UNIVERSITY OF MASSACHUSETTS BOSTON
CENTER OF SCIENCE AND MATH IN CONTEXT (COSMIC)

# WIPRO SEF

## YEAR 10
## ANNUAL REPORT
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# INTRODUCTION

## Wipro SEF Program Overview

The Wipro Science Education Fellowship (SEF) is a four-year STEM district transformation program. Cohorts of K-12 teachers participate in a rolling two-year professional development experience designed to improve individual teacher practice, foster teacher leadership opportunities, and create a district corps of teacher leaders. Professional development for fellows is led by a university in partnership with the local school district. The program was developed at the Center of Science and Mathematics in Context (COSMIC) at UMass Boston and is now in 7 universities and 35 partner school districts throughout the United States.

## Year One: Thinking About Teaching

### › Monthly Fellows Meetings

Fellows from approximately five different school districts gather once a month at the host university to engage in professional development in the areas of instruction, reflective practice, adult learning, and leadership.

### › Collaborative Coaching and Learning of Science (CCLS) groups

Fellows engage in research-based, structured inquiry into their own teaching and growth. Fellows meet in CCLS teams to share videos of themselves teaching in their classroom as well as sharing student work to learn from each other, to reflect on science content and pedagogy, and to improve their teaching of science. These small professional learning communities determine their own schedules, courses of study, and the lessons they will all be videotaping and observing with support and guidance from their university partner.

## Year Two: Implementing the Individualized Growth Plan System (GPS)

Each fellow develops and carries out an individualized growth plan that has a clear vision and identifiable benchmarks. The 100-hour plan focuses on ways to improve the teacher's own instruction and leadership and is developed in collaboration with a university advisor, the district science coordinator and the fellow's principal. The yearlong project includes the fellow leading professional development for other teachers in their school district and culminates with a report and presentation of a poster session at the end of year conference.

### A District Corps of Teacher Leaders

Over a rollout of three successive cohorts of fellows, each participating school district will have as many as 12 fellows who have participated in the extensive 2-year Wipro SEF program. These fellows serve as a leadership group for district science and engineering initiatives.

Phase II and Phase III
After completing the two-year "foundation" program, District science coordinators work with their University partners in exploring ways in which to build on the Fellows experiences, projects and leadership skills in order to support district transformation. Through various and varied initiatives, Fellows engage with other teachers in their districts. Simultaneously, administrators are made more aware of the resources that the Wipro SEF program has seeded in their schools and districts. This phase of funding is also intended to encourage district incentives to support future work that will continue after this Wipro external funding concludes.

## HOW TO READ THIS REPORT

This report captures the work of the Wipro SEF program from June 2022 thru September 2022. It builds on the prior three quarterly reports with some additional reflections from the past year. During this time, all sites met the challenges of maintaining and adapting the Wipro SEF program during the Covid-19 pandemic. The chart below summarizes the activities of this quarter and the activities that took place in this school year. Each site's report includes an overview of the activities that have taken place this quarter. Use the table of contents to locate a site's report. For a quick look at how the program is influencing individual Fellows please refer to the vignettes in the sections entitled "Featured Fellows" Throughout each site's report, you will find remarkable stories of Wipro Fellows supporting their students as teachers and supporting other teachers as teacher leaders. This report also includes a summary of the 2022 Wipro Leadership Conference.

| Year | CA<br><br>Stanford University | FL<br><br>University of South Florida | MA<br><br>University of Massachusetts Boston | MO<br><br>University of Missouri | NJ<br><br>Montclair State University | NY<br><br>Mercy College | TX<br><br>University of North Texas Dallas |
|---|---|---|---|---|---|---|---|
| 2019-2020 | Year 2 | Year 2 | Phase II & Lead Institution | Year 2 | Phase II | Phase II | Year 3 |
| 2020-2021 | Year 3 | Year 3 | Phase II & Lead Institution | Year 3 | Phase II | Phase II | Year 4 |
| 2021-2022 | Year 4 | Year 4 | Phase II & Lead Institution | Year 4 | Funding ended | Phase II | Phase II |
| 2022-2023 | Phase II | Phase II | Phase III & Lead Institution | Phase II | Phase III | Phase III | Phase III |

*Table of Wipro SEF sites*

| | *Cohort 1* | *Cohort 2* | *Cohort 3* | *Phase II* |
|---|---|---|---|---|
| Year 0 | Recruitment | | | |
| Year 1 | Collaborative coaching and learning in Science (CCLS) | Recruitment | | |
| Year 2 | Growth Plan System (GPS) | CCLS | Recruitment | |
| Year 3 | | GPS | CCLS | |
| Year 4 | | | GPS | |
| Phase II &III | | | | Activities proposed by individual sites. |

*Key to yearly activities*

## UMass Boston Lead Institution- Building and Supporting a Network of Wipro SEF sites

### Contracts and Statements of Works

All sites have committed to their innovation strategy to contribute to the goal of "district transformation through teacher leadership." All sites have been working with their Offices of Research and Sponsored Programs (ORSP) and UMass Boston's ORSP and have completed all required financial forms. As has been the case for the last round of funding, the contracts are for one year at a time with the expectation that all four years of the program innovations will take place.

### 2022 Site Leaders Retreat

On September 9 thru 11 a site leaders retreat was held at UMass Boston. The retreat was the first time that site leaders have been able to meet in person since the start of the Covid pandemic. Each site sent one representative.

| CA | FL | MA | MO | NJ | NY | TX |
|---|---|---|---|---|---|---|
| Stanford University | University of South Florida | University of Massachusetts Boston | University of Missouri | Montclair State University | Mercy College | University of North Texas Dallas |
| Janet Carlson | David Rosengrant | Arthur Eisenkraft<br>Marilyn Decker | Meera Chandrasekhar<br>Via ZOOM | Monica Taylor | Kristin Larson | Ratna Narayan |

In addition to the site leaders Ann Gurnee, project evaluator attended the retreat.

The purpose of the retreat was twofold:

- To continue to build and strengthen the Wipro SEF community of University Sites

- To provide an opportunity for each site to share their new Innovation projects and to receive feedback from the other sites on their plans

On Friday night a welcome dinner was held at a local restaurant. On Saturday each site was given an opportunity to present their new Innovation project and one challenge they are anticipating with the new project. The Innovation projects all build on the foundation that was laid with the original Wipro Science Education Fellowship, but each site has taken a different direction for their Innovation Projects. Following each presentation, the group used a tuning protocol to provide warm and cool feedback. The feedback sessions resulted in lively discussions and suggestions to help each site with their challenge. Following this busy day, a group dinner was held in Boston. Professor Robert Chen, a founding member of the Wipro SEF Boston team also joined the group for dinner.

On Sunday the site presentations continued and Anne Gurnee, the project evaluator provided a summary of her approach to evaluating the newly funded Innovation projects. Since each site has taken a different approach, the data sources will be different than those used in phase I of the Wipro SEF program.

The Leader's retreat ended with each site reflecting on lessons learned. These will form the basis for future growth in the plans for the next phase of work.

## 2022 District Science Coordinators Retreat (forthcoming)

One outcome of the Leaders' retreat was the agreement that the goal of District Transformation through Teacher Leadership will require communities of the Fellows, the District Science Coordinators (DSCs) and the administrators of the school districts. Building on the success of the District Leadership remote conferences of the past two years, we agreed to hold an in-person meeting of some DSCs in late October. This will be followed with a remote conference in February and another in-person meeting at the end of the school year.

