

# 2021 | Year 3

# Get The Facts Out Annual Report



### Authors

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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 <u>Creative Commons license described here</u>.



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## Accomplishments

### What are the major goals of the project?

Get the Facts Out (GFO) is a national information campaign 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. GFO 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.

To develop and implement a national campaign we formed a project team that includes leadership from professional societies in the mathematical and physical sciences, experts in behavioral change and leaders in teacher education, 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 GFO 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 project are to:

- (1) change perceptions of the teaching profession among 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.

Activity Years 2-4 Toolkit development Toolkit revised based on user feedback, research and evaluation Messaging sent to target audiences Workshops and webinars offered Society campaigns User groups facilitated Survey & enrollment data gathered from both types of sites Research Site visits completed F-PTaP survey development paper published Data on champions and change agents gathered Evaluation Evaluative feedback on motivation and preparation given Evaluative lens on research done **Project Management Team meetings Project Area Teams meetings** Project management Annual Project meeting

The strategic plan for year 2-4 as written in our proposal is as follows:

In response to our External Evaluator's (EE) recommendations, we have been developing a detailed strategic plan each year organized by Working Group (WG). These strategic plans are much more detailed than the proposal strategic plan and better reflect our project intentions for the year.

Additionally, we developed Yr 3 Top Priority Initiatives that are directly in response to the Yr 2 EE's Report. Finally, our annual meeting is held in August each year and additional recommendations were suggested by the National Advisory Board (NAB) at that time.

### Year 3 Top Priority Initiatives:

- 1. Work towards a reliable way to identify GFO Champions (GFO users) and track their activities (with an emphasis on study sites where additional data sources can help to assess reliability)
- 2. Enhance support for study sites to implement GFO campaigns, and begin to assess effectiveness of this support
- 3. Coordinate Change Agent workshops across the project
- 4. Achieve adequate national scale through the national campaigns
- 5. Use items 1 4 above to begin answering the question of Scaling: How might the project define and achieve the desired scale?
- 6. Develop faculty-facing resources (videos, brochure, poster)

### Year 2 National Advisory Board Recommendations

The NAB reviewed the Yr 2 annual report, the Yr 2 EE's report, and spent 12 additional hours hearing from the Project Management Team and the Comprehensive Study Sites. The NAB's response to our Year 3 Top Priority Initiatives is as follows: "The Year 3 priorities appropriately recognize where the project most needs to improve. The change agents are a strong component of the program. The biggest gap is the local champions. There may be many faculty using GFO materials, but the project doesn't know, so it makes sense to focus on trying to better understand what's happening here." The NAB went on to provide detailed recommendations on how to form a GFO Community to support Champions once they had been identified. Additionally, recommendations were provided for encouraging faculty to register as Champions and to report their GFO activities.

AY 20/21 Strategic Plan : Below is an outline format organized by WG.

### PI Team

Approve 20-21 strategic plan, approve the NAB and Annual meeting agendas, hold the Virtual NAB meeting and Annual meeting, approve NSF Annual report, approve communications strategy and branding strategy, approve plan to seek additional funding, review plans to achieve desired scale, check on each working group's progress towards their 20/21 objectives.

### **Planning and Management**

Draft AY 20-21 strategic plan, draft NAB and Annual meeting agendas, plan and submit NSF annual report, build a partnership with HBCUTeach, make plans to integrate NAB feedback, draft plan to answer the question of scaling, seek additional funding, and schedule NAB and Annual meeting.

### Communications

Draft communications strategy and branding strategy, roll out these strategies and then monitor and revise as needed.

### Societies

Assess, revise, and implement marketing plans, create and maintain online fora, publish GFO Newsletters, develop a plan to engage study sites, organize virtual meetings for study sites.

### **Change Agents by Discipline**

Create plans for AY 20-21 workshops and local efforts, reach out to ~10 new institutions per Change Agent (eg. host a national/regional workshop), report activities via the tracking form and utilize evaluation surveys, submit self assessments each semester, support adopted GFO Champions, continue to implement local efforts and provide written feedback to the Toolkit WG, create blog articles for the website, and attend All Change Agent meeting(s).

### **Toolkit Design and Website Development**

Update resources based on feedback, create and post blog articles for the website, continue to build out facts and data, finalize Champion support plan and maintain Champion listing on the website, develop six short videos, continue to get the version 2.0 features implemented on the website, finalize student and faculty facing brochures, develop faculty-facing poster and other resources, hold All Change Agent meeting, host virtual AMTE Task Force KickOff, and support the AMTE GFO Kickoff at AMTE annual meeting.

### **Research Team**

Create plans for AY 20-21, conduct site visits and create site visit reports, complete and deliver reports for baseline PTaP and PTaP.HE data collection to each Study Site, continue to collect Yr 2 PTaP and PTaP.HE data and begin Yr 3 data collection, draft and publish PTaP paper, draft PTaP.HE paper, write blog articles, engage in professional development for the post docs, directly recruit MSIs to become Study Sites, share teacher salary data with each Study Site, analyze Yr 1 and Yr 2 data to inform the project, attend and present research outcomes at professional conferences.

### Evaluation

Interview new mathematics change agents, interpret the Faculty Strategy Implementation (FSI) data collected with baseline PTaP.HE data, observe workshops or webinars, continue to administer workshop surveys, evaluate local champion activities, roll out fidelity of implementation rubric broadly and collect data, plan a survey of people engaged in GFO, create blog articles on evaluation results, conduct an interview with each PI

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

Major Activities: Period: 7/1/20 – 6/30/21

### PI Team

- Approved: AY 20-21 strategic plan, NAB and Annual meeting agendas, NSF Annual report. Checked on each WG's progress towards their 20/21 objectives and held Virtual NAB and Annual meeting
- Approved a plan to improve communication alleviating the need for the Communications WG and approved a branding strategy proposed by the Toolkit Design WG
- Discussed: plans to seek additional funding and reviewed, Society WG plans to achieve desired scale, goals and agenda for the upcoming Fall online "mini- conference", and various reports produced by our EE

### **Planning and Management**

- Drafted AY 20-21 strategic plan, began drafting AY 21-22 strategic plan, drafted NAB and Annual meeting agendas, planned and submitted NSF annual report, scheduled the NAB and Annual meeting
- Discussed PI Adam's plans to build a partnership with HBCUTeach, drafted plans to seek additional funding through an NSF Supplement, a new NSF proposal in 2022, and possible connections for private funding
- Drafted a proposal for a "mini-conference" in the Fall '21 to address the key teacher recruitment questions facing each discipline.

### Societies

- Developed a Champion Engagement Strategy (CES) that outlines the many ways GFO is (or will be) engaging Champions
- Approved new CES WG
- Facilitated EE's large-scale survey of the membership of ACS, APS, and AAPT.
- Published 5 Newsletters. Each includes event announcements, brief tips for implementing GFO resources, recent results from GFO research, and highlight a Change Agent
- Developed press releases and letters of support as recognition and Support for Comprehensive Study Sites (FKA Qualitative Sites)

### Change Agents (CA) by Discipline

- Created plans for AY 20-21 workshops and local efforts and revised as the landscape evolved due to Covid
- Conducted 73 activities (59 last year) reaching approximately 970 faculty
- Reported activities via the tracking form and utilized evaluation pre/post surveys showing an avg effect size of 2.0 (see 2021 EE's report)
- Support adopted GFO Champions
- Implement local efforts and provide feedback to the Toolkit WG, and attended All CA meeting

### **Resource Development**

- A Teacher's Life by the Numbers (TLN attached) is a new resource that provides a snapshot of teacher salaries (yrs 1 & 15) in an area with other cost of living indicators
- Mined teacher salary data, housing costs, and average weekly wage for 318 school districts in the U.S. chosen either because they are close to a Study Site or a Champion requested the data. Data shared via a google spreadsheet with salaries for years 1, 5, 15 and end of career as well as coaching stipends, BLS avg. wage, avg. home prices, and avg. rent for a 2 bedroom apartment.
- Created TLN flyers for 71 locations and shared with the nearby Study Site or requesting Champion.

### Blog

- Live August 2020. 9 Blogs posted
- Teacher Retirement blog has gone viral with 12,000 total views approximately 90/day

### Worked with Circuit Media, a digital communications and design agency, to develop

- 6 short professional videos. 4 published, 1 neary complete and 1 is becoming a five chapter video
- draft user's guide. Feedback is that it needs to be much more in depth.
- updated poster series (see attached) that has been successfully tested with both students and faculty
- GFO website in WordPress. Current site (developed by the APS Web Team) maintenance and updates are very time intensive. New site will be maintained by GFO Project Team & hosted on an APS platform.

### Faculty Presentation - Teaching the Best Kept Secret

- Reformatted to facilitate virtual presentations
- Created a 15-, 30- & 60-minute version for just sharing the facts. Also created 30-, 60- & 240-minute versions for

creating new Champions (facts + GFO Resources and how to use them)

- Integrated the pre/post test and virtual sign in sheet to all versions.
- Posted a checklist co-developed with our External Evaluator to help with fidelity of implementation

### Student Presentations - Busting Myths about the Teaching Profession

- Created 5-, 15- & 30-minute versions
- Updated and revised as needed
- Created a pre/post w/ evaluation questions and integrated into the publicly available slide decks
- Posted a checklist co-developed with our External Evaluator to help with fidelity of implementation

### **Champion Support**

- Built out a system for Champions to register on the website, report their activities, or register a presentation that utilized the pre/post test so they can receive feedback from the EE.
- Created an extensive database to track all champions, their activities, and our contact with them
- Once the website is ported to WordPress, we will use HubSpot to automate much of this process

### **Change Agent Support**

- Held an All Change Agent meeting that included the new AMTE Task Force
- Supported AMTE Task Force during intensive preparation for AMTE annual meeting

### Social Media

- 2-3 posts to Facebook/week
- Created additional Memes

### YouTube Channel - "Get the Facts Out"

- Created channel to host the professional CM videos as well as webinars and research presentations
- Plan to also share Champion created video resources

### **Research Team**

- Engaged in annual project planning for AY 20-21 and AY 21-22 and conducted professional development for postdocs and research assistants
- To support the resource development the Research Team
- Tested the new poster series via interviews and focus groups with both students and faculty at all six Comprehensive Study Sites (CSS)
- Identified and tested additional photos with students and faculty (faculty and students rarely respond positively to the same photos) at all CSS
- Initial testing of the draft user's guide with faculty (clear feedback that it needs more detailed content)
- Individual interview and focus group testing of the new videos with students and with faculty at half the CSS so a far
- Continuing to identify research to support each 'Did you know' and factual question on the PTaP.HE (will be posted on new GFO site)
- Developed and tested more 'Did you Know' statements as needed for production of the new videos.

### Partnered with HBCUTeach

- Delivered a webinar to all eleven HBCU partner institutions (160 attendees)
- Collected perceptions data from students and faculty at 4 of these sites
- Worked with 2 sites' administration and faculty to strategize how GFO could help with their recruitment efforts
- Conducted student perceptions interviews and focus groups at one site so far.

### **Study Sites**

- Continued to recruit Study Sites specifically targeting MSIs
- Conducted 3 virtual site visits in the Fall '20 semester (late spring '20 visits cancelled due to COVID). Conducted 1 in person and one virtual site visit in the Spring.
- Completed and delivered 34 Yr1 Study Site reports, includes PTaP (student survey) and PTaP.HE (faculty survey) data. Completed 15 Yr2 reports.
- Completed Yr 2 PTaP and PTaP.HE data collection and began Yr 3 collection

### **Research Papers/presentations**

- 2 PTaP development and validation manuscript drafted, 2 papers (1 published, 1 in review) that address aspects of the PTaP.HE development and validation, published 2 papers on PTaP.HE results, and 1 paper (in review) on PTaP results by MSI type.
- 2 blog articles
- Research section for each newsletter
- Research presentations at various professional conferences

### **Research analyses**

• New Factor Analysis on PTaP.HE v2.0 & PTaP (statements added in Year 2). PTaP categories are unchanged. PTaP.HE categories emerged different enough to require expert review and renaming.

- Analyzed PTaP data by MSI status as well as student identity (race/ethnicity)
- Analyzed FSI (Faculty Strategy Implementation) survey

### **Evaluation**

- Observed workshops or webinars, continued to administer workshop surveys, rolled out fidelity of implementation rubric broadly and collected data, planned a survey of people engaged in GFO, and wrote 2 blog articles
- Additionally conducted interviews and analyzed data to create the following reports:
- 2021 Society Survey report
- 2021 Annual Evaluation report
- 2021 PI and AMTE interview report
- 2021 Champion Pilot interview report
- 2020 Change Agent FSI report

### **Specific Objectives:**

GFO Goals are listed in section 1. above

We have collected extensive data on the effectiveness of both the faculty and student presentations across presenter in support of Goal 1. We also now have strong data supporting Goal 2 and very preliminary data in support of Goal 3. Additionally, we will share this year's work to broaden participation in STEM. Finally, we will describe our efforts to accomplish our Year 3 Priority Initiatives.

### Goal 1

This year we have been collecting pre/post data on both the faculty and student presentations. These pre/post tests have each been aligned with the objectives of the presentations and were developed in cooperation with the external evaluator (EE). They are included in all slide decks available on the GFO website so that both Champions and CAs can easily use them.

This past year pre/post tests were administered with 22 different faculty presentations (13 by non-Mines team members) and 13 different student presentations (10 by non- Mines team members). The effect sizes were very similar for both presentation types 1.98 and 2.09 for the student and faculty presentations respectively. The EE found that a variety of presenters are effective, "While Mines had generally higher gains, these results were well within 1 standard deviation."

### Goal 2

GFO is an Institutional and Community Transformation project; therefore, it's critical that we have faculty uptake of the GFO resources. This past year our main charge from both the EE and the NAB was to identify GFO Champions (people who share the facts using GFO resources). One measure of this engagement is the resource downloads from the website, but we also engaged in a much more concrete effort by creating a database of known faculty Champions.

Website analytics indicate that since January 2020, 1661 resources (presentations, posters, brochures, etc...) have been downloaded. Faculty often report downloading the slide deck once; however, some faculty download resources each time they use them, or one faculty might download several different resources. Faculty are also able to download the resources directly from our Google Drive Folder which does not track downloads. Therefore, it is difficult to accurately quantify the number of Champions based solely on resource downloads.

The new Champion database provides another indicator. We took a multi-pronged approach to the challenge of creating the Champion database. First, we had all project personnel write down any GFO users they were aware of. We also created a Google form for Champion registration linked in multiple places on the website. This system resulted in two types of c/Champions, those who registered themselves (Champion with an uppercase C) and those who were identified by others (champions with a lowercase c). Invitations were shared during Champion presentations, during site visits, and the most effective single method was when PI Adams emailed all our champions and Study Sites asking them to register their activities for this NSF annual report. When a faculty registers as a Champion,

- Their profile can be posted on the GFO Community map (see attached) along with a link to their program
- They are assigned a Change Agent, who then reaches out to offer support.
- They are eligible to request local teacher salary data mining
- They receive recognition via the GFO Newsletter
- They can request a letter of support for their faculty review
- As they use resources they can register their activities to earn points towards a 1- star, 2-star, or 3-star Champion

As of the writing of this report we have 122 unique C/champions with 85 Champions representing over 90 unique institutions. There are over 113 activities registered compared to the 1661 resources downloaded from the website.

We know that this number of faculty c/Champions is an extreme underestimate of those using GFO resources. The registration system is new and we regularly meet GFO users who have not found the time to register. During the EE's Champion Pilot interviews, she found that most of the interviewees were not registered Champions and those that were, reported the only enticing reason to register is to help the project in its reporting. The incentives listed above do not seem to be strong incentives for the particular faculty who were interviewed.

### Goal 3

Preliminary data from the pre/post student survey and from the pilot Champion interviews indicates a positive trend in student enrollment in teacher prep programs.

The pre/post includes the statement, "I want to become a grade 7-12 teacher" and students are asked to rate their agreement with this statement on a 5-point likert scale both before the presentation and then after. From our EE's report, "The shift towards wanting to become a teacher is minimal on average but the standard deviation is large (0.78 pre, 0.81 post), showing that many do shift their perceptions -- which is the desired outcome."

The second set of data comes from the EEs pilot Champion report of interviews of 16 Champions and potential champions. "Most champions expressed overall enthusiasm and gratitude for the project, but four in particular were able to express that they had observed clear impacts of using the materials.:

- One mentioned that they had boosted the enrollment from 41 to 107 in their STEP 1 course.
- One said they had 6 people now interested in the program, which is a change.
- One said 6 had indicated interest after a presentation, which is more than the past.
- One said students were excited, and those who hadn't considered it before at least said 'maybe'."

### **Broadening participation**

As part of our efforts to broaden participation in STEM we have carefully reviewed our project efforts and published a blog article that outlines exactly what GFO is doing to support programs in recruiting diverse prospective teachers. We have also analyzed our Study Sites (SS) and student data to learn how well we are representing STEM majors in our work. Additionally, we have undergone a preliminary analysis of our student survey data by IHE type and student group (see Significant Results section below)

Year 3 Top Priority Initiatives: (listed in section 1. major goals)

- 1. See Goal 2 section above.
- 2. Mined teacher salaries for each SS and shared a customized TLN flyer with each, Adams held some individual virtual meetings, posted check lists for presentations and campaigns to website, blog article on implementation, continued site visits and annual meeting for Comprehensive SS. PhysTEC held a video conference & session for Champions to share GFO campaigns.
- 3. Everything becoming virtual really impacted how workshops are delivered. Adams started doing many more webinars, conferences became less useful, and we adopted the apprenticeship model for CAs and are encouraging CAs to give colloquia at outside IHEs. We are coordinating CA activities across discipline and within by having Isola attend all meetings.
- 4. See EE report, GFO has reached ~1000 IHEs to date
- 5. The question of scale includes range of audience as well as depth vs. breadth. We have consciously chosen not to focus on changing the public's perceptions by sticking with faculty, students, and parents. Based on our data and EE feedback we are recommending depth, specifically use of the student and faculty presentations for any sort of presentation vs. simply getting the word out. To encourage others to present, we have decided to adopt an apprenticeship model where CAs or Champions co-present with Adams so that they become comfortable presenting on their own and then they can apprentice a new GFO user, etc.
- 6. We updated the faculty presentation to address misconceptions uncovered by the PTaP.HE, we created the new videos and tested with faculty, we have learned of the desire for a fairly detailed "getting started guide" and have a draft, and we updated the website to address much of the need. We plan to do more in this area but had to refocus our attention on retooling resources for a virtual world.

### **Significant Results:**

### Analysis of Student Interest and Perceptions by Race/Ethnicity

This summer we analyzed our student survey data to determine if there are differences by institution MSI status or differences by selfidentified race/ethnicity. First, we looked at the demographics of our Study Sites to find out if we have a representative sample of sites now that we've successfully recruited more MSIs. We have uploaded a pdf document, "PTaPanalysis\_race-ethnicity" in the supporting files that contains data for this section along with some nice tables and graphic visuals.

We learned that our Study Site representation by MSI status is now quite good. When we analyzed our sites in 2020 we found that our study sites had a representative number of MSIs (Minority Serving Institutions) however; an underrepresentation of HBCUs (Historically Black College or University) and PBIs (Predominantly Black Institution). This past year we engaged in Study Site recruitment, in particular through a partnership with HBCUTeach. HBCUTeach provided an opportunity to share GFO with their 11 sites; 6 of these sites have engaged with GFO beyond this presentation and 4 collected PTaP and PTaP.HE data. Of our 46 Study Sites who actively collected data in Year 2, 26% are MSIs and 11% are HBCUS or PBIs compared to the national average of 20% MSI and 6% HBCU or PBI.

When analyzing our data by MSI status, we found some small statistically significant differences in some categories, but there didn't seem to be a strong consistent story in the data. We also had concerns that geographic location might be a stronger influence than MSI status and our data cannot differentiate between those two potential influences.

We then analyzed the data by race/ethnicity and found some very interesting and some surprising results. We found that 60% of students who identify as White are interested in becoming a teacher with 13% indicating that they are currently pursuing certification. We also found that 77% of students who identify as Hispanic are interested in becoming a teacher with 20% indicating that they are pursuing certification. At first this seems inconsistent with the fact that 9% of the teacher workforce is Hispanic but 17% of the U.S. labor force is Hispanic. However, we looked at the percentage of STEM majors who identify as Hispanic and found that they underrepresent college students. 20% of college students are Hispanic but only 10% of STEM degrees are awarded to Hispanic students. Therefore, we believe one key challenge to Hispanic STEM teacher recruitment is overall Hispanic STEM major recruitment. As a group, interest in teaching is higher than any group we measured, there simply aren't enough Hispanic people majoring in STEM. The good news is that there is a large fraction of STEM Hispanic majors, 57%, who indicate an interest in teaching but who are not yet pursuing certification. Our research shows that a large number of these students will pursue a career in teaching once the facts of the profession have been shared with them. One institution, University of Texas at Austin has data consistent with this measure of interest by Hispanic STEM students. UT Austin is an HSI with 25% of their population identifying as Hispanic; but, over 40% of their Uteach candidates identify as Hispanic.

When analyzing the group of students who identify as Black or African American we see similar results in interest in becoming a teacher. 69% have an interest in math or science grade 7-12 teaching with 14% pursuing certification. Again, there is an underrepresentation of STEM degrees awarded; Black students receive 9% of STEM degrees and make up 15% of college students.

