association of Physics Teachers Winter 2019 Meeting. Houston, TX. Status = OTHER; Acknowledgement of Federal Support = Yes

Drew Isola (2019). *BG04 How Can AAPT Members Support 'Get the Facts Out'?*. AAPT WM 19. Houston, TX. Status = OTHER; Acknowledgement of Federal Support = Yes

Wendy K. Adams (2019). *BG05 Get the Facts Out: Understanding the Impact on Diverse Populations*. AAPT WM 19. Houston, TX. Status = OTHER; Acknowledgement of Federal Support = Yes

Vince Kuo (2019). *BG06 Getting the Facts Out About the High School Teaching Career*. AAPT WM 19. Houston, TX. Status = OTHER; Acknowledgement of Federal Support = Yes

Jennifer Nielson (2018). *Blow Minds. Teach Science or Math..* College Advisement Committee Meeting. Brigham Young University, Provo, UT. Status = OTHER; Acknowledgement of Federal Support = Yes

Savannah Logan and Wendy K. Adams (2019). *Busting Myths about the Teacher Profession, STEM Careers Course*. GFO Initial Site Visit. Chicago State University, Chicago, IL. Status = OTHER; Acknowledgement of Federal Support = Yes

Savannah Logan, Dawson Lang, Jacob Bowytz. (2019). *Busting Myths about the Teaching*. Colorado School of Mines Summer Multicultural Engineering Training Week 1. Golden, CO. Status = OTHER; Acknowledgement of Federal Support = Yes

Kristine E. Callan and Savannah Logan (2019). *Busting Myths about the Teaching Profession*. Engineering Physics Field Session. Golden, CO. Status = OTHER; Acknowledgement of Federal Support = Yes

Richard L. Pearson III (2019). *Busting Myths about the Teaching Profession*. Chemistry Field Session Chemistry. Golden, CO. Status = OTHER; Acknowledgement of Federal Support = Yes

Richard L. Pearson III. (2019). *Busting Myths about the Teaching Profession*. Mining and Metallurgical Engineering Field Session. Golden, CO. Status = OTHER; Acknowledgement of Federal Support = Yes

Kristine E. Callan and Dawson Lang (2019). *Busting Myths about the Teaching Profession*. Colorado School of Mines Summer Multicultural Engineering Training. Golden, CO. Status = OTHER; Acknowledgement of Federal Support = Yes

Savannah Logan (2019). *Busting Myths about the Teaching Profession*. Mathematics Field Session. Golden, CO. Status = OTHER; Acknowledgement of Federal Support = Yes

Savannah Logan, Dawson Lang, and Jacob Bowytz (2019). *Busting Myths about the Teaching Profession*. Colorado School of Mines

Summer Multicultural Engineering Training Week 3. Golden, CO. Status = OTHER; Acknowledgement of Federal Support = Yes

Savannah Logan, Dawson Lang, and Jacob Bowytz (2019). *Busting Myths about the Teaching Profession..* Colorado School of Mines Summer Multicultural Engineering Training Week 2. Golden, CO. Status = OTHER; Acknowledgement of Federal Support = Yes

Kristine E. Callan and Wendy K. Adams (2018). *Enhancing the Perception of Secondary Teaching*. Get the Facts Out KickOff. Golden, CO. Status = OTHER; Acknowledgement of Federal Support = Yes

Terri Taylor (2018). *Get the Facts Out*. ACS National Meeting, ACS Society Committee on Education executive meeting. Boston, MA. Status = OTHER; Acknowledgement of Federal Support = Yes

Ellen Yeziarski (2018). *Get the Facts Out*. Miami University in Ohio, Introductory seminar for first-year chemistry and biochemistry majors. Oxford, OH. Status = OTHER; Acknowledgement of Federal Support = Yes

Jennifer Nielson (2018). *Get the Facts Out*. Deans of Education Meeting. Brigham Young University, Provo, UT. Status = OTHER; Acknowledgement of Federal Support = Yes

Etta Gravely (2019). *Get the Facts Out*. Symposium/Colloquium Class for chemistry and biology majors. North Carolina A&T State University, Greensboro, N. Status = OTHER; Acknowledgement of Federal Support = Yes

Drew Isola (2019). *Get the Facts Out (round-table discussion in High School Teacher Lounge)*. AAPT WM 19. . Status = OTHER; Acknowledgement of Federal Support = Yes

Wendy Adams, Rebecca Vieyra and Kristine Callan (2018). *Get the Facts Out (round-table discussion in High School Teacher Lounge)*. AAPT SM 18. Washington, D.C. Status = OTHER; Acknowledgement of Federal Support = Yes

Willy Hunter (2019). *Get the Facts Out Faculty Toolkit Trial*. StemEd Center Faculty Meeting. Illinois State University, Normal, IL. Status = OTHER; Acknowledgement of Federal Support = Yes

Wendy K. Adams, Monica Plisch (2018). *Get the Facts Out Project Vision and Theory of Change, Get the Facts Out KickOff*. Workshop. Colorado School of Mines, Golden, CO. Status = OTHER; Acknowledgement of Federal Support = Yes

Karen Magee-Sauer (2019). *Get the Facts Out about STEM Teaching*. Workshop for STEM faculty. Rowan College of Gloucester County, Sewell, NJ. Status = OTHER; Acknowledgement of Federal Support = Yes

Duane Merrell (2019). *Get the Facts Out about STEM Teaching*. Workshop of STEM students and faculty. Brigham Young University, Provo, UT. Status = OTHER; Acknowledgement of Federal Support = Yes