The conference is set for Oct 28 – Oct 30 in Dallas, TX. The agenda is being prepared by Tammy Moriarity (Stanford) and Arthur Eisenkraft (UMass).

## 2022 Research Meeting

The Wipro Science Education Fellowship program has generated enormous sets of data through the V-CCLS portfolios, the H-CCLS portfolios, the videotapes from all V-CCLS and H-CCLS meetings, and the GPS projects (including websites, portfolios, and reports.) These artifacts exist at each site. In addition, we have the data and reports from the external evaluator and summarized in our annual reports.

This data speaks to our past successes as each site completed the Wipro SEF "foundation program" of four years with their school districts. The innovation phase further promoting district transformation through teacher leadership will provide new insights and research opportunities.

To that end, two education researchers, two experts on teacher leadership, Wipro's external evaluator (Anne Gurnee) and Arthur Eisenkraft met for one-day in late August to brainstorm possible research questions that we can contribute to the field and how we can support high quality conversations regarding the nascent research field of science teacher leadership. One exciting suggestion is to consider editing a special issue of a respected science education journal (i.e., Journal of Science Teaching Education) and have researchers share their insights and their work regarding teacher leadership. Other ideas emerging from our discussions will also be considered as we develop the evaluation plan for this next phase of Wipro SEF.

## Introduction

### Cohort 3 GPS progress

Cohort 3 CA Wipro Fellows implemented their GPS Projects during the 2021-2022 school year. Twenty-one out of twenty-four projects were completed by June 2022. Three fellows needed to take an extension to their projects due to health and personal issues affecting their ability to complete their projects in meaningful ways. These three fellows will continue their projects into the 2022-2023 school year and will present their projects at the End of Year Conference in 2023. They will continue to work with a CSET Coach throughout the school year.

### Cohort 3 Portfolios

Twenty-one Cohort 3 portfolios have been submitted. Please see the Table below for links to the GPS Project posters, presentation slide decks, and portfolios

**CA Cohort 3 GPS Projects (2021-2022)**

| Name | District | Poster | Presentation Slide Deck | WiX Portfolio |
|---|---|---|---|---|
| Robert Coverdell-Meneses | SFUSD (HS) | Link | Link | Link |
| Amanda Lim | SFUSD (MS) | Link | Link | Link |
| Mithril Cox | SFUSD(ES) | Link | Link | Link |
| Thomas "Tommy" Fulwiler | SFUSD (HS) | Link | Link | Link |
| Victoria "Tori" Lanterman | SFUSD (ES) | Link | Link | Link |
| Elizabeth Reiff | SFUSD (MS) | Link | Link | Link |

| Name | District | Poster | Presentation Slide Deck | WiX Portfolio |
|---|---|---|---|---|
| Laura Spanier | SFUSD (MS) | Link | Link | Link |
| Adrian Tamayo | SFUSD (MS) | Link | Link | Link |
| Brittney O'Brien | Mtn. View Whisman(ES) | Link | Link | Link |
| Margaret Poor | Mtn. View Whisman(ES) | Link | Link | Link |
| Jenny DeGraaff | Mtn. View Whisman(ES) | Link | Link, PDF | Link |
| Jaclyn O'Brien Diaz | Mtn. View Whisman(ES) | Link | Link | Link |
| Yichang Liu | SJUSD(HS) | Link | Link | Link |
| Jessica Paulsen | SJUSD | Link | Link | Link |
| Alex Johnson | Campbell Union HS | Link | Link | Link |
| Gargi Verma | Campbell Union HS | Link | Link | Link |
| Chelsea Alvarez | Moreland (ES) | Link | Link | Link |
| Nicholas Guttadauro | Moreland (MS) | Link | Link | Link |
| Julie McKinley-Reed | Moreland(ES) | Link | Link | Link |
| Sierra Vance | Moreland(ES) | Link | Link | Link |

**Portfolio Feedback**

Each fellow received feedback from two coaches on the WIPRO Leadership Team. The feedback was sent via email to each participant. Here are few samples of feedback given by coaches:

Sample Feedback #1: *As I read your reflections, it was great to read about the successes as well as the times where you questioned or doubted yourself. The reflections were very authentic and gave a snapshot of how you were developing your identity as a Department Chair for the science department at your school. It was great to see the department power*

*points as your artifacts because it showed how you were developing a learning community. In your Wipro Pillars section, I totally support the idea of you finding trusted colleagues to reflect with on both leadership and teaching practices! Looking forward to seeing how you will continue to grow in your leadership identity as you continue as Department Chair for your school, but also as you begin to make an impact in your district.*

Sample Feedback #2: *Reading through your portfolio has me reflecting on how insightful of a teacher you are! Using Summary Tables is such a wonderful project to take on because they're being talked about more in the science education world. They're a great way to help students feel like their learning is coherent from lesson to lesson. Reading your reflections, I can tell that you were so thoughtful with some of the challenges that you faced, like how to give students more autonomy over the process. I loved you describing how you pulled other adults into the process, like your coach to help you brainstorm how you might tackle this problem of practice. Your solution of getting students to make a slide of their big takeaway was creative and helped you accomplish the goal of having students reflect on their learning. Your reflections on teacher leadership are also very insightful - the idea of being in several places at once as a leader feels very authentic to how leadership works in practice. I'm happy that your time in Wipro has given you the space to reflect on what teacher leadership looks and feels like to you and I hope you get to continue to expand your leadership practices with new opportunities!*

Sample Feedback #3: *On reading your entire project, it was amazing to see your transformation from being an introverted classroom confined teacher to a confident teacher leader willing to share ideas with your grade level colleagues and the district leaders as well. Taking your district initiatives of using thinking maps and differentiating for particular uses in your classroom was a difficult project in itself but expanding on that to develop ideas on supporting science and ELD was remarkable. I really liked how you feel that anyone can be a leader and how you are taking on more leadership roles in your school and at the district level. I wish you the best in your future work in creating culturally responsive classrooms and becoming a science teacher leader.*

**The following portfolios stood out for the CA team**
**Portfolio 1(LINK) - Seeds of Change, Brittney O'Brien (TK-5 STEAM Teacher, Mtn. View Whisman School District**

**Portfolio 2 (LINK)- Mobilizing Community to Transform our School Yard into an Outdoor Science Learning Space, Elizabeth Reiff (7th Grade Science Teacher, San Francisco Unified School District)**

**Portfolio 3 (LINK)- Eliminating Barriers to Science Curriculum at the Elementary Level, Chelsea Alvarez (2nd/3rd grade Teacher, Moreland School District)**

The portfolios selected demonstrated how elementary and secondary schools incorporated science into their classrooms during the Covid-19 pandemic. Their projects highlight how teachers applied their learnings from Stanford Wipro professional learning sessions in both years. Additionally, they illustrate the main trajectories of teacher leadership exemplified by this particular cohort. One example shows how a teacher develops a science project for her students, then extends it to other teachers in her grade, and finally includes everyone in the school community. In the second project, students are able to engage in powerful STEM learning experiences that connect them to their local communities, parks, and outdoor spaces. The third project describes how to meet teacher needs in implementing a district-mandated science curriculum and support science teaching in the classroom.

### Reflections on the End of the Year Conference

This year, the CA Wipro SEF End of Year Conference took place on June 11, 2022. Once again, the End of the Year Conference was a valuable experience for fellows as well as district coordinators, school leaders, and other guests. The conference provided avenues for fellows to present their GPS Projects and receive meaningful feedback. It also showcased the hard work and effort that went into their GPS Projects, giving fellows a sense of pride and accomplishment. Please see below for some photos from the event.