Asian or Asian American student interest and pursuit of teacher certification match the Black or African American student group: 70% have interest and 14% are pursuing certification. However, this group is not underrepresented in STEM; 10% of STEM degrees are awarded to Asian or Asian Americans but only 6% of college students identify in this group.

Further analysis of perceptions of the teaching profession sheds further light on these results.

- 1. Perceptions vary by group for those who do not want to teach.
  - Black or African American students perceive more support for teaching
  - Black and Hispanic students are much more likely to view teaching as scientific.
  - Asian students perceive less support and have lower perceptions of employee benefits and stability.
- 2. Perceptions vary by group for those who want to teach
  - Black or African American students perceive the department values teaching
  - Black and Asian students perceive lower personal enjoyment.
  - Asian students perceive teaching as a weaker career choice and have lower perceptions of employee benefits and stability.

This analysis by race/ethnicity is preliminary and we have more work to do. Note that 13% of the students in the sample identified as two or more races. The majority of these students indicated which races they identify with. To be consistent with other analyses, we need to reevaluate our results with all students who indicated a certain group in that group, regardless of any additional identity information that they provided.

### Sharing the facts with faculty makes a difference!

GFO Champions at California State University Long Beach have engaged in targeted efforts to improve faculty perceptions through formal presentations as well as through informal sharing of information. However, they have started but never actually engaged in work to share facts with students. Their efforts with faculty resulted in large changes in student perceptions from 2019 to 2020.. PTaP data shows a 20% shift in students' perceptions of My Department Values and Encourages Teaching but no shifts in in other categories. Additionally, a larger fraction of students reported that they would either become certified to teach or were interested in teaching during our 2020 data collection.

### **Unique Challenges by discipline**

It has become clear this past year that each discipline has its own unique challenges related to recruitment of prospective teachers. In response, GFO is planning a virtual mini-conference September 30, 2021, where experts in each field will be invited to have a conversation around these topics and strategize how best to address each challenge. The challenges by discipline are as follows:

Chemistry: We are not aware of a listing of Chemistry Teacher Educators in the U.S. and Chemistry faculty are typically not aware of the chemistry teacher shortage.

Mathematics: Mathematics departments have a strong hierarchical structure by sub- discipline. Typically those who study theoretical mathematics look down on those who study applied math and they look down on those who are math teacher educators. This puts the math teacher educators in a more uncomfortable position for recruiting math majors into teaching. Mathematics faculty are also not aware of

the math teacher shortage.

Physics: The recent PhysTEC sustainability study is finding a decent fraction of physics teacher educators who see perceptions as their biggest recruitment barrier but are unaware of GFO. Additionally, this study is finding many physics teacher educators with strong misperceptions about the profession which are blocking their belief that recruitment can be successful.

### Key outcomes or other achievements:

### **Executive Summary from EE 2021 Evaluation Report**

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. In the first two years of the project, it focused on developing structures, materials, resources, and outreach to achieve its vision. This year the project focus has (appropriately) shifted to engaging, tracking, and supporting the local faculty ("champions") using the materials.

### The most substantive successes of the project this year are: [1-7]

[1] Significant engagement of champions across disciplines.

As a whole, the data in this report conveys the depth of effort and activity that has occurred within the project. For example:

- 345 people on the email list, and 206 on the Facebook group.
- 113 engaged champions from 89 institutions, at least 65 are active, and 15 are very active.
- Many champions make positive comments when entering their activities. For example, "We love your work. It is an excellent resource," and "Thank you for the phenomenal work that you do!"

[2] Significant and expanded contact with intended audiences reaching over 5000 people (this year) and an estimated 1000 institutions (to date).

- Change agents conducted 73 activities: 26 chemistry, 12 math and 35 physics.
- A total of 138 workshops were conducted by change agents and Pls/staff: 26 by chemistry, 11 by mathematics, 33 by physics, and 68 by GFO staff. 41% of these are regional or national.
- Across champions, change agents, and GFO staff, a total of 81 student presentations, and 105 faculty workshops were delivered in Year 3. These have reached approximately 5200 people. This is an expansion of almost 4 times the number of audience members reached in the previous year.
- Across Years 2 and 3, as many as 1029 institutions have been reached by the project (~615 Physics, ~166 Chemistry, ~248 Mathematics).

Table: Student and faculty presentations conducted by GFO in Year 3

| Student       | Student presentation |        |        |           |          |
|---------------|----------------------|--------|--------|-----------|----------|
| Number        | Est. partic          | ipants | Number | Est. part | icipants |
| Champions     | 32                   | 1055   |        | 22        | 560      |
| Change agents | 24                   | 1090   |        | 36        | 977      |
| PIs/staff     | 25                   | 596    |        | 47        | 971      |
| Total         | 81                   | ~2741  |        | 105       | ~2508    |

[3] Highly effective professional development workshops.

Analysis across workshops with pre/post results show that these workshops and presentations are highly effective for multiple presenters:

- 42% gain / 54% normalized gain for student presentations (1.98 effect size)
- Shift in student perceptions towards seeing teaching as a good career, that it pays similarly to other careers, and less negativity towards becoming a teacher.
- 43% gain / 60% normalized gain for faculty workshops (2.07 effect size).
- Shift in faculty perceptions towards seeing that teaching pays similarly to other careers, and becoming more comfortable with a favorite student becoming a teacher.
- Adequate fidelity of implementation for the average workshop.

[4] Significant national reach in terms of awareness and website use A study of national reach demonstrated impressive results:

- 20,186 unique website sessions and 31,680 pageviews, which have grown over time to over 3000 sessions per month.
- 1584 GFO materials downloaded, though these rates have levelled off.

[5] A surprising fraction of society members are aware of GFO, though typical society members do not necessarily see the value of GFO.

Across all respondents, 24% had heard of GFO, or thought they might have, though many of these positive responses are due to the high awareness among AAPT/PhysTEC members. The greatest awareness is among those who are members of both APS and AAPT (40%) or PhysTEC. Additionally, 9% spontaneously indicated that they would turn to GFO (even before it was revealed that the survey was about GFO). Awareness of GFO was not as high among members of the more traditional scientific societies (APS and ACS); just 8% and 5% respectively. However, this is considered a surprisingly high fraction for those traditional societies. Most have heard of it through newsletters and conferences from the society, as well as from colleagues.

[6] A wide variety of dissemination mechanisms and continuous iteration of project activities.

The project has engaged in extensive continuous improvement, flexibly and dynamically evolving over time to address issues of time, communication, messaging, and scaling. The data in this report shows an extensive array of activities as partners attack dissemination from every angle, from social media, to an effective newsletter, to engaging champions and supporting them in novel ways, to conducting workshops.

### [7] A strong early showing by Mathematics/AMTE

Despite this being the first year of involvement in GFO, AMTE has garnered much success, including:

- 11 workshops by Mathematics change agents, a large percentage of which are national or regional (54%), and a large percentage of which are faculty-facing (82%).
- 32 champions
- 248 institutions reached, over 200 of which were in the last year of the project.

Last year I indicated that number of faculty reached by the change agents may be adequate to reach the desired national reach, if the following conditions were met:

- 1. The workshops are persuasive, using the critical features of Get the Facts Out (i.e. fidelity of implementation).
- 2. The number of national, faculty-facing workshops are increased, especially for chemistry.
- 3. The workshops include faculty from a variety of institutions of higher education.
- 4. The workshops include a bid for faculty to "get the facts out" as local champions.
- 5. The workshops are accompanied by strong national campaigns for repeated exposure to the messages of GFO.

To date, all of these criteria have been met. This is a significant accomplishment.

### The primary challenges of the project at this point are: [1-4]

[1] Many activities are local

Across the activities reported by change agents and PIs, only 47% of activities and 41% of workshops were national or regional. Given that the focus of GFO is on persuading many faculty to take up GFO locally, I feel the regional and national focus should grow significantly in order to reach these local actors.

[2] Less expansive outcomes from Chemistry, with less focus on faculty

Across many measures the outcomes from Chemistry are not at the same level as the other disciplines, such as:

- Chemistry change agents are conducting equal numbers of faculty and student- facing workshops, but a greater number of students are being reached through those workshops.
- A lower number of estimated institutions reached (166 compared to 248 in Mathematics and 615 in Physics).
- 8 Chemistry champions (compared to 47 Physics and 32 Math)
- Only one Chemistry champion conducted a student workshop (compared to 17 Physics and 7 Mathematics).
- Lower awareness of GFO among society members (5% compared to 8% in APS and 27% in AAPT).

However, Chemistry is perhaps in the toughest spot of the 3 disciplines in that it is a society for research-focused professionals (compared to AMTE, which focuses on teacher education), and does not have an existing depth of community building around teacher education (as does APS/AAPT/PhysTEC).

### [3] Study sites are a nexus of activity

GFO Study Sites account for half of champion institutions, and are more active in conducting activities (including student presentations): 70% of GFO study sites conducted at least one activity (compared to 50% at other institutions), and 64% have done a student presentation (versus 26% at other institutions).

[4] The main places that society members seek career information are not a focus of GFO.

In the society survey, those who mentor undergraduates were asked where they find information about K-12 teaching careers. Most explained that they would reach out to teachers, including former students who are teachers (31%), and to their local schools of education (47%). This was especially true of ACS members. Neither of these audiences are the current focus of GFO.

The evidence and findings leading to these recommendations are in the body of the uploaded full 2021 Evaluation report.

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

### **Post-Doctoral Researchers**

The project has hired two post-docs, who work with PI Adams at the Colorado School of Mines. Neither came to the project with formal training in Physics Education Research (PER). Logan is a biophysicist by training and has a strong interest in transitioning to PER. Breakall is a chemistry education researcher by training and is looking to expand his quantitative skills. Adams, a seasoned physics education researcher, is leading their training through both regular project research activities and a separate reading group which dives into the literature. This year we focused on factor analysis, developing effective virtual presentations, evaluating the value of different types of virtual venues for sharing our work, and data collection techniques.

Additionally, Breakall and Logan are each responsible for hiring and mentoring an undergraduate research assistant to help with their respective projects. Finally, Adams is supporting their growth as research professionals providing training related to all aspects of project management and university policy. Specifically, this year we focused on university procedures for curriculum, budgeting, faculty positions. We also compared the career prospects of faculty positions, industry positions, and K- 12 teaching.

### **Professional Development for faculty**

This past year we have moved purposefully into an apprenticeship model. In the past Change Agents and other GFO adopters were supported in a range of ways. What we have learned is that those who were apprenticed become independent champions while those who were supported in other ways become more knowledgeable about the profession, but don't necessarily become confident enough to share the resources on their own. Based on these past experiences and the additional challenges of presenting virtually, we moved to a full apprenticeship model where change agents co-present with Adams before becoming independent. Once these change agents have ownership of the materials, they can present and also mentor other faculty via the apprenticeship model. At first, this seemed inefficient but it's success rate is so high, it's clearly worth the time.

Now that we are identifying C/champions at a steady rate, these champions are each being assigned a change agent. The change agent offers support including offering to co-present with the C/champion the first time they share the facts. This is further facilitated by the opportunity to present virtually.

### **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.

### **Undergraduate Assistants and Research Assistants**

The project has hired several undergraduate researchers and recent graduates from different institutions including Colorado School of Mines, Brigham Young University, Virginia Commonwealth University, University of Texas Rio Grande, and University of North Texas who have worked on various aspects of the project including teacher salary data mining, analysis of perceptions data, survey data collection, and writing of the site reports. These research assistants are being trained and supported by PI Adams and post-doc Breakall.

### Have the results been disseminated to communities of interest? If so, please provide details.

GFO is an Institutional and Community Transformation project; therefore, it's critical that we have an effective dissemination approach to facilitate faculty uptake of the GFO resources. This past year we pivoted quickly to focus on a fully virtual dissemination approach. We modified our presentations to be easily facilitated and effective when delivered virtually. Our first virtual presentations were in early May 2020 and GFO staff and Change Agents have now delivered ~140 virtual presentations reaching approximately 2000 faculty and 1700 students during year 3. The EE annual report includes detail on these activities and their effectiveness.

The project also disseminates its results in a variety of additional ways including the GFO newsletter, the GFO website, blog articles, society publications, society newsletters, the GFO YouTube channel, and during CSS virtual site visits.

#### **Mines Team**

This year the Mines team, led by PI Adams, was able to engage in many more presentations without the need to travel. These included national stand alone webinars, such as the AAAS-ARISE series, meetings with individual universities, and virtual participation in the usual venues such as the national AAPT conferences, PhysTEC, ACS, and UTeach. We learned that virtual versions of the standard conferences were not effective at reaching faculty, participation was minimal. However, the events that were organized because the world is virtual such as AAAS-ARISE, ILAC2020, HBCUTeach webinar, were all extremely efficient and effective ways to reach faculty.

Research Publications included:

- 3 PERC 2020 Conference Proceedings papers published
- 2 manuscripts submitted to the PERC 2021 Conference Proceedings.

### **Association of Mathematics Teacher Educators**

Yr 3 of the GFO project was AMTE's first year working with GFO. During the year, AMTE completed the following activities:

Recruited a GFO Task Force/GFO Change Agents. To recruit task force members, AMTE put out a call to its membership asking for volunteers. 25 people responded to the call. From the group, AMTE leadership selected 5 members who are recognized as leaders in mathematics education and are geographically diverse. The GFO task force has carried out the majority of AMTE's work with the GFO project.

AMTE GFO Task Force Members: Tim Hendrix, Meredith College, Jean Lee, University of Indianapolis, W Gary Martin, Auburn University, Amy Roth McDuffie, Washington State University, Glenn Waddell, University of Nevada, Reno

- Task force members have worked with GFO personnel to learn about the GFO resources, how these resources are intended to be used, assessment instruments, procedures for documenting presentations, etc. Recently they have been developing a plan for a change agent matching process.
- The task force members spent much of the first half of the year becoming familiar with the GFO materials and resources and considering how the materials might be used with mathematics education audiences.
- The Task Force made some modifications to the GFO faculty presentation to gear it to a mathematics education audience, such as adding math-specific data. The intent was not to change the primary messaging, however.
- Task force members have begun to conduct GFO presentations, both independently and as a group. These have been virtual due to the pandemic, but there are plans to begin to conduct face-to-face workshops in the next year.

The Task Force is planning for their first face-to-face workshop to take place at the AMTE annual conference in February 2022.

### **American Physical Society**

APS has disseminated the GFO resources to communities of interest during Yr3 through several mechanisms including:

### **Change Agents**

- In Yr 3, a new change agent joined the team. Sarah Formica, Professor of Physics at the University of North Georgia is the PI of a PhysTEC Recruiting Grant and has been a GFO Champion for 2 years. One change agent, Karen Magee-Sauer of Rowan University, had to step away to attend to other responsibilities.
- The four change agents have continued to meet virtually with project staff, implement GFO resources in their own institutions in partnership with other local faculty and staff, and lead workshops at regional and national meetings of physicists and physics teachers. With the changes to GFO's engagement of champions, the change agents have begun being assigned to help specific champions. The change agents remain an essential force in engaging the physics community.

### Local faculty champions

APS has continued to engage PhysTEC member institutions (more than 700 potential faculty champions in 334 different physics departments) through regular emails and the national PhysTEC conference. The 14 institutions and two regional networks currently supported by PhysTEC are required to use GFO resources and collect data on their impact. Many other faculty have also been recruited to use GFO resources at their local sites; there are currently 48 GFO champions in physics (about half of them at PhysTEC-supported institutions). Several of them have agreed to collect perceptions data for GFO.

### **Study Sites**

APS has recruited 27 study sites in physics or physical-science departments. Many of the local champions at these sites now implement GFO resources on a regular basis, and the others are beginning to. These sites include many of those supported by PhysTEC through its Fellows and Supported Sites programs.

### National and regional workshops

In addition to leading GFO workshops at dozens of local institutions, GFO physics champions, physics change agents, and APS staff have given presentations or led workshops at three national meetings.

### **Online community**

Many physics champions are subscribed to the GFO Facebook and Instagram pages. APS regularly reminds our audience of this opportunity.

### **GFO Website**

With PI Adams and other project leaders and staff, APS updates the GFO website regularly. To allow even more flexibility with making updates, GFO is in the process of moving the site to a different platform. APS will continue to host the site and has met with GFO staff and the new web developers to facilitate the transition.

### **Project Management**

APS staff have also contributed to the management of the main GFO project. Co-PI Plisch regularly works with the PI on project design and development. PhysTEC and GFO/APS program manager May assists the PI with the management of PI/Co-PI team meetings and

communications, and recently helped facilitate the development of a Champion Engagement Strategy and associated working group.

### American Chemical Society

ACS efforts over the five year funding period include (1) supporting a team of chemistry change agents, (2) hosting live and virtual workshops and presentations, (3) creating and sustaining a web presence for GFO resources at <u>www.acs.org</u>, and (4) broadly disseminating information about GFO to chemistry faculty members. These efforts are all designed to lead to sustainability beyond the funding period.

During Yr 3, areas of emphasis included the following activities.

- Chemistry change agents
- Change agents communication occurred via videoconference and email correspondence during Yr 3.
- Hosting live and virtual GFO workshops and presentations
- Chemistry change agents and project team members were charged with conducting workshops and presentations to raise awareness about GFO and to actually "get the facts out about STEM teaching" to students and faculty members.

Disseminating information about GFO more broadly

- Use of the resources associated with GFO will be a function of two elements first, faculty knowledge and second, participation. A
  number of mechanisms were employed to reach the chemistry community-at-large about the GFO project.
- ACS leadership took the lead in producing the GFO newsletter. This involved gathering and editing content for inclusion in the project's bimonthly newsletter.

### American Association of Physics Teachers: See report for grant #1821462

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

### Year 4 Initiatives:

- Hold a GFO mini-conference to strategize the year's approach to each discipline's (ie. Physics, Chemistry, Mathematics) key challenges
- Each society will develop a marketing/dissemination plan with clear objectives and customized activities
- How can we get more people, within the current audiences, deeply engaged with GFO? (eg. Include chairs, deans, society chapter leaders and student chapter leaders)
- Exploratory: Can GFO have impact through faculty in schools of education (eg. Workshop at AAEE, work with existing champions to share GFO with education colleagues)?
  - Determine an approach to collect data that further demonstrates the impact of GFO
  - Strategizing next steps for sustainability and growth
  - Establish a discipline specific approach for each Change Agent community to actively focus on increasing the fraction of outreach compared to inreach
  - Support C/champions through the Champion Engagement Strategy

The following is our 21/22 Academic year strategic plan which outlines in detail our plans for the coming year.

### AY 21/22 Strategic Plan

Because the Strategic Plan contains too many characters to include in full, an outline format of those same objectives are included here organized by WG.

### **PI Team**

Approve 21-22 strategic plan, approve the NAB and Annual meeting agendas, hold the Virtual NAB meeting and Annual meeting, approve NSF Annual report, approve plan for sustainability and growth, approve plan to seek additional funding, check on each WG's progress towards their 21/22 objectives.

### **Planning and Management**

Draft AY 21-22 strategic plan, draft NAB and Annual meeting agendas, plan and submit NSF annual report, make plans to integrate NAB feedback, draft plan for sustainability and growth, seek additional funding, and schedule NAB and Annual meeting.

### Societies

Assess, revise, and implement each discipline's marketing plans, publish GFO Newsletters, strategize next steps for sustainability and growth, draft a discipline specific approach for each Change Agent community to actively focus on increasing the fraction of outreach compared to inreach, approve CES WG plans.

### **Change Agents by Discipline**

Create plans for AY 21-22 workshops and local efforts, reach out to ~10 new institutions per Change Agent (eg. deliver colloquia, host a

regional workshop), report activities via the tracking form and utilize evaluation surveys, submit self- assessments each semester, support adopted GFO Champions, continue to implement internal institutional recruitment efforts and provide written feedback to the Resource WG, create blog articles for the website, and attend All Change Agent meeting(s).

### **Champion Engagement Strategy**

Coordinate and prioritize all project activities that engage C/champions, actively maintain online forum, actively maintain Facebook page, maintain champion listing on the website, data mining by request, share teacher salary data and TLN flyers with each Study Site, coordinate with the change agent WGs to identify the best workshop/colloquia opportunities, plan, coordinate, and post 5-10 blog articles from various WGs, and report progress to the Societies WG

### **Resource Development**

Finalize GFO Users Guide: Where to Start and user-test, complete conversion of website to WordPress, update the Explore Teaching page framing with DYKs, create facts and data section and the Teacher's Life by the Numbers section of the new website, complete the last two of the six video series with CM, update resources based on feedback, create 1-2 blog articles, develop 1 or 2 short videos with a math or chemistry focus, continue to develop faculty-facing resources (eg. poster for copy room), hold All Change Agent meeting, create GFO best practices videos for the GFO YouTube channel.

### **Research Team**

Create plans for AY 21-22, present at Utah and National AAEE (American Association for Education Employment), conduct perceptions intervention study on intro chemistry and intro physics courses at Mines, conduct site visits and create site visit reports, complete and deliver reports for baseline PTaP and PTaP.HE data collection to each Study Site, continue to collect Year 3 PTaP and PTaP.HE data and begin Year 4 data collection, continue to conduct resource testing with a special focus on HBCU's in the South, analyze Yr 2 FSI and SSE data, analyze Yr 1-3 Perceptions and use data, draft and publish research papers, write blog articles about research findings, engage in postdoc PD, , attend and present research outcomes at professional conferences (eg. PhysTEC, BCCE, Noyce).