Kristine E. Callan, Adria Brown, Nicholas Dyer, and J. Hunt (2019). *Get the Facts Out: Benefits Compared to Industry and University Teaching*. Western Regional Noyce Summit 2019. Tuscon, AZ. Status = OTHER; Acknowledgement of Federal Support = Yes

Kristine E. Callan, Gay Stewart, and Wendy K. Adams (2018). *Get the Facts Out: Benefits Compared to Industry and University Teaching*. Noyce National Summit 2018. Washington, D.C.. Status = OTHER; Acknowledgement of Federal Support = Yes

Wendy K. Adams (2019). *Get the Facts Out: Building a local GFO campaign*. PhysTEC 2019. Boston, MA. Status = OTHER; Acknowledgement of Federal Support = Yes

Wendy K. Adams (2019). *Get the Facts Out: Changing the Conversation around STEM Teacher Recruitment*. American Physical Society March Meeting. Boston, MD. Status = OTHER; Acknowledgement of Federal Support = Yes

Wendy K. Adams (2019). *Get the Facts Out: Changing the Conversation around STEM Teacher Recruitment*. PhysTEC Annual Conference. Boston, MD. Status = OTHER; Acknowledgement of Federal Support = Yes

Wendy K. Adams, Kristine Callan (2019). *Get the Facts Out: Changing the conversation around STEM teacher recruitment*. American Association of Physics Teachers Summer 2018 Meeting. Washington, D.C.. Status = OTHER; Acknowledgement of Federal Support = Yes

Wendy K. Adams, Savannah Logan (2019). *Get the Facts Out: Start your own campaign*. Workshop. West Virginia University, Morgantown, WV. Status = OTHER; Acknowledgement of Federal Support = Yes

Wendy K. Adams, Savannah Logan (2019). *Get the Facts Out: Start your own campaign*. Workshop. California State University, Long Beach,

CA. Status = OTHER; Acknowledgement of Federal Support = Yes

Wendy K. Adams, Savannah Logan (2019). *Get the Facts Out: Start your own campaign*. Get the Facts Out: Start your own campaign. Brigham Young University, Provo, UT. Status = OTHER; Acknowledgement of Federal Support = Yes

Wendy K. Adams, Savannah Logan (2019). *Get the Facts Out: Start your own campaign*. Workshop. University of Wisconsin – La Crosse, La Crosse, WI. Status = OTHER; Acknowledgement of Federal Support = Yes

Wendy K Adams, Richard L Pearson III, Savannah Logon (2019). *Get the Facts Out: Understanding the impact on diverse populations*. American Association of Physics Teachers Winter 2019 Meeting. Houston, TX. Status = OTHER; Acknowledgement of Federal Support = Yes

Wendy K. Adams and Adria Brown (2018). *Get the Facts Out: What is the teaching profession actually like?*. Mines First Year Student Orientation. Golden, CO. Status = OTHER; Acknowledgement of Federal Support = Yes

Rose Mary Zbiek (2019). *Getting the Facts Out: Countering Negative Messages about Teaching as a Career*. Pennsylvania Association of Mathematics Teacher Educators Annual Symposium. Shippensburg, PA. Status = OTHER; Acknowledgement of Federal Support = Yes

Peer-reviewed (2019). *Help Us Get the Facts Out to Recruit More Teachers*. Workshop for faculty. UTeach Annual Meeting, Austin, TX. Status = OTHER; Acknowledgement of Federal Support = Yes

Wendy K. Adams, R. Vieyra (2018). *Improving the Perceptions of STEM Teaching*. 100Kin10 Webinar. . Status = OTHER; Acknowledgement of Federal Support = Yes

L Jodi Wesemann, C. Joerg Schlatterer, Corrie Kuniyoshi, Terri Taylor Chambers. (2019). *Learning across disciplines: Addressing teacher recruitment, career development, and graduate student diversity through partnerships*. Gordon Research Conference, Chemistry Education Research and Practice. Lewiston, ME. Status = OTHER; Acknowledgement of Federal Support = Yes

Vince Kuo, Drew Isola, Savannah Logan, Richard Pearson (2019). *Share-a-thon: Get the Facts Out*. PhysTEC19. Boston, MA. Status = OTHER; Acknowledgement of Federal Support = Yes

Vince Kuo (2019). *So your son or daughter is thinking about teaching?*. Orientation Step1: Launch - Multiple summer dates. Golden, CO. Status = OTHER; Acknowledgement of Federal Support = Yes

Vince Kuo (2019). *So you're thinking about being a teacher eh? Here are a few things you should know...*. Colorado Wyoming American Association of Physics Teachers Annual Meeting. Golden, CO. Status = OTHER; Acknowledgement of Federal Support = Yes

Wendy K. Adams (2018). *Starting a Local GFO Campaign*. Get the Facts Out KickOff. Golden, CO. Status = OTHER; Acknowledgement of Federal Support = Yes

Cami Benson, Wendy Adams and Blue O'Brennan (2018). *Teaching Myth Busters*. Get the Facts Out KickOff. Golden, CO.. Status = OTHER; Acknowledgement of Federal Support = Yes

Kristine E. Callan, Zabdiyel Tan, and Alyssa Teteris (2019). *Teaching Myth Busters*. Teacher Education Alliance Campus Wide Event. Golden, CO. Status = OTHER; Acknowledgement of Federal Support = Yes

Karen Magee-Sauer (2019). *Teaching Myth Busters: What is the teaching profession actually like?*. Workshop for STEM students.. Rowan College of Burlington County, Mt Laurel, NJ. Status = OTHER; Acknowledgement of Federal Support = Yes

Vince Kuo (2019). *Teaching Myth Busters: What is the teaching profession actually like?*. Workshop residence life staff. Colorado School of Mines, Golden, CO. Status = OTHER; Acknowledgement of Federal Support = Yes