End of year Conference June 2022 _ Conference Program Letter and Setting

Fellows also displayed posters during a “poster viewing and feedback” session. The posters added to the professionalism of the conference experience.  See below for photos of the poster viewing and feedback session.

GPS project presentation by a Wipro fellow of Cohort 3


Wipro Fellows during the Poster session at End of Year Conference

One thing that could be improved in the future is to collect or take a photo of the warm and cool sticky note feedback that was given to each fellow. After the conference, fellows took their posters home, so there is no record about what kind of feedback was given.

## Yearly Reflection 2021-22

*Successes*

One of the biggest successes this year was how the CA Wipro SEF Program provided a place where fellows felt supported in their work as classroom teachers and as teacher leaders. The 2021-2022 school year was a time when teachers were "coming back" from Covid, but not fully out of the pandemic. With unpredictable student attendance and teacher consistency, fellows experienced constant shifts in lesson plans and felt the weight of systemic challenges throughout the school year. Fellows often expressed their gratitude for the Wipro Fellowship as being a place where they still felt nurtured as human beings and as professionals. The CA Wipro SEF Program had consistent coaching calls with each fellow as well as monthly professional learning sessions that kept the cohort connected and focused on their teaching practice.

While the Covid pandemic has presented its unique set of challenges for teachers in teaching both distance and hybrid settings, it also placed teachers in situations where they could leverage their learnings from the fellowship to pursue opportunities to demonstrate their leadership. In many cases, the challenges the teachers faced were adapted for their leadership projects. Some examples include the extensive adoption of the use of technology-based materials to support students and teachers, adopting the district goals to support multilingual learners and creating more community-based projects.

*Challenges*

One of the biggest challenges for the CA Wipro SEF Team was the lack of time we actually had to provide professional learning for this cohort. Cohort 3 fellows were recruited during the height of the pandemic. Their entire first year of the program was completely virtual and their second year only started with in-person sessions half-way through the 2021-2022 school year. With limited in-person sessions, there were many professional learning experiences around science teaching and learning that were either condensed or skipped altogether. Although the CA Leadership Team did the best they could under the circumstances, there was always a feeling that the team wished they could have done more.

## Wipro by the Numbers

| Name of District | Total student population | % High needs students* | % High needs students* | Number of fellows from this district |
|---|---|---|---|---|

| | | **(Free and reduced lunch)** | **(Multilingual learners)** | **Cohort 1,2 and 3** |
|---|---|---|---|---|
| Campbell Unified | 6230 | 37.3 | 19 | 9 |
| Moreland | 4043 | 30.8 | 69.5 | 12 |
| Mountain View-Whisman | 4522 | 24.4 | 58.3 | 11 |
| San Jose Unified | 26,901 | 37.5 | 51.7 | 13 |
| San Francisco Unified | 55,592 | 50.4 | 56.9 | 16 |

***** % of students on free and reduced lunch and % of multilingual learners are for the year 2020-202

**District coordinators impacted by Wipro SEF**

The CA Wipro SEF Program has experienced very little turnover in District Coordinators since the onset of the program. The following District Coordinators have been involved in the program:

Campbell Union High School District

- Emily Hanson

Moreland School District

- Destiny Ortega

Mountain View Whisman School District

- Ranen Bhattacharya

San Jose Unified School District

- Brad Craycroft (1st year of the Wipro SEF Program only)
- Diane Aronson (current)

San Francisco Unified School District

- Eric Lewis

## **Highlights** from the four years of Wipro SEF funding

The following areas are the highlights of the CA Wipro SEF Program from the first four years of Wipro SEF funding.

*Sustained high-quality professional learning*

Over the course of the first four years of funding, the CA Wipro Leadership Team has been thoughtful and intentional about the professional learning experiences offered to fellows throughout their time in the program. All three cohorts were interrupted by Covid-19 in some way and the CA Wipro Team were responsive to fellows' needs. Professional learning continued to focus on high-quality science teaching and learning, educational equity, and teacher leadership. The CA Wipro Team created clear learning arcs for each Cohort over the course of the two years they had in the program. It's important to note that each Cohort had slightly different learning trajectories as the needs of the fellows were different due to the changing contexts of schools and districts these past four years.

*Strong Relationships*

Building strong relationships was a primary focus for the CA Wipro Leadership Team. Strong relationships were developed between coaches and fellows, between fellows, and between the IHE and the school districts. The CA Wipro Team intentionally planned opportunities for these relationships to be developed during professional learning sessions as well as in their V-CCLS and H-CCLS work. These relationships were key to supporting each other through the Covid-19 pandemic.

*Clear learning arc for teacher leadership development*

The CA Wipro Team had a clear learning arc for teacher leadership that had the goal of developing teachers' leadership identities and broadening their perspectives on their school and district contexts. The learning arc included the following:

- Examining definitions of teacher leadership from research articles
- Learning how to distinguish between adaptive and technical challenges
- Understanding the affordances and challenges of formal and informal authority and what it means to self-authorize
- Learning about different leadership practices from various scholars

Having a clear idea of what we wanted fellows to learn and providing opportunities for them to reflect on their own leadership capacity made this part of their Wipro SEF experience particularly strong. The evidence for this can be found in their portfolio reflections. Here is an example reflection from one of the Cohort 3 fellows:

*I have learned a lot about myself in the past two years in the Wipro SEF program. I was hesitant to join the program because I have never seen myself as a leader. I thought I was not experienced enough to join because I had only been a teacher for a few years. I am introverted and do not enjoy speaking in front of groups. I have always been more of a listener, especially with people I do not know. However, in the last two years, I have really tried to step out of my comfort zone. I have taken on several leadership positions at my school and within the district as a whole. I am a presenter on the ELD committee for all of first grade. This requires presenting to all the first-grade teachers in the Moreland District, many of whom have a lot more years of experience teaching than I do. I thought that being a more novice teacher, I should leave the leadership roles to veterans and people who know more about teaching than I do. However, I have realized that I do know a lot and my ideas are valuable. I have grown so much as an educator in the last five years from being in the classroom with students every day. Wipro helped me realize that anyone can be a leader and everyone's ideas are valuable and can contribute something to the group.*

*I am trying to take on more leadership roles in my school and at the district level. I want to continue collaborating with others in the future and not just work alone. I hope to find a way to get and give feedback so that we can all enhance our teaching practice. I also want to embrace change, which is something that can be difficult for me, but is necessary. I am most likely moving schools next year which will bring an opportunity for new challenges and growth. In the future, I want to try new grade levels and maybe a different district. I do not want to become complacent or stuck in my ways so much that I won't try new things. I want to keep learning and applying the best teaching practices for the group of students that is in my room that year. To me, that means not doing the same activities year after year. There are always ways to modify and enhance a lesson. I want to stay up to date on the best teaching practices as well as social emotional supports for my students. I hope to always have a classroom that is a safe place for people no matter their race, gender, beliefs, orientation, etc. I want to continue creating a culturally responsive classroom and hope that every student feels they belong. I want to support English learners in their language development without taking away from their other culture and traditions. Most of all, I want my students to love learning and feel successful and happy in the ever-changing school environment.*

**Site view Teacher Leadership**

The CA Wipro SEF has a clear stance on teacher leadership. Our site believes that leadership is practice that can be learned and developed. Leadership is intentional and is not dependent on a formal role or position. Teachers can practice leadership by noticing what is happening in their systems and with the people interacting in those systems, and then making intentional choices about how to respond or act in ways that move the system

towards intended goals or outcomes. CA Wipro SEF Fellows learn about different definitions of teacher leadership in educational research, affordances, and challenges of different types of authority, concepts in adult development and group relations, and various ways to practice leadership.