### Evaluation: TBD Planning will be completed in July

## Supporting Files [1-4]

- 1. 2021 Report prepared by the External Evaluator GFO 2021 Annual Evaluation Report.pdf
- 2. GFO Community map which is a U.S. map showing the location of each GFO Champion and Study Site.



STEM teacher recruitment



necessarily reflect the views of NSF.

4. Data and charts supporting the section describing our analysis of student interest and perceptions data by race/ethnicity group

# Year 2 PTaP Data

### **Research questions**

- 1. How does student interest in grade 7-12 mathematics and science teaching differ by student identity?
- 2. How do student perceptions of grade 7-12 mathematics and science teaching very by group?



### U.S. K-12 teachers vs. U.S. Labor Force

| Race              | Teachers*  | U.S. Labor<br>Force** |
|-------------------|------------|-----------------------|
| White (non-       | <b>79%</b> | 67%                   |
| Hispanic)         |            |                       |
| Black (non-       | 7%         | 12%                   |
| Hispanic)         |            |                       |
| Hispanic          | 9%         | 17%                   |
| Asian             | 2%         | 6%                    |
| American          | 1%         | 1%                    |
| Indian/Alaska     |            |                       |
| Native            |            |                       |
| Two or more races | 2%         | 2%                    |

\*NCES 2015-2016 school year \*\*U.S. Labor Force 2016: BLS.gov

# Year 2 PTaP Data

|  | Total  | % of Study Sites | National % |  |  |
|--|--------|------------------|------------|--|--|
| Institution Type   | Number |                  |            |  |  |
| All Institutions   | 46     | 100%             | -          |  |  |
| MSI  | 12     | 26%              | 20%        |  |  |
| HSI  | 6      | 13%              | 11%        |  |  |
| AANAPISI   | 4      | 9%               | 4%         |  |  |
| HBCU   | 4      | 9%               | 3%         |  |  |
| PBI  | 1      | 2%               | 3%         |  |  |
| Demographics of the 46 GEO Comprehensive Sites. MSI - Minority Serving Institution, HSI - Hispanic Serving Institution |        |                  |            |  |  |

Demographics of the 46 GFO Comprehensive Sites. MSI – Minority Serving Institution, HSI – Hispanic Serving Institution, AANAPISI - Asian American and Native American Pacific Islander – Serving Institutions, HBCU – Historically Black Colleges and Univ ersities, PBI - Predominantly Black Institutions

| N=2364                      | White or<br>Caucasia<br>n | Black or<br>African<br>America<br>n | Hispanic<br>or Latino | Asian or<br>Asian<br>America<br>n | American<br>Indian or<br>Alaska<br>Native | Native<br>Hawaiian<br>or Other<br>Pacific<br>Islander | Middle<br>Eastern or<br>North<br>African | Prefer not<br>to say | Two or<br>more |
|-----------------------------|---------------------------|-------------------------------------|-----------------------|-----------------------------------|---|---|--|----------------------|----------------|
| # of<br>response<br>s       | 65%<br>(1531)             | 5%<br>(122)                         | 8%<br>(185)           | 6%<br>(148)                       | 0.2%<br>(5)                               | 0.1%<br>(3)   | 1%<br>(33)                               | 2%<br>(47)           | 12%<br>(290)   |
| % U.S.<br>STEM<br>degrees** | 63%                       | 8.8%                                | 10.3%                 | 9.7%                              | 0.6%                                      |   |  |                      |                |

Data is limited to STEM students. Each student appears only once . \*\*retrieved from https://www.nsf.gov/nsb/sei/edTool/data/college -11.html

# Pictogram of Prospective Teachers

POPT (*popped*) Responses from a series nine statements that directly address a student's interest in becoming a grade 7-12 math or science teacher



Planning to Pursue Certification includes those who answered agree/strongly agree (A/SA) to either "I plan to pursue certification at my institution" or "I plan to pursue certification through another route "las Interestincludes those who A/SA with any of the six I would if (VIf) statements and/or those who answered A/SA to "I want to become a grade 12 teacher" (WTT) but did not A/SA with either certification statement includes those remaining who chose neutral on any one of WTT, either certification statement. Doesn't Want to Teachincludes those who D/SD with all seven statements.

## I want to become a grade 7-12 teacher: NO



| l want to become a<br>grade 7-12 teacher.<br><mark>NO</mark> | White or<br>Caucasian<br>(1032) | Black or<br>African<br>American<br>(77) | Hispanic<br>or Latino<br>(104) | Asian or<br>Asian<br>American<br>(97) |
|--|---------------------------------|---|--------------------------------|---------------------------------------|
| Overall  | 40.8(0.4)                       | 43.8(1.4)*                              | 38.6(1.2)*                     | 37.8(1.4)*                            |
| My Department<br>Supports Me<br>Teaching                     | 62.1(1.0)                       | 66.6(2.94)                              | 59.1(3.2)                      | 60.1(3.4)                             |
| My Department<br>Values and<br>Encourages<br>Teaching        | 34.5(0.9)                       | 39.5(3.3)*                              | 32.3(2.5)                      | 31.6(3.0)                             |
| As a Career Choice   | 38.8(0.8)                       | 54.5(2.8)*                              | 40.4(2.4)                      | 37.8(3.6)                             |
| Teaching Is Scientific                                       | 53.1(0.9)                       | 74.3(3.2)*                              | 61.0(2.7)*                     | 57.3(2.8)*                            |
| Employee Benefits<br>and Stability                           | 29.8(0.9)                       | 33.9(3.1)                               | 24.5(2.9)*                     | 24.0(2.8)*                            |
| Personal Enjoyment   | 22.8(0.4)                       | 15.8(1.9)*                              | 11.6(1.5)*                     | 23.5(1.4)                             |
| Teaching   | 58.3(0.9)                       | 65.4(2.9)*                              | 55.8(3.2)                      | 51.2(3.1)*                            |
| All Students Can<br>Learn                                    | 63%                             | 47%                                     | 44%                            | 50%                                   |

\* Values with an asterisk are significantly different than the perceptions of White respondents

Perceptions vary by group for those who do not want to teach.

- Black or African American students perceive more support for teaching
- Black and Hispanic students are much more likely to view teaching as scientific.
- Asian students perceive less support and have lower perceptions of employee benefits and stability.

# I want to become a grade 7-12 teacher: YES



**Need more** 

majors!

diverse STEM

| I want to become a grade                           | White or           | Black or<br>African | Hispanic          | Asian or<br>Asian |
|--|--------------------|---------------------|-------------------|-------------------|
| 7-12 teacher. YES                                  | Caucasian<br>(202) | American<br>(16)    | or Latino<br>(31) | American<br>(24)  |
| Overall  | 68.5(0.8)          | 66.0(3.5)           | 66.7(2.0)         | 61.5(2.7)         |
| My Department Supports<br>Me Teaching              | 80.3(2.1)          | 78.1(5.6)           | 79.0(7.2)         | 72.9(6.0)         |
| My Department Values<br>and Encourages<br>Teaching | 63.7(2.4)          | 73.8(7.7)*          | 65.2(5.8)         | 59.4(7.1)         |
| As a Career Choice                                 | 76.0(1.5)          | 68.8(6.9)           | 68.1(6.9)         | 60.2(5.1)*        |
| Teaching Is Scientific                             | 78.7(1.6)          | 76.3(6.9)           | 76.1(4.8)         | 69.2(5.1)*        |
| Employee Benefits and<br>Stability                 | 48.9(2.3)          | 56.3(9.3)           | 48.4(4.8)         | 41.7(3.9)*        |
| Personal Enjoyment                                 | 88.3(1.0)          | 77.5(6.2)*          | 86.2(3.1)         | 79.8(4.4)*        |
| Others Support Me<br>Teaching                      | 82.0(1.8)          | 82.3(5.6)           | 82.3(4.2)         | 72.2(5.3)*        |
| All Students Can Learn                             | 77%                | 50%                 | 81%               | 79%               |

\* Values with an asterisk are significantly different than the perceptions of White respondents

Perceptions vary by group for those who want to teach

- Black or African American students perceive the department values teaching
- Black and Asian students perceive lower personal enjoyment.
- Asian students perceive teaching as a weaker career choice and have lower perceptions of employee benefits and stability.

### Asian 2% 6% American 1% 1% Indian/Alaska Native Two or more races 2% 2%

| Race        | Teachers | U.S. Labor<br>Force |
|-------------|----------|---------------------|
| White (non- | 79%      | 67%                 |
| Hispanic)   |          |                     |
| Black (non- | 7%       | 12%                 |
| Hispanic)   |          |                     |
| Hispanic    | 9%       | 17%                 |

| N=2364                        | White or<br>Caucasian | Black or<br>African<br>American | Hispanic or<br>Latino | Asian or<br>Asian<br>American | American<br>Indian or<br>Alaska Native | Native<br>Hawaiian or<br>Other Pacific<br>Islander | Middle<br>Eastern or<br>North African | Prefer not to<br>say | Two or<br>more |
|-------------------------------|-----------------------|---------------------------------|-----------------------|-------------------------------|--|--|---------------------------------------|----------------------|----------------|
| # of<br>response<br>s         | 65%<br>(1531)         | 5%<br>(122)                     | 8%<br>(185)           | 6%<br>(148)                   | 0.2%<br>(5)                            | 0.1%<br>(3)  | 1%<br>(33)                            | 2%<br>(47)           | 12%<br>(290)   |
| % U.S.<br>STEM<br>degrees**   | 63%                   | 8.8%                            | 10.3%                 | 9.7%                          | 0.6%                                   |  |                                       |                      |                |
| % U.S.<br>College<br>students | 52%                   | 15.2%                           | 19.8%                 | 5.7%                          | 0.8%                                   | 0.4%   |                                       |                      | 3.3%           |

## U.S. K-12 teachers vs. U.S. Labor Force

## **Products**

Books

**Book Chapters** 

Inventions

### **Journals or Juried Conference Papers**

### View all journal publications currently available in the <u>NSF Public Access Repository</u> 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.

Breakall, Jared B. and Logan, Savannah L. and Pearson III, Richard L. and Pyper, Brian A. and Adams, Wendy K. (2020). Maybe we aren't that different after all: Faculty perceptions of grade 7-12 teaching as a career. *2020 Physics Education Research Conference Proceedings*. 51 to 56. Status = Deposited in NSF-PAR <u>doi: https://doi.org/10.1119/perc.2020.pr.Breakall</u>; Federal Government's License = Acknowledged. (Completed by Adams, null on 07/15/2021)

Logan, Savannah L. and Breakall, Jared B. and Pearson, Richard L. and Adams, Wendy K.. (2020). College faculty support for grade 7-12 teaching careers: survey results and comparisons to student perceptions. *2020 Physics Education Research Conference Proceedings*. 291 to 296. Status = Deposited in NSF-PAR <u>doi: https://doi.org/10.1119/perc.2020.pr.Logan</u>; Federal Government's License = Acknowledged. (Completed by Adams, null on 07/15/2021)

Pearson III, Richard L. and Logan, Savannah L. and Adams, Wendy K.. (2020). Faculty perception insights obtained from faculty interviews during the development of the Perceptions of Teaching as a Profession in Higher Education (PTaP.HE) instrument. *2020 Physics Education Research Conference Proceedings*. 394 to 399. Status = Deposited in NSF-PAR <u>doi: https://doi.org/10.1119/perc.2020.pr.Pearson\_III</u>; Federal Government's License = Acknowledged. (Completed by Adams, null on 07/15/2021)

Logan, Savannah L. and Pearson III, Richard L. and Adams, Wendy K. (2020). GFO copywrite: development and testing of written and visual materials for recruiting STEM teachers. *PERC 2019*. Status = Deposited in NSF-PAR https://doi:10.1119/perc.2019.pr.Logan; Federal Government's License = Acknowledged. (Completed by Adams, Wendy on 07/28/2020)

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 https://doi:10.1119/1.5094433 ; Federal Government's License = Acknowledged. (Completed by Adams, Wendy on 06/23/2019)

Breakall, Jared B., Logan, Savannah L., and Adams, Wendy K., Faculty perceptions of grade 7-12 math and science teaching as a career: Evidence from a reduced-basis factor analysis of the PTaP.HE Instrument. 2021 Physics Education Research Conference Proceedings. Status = UNDER\_REVIEW.

Logan, Savannah L., Breakall, Jared B., and Adams, Wendy K., A comparison of student perceptions of the teaching profession at minorityserving and non-minority-serving institutions. 2021 Physics Education Research Conference Proceedings. Status = UNDER\_REVIEW.

### Licenses

### **Other Conference Presentations / Papers**

Drew Isola (2020). "So, what does a typical mid-career teacher make anyway?". AAPT Summer Meeting. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

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 = PUBLISHED; Acknowledgement of Federal Support = Yes

David May, Monica Plisch (2020). A Theory of Change for Getting the Facts Out\*. American Association of Physics Teachers Winter 2020 Meeting. Orlando, FL. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Jean Lee, Glenn Waddell, Amy Roth-McDuffie, Tim Hendrix, Gary Martin (2021). AMTE Get the Facts Out Webinar. AMTE members interested in AMTE GFO work. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Joshua Grossman, Angela Johnson (2021). An Asynchronous, Interactive, Get-The-Facts-Out Activity and More. AAPT Winter Meeting. Virtual. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

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

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

James Hofmann, Joseph Kozminski, Dorene Huvaere (2021). Building for Growth: New Pathways and Recruiting Initiatives for Lewis University's Physics Teacher Preparation Program. PhysTEC Conference. Virtual. Status=PUBLISHED; Acknowledgement of Federal Support= Yes

Jared Breakall, Savannah Logan (2020). Busting Myths About the Teaching Profession. West Virginia University site visit. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Jared Breakall, Savannah Logan (2020). Busting Myths About the Teaching Profession. Student Seminar Colorado School of Mines GFO Site Visit. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Jared Breakall, Savannah Logan (). Busting Myths About the Teaching Profession. Presentation to the Colorado School of Mines Society of Physics Students. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Jared Breakall (2020). Busting Myths About the Teaching Profession. GFO Site Visit Focus Group. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Wendy Adams, Adria Brown (2021). Busting Myths About the Teaching Profession. Social for Colorado School of Mines students. Golden, CO. Status = OTHER; Acknowledgement of Federal Support = Yes

Dawson Lang, Emma Khorunzy and Wendy K. Adams (2021). *Busting Myths About the Teaching Profession*. Challenge Program. Golden, CO. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Wendy Adams, Savannah Logan (2020). Busting Myths About the Teaching Profession: Teach@Mines. Mines Admissions Session. Virtual. 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 = PUBLISHED; 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 = PUBLISHED; 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 = PUBLISHED; 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 = PUBLISHED; 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 = PUBLISHED; 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 = PUBLISHED; Acknowledgement of Federal Support = Yes

Rose Mary Zbiek (2019). Busting Myths about the Teaching Profession. First year seminar for mathematics majors at Penn State (University Park campus). University Park, PA. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Wendy Adams, Jared Breakall (2021). Busting Myths about the Teaching Profession. BYU Student Seminar. Provo, UT. Status = OTHER; Acknowledgement of Federal Support = Yes

Jared Breakall, Wendy Adams (2021). Busting Myths about the Teaching Profession. Math Ed department students and Faculty. Provo, UT. Status = OTHER; Acknowledgement of Federal Support = Yes

Jared Breakall, Wendy Adams (2021). Busting Myths about the Teaching Profession. STEM Teaching Majors at BYU. Provo, UT. Status = OTHER; Acknowledgement of Federal Support = Yes

Dawson Lang and Wendy K. Adams (2021). *Busting Myths about the Teaching Profession*. Summer Multicultural Engineering Training (SUMMET). Golden, CO. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Dawson Lang and Wendy K. Adams (2021). *Busting Myths about the Teaching Profession*. Summer Multicultural Engineering Training (SUMMET). Golden, CO. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Dawson Lang and Wendy K. Adams (2021). *Busting Myths about the Teaching Profession*. Summer Multicultural Engineering Training (SUMMET). Golden, CO. Status = PUBLISHED; 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 = PUBLISHED; Acknowledgement of Federal Support = Yes

O'Brennan, B. & Logan, S. L. (2020). *Busting myths about the teaching Profession*. Physics Teaching Techniques Course – Colorado School of Mines. Golden, CO. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Wendy K. Adams (2019). *Busting myths about the teaching profession*. TEA student club. Colorado School of Mines, Golden, CO. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Wendy Adams, Jared Breakall, Duane Merrell, Jennifer Nielson, (2020). *Busting myths about the teaching profession*. Provo Site Visit. Provo, Utah. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Ellen Yezierski (2019). *Career Exploration: High School Chemistry Teaching*. First year seminar for CHM and BCHM majors. Miami University. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Jean Lee, Travis Miller (2021). Changing the Narrative of the Teaching Profession Through Data. Hoosier Association of Science Teachers Inc, Indiana Council Teachers of Mathematics Virtual 2021 Conference. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Jared Breakall (2020). *Chemistry faculty's perceptions of grade 7-12 teaching as a career: Results and implications for teacher recruitment*. National ACS Conference. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Savannah Logan, Jared B. Breakall, Wendy K. Adams (2020). *College Faculty Support for Grade 7-12 Teaching Careers: Survey Results and Comparisons to Student Perceptions*. Physics Education Research Conference (PERC) 2020. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Logan, S. L., Breakall, J. B., Pearson III, R. L., and Adams, W. K. (2020). *College faculty support for grade 7-12 teaching careers: Survey results and comparisons to student perceptions*. 2020 Physic Education Research Conference Proceedings. virtual. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Jared Breakall, Savannah Logan, Wendy Adams (2021). *College students' perceptions of grade 7-12 math and science teaching as a career*. PhysTEC Conference. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Savannah Logan, Jared B. Breakall, Wendy K. Adams (2021). *Creating Effective Teacher Recruitment Resources Using Cognitive Science*. PhysTEC Conference 2021. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Drew Isola, Allie Costley, Wendy K. Adams (2020). *Data mining: Helping faculty share an accurate picture of the teaching profession in their region*. 2020 Physic Education Research Conference Proceedings. virtual. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Drew Isola, Allison Costley, Wendy Adams (2021). *Data mining: Helping faculty share an accurate picture of the teaching profession in their region*. PhysTEC 2021. Virtual. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Sarah Formica (2021). *Did You Know... Busting Myths about Teaching*. CU Boulder Physics faculty meeting. Virtual. 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 = PUBLISHED; Acknowledgement of Federal Support = Yes

Adams, W. K., Breakall, J. B., and Logan, S. L. (2020). Faculty Perceptions of the Teaching Profession: PTaP.HE categorization, interpretation, and setting a benchmark. PhysTEC Annual Conference. Denver, CO. Status = OTHER; Acknowledgement of Federal Support = Yes

Wendy Adams, Jared Breakall, Savannah Loga, Richard Pearson, Brian Pyper (2020). *Faculty perceive they are more supportive than their perceptions may suggest...*. PERC 2020. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Breakall, J. B., Pearson, R. P. III, Logan, S. L., & Adams, W. K. (2020). *Faculty's Perceptions of 7-12 Teaching as a Career: Changing the Conversation Around Physics Teacher Recruitment*. PhysTEC Annual Meeting 2020. Denver, CO. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Savannah Logan and Wendy K. Adams (2020). *GFO Copywrite: Development and Testing of Materials for Recruiting STEM Teachers*. American Association of Physic Teachers Winter Meeting 2020. Orlando, FL. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Savannah Logan, Jared B. Breakall, Wendy K. Adams (2020). *GFO Copywrite: Research-Based Materials for Recruiting STEM Teachers*. AAPT Summer Meeting 2020. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Drew Isola, Wendy K. Adams (2020). *GFO Discussion in the K12 Teachers Resource Room*. AAPT Summer Meeting. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Jared Breakall, Savannah Logan (2021). GFO Faculty Focus Group to Test Videos. GFO-CSULB Faculty Focus Group to Test Videos. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Terri Chambers, Jennifer Nielson, Ellen Yezierski (2019). *GFO Informational Presentation for ACS Society Committee on Education*. ACS National Meeting. San Diego, CA. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Drew Isola (2020). GFO Invited Speake. AAPT WM 2020. Orlando, FL. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Pearson, R. L.III, Logan, S. L. & Adams, W. K. (2019). *GFO PTaP 2019: Preliminary Scores and Analysis*. American Association of Physics Teachers Winter 2020 Meeting. Orlando, FL. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Jared Breakall, Savannah Logan (2021). *GFO Student Focus Group to Test Videos*. GFO-CSULB Site Visit Student Focus Group. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Terri Chambers, Jennifer Nielson (2019). *GFO Symposium*. Symposium at ACS National Meeting. San Diego, CA. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Jared Breakall (2021). GFO Video Focus Group. CSU-Long Beach site visit. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Terri Chambers, Ellen Yezierski, Jennifer Nielson, Willy Hunter, Etta Gravely, Stephanie Ryan (2019). *GFO Webinar*. ACS Society Committee on Education. Webinar. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Ellen Yezierski (2020). *GFO Workshop for CHM and BCHM Students*. CHM and BCHM Students. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Drew Isola (2020). *GFO resources discussion in the K12 lounge*. AAPT Winter Meeting 2020. Orlando FL. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Karen Magee-Sauer (2019). *GFO to Guide Community College Students to HS STEM Teaching Invited*. American Association of Physics Teachers Summer Meeting 2019. Provo, UT. Status = PUBLISHED; 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 = PUBLISHED; Acknowledgement of Federal Support = Yes

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

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

Terri Chambers (2019). *Get the Facts Out*. ACS National Meeting, Society Committee on Education Executive Committee Meeting. San Diego, CA. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Isola, D., Adams, W. K., Pearson, R. P. III, & Logan, S. L. (2019). Get the Facts Out. American Association of Physics Teachers Summer 2019 Meeting.