Karen Magee-Sauer (2019). *Teaching Myth Busters: What is the teaching profession actually like?*. Workshop for STEM students. Rowan College of Burlington County, Mt. Laurel, NJ. Status = OTHER; Acknowledgement of Federal Support = Yes

Wendy K. Adams and Savannah Logan (2019). *Teaching: The best kept secret!*. Teach@Mines Teacher Advisory Group. Golden, CO. Status = OTHER; Acknowledgement of Federal Support = Yes

Richard L. Pearson III and Savannah Logan. (2019). *The Beginning of a New Survey: Faculty Perceptions of Teaching as a Profession*. American Association of Physics Teachers WM 2019. Houston, TX. Status = OTHER; Acknowledgement of Federal Support = Yes

Wendy K. Adams (2018). *The PTaP Survey*. SoCal PhysTEC Network Inaugural meeting. Long Beach, CA. Status = OTHER; Acknowledgement of Federal Support = Yes

Rose Mary Zbiek (2019). *What is GFO and how can I engage mathematics education colleagues in the state*. Mathematics Education Faculty Group. Port Matilda, PA. Status = OTHER; Acknowledgement of Federal Support = Yes

Christina Eubanks-Turner (2019). *Why you consider a career in math teaching*. Presentation. Loyola Marymount University, Los Angeles, CA. Status = OTHER; Acknowledgement of Federal Support = Yes

Wendy K. Adams, Savannah Logan (2019). *Workshop*. Get the Facts Out: Start your own campaign. Chicago State University, Chicago, IL. Status = OTHER; Acknowledgement of Federal Support = Yes

Judith Covington (2019). *Workshop- Get the Facts Out*. LA/MS Section of the MAA meeting. Jackson, MS. Status = OTHER; Acknowledgement of Federal Support = Yes

Ben Ford (2019). *Workshop: Get the Facts Out: Changing the Conversation About Teaching*. Department of Mathematics and Statistics. Sonoma State University Rohnert Park, CA. Status = OTHER; Acknowledgement of Federal Support = Yes

Judith Covington and Ben Ford (2019). *Workshop: Get the Facts Out: Changing the Conversation About Teaching*. National Inquiry-Based Learning and Teaching Conference. Denver, CO. Status = OTHER; Acknowledgement of Federal Support = Yes

Other Products

Educational aids or Curricula.

- Brochures – quickly share facts about the teaching profession. Physics, chemistry and math versions. Audience: Anyone who wants to learn more about the profession: students, faculty, parents, staff. <https://getthefactsout.org/recruiting-resources/brochure>
- Directly address misconceptions about the teaching profession by using this suite of suggested approaches to address the range of audiences found on college campuses. <https://getthefactsout.org/recruiting-resources/reaching-students>
- Modifiable flyers to reflect information about local institution’s programs, teaching opportunities, and school colors. Useful for at recruitment events and places visible to students. Tested messaging and tag lines have been integrated throughout. <https://getthefactsout.org/recruiting-resources/flyer>
- Posters include a modifiable template and ready-made versions to promote math, physics, chemistry, and science teaching. Posters can be printed and placed in public areas, including classrooms, hallways, and offices frequented by students. <https://getthefactsout.org/recruiting-resources/poster-physics>
- Specific guidelines on how to develop a brief personal statement about why teaching matters to you as part of your introduction on the first day of class. <https://getthefactsout.org/recruiting-resources/building-testimonials>
- This resource includes highly interactive workshop materials (PowerPoint slides and handouts) designed to facilitate discussion with a group of faculty/staff who may talk with students about teaching as a career. <https://getthefactsout.org/recruiting-resources/presentations-faculty>
- This resource includes workshop materials (PowerPoint slides and handouts) designed to facilitate discussion with groups of students who may or may not be interested in teaching themselves, in a variety of contexts. <https://getthefactsout.org/recruiting-resources/presentation-students>

Survey Instruments.

- Validated survey to assess faculty perceptions about grade 7–12 math and science teaching as a profession. <https://getthefactsout.org/recruiting-resources/assessments-ptap-and-ftpap>
- Validated survey to assess student perceptions about grade 7–12 math and science teaching as a profession. <https://getthefactsout.org/recruiting-resources/assessments-ptap-and-ftpap>

Other Publications

Terri Chambers (2019). *Join ACS in Changing Perceptions of STEM Teaching*. ACS Matters (Distribution: 100k+). Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Terri Chambers (2018). *Join ACS in Changing Perceptions of STEM Teaching*. Committee on Professional Training Newsletter. Distribution ~1K. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Terri Chambers (2018). *Join ACS in Changing Perceptions of STEM Teaching*. ACS Faculty Newsletter. Distribution ~10K. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Terri Chambers (2019). *Join ACS in Changing Perceptions of STEM Teaching*. ACS Faculty Newsletter. Distribution 10K. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Patents

Technologies or Techniques

Thesis/Dissertations

Websites

<https://getthefactsout.org> Project website that includes (1) recruiting resources, (2) facts and data about secondary math and science teaching, (3) list of regional change agents, and (4) mailing list registration to join the initiative.

Participants/Organizations

What individuals have worked on the project?