**Trends in teachers' understanding of Teacher Leadership**

Most teachers' initial understanding of a "teacher leader" was that power and knowledge rested on a particular individual because of some kind of formal role or named position. Many also thought that teacher leadership was about having characteristics such as "confidence" or skills such as "being organized." They also thought that leadership was about having particular responsibilities such as leading professional development or being in charge of a committee. Upon completion of the Wipro Science Education Fellowship, their understanding of teacher leadership changed considerably. They now understand that teacher leadership is a practice that is not dependent on a formal role. Many fellows describe their understanding that teachers leaders are uniquely positioned to influence teaching and learning in their settings. Fellows see that they have a great amount of power to influence others by sharing resources, modeling and refining NGSS aligned instructional practice, initiating conversations, and creating collaborative learning spaces for other science teachers and that these actions contributed to change beyond the classroom.

Here are a few reflections from Cohort 3 Fellows:

"A leading teacher is a collaborative teacher that leads from many spheres of influence including their classroom, school, community, or school district. They inspire other teachers by leading from the classroom, constantly reflecting, and working to improve their craft, modeling & coaching, and facilitating professional learning communities in their schools. A leading teacher builds relationships with colleagues and works to create an improved and cohesive school environment in support of student learning." (Cohort 3 Fellow)

"Underlying all of this is the notion that being a 'leader' is a static attribute - you have it or you do not. And, clearly, there is an assumption that being a leader is intrinsically better than not being a leader. For instance, no one is gratified to hear that their child is seen as a follower. I have come back to this moment over and over when leadership is discussed. Based on my learning from the WIPRO SEF, other research, and personal experience, my working definition is that anyone who is able to nudge the group in a direction is a leader in that moment. We all exhibit leadership when we take the time to make our knowledge and insights known instead of keeping them private." (Cohort 3 Fellow)

**Fellows Reflections over the course of the 4 years of funding**

“As I reflect on myself as an adult learner, I learned that I am socially motivated and other people's perspectives motivate and inspire me. I also learned that leadership theory is important because it minimizes the anxiety of confronting challenges. ” (Cohort 3 Fellow)

“I think it is important to work with other people to accomplish goals and improve teaching. It's hard to effect change by yourself! Educational reform is important to reach underserved populations, and that can only happen with the whole community coming up with ideas and solutions. We can get there with people advocating for improvements, and I want to be one of those people.” (Cohort 2 Fellow)

“I also realize that I was very well supported during my journey as a Wipro Fellow. Given the demands of work, family and the pandemic, I would have given up on the Fellowship if not for the gentle, constant support from my mentor. This makes me even more determined to offer support to my students, be the source of consistency and support them as they wind their way towards success”. (Cohort 1 Fellow)

"I feel better equipped to take on leadership roles, not just within my grade level, but throughout my school and district.” (Cohort 2 Fellow)

“It is my hope that having a better integration of curriculum, hands-on learning and opportunities to explore their thinking will empower them to become better students and foster a curiosity and love for science like the one I have”. (Cohort 3 Fellow)

**Site Leader Reflection**

The opportunity to implement the Wipro SEF Program has been extremely rewarding for the CA Wipro site leadership. The CA Team has been able to become part of a larger community across the country with the same goal of improving teaching and learning in science and developing the capacity of teacher leaders to make positive change in their school districts. The CA Team has continued to learn, refine, and improve upon the Wipro SEF Program for each cohort, and particularly during and after the Covid-19 pandemic. Through the Wipro SEF Program, the CA Team has also developed strong relationships with the five partner school districts, creating continuous opportunities to work together towards common goals.

## Summary of publications, articles, conferences, presentations, dissertations, or awards that related to CA Wipro funding

- Moriarty, T.W., Menon, P.K., Cannon, B.C., and Carlson, J. (2023) *"Science Teacher Leadership: How practice gives rise to empowerment, agency, and equitable opportunities in and beyond the classroom."* Paper submitted to the annual meeting of NARST.
- Carlson, J., Cannon, B.C., Moriarty, T.W., and Menon, P.K., (2022), *"Supporting Teacher Leadership Development: What we learned about uptake?"* Paper presented at the related paper set presentation at the annual meeting of NARST (Presentation Slides)
- Pimentel, D.R., Moriarty, T.W., & Carlson, J. (2021, April). *Supporting science instruction with vertical teams: Teachers' perceptions of mixed grade-band professional learning communities* [Paper presentation]. Paper presented at the annual meeting of NARST. Virtual Conference.
- DeGraaf, J.(2022, April). *"A cross curricular approach using CER"*. Presentation at the annual all school staff meeting in Gabriela Mistral Elementary Mountain View, CA.
- Vance, S. (2022, March). *"Differentiated thinking maps for English Learners".* Presentation at the Moreland district ELD meeting in San Jose, CA.
- CSTA 2019 Conference Presentation, "Equity & NGSS: 5 Equity Principles for Instructional Practice**."**
- CSTA 2019 Conference Presentation, "Leveraging Teacher Communities to Improve NGSS Classroom Practice."

## Phase II- Innovation

### Summary of the new project

**Wipro Fellowship Program**

The CA site will recruit two more cohorts of science teachers from the existing five partner districts to participate in the two-year Wipro SEF Program. Strong relationships have been established between the CSET and the districts and there are many science teachers within each of these districts who would benefit from the continued partnership. The goals and pillars of the program will remain fundamentally the same as the current program. We hope to continue to build the capacity of science teacher leaders within and across districts to further excellent science teaching and learning. The Bay Area is densely populated and

working with the same districts offers the opportunity to more strategically strengthen science leadership in this area by going deeper in each of the districts.

**Wipro District Teams & School Leaders Program**
The CA site will invest in district teams from the five partner districts consisting of District Science Coordinators and Wipro Fellows. We propose to work more closely with each district team to develop their collective capacity to advance effective science teaching and learning in their districts that highlights the NGSS and reduces the persistent inequities that pervade science education. This will not only require working with District Coordinators and Fellows but will also require more direct involvement from principals who have remained mostly in the periphery of the Wipro SEF Program. Thus, the CA site will develop a program specifically for school leaders with the aim of creating strong district teams that can make transformational changes at the site and district level.

**Wipro District Coordinator Professional Learning**
The CA site will support the conceptualization and implementation of continuous professional learning experiences for District Science Coordinators from all Wipro sites. For this work, the CA Team will work in collaboration with UMASS Boston to implement leadership conferences and virtual sessions over the course of three years.