Provo, UT. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Duane Merrell (2020). Get the Facts Out. Virtual Workshop. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Wendy K. Adams (2020). Get the Facts Out. Presentation at Teach@Mines Ice Cream Social. Golden, CO. Status = OTHER; Acknowledgement of Federal Support = Yes

Savannah Logan, Jared Breakall (2020). Get the Facts Out. Ed Psych class at Colorado School of Mines. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Amy Roth McDuffie (2021). *Get the Facts Out*. Mathematics Education Graduate seminar for Washington State University and University of Idaho. Pullman, WA. Status = OTHER; Acknowledgement of Federal Support = Yes

Jean Lee (2021). *Get the Facts Out*. School of Education Leadership and UIndy Marketing for SOE. Indianapolis, IN. 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. Houston, TX. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Wendy K. 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 = PUBLISHED; 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 = PUBLISHED; 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 = PUBLISHED; Acknowledgement of Federal Support = Yes

Duane Merrell (2020). *Get the Facts Out Student*. Physics 191 careers in physics course. Provo, UT. Status = OTHER; Acknowledgement of Federal Support = Yes

Duane Merrell (2020). Get the Facts Out Students. 191 PHcareer course. Virtual. Status = OTHER; Acknowledgement of Federal Support =Yes

Wendy K. Adams and Drew Isola (2021). *Get the Facts Out Videos*. IUSE Summer Labs. virtual. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Terri Chambers, Etta Gravely, Jennifer Nielson, Willy Hunter, Stephanie Ryan, Ellen Yezierski (2020). *Get the Facts Out Webinar*. Webinar. Webinar. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Drew Isola, Wendy Adams, Savannah Logan, Jared Breakall (2020). *Get the Facts Out Workshop*. AAPT Summer Meeting. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Gay Stewart (2020). Get the Facts Out Workshop. Nebraska section AAPT meeting. Lincoln, NE. 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 = PUBLISHED; 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 = PUBLISHED; Acknowledgement of Federal Support = Yes

Karen Magee-Sauer (2020). Get the Facts Out about STEM Teaching. Workshop for physics teachers. Rowan Area Physics Teachers meeting. Glassboro, NJ. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Duane Merrell (2019). Get the Facts Out about STEM Teaching.. Workshop for STEM students and faculty at Utah Valley University. Provo, UT. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

William Hunter (2021). Get the Facts Out about STEM teaching careers...data driven myth busters . Midwest Noyce conference. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Jennifer Nielson, Duane Merrell (2021). Get the Facts Out workshop. Presentation to Career Services directors at BYU. Provo, UT. Status = OTHER; Acknowledgement of Federal Support = Yes

Gay Stewart (2019). Get the Facts Out workshop for faculty. UTeach Conference 13th annual. Austin, TX. Status = OTHER; Acknowledgement of Federal

#### Support = Yes

Jean Lee, Amy Roth-McDuffie, Gary Martin, Glenn Waddell, Tim Hendrix (2021). *Get the Facts Out: AMTE Webinar*. Webinar for AMTE Members. Virtual. 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 = PUBLISHED; 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 = PUBLISHED; Acknowledgement of Federal Support = Yes

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

Etta Gravely, Dr. Calisha Petty (2020). *Get the Facts Out: Busting Myths about the Teaching Profession*. Chemistry Colloquium Class for majors at North Carolina A & T State University. Greensboro, NC. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Wendy K. Adams (2019). *Get the Facts Out: Changing the Conversation About Teaching*. American Association of Physics Teachers Summer Meeting 2019. Provo, UT. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Wendy Adams (2020). *Get the Facts Out: Changing the Conversation Around STEM Teacher Recruitment*. PhysTEC NAB. Virtual. 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 = PUBLISHED; 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 = PUBLISHED; Acknowledgement of Federal Support = Yes

Wendy Adams, Jared Breakall, Savannah Logan (2021). *Get the Facts Out: Changing the Conversation around STEM Teacher Recruitment*. PhysTEC SoCal Conference. Virtual. 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 = PUBLISHED; Acknowledgement of Federal Support =Yes

Etta Gravely, Ginger Redd (2019). *Get the Facts Out: Myths and Misperceptions About the Teaching Profession*. "Biology Orientation Class at North Carolina A & T State University. Greensboro, NC. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Wendy Adams, Savannah Logan, Jared Breakall (2021). *Get the Facts Out: Recruiting physics teachers in a virtual world*. AAPT Winter Meeting 2021. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Wendy Adams, Savannah Logan, Jared Breakall (2020). *Get the Facts Out: Resource updates and recent research results*. AAPT Summer 2020. Virtual. 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 = PUBLISHED; 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 = PUBLISHED; 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 = PUBLISHED; 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 = PUBLISHED; Acknowledgement of Federal Support = Yes

Duane Merrell, Wendy K. Adams, Jennifer Nielson, Jared Breakall (2021). *Get the Facts Out: Students, Advisors, Faculty*. Physics and Physical Science Teaching Majors presentation during site visit. Provo, UT. Status = OTHER; Acknowledgement of Federal Support = Yes

Wendy Adams (2020). *Get the Facts Out: Teaching, The Best Kept Secret!*. 100Kin10 Steal this Session. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Timothy Hendrix, Glenn Waddell, Liza Bondurant (2021). *Get the Facts Out: Teaching, the Best Kept Secret*. Mississippi Association of Mathematics Teacher Educators (MAMTE) Annual Meeting. Virtual. 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 = PUBLISHED; 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 = PUBLISHED; Acknowledgement of Federal Support = Yes

Etta Gravely, Ginger Redd (2019). *Get the Facts Out: Workshop for Chemistry Faculty*. Faculty Meeting. Greensboro, North Carolina. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Sarah Formica (2021). Get the Facts Out: Workshop for STEM Students. Principles of Physics I class at UNG. Dahlonega, GA. Status = OTHER; Acknowledgement of Federal Support = Yes

Sarah Formica (2021). Get the Facts Out: Workshop for STEM Students. Zoom presentation for STEM students in the LA pedagogy class. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Jean Lee (2020). *Get the Facts Out: Workshop for Secondary School of Education Majors*. Mandatory SOE Secondary Major Orientation Meeting. Indianapolis, IN. Status = OTHER; Acknowledgement of Federal Support = Yes

Gay Stewart (2019). Get the Facts Out: Workshop for physics faculty. Fall Meeting Ohio Section AAPT. Gates Mills, OH. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Wendy Adams, Jared Breakall and Savannah Logan (2020). Get the Facts out - Faculty. Colorado School of MInes GFO Site Visit. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Mark Hannum (2020). *Getting the Facts Out About STEM Teaching Professions*. American University Physics Department Colloquium. Washington, DC. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Joseph Kozminski, Dorene Huvaere, James Hofmann (2021). *Getting the Facts Out about Physics Teaching at Lewis University*. AAPT Winter Meeting. Virtual. Status = PUBLISHED; 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 = PUBLISHED; Acknowledgement of Federal Support = Yes

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

Etta Gravely, Dr. Calisha Petty (2020). *How Much Do You Really Know About the Teaching Profession*. Freshman and Sophomore Chemistry Colloquium Classes at North Carolina A & T State University. Greensboro, NC. Status = PUBLISHED; Acknowledgement of Federal Support=Yes

Wendy K. Adams, Gay Stewart, Jared B. Breakall, and Kaitlin Miller (2021). *Improving STEM teacher recruitment through research-based and user-tested recruitment materials: A comparison of perceptions of the teaching profession by population group*. UTeach. virtual. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

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

Duane Merrell (2020). Intro to teaching. Physics 276 course. Provo, UT. Status = OTHER; Acknowledgement of Federal Support = Yes

Richard Pearson, III and Wendy Adams (2021). *It's all about perspective: How an aeronautical university fits GFO*. AAPT Winter Meeting 2021. Virtual. 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 = PUBLISHED; Acknowledgement of Federal Support = Yes

David May et al (2021). *Lightning Session: Recruiting Using Get the Facts Out Materials*. PhysTEC Conference session. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Sara Callori, Sarah Formica, Allison Daubert, Angela Johnson, Josh Grossman, Meg Gardner (2021). *Lightning Session: Recruiting Using Get the Facts Out Materials*. PhysTEC Conference. Virtual. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Breakall, J. B., Logan, S. L., Pearson III, R. L., Pyper, B. and Adams, W. K. (2020). *Maybe we aren't that different after all: Faculty perceptions of grade* 7-12 teaching as a career. 2020 Physic Education Research Conference Proceedings. Status = PUBLISHED; Acknowledgement of Federal Support = Yes Judith Covington, Christina Eubanks-Turner, Ben Ford, Timothy Hendrix, Rose Mary Zbiek (2020). *My Best Student Wants to Teach*. MAA Focus. MAA Focus. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Etta Gravely, Ginger Redd (2019). *Myths & Misperceptions About Teaching*. Chemistry Colloquim Class for majors at North Carolina A &T State University in Greensboro, NC. Greensboro, NC. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Wendy Adams, Drew Isola, Jared Breakall, Savannah Logan (2021). *NEW: Videos about the teaching profession*. PhysTEC 2021. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Wendy Adams, Drew Isola, Jared Breakall, Savannah Logan (2021). *NEW: Videos about the teaching profession!*. PhysTEC Conference. Virtual. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Drew Isola, Wendy K. Adams, Savannah Logan, Duane Merrell (2020). *New Resources for Getting the Facts Out About STEM Teaching Professions*. PhysTEC Conference. Denver, CO. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Drew Isola, Wendy K. Adams (2020). *Overcoming obstacles in implementing materials that combat misperceptions about the teaching profession*. PhysTEC conference. Denver, CO. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Jared Breakall (2021). *Past, Present, and Future Research*. Faculty members at SUU. Cedar City, UT. Status = OTHER; Acknowledgement of Federal Support = Yes

Savannah Logan, Richard Pearson, Wendy K. Adams (2019). *Perceptions of the Teaching Profession at Universities Across the US*. American Association of Physics Teachers Summer 2019 Meeting. Provo, UT. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Savannah Logan (2019). *Perceptions of the Teaching Profession at Universities Across the United States*. AAPT Summer 2019 Meeting. Provo, UT. Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Savannah Logan (2019). Poster- GFO Copywrite: Development and Testing of Written and Visual Materials for Recruiting STEM Teachers. Noyce Summit 2019. Washington, DC. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Savannah Logan (2019). *Poster- GFO Copywrite: Development and Testing of Written and Visual Materials for Recruiting STEM Teachers*. PERC 2019. Provo, UT. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Wendy K. Adams, Savannah Logan, and Richard Pearson (2020). *Research Design of the Get the Facts Out Project*. American Association of Physic Teachers Winter Meeting 2020. Orlando, FL. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Savannah Logan, Jared B. Breakall, Wendy K. Adams (2020). *Research-based, User-tested Materials for Recruiting STEM Teachers*. Physics Education Research Conference (PERC) 2020. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Richard Pearson (2020). Results of faculty interviews durign the development of the Perceptions of TEaching as a profession in Higher Education (PTaP.HE) instrument. PERC 2020. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Pearson III, R. L., Logan, S. L. and Adams, W. K. (2020). Results of faculty interviews during the development of the Perceptions of Teaching as a Profession in Higher Education (PTaP.HE) instrument.. 2020 Physic Education Research Conference Proceedings. . Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Duane Merrell (2019). *Secondary Physics Teaching: Let's Look at the Facts Invited*. American Association of Physics Teachers Summer Meeting 2019. Provo, UT. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Terri Chambers, Jared Breakall, Etta Gravely, William Hunter, Jennifer Nielson, Ellen Yezierski (2021). *Secondary chemistry teaching: Do you know the facts?*. MidAtlantic Regional Meeting of ACS. Virtual. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Vince Kuo (2020). *Share-a-Thon: Recruitment and Getting the Facts Out*. PhysTEC Annual Conference. Denver, CO. Status = PUBLISHED; 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 = PUBLISHED; 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 = PUBLISHED; 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 = PUBLISHED; Acknowledgement of Federal Support = Yes

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

Pyper, B., Logan, S. L., Pearson, R. P. III, Adams, W. K. (2020). *Statistical analyses of the PTaP.HE, a faculty perceptions instrument*. American Association of Physic Teachers Winter Meeting 2020. Orlando, FL. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Terri Chambers, Kenetia Thompson (2019). *Symposium: Get the Facts Out: Faculty & Student Perceptions of K - 12 Teaching Careers*. ACS National Meeting. San Diego, CA. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Wendy Adams (2020). *Teach@MInes*. Preview Mines. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Wendy Adams, Emma Khorunzy (2021). Teach@MInes. Discover Mines. Virtual. Status = OTHER; Acknowledgement of Federal Support =Yes

Adams, W. K., Plantt, T., and Norfleet, E. (2020). *Teach@Mines*. Teach@Mines Colorado School of Mines Foundation Lunch Bunch, Golden, CO. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Savannah Logan, Cherie Bornhorst, and Stephan Graham (2020). *Teach@Mines Busting myths about the teaching profession*. Teach@Mines Colorado School of Mines All Campus Event. Golden, CO. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Wendy K. Adams (2019). *Teach@Mines Ice Cream Social*. All campus event for anyone interested in teaching. Colorado School of Mines, Golden, CO. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Wendy Adams, Taylor Plantt and Eric Norfleet (2020). *Teach@Mines Lunch Brunch*. Mines Alumni monthly meeting. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Jared Breakall, Savannah Logan, Wendy Adams (2021). *Teacher recruitment: Focus group insights from five Universities*. PhysTEC National Conference. Virtual. 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 = PUBLISHED; 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 = PUBLISHED; 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 = PUBLISHED; 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 = PUBLISHED; 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 = PUBLISHED; Acknowledgement of Federal Support = Yes

Terri Chambers, Jennifer Nielson (2021). *Teaching the Best Kept Secret*. Webinar as part of the Two Year College Chemistry Consortium Spring Webinar Series. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Wendy Adams, Jean Lee and Etta Gravely (2020). *Teaching the Best Kept Secret!*. ILAC2020 - LA Alliance national conference. Virtual. Status = UNDER\_REVIEW; Acknowledgement of Federal Support = Yes

Wendy Adams, Jared Breakall (2020). *Teaching the Best Kept Secret!*. BYU Physics and Chemistry Faculty Meeting. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Wendy Adams and Jared Breakall (2021). *Teaching the Best Kept Secret!*. BYU Site visit. MAE required meeting. Provo, UT. Status = OTHER; Acknowledgement of Federal Support = Yes

Jared Breakall, Savannah Logan (2020). *Teaching the Best Kept Secret*!. Colorado School of Mines site visit. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Wendy K. Adams and Jared Breakall (2021). *Teaching the Best Kept Secret*!. BYU School of Education Leadership, recruiters and Career Center leadership. Provo, UT. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Wendy Adams, Jean Lee (2021). *Teaching the Best Kept Secret! and Get the Facts Out*. UA LittleRock, CSC Deans' Committee. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Wendy Adams (2021). *Teaching the Best Kept Secret! and Teach@Mines*. CASA (Center for Academic Advising) meeting. Golden, CO. Status = OTHER; Acknowledgement of Federal Support = Yes

Wendy K. Adams, Jared B. Breakall, Duane Merrell, Jennifer Nielson (2020). *Teaching! The best kept secret!*. Physics Department Meeting. Provo, Utah. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Jared Breakall and Savannah Logan (2020). *Teaching, the best kept secret!*. Circuit Media, Denver, CO. Virtual. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Wendy Adams, Jared Breakall, and Savannah Logan (2020). *Teaching, the best kept secret!*. West Virginia University Academic Advising Council, Morgantown, VA. Virtual. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Ellen Yezierski (2020). *Teaching: Best Kept Secret*. Executive Committee of the Younger Chemistry Education Scholars. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Terri Chambers, Willy Hunter (2020). *Teaching: Best Kept Secret*. ACS-Hach Land Grant University Reps. Virtual. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Jennifer Nielson, Wendy Adams, Jared Breakall, Duane Merrell (2020). *Teaching: The Best Kept Secret*. GFO workshop for faculty advisors and career service advisors. Provo, UT. Status = OTHER; Acknowledgement of Federal Support = Yes

Jennifer Nielson, Terri Chambers, Wendy Adams Spencer (2019). *Teaching: The Best Kept Secret*. ACS Society Committee on Education members. Webinar. Status = OTHER; Acknowledgement of Federal Support = Yes

Wendy Adams (2020). Teaching: The Best Kept Secret. All Change Agent Meeting. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Savannah Logan and Wendy K. Adams (2020). *Teaching: The Best Kept Secret!*. California State University – Long Beach. Long Beach, CA. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Adams, W. K., Breakall J. B., & Nielson, J. (2020). *Teaching: The Best Kept Secret*!. Brigham Young University Math and Science Advising. Provo, UT. Status = OTHER; Acknowledgement of Federal Support = Yes

Adams, W. K., Breakall J. B., & Nielson, J. (2020). *Teaching: The Best Kept Secret*!. Brigham Young University Chemistry and Mathematics Departments. Provo, UT. Status = OTHER; Acknowledgement of Federal Support = Yes

Wendy Adams, Jared Breakall, Savannah Logan (2021). *Teaching: The Best Kept Secret!*. SoCal PhysTEC conference 2021. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Wendy Adams, Ellen Yezierski, Jean Lee (2020). *Teaching: The Best Kept Secret!*. AAAS-ARISE Workshop. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Wendy Adams, Jared Breakall and Savannah Logan (2021). *Teaching: The Best Kept Secret!*. Mines Physics Department Colloquium. Golden, CO. Status = OTHER; Acknowledgement of Federal Support = Yes

Ellen Yezierski (2021). *Teaching: The Best Kept Secret! Benefits Compared to Industry and University Teaching*. Meeting with professional advising staff from the Miami College of Arts and Science and one chief departmental advisor (faculty) from PHY. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Wendy Adams (2020). *Teaching: The best Kept Secret!*. West Virginia University advising. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Wendy Adams, Jared Breakall, Savannah Logan (2020). *Teaching: The best Kept Secret!*. Presentation to Faculty at WVU. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Wendy Adams, Jared Breakall, Savannah Logan (2020). *Teaching: The best Kept Secret!*. HBCUTeach Presentation. Virtual. 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 = PUBLISHED; Acknowledgement of Federal Support = Yes

Wendy K. Adams, Savannah Logan (2019). *Teaching: The best kept secret!*. GFO Site Visit Faculty Workshop. Golden, CO. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Pearson, R. L., Cleveland, L., Adams W. K. (2019). The Baseline Data of the PTaP & FPTaP. American Association of Physics Teachers Summer 2019

Meeting. Provo, UT. Status = PUBLISHED; 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 Winter 2019 Meeting, .. Houston, TX. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Kristine Callan (2020). The Best Kept Secret!. 2020 Western Regional Conference. Portland, OR. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

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

Pearson, R. L. III, Logan, S. L. & Adams, W. K. (2019). Understanding the Perception Radar Plots of the PTaP & PTaP.HE. American Association of Physics Teachers Winter 2020 Meeting. Orlando, FL. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Savannah Logan, Jared B. Breakall, Wendy K. Adams (2021). User Testing of Physics Teacher Recruitment Videos, Images, and Other Materials. AAPT Winter Meeting 2021. Virtual. Status = OTHER; Acknowledgement of Federal Support = Yes

Gay Stewart (2019). Want More Students Excited About Teaching? Be a Change Agent! Invited. American Association of Physics Teachers Summer Meeting 2019. Provo, UT. Status = PUBLISHED; 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 = PUBLISHED; 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 = PUBLISHED; 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 = PUBLISHED; Acknowledgement of Federal Support = Yes

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

## **Other Products**

### Databases.

Find a certification program. This page includes three featured resources for finding a teacher certification program (PhysTEC sites, UTeach sites, and ACS-Hach sites). It also includes the only known database of all approved teacher licensure programs in the U.S. <a href="https://getthefactsout.org/find-certification-program">https://getthefactsout.org/find-certification-program</a>

### Audio or Video Products.

- Ellen Yezierski created a video using the latest GFO student presentation template and added information about our local Noyce grant
  as a funding opportunity. She also used local salary and retirement benefit data as suggested in the slide deck. The video was placed in
  a Canvas course module for Chem and Biochem majors who are first year students. The module was on career exploration. Oxford, OH
- Video created for Celebration of Mines, a student event to learn about campus activities. The Video shared the facts about the teaching profession and featured a few of our Teach@Mines graduates' stories.
- Podcast for WSU College of Education Series featuring WSU College of Education Faculty Interview on "ZoomED"
- What you Don't Know About the Teaching Profession https://www.youtube.com/watch?v=cWtXGo9DsF0
- Why I Love My Life as a Teacher: https://www.youtube.com/watch?v=mlTuTYHxrN8
- Why I decided to Pursue Teaching as a Career https://www.youtube.com/watch?v=gzxVqJ20tMw
- Why I decided to Pursue Teaching as a Career https://www.youtube.com/watch?v=gzxVqJ20tMw
- Teaching High School vs. Teaching College: https://www.youtube.com/watch?v=xV4CVPTrAm0