Name	Most Senior Project Role	Nearest Person Month Worked
Adams, Wendy	PD/PI	7
Ensley, Douglas	Co PD/PI	0
Plisch, Monica	Co PD/PI	1
Taylor, Terri	Co PD/PI	0
Levy, Rachel	Co-Investigator	0
Covington, Judith	Faculty	0
Eubanks-Turner, Christina	Faculty	0
Ford, Ben	Faculty	0
Gravely, Etta	Faculty	0
Hendrix, Tim	Faculty	0
Hunter, William	Faculty	0
Klein, Robert	Faculty	0
Kuo, Vince	Faculty	0
Magee-Sauer, Karen	Faculty	0
Merrell, Duane	Faculty	0
Nielson, Jennifer	Faculty	0
Stewart, Gay	Faculty	0

Yeziarski, Ellen	Faculty	0
Zbiek, Rose Mary	Faculty	0
Logan, Savannah	Postdoctoral (scholar, fellow or other postdoctoral position)	5
Pearson III, Richard	Postdoctoral (scholar, fellow or other postdoctoral position)	4
Adams, Alex	Other Professional	0
Costley, Allie	Other Professional	3
Grimes, Jessica	Other Professional	0
Hone, Thomas	Other Professional	0
May, David	Other Professional	1
Thompson, Kenetia	Other Professional	0
Brown, Adria	Undergraduate Student	0
Lang, Dawson	Undergraduate Student	0
Chasteen, Stephanie	Consultant	1
Ferguson, Mark	Consultant	0
Ratliff, Brea	Consultant	0
Ryan, Stephanie	Consultant	0
Westen, Drew	Consultant	0

Full details of individuals who have worked on the project:

Wendy K Adams

Email: wkadams@mines.edu

Most Senior Project Role: PD/PI

Nearest Person Month Worked: 7

Contribution to the Project: Over all project management, lead toolkit development team, lead the research team and lead message development. These roles required leading all project management meetings, day-to-day project management decisions, building out and testing updated and new toolkit resources, leading the design of the GFO website, leading the development of the Faculty Perceptions of Teaching as a Profession Instrument, Coordinating and conducting the qualitative site visits, lead message development and testing, providing Physics Education Research Professional Development to the Post Docs, conducting searches, hiring, and ongoing supervision of project personnel at Mines.

Funding Support: 0.75 months from the Colorado School of Mines Robert Noyce Scholarship Grant #1557254.

International Collaboration: No

International Travel: No

Douglas Ensley

Email: deensley@ship.edu

Most Senior Project Role: Co PD/PI

Nearest Person Month Worked: 0

Contribution to the Project: Replaced shortly after funding awarded by Rachel Levy the new Executive Deputy Director of MAA

Funding Support: None

International Collaboration: No

International Travel: No

Monica J Plisch

Email: plisch@aps.org

Most Senior Project Role: Co PD/PI

Nearest Person Month Worked: 1

Contribution to the Project: Plisch is the Co-lead of the project and the PI of the subaward to APS. She directs all of the subaward activities and leads areas of work for the main grant, including marketing, professional society interactions, and others.

Funding Support: None

International Collaboration: No

International Travel: No

Terri M Taylor

Email: t_taylor@acs.org

Most Senior Project Role: Co PD/PI

Nearest Person Month Worked: 0

Contribution to the Project: ACS project management

Funding Support: Supported full-time through ACS

International Collaboration: No

International Travel: No

Rachel Levy

Email: levy@maa.org

Most Senior Project Role: Co-Investigator

Nearest Person Month Worked: 0

Contribution to the Project: MAA project management. Took over for Doug Ensley as Deputy Executive Director of MAA shortly after the award began.

Funding Support: none

International Collaboration: No

International Travel: No

Judith Covington

Email: covingtonj@nsula.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 0

Contribution to the Project: Math change agent. Team leadership, makes presentations, reviews materials, researches data.

Funding Support: none

International Collaboration: No

International Travel: No

Christina Eubanks-Turner

Email: Christina.Eubanks-Turner@lmu.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 0

Contribution to the Project: Math change agent. Makes presentations, reviews materials, researches data

Funding Support: none

International Collaboration: No

International Travel: No

Ben Ford

Email: ben.ford@sonoma.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 0

Contribution to the Project: Math change agent. Makes presentations, reviews materials, researches data

Funding Support: none

International Collaboration: No

International Travel: No

Etta Gravely

Email: gravely@ncat.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 0

Contribution to the Project: Chemistry change agent. Participated in a kick-off meeting Oct 26-27 (Fri 3-7 pm & Sat 9-2 pm) at Colorado School of Mines, with travel expenses reimbursed. Implemented strategies and materials in the Get the Facts Out toolkit and provide feedback to the development team. Advised implementation of GFO at ACS. Participated in videoconferences with other National Chemistry Change Agents and ACS staff. Co-authored article in the Journal of Chemical Education

Funding Support: none

International Collaboration: No

International Travel: No

Tim Hendrix

Email: hendrixt@meredith.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 0

Contribution to the Project: Math change agent. Took over for Bob Klein. Makes presentations, reviews materials, research data

Funding Support: none

International Collaboration: No

International Travel: No

William Hunter

Email: wjhunte@ilstu.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 0

Contribution to the Project: Chemistry change agent. Participated in a kick-off meeting Oct 26-27 (Fri 3-7 pm & Sat 9-2 pm) at Colorado School of Mines, with travel expenses reimbursed. Implemented strategies and materials in the Get the Facts Out toolkit and provide feedback to the development team. Advised implementation of GFO at ACS. Participated in videoconferences with other National Chemistry Change Agents and ACS staff. Co-authored article in the Journal of Chemical Education

Funding Support: none

International Collaboration: No

International Travel: No

Robert Klein

Email: kleinr@ohio.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 0

Contribution to the Project: Math Change Agent. Attended the GFO Kickoff, resigned November 2018

Funding Support: none

International Collaboration: No

International Travel: No

Vince Kuo

Email: hkuo@mines.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 0

Contribution to the Project: Physics Change Agent. Attended the KickOff in Golden, has conducted a very active local campaign and presented at AAPT section meeting.