**Upcoming events for fall. (September to December)**

| Date | Name of Event | Focus of Event |
|---|---|---|
| September 8 , 2022 | Induction of Cohort 4 Fellows | Celebration of new Wipro SEF Fellows |
| September 22, 2022 | Virtual Professional Learning Session for Cohort 4 Fellows (1.5 hours) | Community Building<br>Introduction to Year 1 work |
| September 16, 2022 | District Coordinator /IHE Meeting | Plan for the year ahead, particularly for the district work |
| October 8, 2022 | In-Person Professional Learning Session for Cohort 4 Fellows (all day) | Science teaching and learning<br>Establishing V-CCLS group work |
| October 10-28 | Recruitment of School Site Leaders for the Wipro | Outreach and recruitment materials |

| | | |
|---|---|---|
| | School Leaders Program (new) | |
| October 28-30 | District Coordinator Leadership Conference in Dallas, TX | DC learning and planning for the year |
| Week of November 7, 2022 (date TBD) | Launch of School Leaders Program | First in-person session |
| November 17, 2022 | Virtual Professional Learning Session for Cohort 4 Fellows (1.5 hours) | Professional learning & follow-up of V-CCLS work so far |
| December 10, 2022 | In-Person Professional Learning Session for Cohort 4 Fellows (all day) | TBD |

## FLORIDA- UNIVERSITY OF SOUTH FLORIDA

### Introduction

### Cohort 3 GPS progress

Our Cohort 3 Fellows completed their GPS projects in June. They presented their results at a poster session at the STEM Academy and TB Wipro SEF Celebration on June 3. All Fellows submitted their portfolios and feedback was provided to them from the site leadership by the end of June.
Four of our Fellows (3 from Cohort 3 and 1 from Cohort 1) joined David Rosengrant in Chicago for NSTA 2022, a nationwide conference. There were four presentations summarizing their GPS work to the attendees:

- Promoting Equity for Girls Through Purposeful STEM Clubs
  Nicole Caltabellotta (Cohort 3) and David Rosengrant
- Changing the Mindset: How Labels for Science Courses Can Affect the Academic Achievement of High School Students
  Ileana Bermudez-Luna (Cohort 3)
- Speed Sharing: STEM and STEAM: Don't Reinvent the "STEM Lesson" Wheel
  Creating meaningful lessons takes time. Finding helpful resources shouldn't.
  Jessica Strauss (Cohort 1) and David Rosengrant
- Speed Sharing: Building Equity in the Science Classroom
  Kellie Delgado (Cohort 3) and David Rosengrant

### Cohort 3 Portfolios

Cohort 3 portfolios have been successfully submitted.
https://www.dropbox.com/home/04%20-%20GPS/Cohort%203/Cohort%203%20Portfolios/Portfolio

### Portfolio Feedback

Each fellow has emailed their GPS portfolio to the USF leadership. Based on the rubric, site leaders assessed each GPS portfolio and provided feedback. At first, mentors reviewed their

**Fellow's Name - Rubric for GPS Project**

| Topic | Not Met (0) | Partially Met (1) | Met (2) | Points | Comments |
|---|---|---|---|---|---|
| Table of Contents | Not present | | present | | |
| Introductory Statement | Overview does not address key components of portfolio or expectations for reader. | Overview addresses either<br>1. key components of portfolio or<br>2. expectations of reader. | Overview addresses both points in previous column. | | |

assigned fellow's portfolios, then a second reviewer looked into those again. Both goal 1 and 2 were reviewed separately in their portfolio. Leadership contacted fellows via email and attached a portfolio feedback document to them. Here is a snapshot of the portfolio rubric.

**Selected Portfolios**

Lora Darby:

Lora has also provided an excellent description and overview of her project. It was easy to follow and provided all required artifacts and descriptions of her work. Both have very nice presentation of the portfolio.

https://www.dropbox.com/scl/fi/ovm9blmdkqmsvm6sbr2i9/Lora-Darby-How-Well-Does-My-Garden-Grow.docx?dl=0&rlkey=1roodpuxs5llesyfuaoeg40c6

Andrea Blomeley Steen**:**

In Andrea's portfolio, the Sway was beautiful to move through and made the alignment of the goal, artifacts, and description easy to follow. Her why is authentic and relevant to our current times. She has the transparency in what was doable this year and what she plans to tackle in the year ahead.

https://www.dropbox.com/scl/fi/2uqzxadwt69rh15dkfevw/Portfolio.docx?dl=0&rlkey=rv78r9874gr5s07crewge8n01

## Reflections on the End of the Year Conference

Many reflections of our end of the year conference (celebration) are in the June quarterly report. The following is from that report with some edits:

- GPS Presentations: Everything went great! By having the conference in conjunction with the STEM Academy the Fellows were able to present their work to a larger audience. Photos and the program for the STEM Academy are in Trello for the June 2022 report.
- Invited Guests- DSC's, Principals, etc. There were more administrators than in the past. This was accomplished through personal invitations to the principals of all the Fellows' schools, district administrators recommended by DSCs, and other administrators recommended by the Fellows. In addition, two associate deans and the department chair from the College of Education attended.

- Conference logistics: As noted above it was great having it with STEM Academy. This provided an opportunity for non-Wipro teachers to attend the poster session. The brochure was a simple agenda with list of cohort 2 and 3 Fellows. That seemed sufficient.
- Other – Representatives from the local Wipro corporation were invited. A representative was unable to attend in person but sent comments that were read at the conference.

### Yearly Reflection from the Tampa Team

One of the best things about this past year was the fact that we were able to pivot back into face-to-face instruction. The challenge though was that we kept getting pushed back as to when that would happen. It seemed that every meeting presented a challenge. For example, in October we were going to work with the St. Petersburg Science Festival and do a ceremony on stage for our fellows, but the festival went virtual for an additional year. In December we were going to try and do live but the numbers spiked up again. We were able to get live in the end of the spring semester by meeting in the Florida Aquarium in Tampa. Though we were live, we did have some slight resistance from a few fellows as they became comfortable with online formats. However, once we were in person it was a great time, and they were able to interact together like they had known one another for years.

Then in the end of the year, we had our largest success which was the end of the year GPS project presentations. We were to combine this with Hillsborough County School District STEM event. Not only did we have a session specifically for the GPS posters and our fellows, but several fellows also presented in other sessions throughout the three days. This partnership was very successful because it allowed us to increase the impact that Wipro could have throughout the district. In the future we will be revisiting this partnership due to the success this year.

### Other Activities

The culminating event for our third cohort of fellows was the GPS presentation as described in the previous report. We did have some fellows (as previously mentioned) present at national conferences during this time frame. The bulk of our work during this quarter was revising and resubmitting the Phase 2 application.

Though not directly related to Wipro but it happened as a result of Wipro, we are starting to have some of our DSC's be adjunct faculty in our science courses at USF. This would probably not have happened had it not been for this project.

## Wipro SEF by the Numbers

### Over the course of the initial 4 years of Wipro funding:

| Name of District | Total student population | % High needs students* | Number of fellows from this district |
|---|---|---|---|
| Hillsborough | 222,664 | 57 | 30 |
| Pasco | 81,349 | 51 | 15 |
| Pinellas | 94,947 | 63 | 15 |

*This is the percentage free or reduced lunch. Data from FLDOE.

### District coordinators have been impacted by Wipro SEF

Two from Hillsborough and one each from Pasco and Pinellas.

### Highlights from the four years of Wipro SEF funding at USF

The coming together of the Fellows in our monthly meetings, induction ceremonies, and end of the year conferences was a highlight for the site leadership. This is when we were able to interact with the Fellows and the DSCs most closely and to truly see how the Fellows bonded and worked together across districts and across levels. This project truly empowered them to be teacher leaders, both in formal and informal leadership positions. All were able to make presentations to other teachers about their GPS projects and what they learned in the CCLS, and many of them presented nationally for the first time which they may never have had done if it were not the Wipro SEF. In addition, Fellows presented at the annual STEM Academy hosted by Hillsborough County. Another highlight was the way in which leadership from USF and the three districts bonded as a team. We expect much to come from this in future collaborations.