### Educational aids or Curricula.

- "Thinking about Teaching" This is a customizable series of brochures for sharing the facts that includes four versions. One each for physics, chemistry, math, and science. <u>https://getthefactsout.org/brochure</u>
- Busting Myths About the Teaching Profession. This is a student-facing presentation for sharing the facts about the profession. It comes in three lengths and includes a pre/post test. <u>https://getthefactsout.org/presentation-students</u>

- Data handout for sharing with students. It includes info on student loan forgiveness and teacher life satisfaction. https://getthefactsout.org/sites/default/files/2020-12/StudentHandOut\_SatisfactionLoansRetirement\_121120\_0.pdf
- Data handout for students that contains teacher salalry information including a comparison with college teaching faculty and with starting salaries by major.https://getthefactsout.org/sites/default/files/2020-12/StudentHandOut\_TeacherSalaries\_Denver\_Updated.pdf
- Teaching the Best Kept Secret! This is a presentation for faculty/staff that comes in several lengths. There are two versions, one for simply sharing the facts and one for sharing the facts and the GFO resources. <a href="https://getthefactsout.org/presentation-faculty">https://getthefactsout.org/presentation-faculty</a>
- The customizeable program flyer template has two flyer templates in Powerpoint that contain tested GFO messaging.
- These templates are designed to showcase a university's teacher preparation pathway while sharing the facts about the profession.https://getthefactsout.org/flyer

### Survey Instruments.

- The PTaP Perceptions of Teaching as a Profession is a survey instrument for measuring student perceptions of grade 7-12 math and science teaching as a profession. <u>https://getthefactsout.org/perceptions-surveys-ptap-and-ptaphe</u>
- The PTaP.HE Perceptions of Teaching as a Profession in Higher Education is a survey instrument for measuring facutly perceptions of grade 7-12 math and science teaching as a profession. <u>https://getthefactsout.org/perceptions-surveys-ptap-and-ptaphe</u>

### Protocols.

Reaching Students is a compilation of advice that includes methods and venues for reaching students on a college campus. This is one of the most visited pages (after the blog) on the GFO site. <u>https://getthefactsout.org/reach-students</u>

### Poster.

- Virtual Poster posted online for students at West Virginia University
- Customizable poster series with 2-3 posters for mathematics, physics, chemistry and science. Found on the GFO website: <u>https://getthefactsout.org/poster</u>



## **Other Publications**

Terri Chambers (2020). ACS Approval Program Newsletter. National. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Terri Chambers (2021). ACS Matters. National newsletter item. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Jared Breakall (2020). *Career advice from the front lines: A discussion with a middle school science teacher*. Blog article on website; https://getthefactsout.org/blog/career-advice-front-lines-discussion-middle-school-science-teacher. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Terri Chambers (2021). ChemUnity News. Newsletter Item. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Savannah Logan (2020). *Do college faculty members support grade 7-12 teaching?*. Blog article on website; https://getthefactsout.org/blog/do-college-faculty-members-support-grade-7-12-teaching. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

 William Hunter, Terri Chambers, Ellen Yezierski, Etta Gravely, Jennifer Nielson, Kevin Diaz (2021). Get the Facts Out Article in AACT's publication

 "Chemistry
 Solutions".

 https://teachchemistry.org/periodical/issues/november-2020/getting-the-facts-out-about-secondary-chemistry-teaching.
 Status

 = OTHER;
 Acknowledgement of Federal Support = Yes

The GFO Newsletter Team (2020). *Get the Facts Out Newsletter | April 2020*. Newsletter distributed via email and on website; https://us7.campaign-archive.com/?u=502af9db3395cd26ce7819dc6&id=0995c9c0ca. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

The GFO Newsletter Team (2020). *Get the Facts Out Newsletter | August 2020*. Newsletter distributed via email and on website; https://us7.campaign-archive.com/?u=502af9db3395cd26ce7819dc6&id=4affea5c3d. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

The GFO Newsletter Team (2020). *Get the Facts Out Newsletter | December 2020*. Newsletter distributed via email and on website; https://us7.campaign-archive.com/?u=502af9db3395cd26ce7819dc6&id=e86589e809. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

The GFO Newsletter Team (2021). *Get the Facts Out Newsletter | March 2021*. Newsletter distributed via email and on website; https://us7.campaign-archive.com/?u=502af9db3395cd26ce7819dc6&id=8aafdba2a9. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

The GFO Newsletter Team (2021). *Get the Facts Out Newsletter | May 2021*. Newsletter distributed via email and on website; https://us7.campaign-archive.com/?u=502af9db3395cd26ce7819dc6&id=43127ad3e3. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

The GFO Newsletter Team (2020). *Get the Facts Out Newsletter | October 2020*. Newsletter distributed via email and on website; https://us7.campaign-archive.com/?u=502af9db3395cd26ce7819dc6&id=fc6d410dbd. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

GFO Newsletter Team (2020). *Get the Facts Out Newsletter | Spring 2020*. Newsletter distributed via email and on website; https://us7.campaign-archive.com/?u=502af9db3395cd26ce7819dc6&id=3dd2d053bc. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Terri Chambers (2021). Get the Facts Out Webinar. National. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Terri Chambers, Etta Gravely, William Hunter, Jennifer Nielson, Ellen Yezierski, Kevin Diaz (2021). *Getting the Facts Out About Secondary Chemistry Teaching*. National Article in Chemistry Solutions. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Drew Isola (2020). *How Do Teacher Retirement Plans Work?*. Blog article on website; https://getthefactsout.org/blog/how-do- teacher-retirement-plans-work. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Stephanie Chasteen (2021). *How do I use the Get the Facts Out resources effectively?*. Blog article on website; https://getthefactsout.org/blog/how-do-i-use-get-facts-out-resources-effectively. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Wendy K Adams and Savannah Logan (2021). *How is Get the Facts Out addressing diversity, inclusion, and access?*. Blog article on website; https://getthefactsout.org/blog/how-get-facts-out-addressing-diversity-inclusion-and-access. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Jared Breakall (2021). *Life as a High School Chemistry Teacher: Career advice from the front lines*. Blog article series on website; https://getthefactsout.org/blog/life-high-school-chemistry-teacher-career-advice-front-lines-0. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Jared Breakall (2021). *Life as a High School Physics Teacher: Career advice from the front lines*. Blog article on website; https://getthefactsout.org/blog/life-high-school-physics-teacher-career-advice-front-lines. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Jared Breakall (2021). *Life as a Middle School Math Teacher: Career advice from the front lines*. Blog article series on website; https://getthefactsout.org/blog/life-middle-school-math-teacher-career-advice-front-lines. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Jennifer Nielson, Terri Chambers (2021). *Teaching, the Best Kept Secret*. Two Year College Chemistry Consortium Webinar Series. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Jared Breakall (2020). The Top 3 Reasons Science and Math Students Want to Become Teachers. Blog article on website;

https://getthefactsout.org/blog/top-3-reasons-science-and-math-students-want-become-teachers. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

### **Patent Applications**

### **Technologies or Techniques**

### **Thesis/Dissertations**

### Websites or Other Internet Sites

- Get the Facts Out <a href="https://getthefactsout.org/">https://getthefactsout.org/</a> Website with both prospective teacher and faculty facing content. Site contains a section for exploring the profession, the only known online database of all US teacher preparation programs, GFO resources for faculty, GFO community, and GFO Blog
- Get the Facts Out YouTube channel <a href="https://www.youtube.com/channel/UCLj0yYLoz68D74tqVMq6veA/featured">https://www.youtube.com/channel/UCLj0yYLoz68D74tqVMq6veA/featured</a> Here on the official YouTube channel of the Get the Facts Out project, we share videos about the teaching profession, teacher recruitment, and how to use our research-based, user-tested resources

## **Participants/Organizations**

### What individuals have worked on the project?

| Name                | Most Senior Project Role                                      | Nearest Person Month Worked |
|---------------------|---|-----------------------------|
| Adams, Wendy        | PD/PI   | 7                           |
| Plisch, Monica      | Co PD/PI  | 1                           |
| Stockero, Shari     | Co PD/PI  | 1                           |
| Taylor, Terri       | Co PD/PI  | 0                           |
| Formica, Sarah      | Faculty   | 0                           |
| Gravely, Etta       | Faculty   | 0                           |
| Hendrix, Tim        | Faculty   | 0                           |
| Hunter, William     | Faculty   | 0                           |
| Kuo, Vince          | Faculty   | 0                           |
| Lee, Jean           | Faculty   | 0                           |
| Magee-Sauer, Karen  | Faculty   | 0                           |
| Martin, Gary        | Faculty   | 0                           |
| Merrell, Duane      | Faculty   | 0                           |
| Nielson, Jennifer   | Faculty   | 0                           |
| Roth McDuffie, Amy  | Faculty   | 0                           |
| Stewert, Gay        | Faculty   | 0                           |
| Waddell, Glenn      | Faculty   | 0                           |
| Yezierski, Ellen    | Faculty   | 0                           |
| Breakall, Jared     | Postdoctoral (scholar, fellow or other postdoctoral position) | 11                          |
| Logan, Savannah     | Postdoctoral (scholar, fellow or other postdoctoral position) | 9                           |
| Costley, Allie      | Other Professional  | 3                           |
| Grimes, Jessica     | Other Professional  | 0                           |
| May, David          | Other Professional  | 2                           |
| Roti Roti, Annelise | Other Professional  | 0                           |
| Thompson, Kenetia   | Other Professional  | 0                           |
| Bolda, Leslie       | Non-Student Research Assistant                                | 1                           |
| Miller, Kaitlin     | Non-Student Research Assistant                                | 1                           |
| Khorunzhy, Emma     | Undergraduate Student   | 1                           |
| Lang, Dawson        | Undergraduate Student   | 0                           |
| Lister, Caleb       | Undergraduate Student   | 1                           |
| Chasteen, Stephanie | Consultant  | 2                           |
| Dearing, Jim        | Consultant  | 0                           |
| Ferguson, Mark      | Consultant  | 0                           |

| Levine, Zach   | Consultant   | 0   |
|--|--|---|
| McKagan, Sarah   | Consultant   | 0   |
| Ryan, Stephanie  | Consultant   | 0   |
| Full details of individ  | duals who have worked (  | on the project:   |
| Wendy K Adams<br>Email: wkadams@min<br>Most Senior Project<br>Nearest Person Mont<br>Contribution to the P<br>Strategy. Adams enga<br>Comprehensive Study<br>Funding Support: 1 min<br>getting the facts out a<br>Change in active other<br>International Collabo<br>International Travel: | nes.edu<br>ct Role: PD/PI<br>ch Worked: 7<br>Project: Adams leads the PI T<br>ages in as many presentatic<br>/ Sites.<br>onth Mines-UNC Robert Noy<br>th Mines. 4 months Teach@N<br>er support: No<br>ration: No<br>No | eam, the Research Team, the Resource Development and the Champion Engagement<br>ons to share the facts as possible and provides support to Change Agents and the<br>ce Scholarship Grant Award #1557254 some of the responsibilities for this grant include<br>lines which supports Mines teacher recruitment efforts |
| Monica J Plisch<br>Email: plisch@aps.org<br>Most Senior Project R<br>Nearest Person Mont<br>Contribution to the Pr<br>Groups and meets reg<br>Funding Support: Nor<br>Change in active othe<br>International Collabo<br>International Travel:  | Role: Co PD/PI<br>th Worked: 1<br>roject: Plisch is a Co-PI and lea<br>gularly with the PI to lead the<br>er support: No<br>iration: No<br>No  | ads APS's activities for the project. She chairs the Societies and Communications Working<br>e entire project.  |
| Shari Stockero<br>Email: stockero@mtu<br>Most Senior Project R<br>Nearest Person Mont<br>Contribution to the P<br>leaders to identify the<br>Funding Support: non<br>Change in active othe<br>International Collabo<br>International Travel:   | .edu<br>Role: Co PD/PI<br>th Worked: 1<br>Project: Shari serves as co-PI<br>e AMTE Taskforce.<br>ne<br>er support: No<br>iration: No<br>No   | and coordinates AMTEs engagement with GFO. Shari worked with a team of AMTE   |
| Terri M Taylor<br>Email: t_taylor@acs.o<br>Most Senior Project R<br>Nearest Person Mont<br>Contribution to the P<br>consultants who work<br>Funding Support: Terr<br>Change in active othe<br>International Collabo<br>International Travel:   | org<br>Role: Co PD/PI<br>th Worked: 0<br>roject: Terri serves as co-PI a<br>k on the project, leads her te<br>ri is supported by ACS and lea<br>er support: No<br>ration: No<br>No                                     | nd leads the American Chemical Society's engagement with GFO. She supervises the<br>am of 4 faculty Change Agents and is the thought leader for GFO engagement.<br>ading GFO is a portion of her ACS job responsibilities.  |
| Sarah Formica<br>Email: sarah.formica@<br>Most Senior Project<br>Nearest Person Mont<br>Contribution to the Pr<br>Funding Support: non<br>International Collabo<br>International Travel:   | @ung.edu<br>t Role: Faculty<br>th Worked: 0<br>roject: GFO Change Agents a<br>ne<br>ration: No<br>No   | re contracted to recruit and support GFO champions with expert advice and guidance.   |
| Etta Gravely<br>Email: gravely@ncat.e<br>Most Senior Project R<br>Nearest Person Mont<br>Contribution to the P   | edu<br>Role: Faculty<br>:h Worked: 0<br>roject: Chemistry change age   | ent. 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.<br>Funding Support: none<br>International Collaboration: No   |
|---|
| International Travel: No  |
| Tim Hendrix<br>Email: hendrixt@meredith.edu<br>Most Senior Project Role: Faculty<br>Nearest Person Month Worked: 0<br>Contribution to the Project: Math change agent and past Executive Director of AMTE. Tim worked as a change agent sharing GFO<br>materials nationally. Tim is just joined the Evaluation Working group as our Change Agent representative<br>Funding Support: none<br>International Collaboration: No<br>International Travel: No  |
| William Hunter  |
| Email: wjhunte@ilstu.edu<br>Most Senior Project Role: Faculty<br>Nearest Person Month Worked: 0<br>Contribution to the Project: Chemistry change agent. Implemented strategies and materials in the Get the Facts Out toolkit and provide<br>feedback to the development team. Advised implementation of GFO at ACS. Participated in videoconferences with other National<br>Chemistry Change Agents and ACS staff.<br>Funding Support: none<br>International Collaboration: No<br>International Travel: No   |
| Vince Kuo<br>Email: hkuo@mines.edu<br>Most Senior Project Role: Faculty<br>Nearest Person Month Worked: 0<br>Contribution to the Project: Physics Change Agents are contracted to recruit and support GFO champions with expert advice and<br>guidance.<br>Funding Support: none<br>International Collaboration: No<br>International Travel: No   |
| Jean Lee<br>Email: jslee@uindy.edu<br>Most Senior Project Role: Faculty<br>Nearest Person Month Worked: 0<br>Contribution to the Project: Jean serves as the head of the AMTE GFO Task Force/Change Agent. She has expertly led the new AMTE<br>change agents from a group of strong skeptics to some of GFO's strongest advocates! jean has conducted several presentations with PI<br>Adams and now co-presents with other AMTE change agents in various venues. Jean also serves as the AMTE representative on the<br>Societies Working Group.<br>Funding Support: None<br>International Collaboration: No |
| Karen Magee-Sauer<br>Email: sauer@rowan.edu<br>Most Senior Project Role: Faculty<br>Nearest Person Month Worked: 0<br>Contribution to the Project: Physics Change Agent but transitioning away from GFO as permanent Dean of her college. Magee-Sauer<br>still shares the facts locally.<br>Funding Support: none<br>International Collaboration: No<br>International Travel: No  |
| Gary Martin<br>Email: martiwg@auburn.edu<br>Most Senior Project Role: Faculty<br>Nearest Person Month Worked: 0<br>Contribution to the Project: Gary is an AMTE Change Agent. He participates in regular AMTE Change Agent meetings and has presented<br>GFO nationally with other AMTE change agents. Glenn also supports new math champions.<br>Funding Support: none<br>International Collaboration: No<br>International Travel: No<br>Duane Merrell   |

| Email: duane_merrell@byu.edu<br>Most Senior Project Role: Faculty<br>Nearest Person Month Worked: 0<br>Contribution to the Project: Physics Change Agent. Engaging in a very active local campaign at Brigham Young University. Presented at<br>national AAPT meetings Also active member of the National Advisory Board and attended the annual meeting.<br>Funding Support: none<br>International Collaboration: No<br>International Travel: No   |
|---|
| Jennifer Nielson<br>Email: jnielson@chem.byu.edu<br>Most Senior Project Role: Faculty<br>Nearest Person Month Worked: 0<br>Contribution to the Project: Chemistry change agent. Implemented strategies and materials in the Get the Facts Out toolkit and<br>provided feedback to the development team. Advised implementation of GFO at ACS. Participated in videoconferences with other<br>National Chemistry Change Agents and ACS staff. Participated in the Mines GFO Site visit and conducted virtual workshops<br>Funding Support: none<br>International Collaboration: No<br>International Travel: No   |
| Amy Roth McDuffieEmail: mcduffie@wsu.eduMost Senior Project Role: FacultyNearest Person Month Worked: 0Contribution to the Project: Amy is an AMTE Change Agent. He participates in regular AMTE Change Agent meetings and has presentedGFO nationally with other AMTE change agents. Glenn also supports new math champions.Funding Support: noneInternational Collaboration: NoInternational Travel: No   |
| Gay Stewert<br>Email: gbstewart@mail.wvu.edu<br>Most Senior Project Role: Faculty<br>Nearest Person Month Worked: 0<br>Contribution to the Project: Physics Change Agent. Conducted active local campaign and presented nationally at UTeach and AAPT<br>meetings. Consulted in the Project Planning team. Reviewed annual report.<br>Funding Support: none<br>International Collaboration: No<br>International Travel: No  |
| Glenn Waddell<br>Email: gwaddell@unr.edu<br>Most Senior Project Role: Faculty<br>Nearest Person Month Worked: 0<br>Contribution to the Project: Glen is an AMTE Change Agent. He participates in regular AMTE Change Agent meetings and has presented<br>GFO nationally with other AMTE change agents. Glenn also supports new math champions.<br>Funding Support: none<br>International Collaboration: No<br>International Travel: No  |
| Ellen Yezierski<br>Email: yeziere@miamioh.edu<br>Most Senior Project Role: Faculty<br>Nearest Person Month Worked: 0<br>Contribution to the Project: Chemistry change agent. Implemented strategies and materials in the Get the Facts Out toolkit and provide<br>feedback to the development team. Advised implementation of GFO at ACS. Participated in videoconferences with other National<br>Chemistry Change Agents and ACS staff. Presented virtual workshops. Served the year as the change agent representative on the<br>evaluation working group and has transitioned into the change agent representative on the Champion Engagement Strategy Working<br>group.<br>Funding Support: none<br>International Collaboration: No<br>International Travel: No |
| Jared Breakall<br>Email: jbreakall@mines.edu<br>Most Senior Project Role: Postdoctoral (scholar, fellow or other postdoctoral position)<br>Nearest Person Month Worked: 11  |

**Contribution to the Project:** Breakall has taken leadership in many areas including supervising undergraduate research assistant, conducting a factor analysis on both the PTaP and PTaP.HE. He has led the quantitative analysis of the PTaP.HE all year and more recently

the PTaP instruments. Attends weekly research meetings, conducted two virtual site visits and on in person site visit with Adams, presented research and various conferences, helped facilitate the new partnership with HBCUTeach and has written two manuscripts about the PTaP.HE development

Funding Support: two months on Teach@Mines which supports some of his GFO recruitment efforts.

### 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:** 9

**Contribution to the Project:** Conducted virtual site visits. Presented at National AAPT meetings and PhysTEC. Attended the annual meeting and advisory board meetings as well as all change agent meetings. Wrote a PERC paper both summers.