Funding Support: none

International Collaboration: No

International Travel: No

Karen Magee-Sauer

Email: sauer@rowan.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 0

Contribution to the Project: Physics Change Agent. Participated in the GFO KickOff and has been engaging in an active local campaign at Rowan University and surrounding community colleges.

Funding Support: none

International Collaboration: No

International Travel: No

Duane Merrell

Email: duane_merrell@byu.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 0

Contribution to the Project: Physics Change Agent. Participated in the GFO KickOff and has been engaging in an active local campaign at Brigham Young University. Also member of the National Advisory Board which has not yet met.

Funding Support: none

International Collaboration: No

International Travel: No

Jennifer Nielson

Email: jnielson@chem.byu.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 0

Contribution to the Project: Chemistry change agent. Participated in a kick-off meeting Oct 26-27 (Fri 3-7 pm & Sat 9-2 pm) at Colorado School of Mines, with travel expenses reimbursed. Implemented strategies and materials in the Get the Facts Out toolkit and provided feedback to the development team. Advised implementation of GFO at ACS. Participated in videoconferences with other National Chemistry Change Agents and ACS staff. Submitted an abstract to the Get the Facts Out symposium (August 2019). Co-authored article in the Journal of Chemical Education

Funding Support: none

International Collaboration: No

International Travel: No

Gay Stewert

Email: gbstewart@mail.wvu.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 0

Contribution to the Project: Physics Change Agent. Participated in the GFO KickOff, has conducted active local campaign and presenting nationally at UTeach and AAPT meetings. Review annual report.

Funding Support: none

International Collaboration: No

International Travel: No

Ellen Yeziarski

Email: yeziere@miamioh.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 0

Contribution to the Project: Chemistry change agent. Participated in a kick-off meeting Oct 26-27 (Fri 3-7 pm & Sat 9-2 pm) at Colorado School of Mines, with travel expenses reimbursed. Implemented strategies and materials in the Get the Facts Out toolkit and provide feedback to the development team. Advised implementation of GFO at ACS. Participated in videoconferences with other National Chemistry Change Agents and ACS staff. Co-authored article in the Journal of Chemical Education

Funding Support: none

International Collaboration: No

International Travel: No

Rose Mary Zbiek

Email: rmz101@psu.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 0

Contribution to the Project: Math change agent. Makes presentations, reviews materials, researches data, assisted with website user design by providing math faculty perspective.

Funding Support: none

International Collaboration: No

International Travel: No

Savannah Logan

Email: sllogan@mines.edu

Most Senior Project Role: Postdoctoral (scholar, fellow or other postdoctoral position)

Nearest Person Month Worked: 5

Contribution to the Project: Assisted Adams and Pearson with interviews to support the Faculty Perceptions of Teaching as a Profession instrument development, visited all qualitative sites with Adams and conducted focus groups and workshops during four of these visits, created the first GFO Newsletter, and conducted data mining.

Funding Support: 4.8 months Colorado School of Mines Robert Noyce Scholarship Grant Award #1557254

International Collaboration: No

International Travel: No

Richard Pearson III

Email: rlpearson@mines.edu

Most Senior Project Role: Postdoctoral (scholar, fellow or other postdoctoral position)

Nearest Person Month Worked: 4

Contribution to the Project: Worked with Adams to develop and collect evidence of validity for the Faculty Perceptions of Teaching as a Profession instrument, attended the GFO Kick Off, assist with research project management, assisted with hand out design and

layout, led the quantitative site data collecting Spring 2019, and conducted data mining throughout the year.

Funding Support: 0.84 months Colorado School of Mines Robert Noyce Scholarship Grant Award #1557254

International Collaboration: No

International Travel: No

Alex Adams

Email: aadams@aps.org

Most Senior Project Role: Other Professional

Nearest Person Month Worked: 0

Contribution to the Project: Adams provided staff support for APS subaward activities.

Funding Support: none

International Collaboration: No

International Travel: No

Allie Costley

Email: amcostley@mines.edu

Most Senior Project Role: Other Professional

Nearest Person Month Worked: 3

Contribution to the Project: Provides administrative support for the project including management of sub awards, hiring of personnel on the Mines side, coordination of events, provide research support including assistance with focus groups and data analysis, assist PI where needed.

Funding Support: 3 months Teach@Mines. Some Teach@Mines work is for GFO

International Collaboration: No

International Travel: No

Jessica Grimes

Email: j_grimes@acs.org

Most Senior Project Role: Other Professional

Nearest Person Month Worked: 0

Contribution to the Project: ACS support staff

Funding Support: none

International Collaboration: No

International Travel: No

Thomas Hone

Email: hone@aps.org

Most Senior Project Role: Other Professional

Nearest Person Month Worked: 0

Contribution to the Project: Hone provided staff support for APS subaward activities.

Funding Support: none

International Collaboration: No

International Travel: No

David May

Email: may@aps.org

Most Senior Project Role: Other Professional

Nearest Person Month Worked: 1

Contribution to the Project: May manages all APS subaward activities, provides staff support for PI team meetings and partner society marketing campaigns, and is the project liaison to the APS Communications Department on issues related to website and marketing.