As a result of going through the Wipro program, the Fellows boosted their self-confidence in becoming stronger teacher leaders. For example, fellows from cohorts 1-3 have joined teams to strengthen the STEM programs within Pinellas County by being part of STEM Focus Groups and starting various STEM clubs at their schools. In addition, many of the Fellows have been planning and facilitating professional development sessions for other teachers at district-wide science trainings, such as Argument Driven Inquiry Sessions, and SIM Content Enhancement Routines. Lastly, some of the Fellows have been more involved with equity initiatives within the districts.

Our site was privileged to have Pam Pelletier as a partner and as an observer of what we accomplished. She noted several trends. First, she told us she saw the DSCs as active, committed, and powerful leaders of the program, who worked well with us as we collaborated to lead the site. This provided many opportunities for leadership growth among the DSCs, as they shared in leading the site and developed their toolkit and skillset. She told us that she saw the DSCs as consummate professionals, which showed in every aspect of their work with us and with the Fellows.

Second, Pam noted that we leveraged the fellows in every session to help them to develop their knowledge, skill, and leadership abilities by offering opportunities to share and provide feedback and support to their colleagues. It showed them that they had something to offer to others, even at the outset of the program, and they certainly grew in their abilities as teacher leaders.
A third trend that Pam saw was that of us having Fellows from previous cohorts share their experiences during in their CCLS groups, the GPS process, and their project accomplishments. They shared their knowledge about specific topics and facilitated sessions. This honored them and showed them in a wonderful light to their colleagues, emphasizing their development as teacher leaders.

### USF and Teacher Leadership

Leadership is advocating for your profession and those in it. You are working to elevate teachers and what it means to teach. There is no single way to do this, but rather it is a multi-faceted approach. Without it, we cannot grow.

For example, in Pinellas County Fellows can become site-based leaders by engaging in various available programs such as PLC leader, Data Champion, or Restorative Practices. There are also leadership opportunities in the district beginning with Aspiring Leaders and Leadership U to begin working toward administrative leadership.

**In the GPS portfolios, teachers are asked to reflect on their growth as a Teacher Leader. What are some of the trends USF saw in teachers' understanding of Teacher Leadership?**
An important trend is that the Fellows really feel empowered. We believe it is also because they are doing something that they want to do and have an interest in, thus they are creating it to make a difference that is meaningful to them and others.

In Pinellas County a common trend that Fawnia Schultz noticed is that many of the Fellows recognized that they possess the skills required to be a teacher leader and Wipro has

increased their confidence to take on more leadership roles at their school and within the district. Many recognized the need for more teacher leaders in terms of STEM programs and seemed to be the area of interest amongst many fellows. Overall, the teachers recognized that to be a teacher leader does not mean they have to become administrative leaders. Below are some quotes from GPS portfolios:

> "Learning to give warm and cool feedback has helped me with my own teaching but will also be a great skill to have when I become an instructional coach. The program has also helped prepare me for conducting professional development. I now feel more confident in attempting to lead professional development for other teachers."
>
> "[It] built my confidence in my ability to be a teacher leader in the areas of STEM and science" "confidence to apply for STEM Club coordinator"
>
> "While I may never be a district-wide leader, like a science coach or administrator, my work during the Wipro Fellowship has shown me that anyone can be a teacher leader. I plan to continue growing as a leader at my school by sharing my work with other teachers on my staff and inviting them to join me as I continue to learn how to be a better STEM teacher. "
>
> "I will continue to work with our Pinellas County STEM curriculum writing team. I have teamed up with a Wipro Cohort I colleague, Sarah Swoch as we research activities and funding needed for STEM environmental camps next summer. We are committed to preparing students with STEM skills needed in middle school so they can be ready for success in STEM programs in high school."
>
> "My confidence as a teacher was refreshed, boosted, and reassured. I evolved to be more outspoken, teachable, and open minded as a humbly rising teacher leader."
>
> "They have also shown me that I have experience and ideas that are worth sharing! Going forward, I hope to continue that process by actively seeking opportunities to collaborate with educators outside of my school. As a leader in my school, I hope that this will encourage other teachers around me to do the same. One of the things that I am learning is confidence. However, through this process I have rediscovered that being an effective educator and leader necessitates active listening and a willingness to learn and collaborate - two things that I know that I do possess. Relearning that these traits are what make great leaders has helped me have the confidence to grow into that role more fully."

## GPS themes

- Nature: Enrichment with plant focus, plants and gardens, growing plants
- Capacity: 21stcentury skills and technology, science leadership, sharing of resources and grant information, equity, and mentoring
- Equity: Social emotional mentorship; feedback; access through equity; involving, informing, and connecting family and school; SEL framed by teacher feedback to students
- STEM: Science content, standard
- Instructional Methods: Asking scientific questions, modeling in lesson delivery, project-based lesson, implementing technology tools, inquiry-based activities,
- Discourse/Argumentation: Fostering creative discussion in a science classroom, learning science through argumentation and discussion.

## Fellows Reflections: Over the course of the 4 years of funding, fellows have been asked to reflect on their experience

Omari Baines (Cohort 1) "The greatest part about Wipro so far is getting feedback from fellows in my group after viewing my lesson. It's great to have someone other than an administrator giving me feedback. I've also enjoyed utilizing practices and strategies from other teachers and implementing them in my own classroom. Wipro has allowed me to grow as a teacher and develop a different perspective in the education world in ways I couldn't imagine.

Karen Bulino (Cohort 2) "Through the V-CCLS group, I found myself immersed in content through a completely new perspective. Observing the vertical articulation of our standard in three elementary school classrooms, my middle school classroom, and finally in the high school classroom offered me insight into what our kids need to be successful. For the first time I saw these standards come to life in the classroom, rather than connected standards on a task card."

Laurie Vaughn-Grantges (Cohort 3) "Even through this COVID pandemic, the USF Wipro team organized and developed a long-lasting program of professional development unlike any I have ever experienced. I am truly thankful to have been chosen for this personal and professional journey, while having support of the most inspiring and supportive colleagues from Pinellas, Hillsborough, and Pasco counties. We have much to learn from each other! As a result of my work with Wipro for two consecutive summers, I presented at the STEM Academy at Middleton High School."

## Site Leader Reflection: How has Wipro SEF funding impacted your site's leadership?

One thing that stands out on the leadership side is how much closer the DSCs have become with one another as well as how much closer the USF leadership team have become with the DSCs. The DSCs have been able to have much richer conversations with what is happening in their particular districts and learning about what is happening in the other districts. This leads to a stronger science education program as a whole across the district when the leadership becomes more knowledgeable and can take best practices and implement them in their own district. For example, Fawnia Schultz told us

> "Personally, Wipro has had an impact on how I view myself as a leader within my district. Prior to the start of the Wipro project, I did not see myself as a leader within my district. The work as a district coordinator, attending the national Wipro Leadership meetings, and DSC conferences has changed my viewpoint. I now understand the various different ways I can be a leader within a giant educational system."

Pam Pelletier also provided some examples of what she observed of how our collaboration with the DSCs impacted their leadership. For example, in 2019 she wrote

> "It seems that these 5 (Fawnia, Larry, Lesley, Allan, and Karl) are working together as a broader team and collaborating to utilize the knowledge and skills of the larger group. This is a powerful way to deepen their professional relationships and the quality of what the fellows experience. The partnership of university faculty and district leaders will make this great professional development even better for fellows! They are scheduling time between each PD session to plan together (face-to-face or virtually). What a wonderful way for Allan and Karl to show confidence and respect for their coordinators!"