**Funding Support:** 5 months Colorado School of Mines Robert Noyce Scholarship Grant Award #1557254 which supports some of Logan's GFO efforts

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 personell on the Mines side, coordination of events, provide research support including leading the teacher salary data mining and supervising undergraduate assistants, 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

### **David May**

Email: may@aps.org Most Senior Project Role: Other Professional

### **Nearest Person Month Worked: 2**

**Contribution to the Project:** David manages APS's project activities for GFO, and some of AAPT's as well (since he manages PhysTEC, a project of both APS and AAPT). He is the working group organizer for Societies and Campion Engagement Strategy as well as the PI Team. He has led the organization of all the Champion engagement activities and facilitates the grant's interactions with other APS departments. **Funding Support:** none

International Collaboration: No International Travel: No

### Annelise Roti Roti

Email: rotiroti@aps.org Most Senior Project Role: Other Professional Nearest Person Month Worked: 0 Contribution to the Project: Assists with coordinating APS GFO program activities, mostly through PhysTEC 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

Leslie Bolda Email: lbolda@mines.edu Most Senior Project Role: Non-Student Research Assistant **Nearest Person Month Worked:** 1 Contribution to the Project: Research assistant. Leslie analyzed the first year of the Faculty Strategy Implementation Survey and created a report and presented to the PI Team Funding Support: none International Collaboration: No International Travel: No **Kaitlin Miller** Email: kmiller3@mines.edu Most Senior Project Role: Non-Student Research Assistant **Nearest Person Month Worked:** 1 Contribution to the Project: Kaitlin is data mining for teacher salaries, she's developed a mac/pc friendly template for A Teacher's Life by the Numbers and has analyzed all of the PTaP data from Year 2 and completed those sections for the Study Site Reports. Funding Support: None International Collaboration: No International Travel: No Emma Khorunzhv Email: ekhorunzhy@mymail.mines.edu Most Senior Project Role: Undergraduate Student **Nearest Person Month Worked:** 1 Contribution to the Project: Emma conducts data mining for teacher salaries, has helped build out the Study Site reports, created many A Teacher's Life by The Numbers flyers, and presented at student events about the teaching profession. Funding Support: none International Collaboration: No International Travel: No **Dawson Lang** Email: dawsontlang@mymail.mines.edu Most Senior Project Role: Undergraduate Student Nearest Person Month Worked: 0 Contribution to the Project: Conducted several Busting Myths About the Teaching Profession presentations for students, edited new Teach@Mines video about the facts, mine local teacher salary data Funding Support: none International Collaboration: No International Travel: No Caleb Lister Email: cmlister@mines.edu Most Senior Project Role: Undergraduate Student **Nearest Person Month Worked:** 1 Contribution to the Project: Caleb is a BYU math education major who is very interested in mining teacher salary data. He also has completed all of the analysis of the PTaP.HE Year 2 data and is working on the respective sections of the Study Site reports. Funding Support: None International Collaboration: No International Travel: No **Stephanie Chasteen** Email: stephanie@chasteenconsulting.com Most Senior Project Role: Consultant Nearest Person Month Worked: 2 Contribution to the Project: External Evaluator Funding Support: none International Collaboration: No International Travel: No Jim Dearing Email: dearjim@msu.edu Most Senior Project Role: Consultant Nearest Person Month Worked: 0 Contribution to the Project: Attended annual meeting and served on the National Advisory Board 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 Resource Development WG to develop emotionally compelling messaging, advice on SEO for the website and new Blog. Provided template and expert advice for the new GFO YouTube Channel, assisted with the design of the new website. Attended the annual meeting and serves on the National Advisory Board Funding Support: none International Collaboration: No International Travel: No Zach Levine Email: zlevine@teach.org Most Senior Project Role: Consultant Nearest Person Month Worked: 0 Contribution to the Project: Attended the annual meeting and served on the National Advisory Board Funding Support: none International Collaboration: No International Travel: No Sarah McKagan Email: sam.mckagan@gmail.org Most Senior Project Role: Consultant Nearest Person Month Worked: 0 Contribution to the Project: Serves as the Lead National Advisory Board member, prepared the NAB report/recommendations, assisted with website redesign, attended the annual meeting, and provided feedback on the PTaP.HE naming. Funding Support: none International Collaboration: No International Travel: No **Stephanie Ryan** Email:sryan@ryaneducationconsulting.com Project Consultant Most Senior Role: 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

### 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            |
| Bridgewater State University               | Academic Institution         | Bridgewater, MA             |
| University of Maryland                     | Academic Institution         | College Park, MD            |
| University of Massachusetts                | Academic Institution         | Amherst, Massachusetts      |
| University of Massachusetts Lowell         | Academic Institution         | Lowell, Massachusetts       |
| University of Mississippi                  | Academic Institution         | Oxford, MS                  |
| University of North Carolina - Chapel Hill | Academic Institution         | Chapel Hill. North Carolina |
| University of North Georgia                | Academic Institution         | Dahlonega, GA               |
| University of Saint Joseph                 | Academic Institution         | Hartford. Connecticut       |
| University of Tennessee - Martin           | Academic Institution         | Martin. TN                  |
| University of Texas - Rio Grande Valley    | Academic Institution         | Edinburg, TX                |
| University of Texas at Austin              | Academic Institution         | Austin, TX                  |

| Bringham Young University                                 | Academic Institution | Provo, UT                    |
|---|----------------------|------------------------------|
| University of Texas-Rio Grande Valley                     | Academic Institution | Edinburg, Texas              |
| University of Washington Bothell                          | Academic Institution | Bothell, WA                  |
| University of West Georgia                                | Academic Institution | Carrollton, Georgia          |
| University of Western Florida                             | Academic Institution | Pensacola, Florida           |
| University of Wisconsin - La Crosse                       | Academic Institution | La Crosse, WI                |
| University of Wisconsin - River Falls                     | Academic Institution | River Falls, Wisconsin       |
| Utah State University                                     | Academic Institution | Logan, Utah                  |
| Wartburg College  | Academic Institution | Denver, CO                   |
| Waynesburg University                                     | Academic Institution | Waynesburg, PA               |
| West Chester University                                   | Academic Institution | Chester County, Pennsylvania |
| Bringham Young University - Idaho                         | Academic Institution | Rexburg, ID                  |
| West Virginia University                                  | Academic Institution | Morgantown, WV               |
| Western Colorado University                               | Academic Institution | Gunnison, Colorado           |
| Western Kentucky University                               | Academic Institution | Bowling Green, Kentucky      |
| Western Washington University                             | Academic Institution | Bellingham, Washington       |
| Westmont College  | Academic Institution | Santa Barbara, CA            |
| Worcester Polytechnic Institute                           | Academic Institution | Worcester, MA                |
| Wright State University                                   | Academic Institution | Dayton, OH                   |
| Cal State University - Channel Islands                    | Academic Institution | Camarillo, California        |
| Cal State University - Chico                              | Academic Institution | Chico, California            |
| California Polytechnic State University - San Luis Obispo | Academic Institution | San Luis Obispo, CA          |
| California State University - Fullerton                   | Academic Institution | Fullerton, CA                |
| California State University - Northridge                  | Academic Institution | Northridge, CA               |
| California State University, Fresno                       | Academic Institution | Fresno, CA                   |
| California State University, Long Beach                   | Academic Institution | Long Beach, CA               |
| Andrews University  | Academic Institution | Berrien Springs, MI          |
| California State University, Monterey Bay                 | Academic Institution | Monterey Bay, CA             |
| California State University, San Bernardino               | Academic Institution | San Bernardino, CA           |
| California State University, San Marcos                   | Academic Institution | San Marcos, CA               |
| Central Connecticut State University                      | Academic Institution | New Britain, Connecticut     |
| Central Washington University                             | Academic Institution | Ellensburg, WA               |
| Chicago State University                                  | Academic Institution | Chicago, IL                  |
| Christel House  |                      | Indiananolis IN              |
|   | Academic Institution |                              |
| Clemson University  | Academic Institution | Clemson, SC                  |

| Colgate University                                  | Academic Institution | Hamilton, NY        |
|---|----------------------|---------------------|
| Appalachian State University                        | Academic Institution | Boone, NC           |
| Colorado School of Mines                            | Academic Institution | Golden, CO          |
| Colorado State University                           | Academic Institution | Fort Collins, CO    |
| Columbus State University                           | Academic Institution | Columbus, GA        |
| Curry College                                       | Academic Institution | Milton, MA          |
| Delta State University                              | Academic Institution | Cleveland, MS       |
| Eastern Kentucky University                         | Academic Institution | Richmond, Kentucky  |
| Eastern Michigan University                         | Academic Institution | Ypsilanti, MI       |
| Embry-Riddle Aeronautical University                | Academic Institution | Daytona Beach, FL   |
| Florida International University                    | Academic Institution | Miami, FL           |
| Florida State University                            | Academic Institution | Tallahassee, FL     |
| Association of Mathematics Teacher Educators        | Other Nonprofits     | Houghton, MI        |
| Fort Hayes State University                         | Academic Institution | Hays, Kansas        |
| Gettysburg College                                  | Academic Institution | Gettysburg, PA      |
| Hofstra University                                  | Academic Institution | Hempstead, NY       |
| Idaho State University                              | Academic Institution | Pocatello, ID       |
| Illinois Wesleyan University                        | Academic Institution | Bloomington, IL     |
| Indiana University - Purdue University Indianapolis | Academic Institution | Indianapolis, IN    |
| James Madison University                            | Academic Institution | Harrisonburg, VA    |
| Kennesaw State University                           | Academic Institution | Kennesaw, GA        |
| Lewis University                                    | Academic Institution | Romeoville, IL      |
| Louisiana Tech University - UTeach Tech Program     | Academic Institution | Ruston, Louisiana   |
| Auburn University                                   | Academic Institution | Auburn, Alabama     |
| Maryville College                                   | Academic Institution | Maryville, TN       |
| Mathematical Association of America                 | Other Nonprofits     | Washington, DC      |
| Mercy College                                       | Academic Institution | Dobbs Ferry, NY     |
| Middle Tennessee State University                   | Academic Institution | Murfreesboro, TN    |
| Mississippi State University                        | Academic Institution | Starkville, MS      |
| Missouri University of Science and Technology       | Academic Institution | Rolla, MO           |
| Morehead State University                           | Academic Institution | Morehead, KY        |
| Morgan State University                             | Academic Institution | Baltimore, Maryland |
| Nicholls State University                           | Academic Institution | Thibodaux, LA       |
| Northern Arizona University                         | Academic Institution | Flagstaff, AZ       |
| Augustana University                                | Academic Institution | Sioux Falls, SD     |
| Northern Arizona University                         | Academic Institution | Flagstaff, AZ       |

| Northwest Missouri State University       | Academic Institution                      | Maryville, MO                         |
|---|---|---------------------------------------|
| Northwestern Oklahoma State University    | Academic Institution                      | Alva, OK                              |
| Northwestern State University             | Academic Institution                      | Natchitoches, LA                      |
| Oral Roberts University                   | Academic Institution                      | Tulsa, OK                             |
| Pacific University                        | Academic Institution                      | Forest Grove, OR                      |
| Penn State Behrend                        | Academic Institution                      | Erie, PA                              |
| Prince George's Community College         | Academic Institution                      | Largo, MD                             |
| Roosevelt University                      | Academic Institution                      | Chicago, IL                           |
| Rowan University                          | Academic Institution                      | Glassboro, NJ                         |
| Aurora University                         | Academic Institution                      | Aurora, Illinois                      |
| SUNY Buffalo State College                | Academic Institution                      | Buffalo, NY                           |
| Sacred Heart University                   | Academic Institution                      | Fairfield, CT                         |
| Saint Leo University                      | Academic Institution                      | St. Leo, FL                           |
| Shepherd University                       | Academic Institution                      | Sheperdstown, WV                      |
| Southern University and A&M College       | Academic Institution                      | Baton Rouge, LA                       |
| St. Mary's College of Maryland            | Academic Institution                      | St. Mary's City, MD                   |
| Taylor University                         | Academic Institution                      | Upland, IN                            |
| Texas A&M University - Commerce           | Academic Institution                      | Commerce, TX                          |
| The Citadel                               | Academic Institution                      | Charleston, SC                        |
| The College of New Jersey                 | Academic Institution                      | Ewing Township                        |
| Azusa Pacific University, CA              | Academic Institution                      | Azusa, California                     |
| The Ohio State University                 | Academic Institution                      | Columbus, OH                          |
| The University of Alabama                 | Academic Institution                      | Tuscaloosa, AL                        |
| University of Akron                       | Academic Institution                      | Akron, OH                             |
| University of Arizona                     | Academic Institution                      | Tuscon, AZ                            |
| University of Arkansas                    | Academic Institution                      | Fayetteville, AR                      |
| University of California - Berkeley       | Academic Institution                      | Berkeley, CA                          |
| University of California - Irvine         | Academic Institution                      | Irvine, CA                            |
| University of California - Merced         | Academic Institution                      | Merced, CA                            |
| University of Central Florida             | Academic Institution                      | Orlando, Florida                      |
| University of Colorado - Boulder          | Academic Institution                      | Boulder, CO                           |
| Berry College                             | Academic Institution                      | Berry, Georgia                        |
|   |   |                                       |
| University of Colorado - Colorado Springs | Academic Institution                      | Colorado Springs, CO                  |
| University of Connecticut                 | Academic Institution Academic Institution | Colorado Springs, CO<br>Mansfield, CT |

| University of Detroit Mercy                | Academic Institution | Detroit, MI       |
|--|----------------------|-------------------|
| University of Florida                      | Academic Institution | Gainesville, FL   |
| University of Hartford                     | Academic Institution | West Hartford, CT |
| University of Hawai'i at Mānoa             | Academic Institution | Honolulu, HI      |
| University of Houston                      | Academic Institution | Houston, TX       |
| University of Illinois at Urbana-Champaign | Academic Institution | Champaign, IL     |
| University of Kansas                       | Academic Institution | Lawrence, KS      |

### Full details of organizations that have been involved as partners:

| American Chemical SocietyOrganization Type: Other NonprofitsOrganization Location: Washington, DCPartner's Contribution to the Project:FacilitiesCollaborative ResearchMore Detail on Partner and Contribution: Identified chemistry change agents, recruited quantitative sties, disseminated GFO resourcesthrough ACS channels.American Physical SocietyOrganization Location: College Park, MDPartner's Contribution to the Project:FacilitiesCollaborative ResearchMore Detail on Partner and Contribution: Identified chemistry change agents, recruited quantitative sties, disseminated GFO resourcesthrough ACS channels.American Physical SocietyOrganization Location: College Park, MDPartner's Contribution to the Project:FacilitiesCollaborative ResearchMore 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 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   |
| Association of Mathematics Teacher Educators<br>Organization Type: Other Nonprofits<br>Organization Location: Houghton, MI<br>Partner's Contribution to the Project:<br>Collaborative Research<br>More Detail on Partner and Contribution: AMTE is our mathematics society partner. AMTE has created a task force of 5 change agents who work<br>to Get the Facts Out to mathematics teacher educators across the U.S. and support new GFO mathematics champions.   |
| Auburn University<br>Organization Type: Academic Institution<br>Organization Location: Auburn, Alabama<br>Partner's Contribution to the Project:<br>Other: Departments from this institution are using GFO resources and providing feedback on their experiences<br>More Detail on Partner and Contribution:  |
| Augustana University<br>Organization Type: Academic Institution<br>Organization Location: Sioux Falls, SD<br>Partner's Contribution to the Project:<br>Collaborative Research<br>More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from<br>the physics faculty and students each year.   |