Funding Support: none

International Collaboration: No

International Travel: No

Kenetia Thompson

Email: K_Thompson2@acs.org

Most Senior Project Role: Other Professional

Nearest Person Month Worked: 0

Contribution to the Project: Support staff for ACS

Funding Support: none

International Collaboration: No

International Travel: No

Adria Brown

Email: adriabrown@mymail.mines.edu

Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 0
Contribution to the Project: Work with Adams on local data mining to support most active GFO campaigns
Funding Support: none
International Collaboration: No
International Travel: No

Dawson Lang
Email: dawsonlang@mymail.mines.edu
Most Senior Project Role: Undergraduate Student
Nearest Person Month Worked: 0
Contribution to the Project: Analyze survey data and create reports for sites.
Funding Support: none
International Collaboration: No
International Travel: No

Stephanie Chasteen
Email: stephanie@chasteenconsulting.com
Most Senior Project Role: Consultant
Nearest Person Month Worked: 1
Contribution to the Project: External Evaluator
Funding Support: none
International Collaboration: No
International Travel: No

Mark Ferguson
Email: mark@bluesteelrealestate.com
Most Senior Project Role: Consultant
Nearest Person Month Worked: 0
Contribution to the Project: Work with Adams to develop emotionally compelling messaging for the toolkit resources
Funding Support: none
International Collaboration: No
International Travel: No

Brea Ratliff
Email: brearatliff@gmail.com
Most Senior Project Role: Consultant
Nearest Person Month Worked: 0
Contribution to the Project: Recruitment of math quantitative sites
Funding Support: none
International Collaboration: No
International Travel: No

Stephanie Ryan
Email: sryan@ryaneducationconsulting.com
Most Senior Project Role: Consultant
Nearest Person Month Worked: 0
Contribution to the Project: ACS Project coordinator beginning 6/15/19. Chemistry-specific research. Participation in Chemistry Change Agent Meetings. Consultation on marketing/dissemination opportunities
Funding Support: none
International Collaboration: No
International Travel: No

Drew Westen
Email: drew@westenstrategies.com
Most Senior Project Role: Consultant
Nearest Person Month Worked: 0
Contribution to the Project: Initial engagement on message testing
Funding Support: none
International Collaboration: No
International Travel: No

What other organizations have been involved as partners?

Name	Type of Partner Organization	Location
American Chemical Society	Other Nonprofits	Washington, DC
American Physical Society	Other Nonprofits	College Park, MD
California State University, Long Beach	Academic Institution	Long Beach, CA
California State University, Monterey Bay	Academic Institution	Monterey Bay, CA
Chicago State University	Academic Institution	Chicago, IL
Cleveland State University	Academic Institution	Cleveland, OH
Colorado School of Mines	Academic Institution	Golden, CO
Colorado State University	Academic Institution	Fort Collins, CO
Eastern Michigan University	Academic Institution	Ypsilanti, MI
Idaho State University	Academic Institution	Pocatello, ID
Illinois Wesleyan University	Academic Institution	Bloomington, IL
James Madison University	Academic Institution	Harrisonburg, VA
Andrews University	Academic Institution	Berrien Springs, MI
Kennesaw State University	Academic Institution	Kennesaw, GA
Mathematical Association of America	Other Nonprofits	Washington, DC
Middle Tennessee State University	Academic Institution	Murfreesboro, TN
Morehead State University	Academic Institution	Morehead, KY
Northwestern State University	Academic Institution	Natchitoches, LA
Prince George's Community College	Academic Institution	Largo, MD
Roosevelt University	Academic Institution	Chicago, IL
Rowan University	Academic Institution	Glassboro, NJ
Texas A&M University - Commerce	Academic Institution	Commerce, TX
University of California - Irvine	Academic Institution	Irvine, CA
Appalachian State University	Academic Institution	Boone, NC
University of Central Florida	Academic Institution	Orlando, Florida
University of Colorado - Boulder	Academic Institution	Boulder, CO
University of Houston	Academic Institution	Houston, TX
University of Mississippi	Academic Institution	Oxford, MS
University of Tennessee - Martin	Academic Institution	Martin, TN
University of Wisconsin - La Crosse	Academic Institution	La Crosse, WI
Wartburg College	Academic Institution	Denver, CO
Waynesburg University	Academic Institution	Waynesburg, PA
West Virginia University	Academic Institution	Morgantown, WV

Westmont College	Academic Institution	Santa Barbara, CA
Boston University	Academic Institution	Boston, MA
Brigham Young University	Academic Institution	Provo, UT
Brigham Young University - Idaho	Academic Institution	Rexburg, ID
California Polytechnic State University - San Luis Obispo	Academic Institution	San Luis Obispo, CA
California State University - Northridge	Academic Institution	Northridge, CA

Full details of organizations that have been involved as partners:

American Chemical Society

Organization Type: Other Nonprofits

Organization Location: Washington, DC

Partner's Contribution to the Project:

Facilities

Collaborative Research

More Detail on Partner and Contribution: Identified chemistry change agents, recruited quantitative sties, disseminated GFO resources through ACS channels.

American Physical Society

Organization Type: Other Nonprofits

Organization Location: College Park, MD

Partner's Contribution to the Project:

Facilities

Collaborative Research

More Detail on Partner and Contribution: Identified physics change agents, developed the website, recruited quantitative sties, disseminated GFO resources through APS and PhysTEC channels, participated in overall project planning.

Andrews University

Organization Type: Academic Institution

Organization Location: Berrien Springs, MI

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from the physics faculty and students each year.

Appalachian State University

Organization Type: Academic Institution

Organization Location: Boone, NC

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from the math and chemistry faculty and students each year.

Boston University

Organization Type: Academic Institution

Organization Location: Boston, MA

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from the physics faculty and students each year.

Brigham Young University

Organization Type: Academic Institution

Organization Location: Provo, UT

Partner's Contribution to the Project:

Facilities

Collaborative Research

More Detail on Partner and Contribution: This institution is a GFO Qualitative Site. Researchers visit this IHE once per year during the grant period to conduct focus groups and give a workshop on the GFO resources. Additionally, once per year the GFO Research Team

collects perceptions survey data from faculty and students in physics, chemistry, and math.