In 2020, she wrote "Planning ahead with the DSCs is wonderfully important to building this team. Having them contribute to the program in meaningful ways is critical to their development and stature in this group. Their teachers see them in a yet another leadership context with the university faculty." As a result of this she noted how the growth in Fawnia's leadership was evidenced in how she facilitated a PD session on equity. In the same year she observed "Larry is doing a great session on NGSS and the Science and Engineering Practices."

In 2021 our focus was on teacher leadership. From Pam's perspective this was powerful for teacher learning. She saw the selection of teacher leadership as a year-long topic to be commendable and held promise for the Fellows and DSCs. She wrote that "this can help

develop their leadership interests and capacities by the thoughtful building and layering of information and experiences over time!"
Beyond that, some of our DSCs are taking an active role in our teacher preparation and graduate programs. Larry Plank has been an adjunct instructor for two difference science courses in our graduate degree program. Lesley Kirkley is currently an adjunct instructor for an undergraduate science methods course with us at USF. This provides our students with a rich leader in their courses who has the best sense of science instruction in the classroom as well as providing our DSC leaders with the opportunity to increase the impact in the science classroom.

Wipro SEF has also provided a plethora of opportunities for the leadership to interact with teachers across the districts on various projects. This work has solidified a link with educators that we may not have used as well in the past.

**Summary of publications, articles, conferences, presentations, dissertations, or awards that relate to USF's Wipro funding**

- Jessica Strauss (Cohort 1) was selected by the Space Foundation as one of 39 outstanding educators to join its Teacher Liaison program in 2020.
- Allan Feldman and David Rosengrant, along with two of our DSCs and a number of Fellows from cohort 1 and 2 attended the virtual Missouri conference on October 24th, 2020.
- Kenny Coogan (Cohort 1): Received a $1,200 grant from the National Future Farmers of America to cover the costs of a school bus, organic soil and vegetable seedlings that his students will install at the University of South Florida Botanical Gardens. As part of his GPS he wrote a 20-page book for children about carnivorous plants.
- Jessica Strauss from Cohort 1 has worked with Dr. Rosengrant on an international project through OAS ITEN. The Inter-American Teacher Education Network (ITEN) is an initiative of the Organization of American States (OAS) that works with Ministries of Education or other governmental teacher education institutions of OAS Member States and classroom teachers to advance the teaching profession in the Western hemisphere. Together, Dr. Rosengrant and Jessica is working with teachers through Sam Sharpe College in Jamacia.
- Tampa Bay Wipro SEF had a large presence and was co-hosts at the STEM Academy held in summer 2021.Presentations by Fellows: •Systems Thinking: Teaching in the 21st Century: Teresa Buckman Augmentation in Inquiry-Based Learning: Nicole Holman and Ileana Bermudez-Luna •Claims, and Evidence, and Reasoning Oh My!: Kelleigh Weeks and Laurie Vaughn-Grantges •Spiraling the Standards in the Biology Curriculum: Nicole Holman.

- Tampa Bay Wipro SEF had a large presence and was co-hosts at the STEM Academy held in summer 2022.

Titles of Presentations:
STEM with Grimm and Other Fairy Tales Melissa Triebwasser
May I Take Your Order? Differentiating with Menus Latasha Seay
Social Justice, Equity, and Bias in the Science Classroom Mishell Thomas- King
Discussion and Discourse in the Science Classroom Nicole Holman, Chelsey Swats, Laurie Vaughn- Grantges, & Rosahun Reno
Teaching about COVID-19 in Middle School Science Kathryn Weeks, Laura Von Staden, Robin Hawk, Allan Feldman, & Jawaher Alsultan
Spiraling the Standards Through the Biology Curriculum Nicole Holman
Science and the Socratic Seminar Teresa Buckman
Food Waste to Energy: Using Anaerobic Biodigesters for Authentic STEM Research in the Classroom Rita Ortiz, Elizabeth Vicario, Allan Feldman, & Sarina Ergas

- Ileana Bermudez Luna was part of the panel discussion "How Science and Engineering Practices Enhance STEM Teaching and Further Teacher Leadership" sponsored by the STEM Teacher Leadership Network on November 10, 2021.
- Four Fellows, three from Cohort 3 and one from Cohort 1, joined David Rosengrant in Chicago for NSTA 2022. Ileana Bermudez-Luna (cohort 3), Nicole Caltabellotta (cohort 3), Kellie Delgado (cohort 3) and Jessica Strauss (cohort 1) went and presented to NSTA (see titles of presentations above).
- A NARST proposal was submitted in August 2022 by graduate assistant, Sharfun Nancy Islam, Dr. David Rosengrant, Dr. Karl Jung and Dr. Allan Feldman on a research project based on Wipro GPS projects.
- Daina Kelly, one of Allan's doctoral students, is doing her dissertation on the Fellows experiences of doing their GPS projects. She expects to defend late spring 2023.

## Phase II

### A summary of the new project

We are inviting all fellows to participate in Phase 2 to submit an enhancement project that will be used to increase the impact of their work across the district. They will be forming teams which must include an official leader of some type and another teacher previously not affiliated with the project. They will submit for funding for either a 2 year or a 1-year project. As part of the project, they will be required to present both at a Wipro sponsored event as well as within or beyond the community and for the 2-year projects, they will need a national presentation/publication of some type. They will learn how to conduct action

research in addition to how to disseminate their findings. The four main categories are as follows:

- Equity and Social Justice in STEM
- Technology Enhancements
- Advanced Curriculum Development
- Establishment of a new V-CCLS group

**Project Team**

Dr. Rosengrant is PI and will lead the project. Allan Feldman will be acting in a lead consultant capacity. Larry Plank, Fawnia Schultz, and Lesley Kirkley will be returning as DSC's and mentors. Pam Pelletier will be providing additional guidance and our graduate student Sharfun Nancy will return for one year.

**Upcoming events for fall. (September to December)**

| Date | Name of Event | Focus of Event |
|---|---|---|
| 9-17-2022 | Project Webinar | Explain Phase 2 and answer their questions. |
| 10-21-22 | Phase 2 applications due | N.A. |
| 11-5-22 | Virtual Meeting | We will meet with the different projects and discuss their feasibility in case it needs to be resubmitted. |
| 12-3-2022 | Project Meeting | This will be our first meeting to discuss the project with those selected to receive funding. |

## MASSACHUSETTS- UNIVERSITY OF MASSACHUSETTS BOSTON

### Wipro By the Numbers

### Initial 4 Years of Wipro funding

| Name of District | Total student population | % High needs students* | Number of fellows from this district |
|---|---|---|---|
| **Boston** | **51433** | **76.2** | **19** |
| **Braintree** | **5842** | **39.3** | **9** |
| **Cambridge** | **7052** | **47.6** | **8** |
| **Malden** | **6564** | **67.8** | **11** |
| **Pembroke** | **2797** | **47.6** | **11** |
| | | | **58 total** |

***Each state reports this differently, please indicate how your state reports this information. For example: % of students on free and reduced lunch**

**District coordinators who have been impacted by Wipro SEF=9**

| | |
|---|---|
| **Boston** | **Pam Pelletier** |
| **Braintree** | **Dianne Rees** |
| **Braintree** | **Betsy Clifford** |
| **Cambridge** | **Lisa Scolaro** |
| **Cambridge** | **Janet MacNeil** |
| **Malden** | **Diane Perito** |
| **Malden** | **Doug Dias** |
| **Pembroke** | **Joan La Croix** |
| **Pembroke** | **Jonathan Shapiro** |

### Phase II Funding for Individual Projects

Beginning in the fall of 2016, the UMass site began funding Phase II projects. The projects were varied in nature and included a book of science stories, nature drawings, a computer science project for elementary students and others. Many of the phase II projects were funded for multiple years from 2016 to 2020.

| Name of District | Total student population | % High needs students* | Number of fellows from this district |
|---|---|---|---|
| **Boston** | **51433** | **76.2** | **6** |
| **Braintree** | **5842** | **39.3** | **2** |
| **Cambridge** | **7052** | **47.6** | **3** |
| **Malden** | **6564** | **67.8** | **4** |
| **Pembroke** | **2797** | **47.6** | **4** |
| | | | **19** |

***Each state reports this differently, please indicate how your state reports this information. For example: % of students on free and reduced lunch**

**Phase II District Funding**

In addition to individual fellows receiving Phase II funding, Braintree Public Schools received phase II district funding. This project involved previous Wipro SEF fellows as well as new teachers who were not part of Wipro SEF. The Braintree project brought aspects of the program such as Vertical Collaborative Coaching and Learning in Science to teachers throughout the district.