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| Organization Type: Academic Institution  |
| Organization Location: Aurora, Illinois  |
| Partner's Contribution to the Project:   |
| Other: Departments from this institution are using GFO resources and providing feedback on their experiences   |
| More Detail on Partner and Contribution:   |
| Azusa Pacific University, CA   |
| Organization Type: Academic Institution  |
| Organization Location: Azusa, California   |
| Partner's Contribution to the Project:   |
| Other: Departments from this institution are using GEO resources and providing feedback on their experiences   |
| More Detail on Partner and Contribution:   |
|  |
| Berry College  |
| Organization Type: Academic Institution  |
| Organization Location: Berry, Georgia  |
| Partner's Contribution to the Project:   |
| Other: Departments from this institution are using GFO resources and providing feedback on their experiences   |
| More Detail on Partner and Contribution:   |
| Bridgewater State University   |
| Organization Type: Academic Institution  |
| Organization Location: Bridgewater, MA   |
| Partner's Contribution to the Project:   |
| Collaborative Research   |
| More Detail on Partner and Contribution: This institution is a GEO Quantitative Site. The Research Team collects perceptions survey data from  |
| the hysics faculty and students each year  |
| Righan Young University  |
| Direction Tong One Admis Institution   |
|  |
| Organization Education. Provo, 01  |
| 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   |
| Brigham Young University - Idaho<br>Organization Type: Academic Institution  |
| Brigham Young University - Idaho<br>Organization Type: Academic Institution<br>Organization Location: Rexburg, ID  |
| Brigham Young University - Idaho<br>Organization Type: Academic Institution<br>Organization Location: Rexburg, ID<br>Partner's Contribution to the Project:  |
| Brigham Young University - Idaho<br>Organization Type: Academic Institution<br>Organization Location: Rexburg, ID<br>Partner's Contribution to the Project:<br>Collaborative Research  |
| Brigham Young University - Idaho<br>Organization Type: Academic Institution<br>Organization Location: Rexburg, ID<br>Partner's Contribution to the Project:<br>Collaborative Research<br>More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from   |
| Brigham Young University - Idaho<br>Organization Type: Academic Institution<br>Organization Location: Rexburg, ID<br>Partner's Contribution to the Project:<br>Collaborative Research<br>More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from<br>the physics faculty and students each year.  |
| Brigham Young University - Idaho<br>Organization Type: Academic Institution<br>Organization Location: Rexburg, ID<br>Partner's Contribution to the Project:<br>Collaborative Research<br>More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from<br>the physics faculty and students each year.<br>Cal State University - Channel Islands  |
| Brigham Young University - Idaho<br>Organization Type: Academic Institution<br>Organization Location: Rexburg, ID<br>Partner's Contribution to the Project:<br>Collaborative Research<br>More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from<br>the physics faculty and students each year.<br>Cal State University - Channel Islands<br>Organization Type: Academic Institution   |
| Brigham Young University - Idaho<br>Organization Type: Academic Institution<br>Organization Location: Rexburg, ID<br>Partner's Contribution to the Project:<br>Collaborative Research<br>More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from<br>the physics faculty and students each year.<br>Cal State University - Channel Islands<br>Organization Type: Academic Institution<br>Organization Location: Camarillo, California   |
| Brigham Young University - Idaho<br>Organization Type: Academic Institution<br>Organization Location: Rexburg, ID<br>Partner's Contribution to the Project:<br>Collaborative Research<br>More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from<br>the physics faculty and students each year.<br>Cal State University - Channel Islands<br>Organization Type: Academic Institution<br>Organization Location: Camarillo, California<br>Partner's Contribution to the Project:   |
| Brigham Young University - Idaho<br>Organization Type: Academic Institution<br>Organization Location: Rexburg, ID<br>Partner's Contribution to the Project:<br>Collaborative Research<br>More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from<br>the physics faculty and students each year.<br>Cal State University - Channel Islands<br>Organization Type: Academic Institution<br>Organization Location: Camarillo, California<br>Partner's Contribution to the Project:<br>Other: Departments from this institution are using GEO resources and providing foodback on their experiences   |
| Brigham Young University - Idaho<br>Organization Type: Academic Institution<br>Organization Location: Rexburg, ID<br>Partner's Contribution to the Project:<br>Collaborative Research<br>More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from<br>the physics faculty and students each year.<br>Cal State University - Channel Islands<br>Organization Type: Academic Institution<br>Organization Location: Camarillo, California<br>Partner's Contribution to the Project:<br>Other: Departments from this institution are using GFO resources and providing feedback on their experiences   |
| Brigham Young University - Idaho<br>Organization Type: Academic Institution<br>Organization Location: Rexburg, ID<br>Partner's Contribution to the Project:<br>Collaborative Research<br>More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from<br>the physics faculty and students each year.<br>Cal State University - Channel Islands<br>Organization Type: Academic Institution<br>Organization Location: Camarillo, California<br>Partner's Contribution to the Project:<br>Other: Departments from this institution are using GFO resources and providing feedback on their experiences<br>More Detail on Partner and Contribution:   |
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| 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.         Cal State University - Channel Islands         Organization Type: Academic Institution         Organization Location: Camarillo, California         Partner's Contribution to the Project:         Other: Departments from this institution are using GFO resources and providing feedback on their experiences         More Detail on Partner and Contribution:         Cal State University - Chico         Organization Type: Academic Institution         Organization Type: Academic Institution  |
| 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.         Cal State University - Channel Islands         Organization Type: Academic Institution         Organization Location: Camarillo, California         Partner's Contribution to the Project:         Other: Departments from this institution are using GFO resources and providing feedback on their experiences         More Detail on Partner and Contribution:         Cal State University - Chico         Organization Type: Academic Institution         Organization Type: Academic Institution         Organization Type: Academic Institution         Cal State University - Chico         Organization Type: Academic Institution         Organization Type: Academic Institution <t< td=""></t<>   |
| 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.         Cal State University - Channel Islands         Organization Type: Academic Institution         Organization Type: Academic Institution         Organization Location: Camarillo, California         Partner's Contribution to the Project:         Other: Departments from this institution are using GFO resources and providing feedback on their experiences         More Detail on Partner and Contribution:         Cal State University - Chico         Organization Type: Academic Institution         Organization Location: Chico, California         Partner's Contribution to the Project:  |
| 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.         Cal State University - Channel Islands         Organization Location: Camarillo, California         Partner's Contribution to the Project:         Other: Departments from this institution are using GFO resources and providing feedback on their experiences         More Detail on Partner and Contribution:         Cal State University - Chico         Organization Location: Cadimic Institution         Organization Type: Academic Institution         Organization Type: Academic Institution are using GFO resources and providing feedback on their experiences         More Detail on Partner and Contribution:         Cal State University - Chico         Organization Type: Academic Institution         Organization Location: Chico, California         Partner's Contribution to the Project:         Other: Departments from this institution are using GFO resources and providing feedback on their experiences         Organization Location: Chico, California         Partner's Contribution to the Project:         Other  |
| 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.         Cal State University - Channel Islands         Organization Location: Camarillo, California         Partner's Contribution to the Project:         Other: Departments from this institution are using GFO resources and providing feedback on their experiences         More Detail on Partner and Contribution:         Cal State University - Chico         Organization Type: Academic Institution         Organization Type: Academic Institution         Organization Type: Academic Institution are using GFO resources and providing feedback on their experiences         More Detail on Partner and Contribution:         California         Partner's Contribution to the Project:         Other: Departments from this institution are using GFO resources and providing feedback on their experiences         Organization Location: Chico, California         Partner's Contribution to the Project:         Other: Departments from this institution are using GFO resources and providing feedback on their experiences         More Detail on Partner and Contr  |
| 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.         Cal State University - Channel Islands         Organization Type: Academic Institution         Organization Type: Academic Institution         Organization to the Project:         Other: Departments from this institution are using GFO resources and providing feedback on their experiences         More Detail on Partner and Contribution:         Cal State University - Chico         Organization Type: Academic Institution         Organization Type: Academic Institution         Organization Type: Academic Institution         Cal State University - Chico         Organization Type: Academic Institution         Organization   |
| Brigham Young University - Idaho<br>Organization Type: Academic Institution<br>Organization Location: Rexburg, ID<br>Partner's Contribution to the Project:<br>Collaborative Research<br>More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from<br>the physics faculty and students each year.<br>Cal State University - Channel Islands<br>Organization Type: Academic Institution<br>Organization Location: Camarillo, California<br>Partner's Contribution to the Project:<br>Other: Departments from this institution are using GFO resources and providing feedback on their experiences<br>More Detail on Partner and Contribution:<br>Cal State University - Chico<br>Organization Location: Chico, California<br>Partner's Contribution to the Project:<br>Other: Departments from this institution are using GFO resources and providing feedback on their experiences<br>More Detail on Partner and Contribution:<br>Cal State University - Chico<br>Organization Location: Chico, California<br>Partner's Contribution to the Project:<br>Other: Departments from this institution are using GFO resources and providing feedback on their experiences<br>More Detail on Partner and Contribution:<br>California Polytechnic State University - San Luis Obisbo<br>Organization Type: Academic Institution   |
| 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.         Cal State University - Channel Islands         Organization Type: Academic Institution         Organization Location: Camarillo, California         Partner's Contribution to the Project:         Other: Departments from this institution are using GFO resources and providing feedback on their experiences         More Detail on Partner and Contribution:         Cal State University - Chico         Organization Type: Academic Institution         Organization Location: Chico, California         Partner's Contribution to the Project:         Other: Departments from this institution are using GFO resources and providing feedback on their experiences         More Detail on Partner and Contribution:         Cal State University - Chico         Organization Location: Chico, California         Partner's Contribution to the Project:         Other: Departments from this institution are using GFO resources and providing feedback on their experiences         More Detail on Partner and Contribution:         Califo  |
| 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.         Cal State University - Channel Islands         Organization Type: Academic Institution         Organization Location: Camarillo, California         Partner's Contribution to the Project:         Other: Departments from this institution are using GFO resources and providing feedback on their experiences         More Detail on Partner and Contribution:         Cal State University - Chico         Organization Type: Academic Institution         Organization Type: Academic Institution         Organization Type: Academic Institution         Organization Partner and Contribution:         Cal State University - Chico         Organization Type: Academic Institution         Organization Location: Chico, California         Partner's Contribution to the Project:         Other: Departments from this institution are using GFO resources and providing feedback on their experiences         More Detail on Partner and Contribution:         California Polytechnic State University - San Luis Obisbo  |
| Brigham Young University - Idaho<br>Organization Type: Academic Institution<br>Organization Location: Rexburg, ID<br>Partner's Contribution to the Project:<br>Collaborative Research<br>More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from<br>the physics faculty and students each year.<br>Cal State University - Channel Islands<br>Organization Type: Academic Institution<br>Organization Location: Camarillo, California<br>Partner's Contribution to the Project:<br>Other: Departments from this institution are using GFO resources and providing feedback on their experiences<br>More Detail on Partner and Contribution:<br>Cal State University - Chico<br>Organization Location: Chico, California<br>Partner's Contribution to the Project:<br>Other: Departments from this institution are using GFO resources and providing feedback on their experiences<br>More Detail on Partner and Contribution:<br>Cal State University - Chico<br>Organization Location: Chico, California<br>Partner's Contribution to the Project:<br>Other: Departments from this institution are using GFO resources and providing feedback on their experiences<br>More Detail on Partner and Contribution:<br>California Polytechnic State University - San Luis Obisbo<br>Organization Type: Academic Institution<br>Organization Type: Academic Institution<br>O |
| Brigham Young University - Idaho<br>Organization Type: Academic Institution<br>Organization Location: Rexburg, ID<br>Partner's Contribution to the Project:<br>Collaborative Research<br>More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from<br>the physics faculty and students each year.<br>Call State University - Channel Islands<br>Organization Location: Camarillo, California<br>Partner's Contribution to the Project:<br>Other: Departments from this institution are using GFO resources and providing feedback on their experiences<br>More Detail on Partner and Contribution:<br>Call State University - Chico<br>Organization Type: Academic Institution<br>Call State University - Chico<br>Organization Type: Academic Institution<br>Organization Type: Academic Institution<br>Organization Type: Academic Institution<br>Call State University - Chico<br>Organization Type: Academic Institution<br>Organization Type: Academic Institution<br>Organization Type: Academic Institution<br>Organization Type: Academic Institution<br>California<br>Partner's Contribution to the Project:<br>Other: Departments from this institution are using GFO resources and providing feedback on their experiences<br>More Detail on Partner and Contribution:<br>California Partner and Contribution:<br>California Polytechnic State University - San Luis Obisbo<br>Organization Type: Academic Institution<br>Organization Type: Academic Institution<br>Organization Location: San Luis Obispo, CA<br>Partner's Contribution to the Project:<br>Collaborative Research<br>More Detail on Partner and Contribution:<br>This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from<br>More Detail on Partner and Contribution:<br>This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from   |
| Brigham Young University - Idaho<br>Organization Type: Academic Institution<br>Organization Type: Academic Institution<br>Partner's Contribution to the Project:<br>Collaborative Research<br>More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from<br>the physics faculty and students each year.<br>Cal State University - Channel Islands<br>Organization Type: Academic Institution<br>Organization Type: Academic Institution<br>Organization to the Project:<br>Other: Departments from this institution are using GFO resources and providing feedback on their experiences<br>More Detail on Partner and Contribution:<br>Cal State University - Chico<br>Organization Type: Academic Institution<br>Organization Type: Academic Institution<br>Organization Type: Academic Institution<br>Organization Location: Chico, California<br>Partner's Contribution to the Project:<br>Other: Departments from this institution are using GFO resources and providing feedback on their experiences<br>More Detail on Partner and Contribution:<br>Cal State University - Chico<br>Organization Location: Chico, California<br>Partner's Contribution to the Project:<br>Other: Departments from this institution are using GFO resources and providing feedback on their experiences<br>More Detail on Partner and Contribution:<br>California Polytechnic State University - San Luis Obisbo<br>Organization Type: Academic Institution<br>Organization Location: San Luis Obispo, CA<br>Partner's Contribution to the Project:<br>Collaborative Research<br>More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from<br>the physics, math and chemistry faculty and students each year.  |
| Brigham Young University - Idaho<br>Organization Type: Academic Institution<br>Organization Location: Rexburg, ID<br>Partner's Contribution to the Project:<br>Collaborative Research<br>More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from<br>the physics faculty and students each year.<br>Cal State University - Channel Islands<br>Organization Type: Academic Institution<br>Organization Type: Academic Institution<br>Organization Location: Camarillo, California<br>Partner's Contribution to the Project:<br>Other: Departments from this institution are using GFO resources and providing feedback on their experiences<br>More Detail on Partner and Contribution:<br>Cal State University - Chico<br>Organization Type: Academic Institution<br>Organization Type: Academic Institution<br>Organization to the Project:<br>Other: Departments from this institution are using GFO resources and providing feedback on their experiences<br>More Detail on Partner and Contribution:<br>Cal State University - Chico<br>Organization tocation: Chico, California<br>Partner's Contribution to the Project:<br>Other: Departments from this institution are using GFO resources and providing feedback on their experiences<br>More Detail on Partner and Contribution:<br>California Polytechnic State University - San Luis Obisbo<br>Organization Location: San Luis Obispo, CA<br>Partner's Contribution to the Project:<br>Collaborative Research<br>More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from<br>the physics, math and chemistry faculty and students each year.<br>California Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from<br>the physics, math and chemistry faculty and students each year.   |
| Brigham Young University - Idaho<br>Organization Type: Academic Institution<br>Organization Location: Rexburg, ID<br>Partner's Contribution to the Project:<br>Collaborative Research<br>More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from<br>the physics faculty and students each year.<br>Cal State University - Channel Islands<br>Organization Type: Academic Institution<br>Organization Type: Academic Institution<br>Organization to cation: Camarillo, California<br>Partner's Contribution to the Project:<br>Other: Departments from this institution are using GFO resources and providing feedback on their experiences<br>More Detail on Partner and Contribution:<br>Cal State University - Chico<br>Organization Location: Chico, California<br>Partner's Contribution to the Project:<br>Other: Departments from this institution are using GFO resources and providing feedback on their experiences<br>More Detail on Partner and Contribution<br>California Poperti:<br>Other: Departments from this institution<br>Organization Location: Chico, California<br>Partner's Contribution to the Project:<br>Other: Departments from this institution are using GFO resources and providing feedback on their experiences<br>More Detail on Partner and Contribution:<br>California Polytechnic State University - San Luis Obisbo<br>Organization Location: San Luis Obispo, CA<br>Partner's Contribution to the Project:<br>Collaborative Research<br>More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from<br>the physics, math and chemistry faculty and students each year.<br>California State University - Fullerton<br>Organization Type: Academic Institution<br>California State University - Fullerton<br>Organization Type: Academic Institution<br>California State University - Fullerton<br>Organization Type: Academic Institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from<br>the physics, math and chemistry faculty and students each year.<br>California State University -                    |
| Brigham Young University - Idaho<br>Organization Type: Academic Institution<br>Organization Location: Resburg, ID<br>Partner's Contribution to the Project:<br>Collaborative Research<br>More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from<br>the physics faculty and students each year.<br>Cal State University - Channel Islands<br>Organization Type: Academic Institution<br>Organization Cocation: Camarillo, California<br>Partner's Contribution to the Project:<br>Other: Departments from this institution are using GFO resources and providing feedback on their experiences<br>More Detail on Partner and Contribution:<br>Cal State University - Chico<br>Organization Type: Academic Institution<br>Organization Type: Academic Institution<br>Organization Type: Academic Institution<br>Organization Iocaction: Chico, California<br>Partner's Contribution to the Project:<br>Other: Departments from this institution are using GFO resources and providing feedback on their experiences<br>More Detail on Partner and Contribution:<br>Cal State University - Chico<br>Organization Iocaction: Chico, California<br>Partner's Contribution to the Project:<br>Other: Departments from this institution are using GFO resources and providing feedback on their experiences<br>More Detail on Partner and Contribution:<br>California Polytechnic State University - San Luis Obisbo<br>Organization Type: Academic Institution<br>Organization Iocation: San Luis Obisbo<br>Organization Iocation: San Luis Obisbo, CA<br>Partner's Contribution to the Project:<br>Collaborative Research<br>More Detail on Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from<br>the physics, math and chemistry faculty and students each year.<br>California State University - Fullerton<br>Organization Iocation: Thuisenstitution<br>Organization Iocation: The Institution<br>Organization Iocation: The Institution<br>Organization Iocation: Fullerton, CA  |
| Brigham Young University - Idaho Organization Type: Academic Institution Organization Type: Academic Institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from the physics faculty and students each year. Cal State University - Channel Islands Organization Type: Academic Institution Organization Type: Academic Institution Organization Type: Academic Institution Organization to the Project: Other: Departments from this institution are using GFO resources and providing feedback on their experiences More Detail on Partner and Contribution: Cal State University - Channel Islands Organization Location: Camarillo, California Partner's Contribution to the Project: Other: Departments from this institution are using GFO resources and providing feedback on their experiences More Detail on Partner and Contribution: Cal State University - Chico Organization Location: Chico, California Partner's Contribution to the Project: Other: Departments from this institution are using GFO resources and providing feedback on their experiences More Detail on Partner and Contribution: California Project: Other: Departments from this institution are using GFO resources and providing feedback on their experiences More Detail on Partner and Contribution: California Project: Other: Departments from this institution are using GFO resources and providing feedback on their experiences More Detail on Partner and Contribution: California Polytechnic State University - San Luis Obisbo 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 Location: Site University - San Luis Obispo Organization Location: Site University - Survey data from the physics, math and chemistry faculty and students each year. Califor   |
| Brigham Young University - Idaho Organization Type: Academic Institution Organization Incation: Receiver Advection Organization of 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. Cal State University - Channel Islands Organization Type: Academic Institution Organization Location: Receiver Advection Organization Location: Receiver Advection Cal State University - Channel Islands Organization Type: Academic Institution Organization Location: Camarillo, California Partner's Contribution to the Project: Other: Departments from this institution are using GFO resources and providing feedback on their experiences More Detail on Partner and Contribution: Cal State University - Chico Organization Location: Chico, California Partner's Contribution to the Project: Other: Departments from this institution are using GFO resources and providing feedback on their experiences More Detail on Partner and Contribution: Cal State University - Chico Organization Location: Chico, California Partner's Contribution to the Project: Other: Departments from this institution are using GFO resources and providing feedback on their experiences More Detail on Partner and Contribution: California Partner's Contribution to the Project: Other: Departments from this institution are using GFO resources and providing feedback on their experiences More Detail on Partner and Contribution: California Polytechnic State University - San Luis Obisbo Organization Type: Academic 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 In Partner and Contribution: This institution is a GFO Quantitative Site. The Research Team c   |
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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, Fresno Organization Type: Academic Institution Organization Location: Fresno, 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. California State University, San Bernardino Organization Type: Academic Institution Organization Location: San Bernardino, 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, San Marcos** Organization Type: Academic Institution Organization Location: San Marcos, CA Partner's Contribution to the Project: Other: Departments from this institution are using GFO resources and providing feedback on their experiences More Detail on Partner and Contribution: **Central Connecticut State University** Organization Type: Academic Institution Organization Location: New Britain, Connecticut Partner's Contribution to the Project: Other: Departments from this institution are using GFO resources and providing feedback on their experiences More Detail on Partner and Contribution: **Central Washington University** Organization Type: Academic Institution Organization Location: Ellensburg, WA Partner's Contribution to the Project: Other: Departments from this institution are using GFO resources and providing feedback on their experiences More Detail on Partner and Contribution: **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. **Christel House** Organization Type: Academic Institution

Organization Location: Indianapolis, IN

Partner's Contribution to the Project:

Other: Departments from this institution are using GFO resources and providing feedback on their experiences

| More Detail on Partner and Contribution:  |      |
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| Clemson University  |      |
| Organization Type: Academic Institution   |      |
| Organization Location: Clemson, SC  |      |
| Partner's Contribution to the Project:  |      |
| Other: Departments from this institution are using GFO resources and providing feedback on their experiences  |      |
| More Detail on Partner and Contribution:  |      |
| 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 GEO Quantitative Site. The Research Team collects perceptions survey data f                                    | from |
| the physics, math and chemistry faculty and students each year.   |      |
| Colgate University  |      |
| Organization Type: Academic Institution   |      |
| Organization Location: Hamilton NV  |      |
| Dartner's Contribution to the Project   |      |
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| Colorado School of Minos  |      |
| Colorado School of Milles<br>Organization Type: Academic Institution  |      |
| Organization Location: Golden CO  |      |
| Distinction Location. Golden, CO  |      |
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| period to conduct focus groups and give a workshop on the Gro resources. Additionally, once per year the Gro Research reall collects  |      |
| Colorado State University   |      |
| Organization Type: Academic Institution   |      |
| Organization Location: Fort Collins CO  |      |
| Partner's Contribution to the Project:  |      |
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| More Detail on Partner and Contribution: This institution is a GEO Quantitative Site. The Pessarch Team collects percentions survey data f                                    | from |
| the math faculty and students each year   | nom  |
| Columbus State University   |      |
| Organization Type: Academic Institution   |      |
| Organization Location: Columbus, GA   |      |
| Partner's Contribution to the Project:  |      |
| Other: Departments from this institution are using GEO resources and providing feedback on their experiences  |      |
| More Detail on Partner and Contribution:  |      |
|   |      |
| Curry College   |      |
| Organization Type: Academic Institution   |      |
| Organization Location: Milton, MA   |      |
| Partner's Contribution to the Project:  |      |
| Other: Departments from this institution are using GFO resources and providing feedback on their experiences  |      |
| More Detail on Partner and Contribution:  |      |
| Delta State University  |      |
| Organization Type: Academic Institution   |      |
| Organization Location: Cleveland, MS  |      |
| Partner's Contribution to the Project:  |      |
| Other: Departments from this institution are using GFO resources and providing feedback on their experiences  |      |
| More Detail on Partner and Contribution:  |      |
| Eastern Kentucky University   |      |
| Organization Type: Academic Institution   |      |
| Organization Location: Richmond, Kentucky   |      |
| Partner's Contribution to the Project:  |      |
| Collaborative Research  |      |
| More Detail on Partner and Contribution:  |      |
| Eastern Michigan University   |      |
| Organization Type: Academic Institution   |      |
| Organization Location: Ypsilanti, MI  |      |
| Partner's Contribution to the Project:  |      |
| · ·   |      |
| Collaborative Research  |      |

the chemistry faculty and students each year. **Embry-Riddle Aeronautical University** Organization Type: Academic Institution Organization Location: Davtona Beach, FL Partner's Contribution to the Project: Other: Departments from this institution are using GFO resources and providing feedback on their experiences More Detail on Partner and Contribution: **Florida International University** Organization Type: Academic Institution Organization Location: Miami, FL Partner's Contribution to the Project: Other: Departments from this institution are using GFO resources and providing feedback on their experiences More Detail on Partner and Contribution: **Florida State University** Organization Type: Academic Institution Organization Location: Tallahassee, FL 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. Fort Hayes State University Organization Type: Academic Institution Organization Location: Hays, Kansas Partner's Contribution to the Project: Collaborative Research More Detail on Partner and Contribution: **Gettysburg College** Organization Type: Academic Institution Organization Location: Gettysburg, 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 physics faculty and students each year. **Hofstra University** Organization Type: Academic Institution Organization Location: Hempstead, NY 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. **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. Indiana University - Purdue University Indianapolis Organization Type: Academic Institution Organization Location: Indianapolis, IN Partner's Contribution to the Project: Other: Departments from this institution are using GFO resources and providing feedback on their experiences More Detail on Partner and Contribution: **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. Lewis University Organization Type: Academic Institution Organization Location: Romeoville, 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 faculty and students each year. Louisiana Tech University - UTeach Tech Program Organization Type: Academic Institution Organization Location: Ruston, Louisiana Partner's Contribution to the Project: Other: Departments from this institution are using GFO resources and providing feedback on their experiences More Detail on Partner and Contribution: Maryville College Organization Type: Academic Institution Organization Location: Maryville, TN Partner's Contribution to the Project: Other: Departments from this institution are using GFO resources and providing feedback on their experiences More Detail on Partner and Contribution: 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: MAA distributed GFO at summer 2019 events. Mercy College Organization Type: Academic Institution Organization Location: Dobbs Ferry, NY Partner's Contribution to the Project: Other: Departments from this institution are using GFO resources and providing feedback on their experiences More Detail on Partner and Contribution: **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. Mississippi State University Organization Type: Academic Institution Organization Location: Starkville, MS Partner's Contribution to the Project: Other: Departments from this institution are using GFO resources and providing feedback on their experiences More Detail on Partner and Contribution: Missouri University of Science and Technology Organization Type: Academic Institution Organization Location: Rolla, MO 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. **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.