Brigham Young University - Idaho

Organization Type: Academic Institution

Organization Location: Rexburg, ID

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from the physics faculty and students each year.

California Polytechnic State University - San Luis Obispo

Organization Type: Academic Institution

Organization Location: San Luis Obispo, CA

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from the physics, math and chemistry faculty and students each year.

California State University - Fullerton

Organization Type: Academic Institution

Organization Location: Fullerton, CA

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from the chemistry faculty and students each year.

California State University - Northridge

Organization Type: Academic Institution

Organization Location: Northridge, CA

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from the physics faculty and students each year.

California State University, Long Beach

Organization Type: Academic Institution

Organization Location: Long Beach, CA

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: This institution is a GFO Qualitative Site. Researchers visit this IHE once per year during the grant period to conduct focus groups and give a workshop on the GFO resources. Additionally, once per year the GFO Research Team collects perceptions survey data from faculty and students in physics, chemistry, and math.

California State University, Monterey Bay

Organization Type: Academic Institution

Organization Location: Monterey Bay, CA

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from the math and chemistry faculty and students each year.

Chicago State University

Organization Type: Academic Institution

Organization Location: Chicago, IL

Partner's Contribution to the Project:

Facilities

Collaborative Research

More Detail on Partner and Contribution: This institution is a GFO Qualitative Site. Researchers visit this IHE once per year during the grant period to conduct focus groups and give a workshop on the GFO resources. Additionally, once per year the GFO Research Team collects perceptions survey data from faculty and students in physics, chemistry, and math.

Cleveland State University

Organization Type: Academic Institution

Organization Location: Cleveland, OH

Partner's Contribution to the Project:

Financial Support

Collaborative Research

More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from the physics, math and chemistry faculty and students each year.

Colorado School of Mines

Organization Type: Academic Institution

Organization Location: Golden, CO

Partner's Contribution to the Project:

Facilities

Collaborative Research

More Detail on Partner and Contribution: This institution is a GFO Qualitative Site. Researchers visit this IHE once per year during the grant period to conduct focus groups and give a workshop on the GFO resources. Additionally, once per year the GFO Research Team collects perceptions survey data from faculty and students in physics, chemistry, and math.

Colorado State University

Organization Type: Academic Institution

Organization Location: Fort Collins, CO

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from the math faculty and students each year.

Eastern Michigan University

Organization Type: Academic Institution

Organization Location: Ypsilanti, MI

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from the chemistry faculty and students each year.

Idaho State University

Organization Type: Academic Institution

Organization Location: Pocatello, ID

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from the chemistry faculty and students each year.

Illinois Wesleyan University

Organization Type: Academic Institution

Organization Location: Bloomington, IL

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from the physics, math and chemistry faculty and students each year.

James Madison University

Organization Type: Academic Institution

Organization Location: Harrisonburg, VA

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from the chemistry faculty and students each year.

Kennesaw State University

Organization Type: Academic Institution

Organization Location: Kennesaw, GA

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from the chemistry faculty and students each year.

Mathematical Association of America

Organization Type: Other Nonprofits

Organization Location: Washington, DC

Partner's Contribution to the Project:

Facilities

Collaborative Research

More Detail on Partner and Contribution: Identified math change agents, recruited quantitative sites, disseminated GFO resources at MAA events.

Middle Tennessee State University

Organization Type: Academic Institution

Organization Location: Murfreesboro, TN

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from the physics, math and chemistry faculty and students each year.

Morehead State University

Organization Type: Academic Institution

Organization Location: Morehead, KY

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from the physics and math faculty and students each year.

Northwestern State University

Organization Type: Academic Institution

Organization Location: Natchitoches, LA

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from the math faculty and students each year.

Prince George's Community College

Organization Type: Academic Institution

Organization Location: Largo, MD

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from the chemistry faculty and students each year.

Roosevelt University

Organization Type: Academic Institution

Organization Location: Chicago, IL

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from the math faculty and students each year.

Rowan University

Organization Type: Academic Institution

Organization Location: Glassboro, NJ

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from the physics, math and chemistry faculty and students each year.

Texas A&M University - Commerce

Organization Type: Academic Institution

Organization Location: Commerce, TX

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from the physics faculty and students each year.

University of California - Irvine

Organization Type: Academic Institution

Organization Location: Irvine, CA

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from the faculty and students each year.

University of Central Florida

Organization Type: Academic Institution

Organization Location: Orlando, Florida

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from the physics faculty and students each year.

University of Colorado - Boulder

Organization Type: Academic Institution

Organization Location: Boulder, CO

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from the physics faculty and students each year.

University of Houston

Organization Type: Academic Institution

Organization Location: Houston, TX

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from the physics and math faculty and students each year.

University of Mississippi

Organization Type: Academic Institution

Organization Location: Oxford, MS

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from the physics and chemistry faculty and students each year.

University of Tennessee - Martin

Organization Type: Academic Institution

Organization Location: Martin, TN

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from the math faculty and students each year.

University of Wisconsin - La Crosse

Organization Type: Academic Institution

Organization Location: La Crosse, WI

Partner's Contribution to the Project:

Facilities

Collaborative Research

More Detail on Partner and Contribution: This institution is a GFO Qualitative Site. Researchers visit this IHE once per year during the grant period to conduct focus groups and give a workshop on the GFO resources. Additionally, once per year the GFO Research Team collects perceptions survey data from faculty and students in physics, chemistry, and math.

Wartburg College

Organization Type: Academic Institution

Organization Location: Denver, CO

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from the math and chemistry faculty and students each year.

Waynesburg University

Organization Type: Academic Institution

Organization Location: Waynesburg, PA

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from the chemistry faculty and students each year.

West Virginia University

Organization Type: Academic Institution

Organization Location: Morgantown, WV

Partner's Contribution to the Project:

Facilities

Collaborative Research

More Detail on Partner and Contribution: This institution is a GFO Qualitative Site. Researchers visit this IHE once per year during the grant period to conduct focus groups and give a workshop on the GFO resources. Additionally, once per year the GFO Research Team collects perceptions survey data from faculty and students in physics, chemistry, and math.

Westmont College

Organization Type: Academic Institution

Organization Location: Santa Barbara, CA

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from the chemistry faculty and students each year.

What other collaborators or contacts have been involved?

Penn State's Mathematics Department, University Park, PA Loyola

Meredith College, Raleigh, NC

University of Minnesota, Minneapolis, MN

Impacts

What is the impact on the development of the principal discipline(s) of the project?

This project is supporting chemistry, physics, and mathematics local faculty champions throughout the United States in providing equivalent and fair information about teaching as a profession compared to other STEM careers by providing high- quality accurate recruitment resources.

Longer term this project will recruit more highly qualified teachers into STEM teaching fields which will help improve workforce training and an educated citizenry. Research shows that students coming into college classes will be better prepared for their college STEM courses if they had well prepared STEM teachers.

What is the impact on other disciplines?

The GFO resources have been and will continue to be developed and tested with subjects from a range of STEM disciplines. These materials are ready for adoption by other societies or faculty in other STEM disciplines interested in recruiting teachers. Additionally, School of Education folks at the qualitative site visits have indicated that they find the resources effective for any field of teaching.

Additionally, mathematics preparation is the primary barrier to participation in STEM disciplines in college, particularly for underserved students. Increasing the pipeline of highly qualified high school mathematics teachers should have a significant impact on numbers of students successful pursuing majors and careers in all STEM disciplines.

What is the impact on the development of human resources?

Faculty

- More accurate and complete knowledge of the STEM teaching profession
- More positive opinion of the STEM teaching professions

Postdocs

- Active contributing members of the PER community who are qualified to secure a PER faculty position.
- Stronger project management and research presentation and writing skills.

STEM Teachers

- Increased number of grades 7-12 math, chemistry, and physics teachers.

Incoming college first-year students

- Better prepared for introductory STEM courses

What is the impact on physical resources that form infrastructure?

Nothing to report.

What is the impact on institutional resources that form infrastructure?

Nothing to report.

What is the impact on information resources that form infrastructure?

The Get the Facts Out website is a resource about the teaching profession hosts a wealth of information and resources related to chemistry, mathematics, and physics teaching professions. The site includes the GFO resources (presentations for faculty and students, ready-to-print posters/brochures/flyers, etc....), facts and data, motivation and avenues for engagement, and other components.

What is the impact on technology transfer?

Nothing to report.

What is the impact on society beyond science and technology?

Nothing to report.

Changes/Problems

Changes in approach and reason for change

Message Testing

The biggest change in the project plan has occurred in our "Message Testing" work. We began by working with Drew Westen, a political messaging consultant, to develop more meaningful messaging about the teaching profession as described in our proposal. Initial engagement yielded a product that was not testing well with STEM faculty and did not fit into our resources. The working relationship was clearly untenable, and we ended the consulting relationship.

We were able to secure an expert with a national profile who has demonstrated marketing success, Mark Ferguson author of Investfourmore.com and eight successful books. He has helped with our "message testing" work. With this change in consultant we have also adjusted responsibilities. Ferguson is developing the messaging in collaboration with PI Adams, while the Research team is conducting the testing via focus groups at selected qualitative sites. This change has been productive so far and due to the discovery that we need separate faculty facing resources, this work has been expanded and will continue into year 2 within the original allotted budget for this aspect of the project. This would not have been possible with the original consultant arrangement.

Toolkit Development

As noted previously, research in year 1 found that faculty have much more deeply held misperceptions about the teaching profession as well as a slightly different set of misperceptions when compared to students. Therefore, we have found a need for additional faculty-facing resources in addition to the existing GFO resources. For this reason, resource development will continue into year 2.

Data Mining

We've also found a strong need for continued data mining to refute the extensive misperceptions that continue to surface around the teaching profession. It has also become clear that some of the required local data mining, such as state-specific retirement benefits, create a large enough energy barrier to deter some local champions from engaging in a GFO campaign. Therefore the Research team will continue to dig into this data and share it via GettheFactsOut.org.

Qualitative sites

When submitted, the proposal included seven Institutions that had committed to serving as GFO Qualitative research sites. When awarded, we reduced our budget by reducing support for site visits by one. During this past year we identified two sites, University of Houston and California State University, San Marcos, which were not ideal for the role of qualitative site so each has chosen to convert to a GFO quantitative site. Brigham Young University was identified as an appropriate replacement qualitative site so that we now have six qualitative sites as intended when funded.

Actual or Anticipated problems or delays and actions or plans to resolve them

The math change agents have focused much of their efforts this year searching for math specific data but have not identified any that is similar to data from the American Institute of Physics' data on high school physics teachers. Based on the GFO research team's faculty interviews, site visits, and student interactions, we have determined that the best solution is to remove the AIP physics specific data from resources and only use data that applies to all STEM disciplines or teaching in general.

Changes that have a significant impact on expenditures

Nothing to report.

Significant changes in use or care of human subjects

Nothing to report.

Significant changes in use or care of vertebrate animals

Nothing to report.

Significant changes in use or care of biohazards

Nothing to report.

Special Requirements

Responses to any special reporting requirements specified in the award terms and conditions, as well as any award specific reporting requirements.

Nothing to report.