| Morgan State University         |   |
|---------------------------------|---|
| Organization Type: Academic Ir  | istitution  |
| Organization Location: Baltimo  | nre, Maryland   |
| Partner's Contribution to the F | roject:   |
| Collaborative Research          |   |
| wore Detail on Partner and Co   |   |
| Nicholls State University       |   |
| Organization Type: Academic Ir  | istitution  |
| Organization Location: Thibod   | aux, LA   |
| Partner's Contribution to the P | roject:   |
| Other: Departments from this i  | nstitution are using GFO resources and providing feedback on their experiences  |
| More Detail on Partner and Co   | intribution:  |
| Northern Arizona University     |   |
| Organization Type: Academic Ir  |   |
| Drganization Location: Flagstal | I, AZ   |
| Collaborative Research          | Toject.   |
| More Detail on Partner and Co   | ntribution. This institution is a GEO Quantitative Site. The Research Team collects percentions survey data from        |
| the physics faculty and studen  | render of the second         |
| Northern Arizona University     |   |
| Organization Type: Academic Ir  | istitution  |
| Organization Location: Flagsta  | ff. A7  |
| Partner's Contribution to the F | roject:   |
| Other: Departments from this i  | nstitution are using GFO resources and providing feedback on their experiences  |
| More Detail on Partner and Co   | ntribution:   |
| Northwest Missouri State Uni    | versity   |
| Organization Type: Academic Ir  | istitution  |
| Organization Location: Maryvi   | ile, MO   |
| Partner's Contribution to the F | roject:   |
| Collaborative Research          |   |
| More Detail on Partner and Co   | ntribution: This institution is a GFO Quantitative Site. The Research Team collects perceptions survey data from        |
| the physics faculty and student | is each year.   |
| Northwestern Oklahoma State     | University  |
| Organization Type: Academic !   | nstitution  |
| Organization Location: Alva, Ol | (   |
| Partner's Contribution to the F | roject:   |
| Other: Departments from this i  | nstitution are using GFO resources and providing feedback on their experiences  |
| More Detail on Partner and Co   | ntribution:   |
| Northwestern State University   |   |
| Organization Type: Academic Ir  | istitution  |
| Organization Location: Natchit  | ocnes, LA   |
| Partner's Contribution to the P | roject:   |
| Collaborative Research          | <b>ntwinution.</b> This institution is a CEO Quantitative Site. The Desearch Team collects percentions survey data from |
| the math faculty and students   | each year   |
|                                 | במנוו אָבמו.  |
| Ural Roberts University         |   |
| Organization Type: Academic Ir  | Istitution  |
| Drganization Location: Tuisa, C |   |
| Other: Departments from this    | roject:   |
| Other: Departments from this i  | institution are using GFO resources and providing reedback on their experiences   |
| More Detail on Partner and Co   | Intribution:  |
| Pacific University              |   |
| Organization Type: Academic Ir  | istitution  |
| Organization Location: Forest   | Grove, OR   |
| Partner's Contribution to the P | roject:   |
| Other: Departments from this i  | nstitution are using GFO resources and providing feedback on their experiences  |
| viore Detail on Partner and Co  | ntribution:   |
| Penn State Behrend              |   |
| Organization Type: Academic Ir  | istitution  |
| Organization Location: Erie, PA |   |
| Partner's Contribution to the F | roject:   |
| Other: Departments from this i  | nstitution are using GFO resources and providing feedback on their experiences  |
| More Detail on Partner and Co   | ntribution:   |
| Prince George's Community Co    | ollege  |
| Organization Type: Academic Ir  | istitution  |
|                                 |   |
| Organization Location: Largo, I | ND  |

| 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.  |
| SUNY Buffalo State College<br>Organization Type: Academic Institution<br>Organization Location: Buffalo, NY<br>Partner's Contribution to the Project:<br>Other: Departments from this institution are using GFO resources and providing feedback on their experiences<br>More Detail on Partner and Contribution:  |
| Sacred Heart University<br>Organization Type: Academic Institution<br>Organization Location: Fairfield, CT<br>Partner's Contribution to the Project:<br>Other: Departments from this institution are using GFO resources and providing feedback on their experiences<br>More Detail on Partner and Contribution:   |
| Saint Leo University<br>Organization Type: Academic Institution<br>Organization Location: St. Leo, FL<br>Partner's Contribution to the Project:<br>Other: Departments from this institution are using GFO resources and providing feedback on their experiences<br>More Detail on Partner and Contribution:  |
| Shepherd University         Organization Type: Academic Institution         Organization Location: Sheperdstown, WV         Partner's Contribution to the Project:         Other: Departments from this institution are using GFO resources and providing feedback on their experiences         More Detail on Partner and Contribution:   |
| Southern University and A&M College<br>Organization Type: Academic Institution<br>Organization Location: Baton Rouge, LA<br>Partner's Contribution to the Project:<br>Other: Departments from this institution are using GFO resources and providing feedback on their experiences<br>More Detail on Partner and Contribution:   |
| St. Mary's College of Maryland         Organization Type: Academic Institution         Organization Location: St. Mary's City, 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 physics faculty and students each year.  |
| Taylor University         Organization Type: Academic Institution         Organization Location: Upland, IN         Partner's Contribution to the Project:         Other: Departments from this institution are using GFO resources and providing feedback on their experiences         More Detail on Partner and Contribution  |
| Texas A&M University - Commerce<br>Organization Type: Academic Institution<br>Organization Location: Commerce, TX<br>Partner's Contribution to the Project:<br>Collaborative Research<br>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.   |
|---|---|
|   | The Citadel   |
|   | Organization Type: Academic Institution   |
|   | Organization Location: Charleston, SC   |
|   | Partner's Contribution to the Project:  |
|   | Other: Departments from this institution are using GFO resources and providing feedback on their experiences                                  |
|   | More Detail on Partner and Contribution:  |
|   | The College of New Jersey   |
|   | Organization Type: Academic Institution   |
|   | Organization Location: Ewing Township   |
|   | Partner's Contribution to the Project:  |
|   | Other: Departments from this institution are using GFO resources and providing feedback on their experiences                                  |
|   | More Detail on Partner and Contribution:  |
|   | The Ohio State University   |
|   | Organization Type: Academic Institution   |
|   | Organization Location: Columbus, OH   |
|   | Partner's Contribution to the Project:  |
|   | Other: Departments from this institution are using GFO resources and providing feedback on their experiences                                  |
|   | More Detail on Partner and Contribution:  |
|   | The University of Alabama   |
|   | Organization Type: Academic Institution   |
|   | Organization Location: Tuscaloosa, AL   |
|   | Partner's Contribution to the Project:  |
|   | Other: Departments from this institution are using GFO resources and providing feedback on their experiences                                  |
|   | More Detail on Partner and Contribution:  |
| - | University of Akron   |
|   | Organization Type: Academic Institution   |
|   | Organization Location Akron Oll   |
|   | Organization Location: Aktor, OH  |
|   | Partner's Contribution to the Project:  |
|   | Other: Departments from this institution are using GFO resources and providing feedback on their experiences                                  |
|   | Nore Detail on Partner and Contribution:  |
|   | University of Arizona   |
|   | Organization Type: Academic Institution   |
|   | Organization Location: Tuscon, AZ   |
|   | Partner's Contribution to the Project:  |
|   | Other: Departments from this institution are using GFO resources and providing feedback on their experiences                                  |
|   | More Detail on Partner and Contribution:  |
| - | University of Arkansas  |
|   | Organization Type: Academic Institution   |
|   | Organization Location: Fayetteville, AR   |
|   | Partner's Contribution to the Project:  |
|   | Other: Departments from this institution are using GFO resources and providing feedback on their experiences                                  |
|   | More Detail on Partner and Contribution:  |
| - | University of California - Berkeley   |
|   | Organization Type: Academic Institution   |
|   | Organization Location: Berkeley, CA   |
|   | Partner's Contribution to the Project:  |
|   | Other: Departments from this institution are using GFO resources and providing feedback on their experiences                                  |
|   | More Detail on Partner and Contribution:  |
|   | 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 California - Merced   |
|   | Organization Type: Academic Institution   |
|   | Organization Location: Merced, CA   |
|   | Partner's Contribution to the Project:  |
|   | Other: Departments from this institution are using GFO resources and providing feedback on their experiences                                  |
|   | More Detail on Partner and Contribution:  |
| - | 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 Colorado - Colorado Springs Organization Type: Academic Institution Organization Location: Colorado Springs, CO Partner's Contribution to the Project: Other: Departments from this institution are using GFO resources and providing feedback on their experiences More Detail on Partner and Contribution: University of Connecticut Organization Type: Academic Institution Organization Location: Mansfield, CT Partner's Contribution to the Project: Other: Departments from this institution are using GFO resources and providing feedback on their experiences More Detail on Partner and Contribution: University of Delaware Organization Type: Academic Institution Organization Location: Newark, DE Partner's Contribution to the Project: Other: Departments from this institution are using GFO resources and providing feedback on their experiences More Detail on Partner and Contribution: University of Detroit Mercy Organization Type: Academic Institution Organization Location: Detroit, MI Partner's Contribution to the Project: Other: Departments from this institution are using GFO resources and providing feedback on their experiences More Detail on Partner and Contribution: University of Florida Organization Type: Academic Institution Organization Location: Gainesville, FL Partner's Contribution to the Project: Other: Departments from this institution are using GFO resources and providing feedback on their experiences More Detail on Partner and Contribution: University of Hartford Organization Type: Academic Institution Organization Location: West Hartford, CT Partner's Contribution to the Project: Other: Departments from this institution are using GFO resources and providing feedback on their experiences More Detail on Partner and Contribution: University of Hawai'i at Mānoa Organization Type: Academic Institution Organization Location: Honolulu, HI Partner's Contribution to the Project: Other: Departments from this institution are using GFO resources and providing feedback on their experiences More Detail on Partner and Contribution: 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 Illinois at Urbana-Champaign Organization Type: Academic Institution Organization Location: Champaign, IL Partner's Contribution to the Project: Other: Departments from this institution are using GFO resources and providing feedback on their experiences More Detail on Partner and Contribution: University of Kansas

Organization Type: Academic Institution Organization Location: Lawrence, KS 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 Maryland Organization Type: Academic Institution Organization Location: College Park, MD Partner's Contribution to the Project:

Other: Departments from this institution are using GFO resources and providing feedback on their experiences More Detail on Partner and Contribution: University of Massachusetts Organization Type: Academic Institution Organization Location: Amherst, Massachusetts Partner's Contribution to the Project: Other: Departments from this institution are using GFO resources and providing feedback on their experiences More Detail on Partner and Contribution: University of Massachusetts Lowell Organization Type: Academic Institution Organization Location: Lowell, Massachusetts Partner's Contribution to the Project: Other: Departments from this institution are using GFO resources and providing feedback on their experiences More Detail on Partner and Contribution: 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 North Carolina - Chapel Hill Organization Type: Academic Institution Organization Location: Chapel Hill, North Carolina Partner's Contribution to the Project: Other: Departments from this institution are using GFO resources and providing feedback on their experiences More Detail on Partner and Contribution: University of North Georgia Organization Type: Academic Institution Organization Location: Dahlonega, 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 physics faculty and students each year. University of Saint Joseph Organization Type: Academic Institution Organization Location: Hartford, Connecticut Partner's Contribution to the Project: Other: Departments from this institution are using GFO resources and providing feedback on their experiences More Detail on Partner and Contribution: 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 Texas - Rio Grande Valley Organization Type: Academic Institution Organization Location: Edinburg, 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 Texas at Austin Organization Type: Academic Institution

Organization Location: Austin, 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 Texas-Rio Grande Valley Organization Type: Academic Institution Organization Location: Edinburg, Texas Partner's Contribution to the Project: Other: Departments from this institution are using GFO resources and providing feedback on their experiences More Detail on Partner and Contribution: University of Washington Bothell Organization Type: Academic Institution Organization Location: Bothell, WA 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 West Georgia Organization Type: Academic Institution Organization Location: Carrollton, Georgia Partner's Contribution to the Project: Other: Departments from this institution are using GFO resources and providing feedback on their experiences More Detail on Partner and Contribution: University of Western Florida Organization Type: Academic Institution Organization Location: Pensacola, Florida Partner's Contribution to the Project: Other: Departments from this institution are using GFO resources and providing feedback on their experiences More Detail on Partner and Contribution: **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. University of Wisconsin - River Falls Organization Type: Academic Institution Organization Location: River Falls, Wisconsin Partner's Contribution to the Project: Other: Departments from this institution are using GFO resources and providing feedback on their experiences More Detail on Partner and Contribution: **Utah State University** Organization Type: Academic Institution Organization Location: Logan, Utah Partner's Contribution to the Project: Other: Departments from this institution are using GFO resources and providing feedback on their experiences More Detail on Partner and Contribution: 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 Chester University Organization Type: Academic Institution Organization Location: Chester County, Pennsylvania Partner's Contribution to the Project:

Other: Departments from this institution are using GFO resources and providing feedback on their experiences

| More Detail on Partner and Contribution:   |
|--|
| 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.  |
| Western Colorado University  |
| Organization Type: Academic Institution  |
| Organization Location: Gunnison, Colorado  |
| Partner's Contribution to the Project:   |
| Other: Departments from this institution are using GFO resources and providing feedback on their experiences                                   |
| More Detail on Partner and Contribution:   |
| Western Kentucky University  |
| Organization Type: Academic Institution  |
| Organization Location: Bowling Green, Kentucky   |
| Partner's Contribution to the Project:   |
| Other: Departments from this institution are using GFO resources and providing feedback on their experiences                                   |
| More Detail on Partner and Contribution:   |
| Western Washington University  |
| Organization Type: Academic Institution  |
| Organization Location: Bellingham, Washington  |
| Partner's Contribution to the Project:   |
| Other: Departments from this institution are using GFO resources and providing feedback on their experiences                                   |
| More Detail on Partner and Contribution:   |
| 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.  |
| Worcester Polytechnic Institute  |
| Organization Type: Academic Institution  |
| Organization Location: Worcester, 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.  |
| Wright State University  |
| Organization Type: Academic Institution  |
| Organization Location: Davton OH   |
| Partner's Contribution to the Project:   |
| Collaborative Research   |
| More Detail on Partner and Contribution: This institution is a GEO Quantitative Site. The Research Team collects percentions survey data from  |
| the physics faculty and students each year.  |
|  |
| Were other collaborators or contacts involved? If so, please provide details,  |

Organizations that have helped disseminate GFO resources include: HBCUTeach, UTeach, and AAAS

## 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. The project also produces primary research on STEM student's and faculty's perceptions of grade 7-12 teaching. Much is first of its kind. This work can be used to guide new research in this needed field of study. Key research outcomes to date include:

- Detailed understanding of student perceptions of grade 7-12 math and science teaching including an instrument that can measure these and measure student interest in the career.
- An understanding of why students who are interested choose to pursue other careers. These reasons often center around salary, retirement and day-to-day satisfaction.
- No differences found by gender or STEM discipline
- Clear and large differences were found when analyzing student interest in and perceptions of grade 7-12 math and science teaching by race/ethnicity
- Students who identify as white have a smaller fraction of those interested in the career and a smaller fraction pursuing certification compared to students who identify in one of the underrepresented groups including: Black or African American, Hispanic or Latino, and Asian or Asian American.
- Students who identify as Black or African American and students who identify as Hispanic or Latino have more positive perceptions of the profession.
- Students who identify as Black or African American and students who identify as Hispanic or Latino are underrepresented in STEM degrees earned compared to all college degrees.

The first research-based, user-tested teacher recruitment materials

- Presentations for Faculty Teaching the Best Kept Secret!
- Presentations for Students Busting Myths about the Teaching Profession
- Poster series and Brochure series
- Tested messaging about the profession that improves both student and faculty views of the profession
- Videos about the profession that share facts and provide a glimpse of teaching as a career
- Data handouts that include data to support the key facts about the profession that have been shown to impact student's career choices.

Detailed understanding of faculty perceptions of grade 7-12 math and science teaching as a profession including an instrument that can measure these..

• In particular we have learned that faculty in general are supportive of students and their career choices but that faculty are very naive about grade 7-12 teaching. Faculty are able to hold these inconsistent views and students sense these negative views and are often dissuaded from the career because faculty are important influences in their lives at the time that they are making a career choice.

• STEM Faculty perceptions and knowledge of the career are not different by discipline, gender or faculty position type

There are unique challenges related to teacher recruitment facing each STEM discipline requiring a customized strategic approach for each.

### 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. 17 of our C/champions are STEM or Science Education faculty and are not specifically Physics, Chemistry, Math or educators.

Additionally, we are learning that Education faculty and Education Employment specialists are finding the GFO resources to be valuable for and effective with any field of teaching. 11 of our registered Champions are in schools of education. We have also been invited to two Association of Education in Employment conferences to present 90 minute GFO workshops, one to each Utah college/university AEE specialist and one at the National American Association of Education Specialists conference in Fall 2021.

Finally, research shows that 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 successfully 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 profession

### Postdocs

- Active contributing members of the DBER community who are qualified to secure a DBER 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 was the impact on teaching and educational experiences?

Nothing to report.

### 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?

### GettheFactsOut.org

The GFO website is a resource about the teaching profession that hosts a wealth of information and resources related to chemistry, mathematics, and physics teaching professions. The site includes information for prospective teachers, 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.

### Get the Facts Out Youtube Channel

The Get the Facts Out Youtube Channel contains professional videos designed to be used as recruitment and informational resources about the teaching profession. The channel also contains recorded research presentations about the project and sample Get the Facts Out webinars. We hope to expand this repository to contain other GFO related videos.

### What is the impact on technology transfer?

Nothing to report.

### What is the impact on society beyond science and technology?

There is a growing body of research that provides evidence that increasing the number and diversity of qualified STEM teachers could open more doors for socioeconomically disadvantaged students and students from underrepresented groups. Additionally, increasing the number of qualified STEM teachers will improve public knowledge and attitudes about STEM fields.

### What percentage of the award's budget was spent in a foreign country?

Nothing to report.

## **Changes/Problems**

### Changes in approach and reason for change

### Shift to Virtual Outreach

This year the GFO PI and Change Agents were not able to attend conferences or site visits in person. Instead we sought out virtual opportunities for outreach and engaged in site visits virtually. Over the summer of 2020, the PI and research team adjusted the presentations for a virtual environment by converting participant interaction from small group conversation to pre/post testing via Survey Monkey, voting via Zoom polls or the chat feature, and monitoring of discussion (by a 2nd facilitator) via chat throughout the presentations. The pre/post tests show that this new format is effective and it actually seems to be easier for new presenters to present in this new format.

In the early part of the lock down we heard a lot of faculty feeling that their past recruitment techniques were no longer possible and did not have ideas on how to continue these efforts. We worked hard to test out ideas at Mines and to collect ideas from other faculty. By mid-Fall 2020 we had a new set of recommendations for recruitment including a template for creating a simple home grown video that shares the facts and info about your program, the virtual presentations for students and faculty, ideas for asynchronous canvas presentations, inperson outdoor socially distanced events using handouts and virtual sign in sheets to name a few. We also pivoted our approach to workshop presentations. PI Adams was asked to do most of these big national presentations since travel time was no longer a barrier. Many of these opportunities were large with close to 200 participants including the AAAS-ARISE and HBCUTeach webinars. This year, in part due to the modified presentation format and prior hesitation from Champions and Change Agents, we adopted an apprenticeship model. Adams, or other experienced GFO presenter, leads the presentation and two Change Agents co-present, with each taking about ¼ of the presentation. We learned that after co- presenting, faculty are much more comfortable taking the lead and even mentoring a new apprentice when presenting GFO workshops.

Finally, our experience in the virtual environment is that almost all conference opportunities for sharing are rather ineffective. We participated in the same conferences we have in the past and shared via both invited and contributed presentations.

Unfortunately in all cases, we did not reach any new faculty. However, we did have new opportunities to attend webinars and one new conference that allowed us to reach a substantial number of faculty as noted in the previous paragraph.

### Website conversion to wordpress

This year we made the decision to convert our Website, that was developed using Drupal, to WordPress. The Drupal site was very time consuming to maintain, the GFO team had very little editing capability, and it is not able to gracefully host our new videos. This new Wordpress site is being developed by Circuit Media, an outside firm, and will be fully editable by the GFO Team. It will be live early fall 2021.

### **Created a Youtube channel**

With the new set of professionally developed videos and the library of recorded GFO virtual presentations, we have decided we need a GFO Youtube Channel. This Channel with live this summer and currently has the four completed professional videos and one GFO virtual presentation. Once the new Wordpress website is complete, it will point to each video on our Youtube channel.

### New Resource: Teaching by the Numbers

In the Year 2 report, we reported that we have learned that mining for teacher salaries is a large energy barrier for faculty. It is something faculty have never engaged in before and it takes some time and skill to accurately identify salaries. Additionally, it's helpful to show salaries from other forms of employment in the area to put the teacher salaries in perspective and to supply some measure of cost of living. It took a fair amount of research to identify reliable sources for each of these types of data. As we did this research, we reached out to an economist for advice. We now share teacher salaries at four points in time (yr 1, yr 5, yr 15 and end of career), Bureau of Labor Statistics average employee wage in that county, average price of a home in that county sourced from Zillow, and average rent for a 2 bedroom sourced from the U.S. Department of Housing and Urban Development.

This past year we developed a one page flyer, called A Teacher's Life by the Numbers, to provide an at-a-glance visual of this data. (See attached samples) We have now mined data in the area of each of our Study Sides, for each Change Agent, and any Champion who requests teacher salary data. They receive a spreadsheet with all of the raw data, a slide with local salaries to be used in their student and faculty presentations as well as a Teacher's Life by the Numbers flyer for their area.

The new Wordpress version of the GFO website will include a resource section that hosts all of these flyers sorted by location.

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

Nothing to report.

### Changes that have a significant impact on expenditures

We have seen some cost savings in advisory board time with two virtual annual meetings and reduced travel for Change Agents. However, we have much higher demands than anticipated for virtual presentations by the Mines team, Champion support with the growing number of Champions, and additional resource development and testing is needed to support the needs of the GFO users. These additional needs are being met by the Mines team of Adams, project manager, postdocs, and research associates. We can shift the small savings from the impact of a virtual year to support a bit more staff time to continue with Champion support, resource development, and national virtual GFO outreach; however, we also plan to apply for a supplement to continue supporting these efforts through the life of the grant.

Similarly, the cost savings from the impact of the virtual year for the AAPT NSF companion grant (#1821462) have also been shifted. These savings have helped support Isola's increased time spent on assisting Adams with project management, Champion tracking and support needs, resource development feedback and focusing on streamlining intraproject communication between the disciplines.

In our year 1 report we shared that the original consultant who was engaged to conduct "Message Testing", Drew Westen of Westen Strategies, was unable to perform the work. We engaged a new marketing expert and shifted testing responsibility to our Research Team. This work continues within the originally allotted budget and we plan to continue this work in Year 4 with a focus on Black and African American students, with a targeted eye on those from the South. We will also continue testing resources with prospective teachers from other

underrepresented groups in the teaching profession.

Finally, we have found that the external evaluator is spending more time on the project than anticipated. Her input has been very valuable and we'd like to continue to engage her at this level.

### Significant changes in use or care of human subjects

The Colorado School of Mines IRB protocol was updated to add External Evaluation consultant, Angie Little, as an investigator so she could conduct PI interviews. The IRB was also updated so that the research team could collect consent forms virtually for focus groups and interviews.

### Significant changes in use or care of vertebrate animals

Nothing to report.

### Significant changes in use or care of biohazards

Nothing to report.

### **Change in primary performance site location**

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.