**Highlights from the Phase II Wipro SEF funding**

Perhaps the biggest highlight of Phase II funding was to see how Fellows became leaders in their own schools and districts. From their initial funding as part of the Wipro SEF program to the phase II program their confidence in their ideas and their ability to carry out a complex project increased. Many of the phase II projects grew out of the fellows GPS projects and having more time enabled the fellows to make their projects a substantial part of the teaching and learning practices in their schools.

## Phase III- Innovation

**A summary of the new project**

The UMass Boston innovation plan for the next round of funding includes working with the original five districts as well as beginning Wipro SEF activities with three new districts.

Each of the original five districts have set up a meeting with the Fellows, the District Science Coordinator and Arthur Eisenkraft to discuss district initiatives. The purpose of these meetings is to help define "district transformation" for each district. This requires identifying the gap between the present district situation and the future vision of the district. This leads to a recognition that there are specific changes that the district may

want to implement in science. In turn, we identify strategies that are within the capabilities of the Fellows (i.e. teacher leaders) and the coordinator to implement over the next few years. The districts will propose a plan and the support (instructional and financial) that are needed. Once the Fellows and coordinator and Arthur agree on the plan, the coordinator and Fellows introduce the plan to the administrators (principals and assistant superintendents) for their input and approval. Once the administration gives the go ahead, the district formally applies for a Wipro grant. When the grant is approved, outreach in the form of newspaper articles and school board presentations will take place to celebrate the success of the district in having a plan and grant approved.

UMass Boston will also try to generate interest in the foundation Wipro SEF program of 4 years in three high-needs districts in the Boston area. Unlike the original sites, these new sites and Fellows will not be receiving the generous stipends of the past and will have to come up with other ways to incentivize participation in the program.

## MISSOURI- UNIVERSITY OF MISSOURI

### Introduction

### Cohort 3 GPS progress

Cohort 3 fellows had completed their GPS work in the classroom by June. After June they worked on completing their portfolios (set up as Wix websites). Those who had not made PD presentations in their districts during the academic year completed them either during the summer or during scheduled PD days prior to the fall semester.

### Cohort 3 Portfolios

Out of 15 Cohort 3 fellows, 11 portfolios have been completed. Eight have been published for public perusal, and three teachers wish to keep their Wix sites unpublished. Four teachers are still in the process of completing their portfolios. Here is the list of published (website) Wix portfolios:

https://hess349.wixsite.com/website-3
https://keads61.wixsite.com/website-2
https://brandyalbrecht.wixsite.com/website-17
https://esnellin2.wixsite.com/website-10
https://wiprofolio.wixsite.com/website-6
https://thelton5.wixsite.com/website-14
https://nataliedixon94.wixsite.com/website-14
https://ngolden54.wixsite.com/website-5

### Portfolio Feedback

Feedback on portfolios has been ongoing process since fellows have been adding to their Wix website portfolios over the year. Their advisors and MU staff have been providing feedback during advising sessions and during other times. Upon completion, the same process of oral feedback has been used.

### Highlighted Portfolios

The first portfolio, built by Josie Hess, is an excellent example of the power of reflection. Josie was very honest and explored all aspects of the program as well as how it was affecting her teaching, students, and sense of self as a teacher-leader. Her perceptions and awareness come out not only in her reflections, but in her quarterly reports when she includes 'wows' such as "It has been great seeing my students get into what they're reading

and finish a book from beginning to end. I have enjoyed seeing students make the connections between ELA and science even without me explicitly pointing it out after they heard me explicitly teaching this for a while." This quotation conveys not only her commitment to her students, but her excitement at the progress made in her GPS goal. In the same report, she is candid in her 'yikes': "It has been incredibly difficult to manage time this year" which reflects her ability to see her project in an objective light.

https://hess349.wixsite.com/website-3

The second portfolio was chosen because of Natalie Dixon's use of visuals and the narration she uses to tell the story of her GPS journey. Natalie states on her front page: "You will see my district and personal goal and how they progressed through the school year. You will see the steps I plan to use moving forward into the next school year. Finally, you will see the Professional Development that I provided to my district about my learning along with my reflection upon this entire process." Natalie is present on her site in a very personal way, yet she has documented her GPS project from start to finish very professionally, using the medium of a website to the fullest. The visuals really drive her commitment to her students and project home.

https://nataliedixon94.wixsite.com/website-14

### Reflections on the End of the Year Conference

The end of the year conference was an excellent way to convene teachers, staff, and administrators together in person and celebrate the work of teachers while sharing learning across projects. While MU staff were also advisors to 3 or 4 fellows each, it was valuable to learn in more detail what all fellows were doing. Overall, we felt that all fellows had put a lot of thought and effort into their GPS work, and also a lot of work into their presentations per se.

Several projects were clearly trying to make an impact on the district and are either joining Cohort 1 and Cohort 2 GPS projects or putting down a seed for district transformation (e.g., projects that focused on technology for the classroom by Erin Snelling and Tyler Helton, standards-based grading by Rex Beltz, Chelsea Jacobs, Jennifer Bacon, Place-based learning by Robin Bishop, Katy Canote and Natalie Dixon). Others were cutting new ground individually, and again could form the basis for expansion within the district, e.g., Cooking with Science by Christie Zoeller, Passion Projects by Brandy Albrecht, Making Time to Write by Melissa Baker, Brain Bins by Kayla Eads, Brain Breaks by Nicole Golden, Integrating Science and ELA by Josie Hess, and Argumentation by Melanie Manning. (Abstracts were included in the June 2022 report). Thinking about these projects in the light of our September IHE meeting discussions, it is evident that we should find a method by which to track any expansion of GPS projects that fellows might undertake in the

upcoming academic year and thus collect data on the impact of the Wipro project on the districts.

Improvements: the poster session at the end of the day is hard to focus on. That's not a problem in that it serves as a way for informal chatting to happen, relaxing before the last session, and allows people to zone in on the projects that most interest them, but it also might be interesting to try as one of the first sessions when people are less tired. The information-sharing was helped by the five-minute presentations about teachers' GPS work.

### Yearly Reflection September 2021 to September 2022

The biggest success has been to watch the growth of the Cohort 3 fellows. They started the year with some trepidation about working on an individual project after having worked collaboratively the previous year. In the first couple of bimonthly meetings, we encouraged them to continue discussing their projects with either a buddy or with a group of fellows who undertaking similar projects (e.g., standards-based grading). Soon they were making enough progress on the projects that the discussion time morphed into a time to share successful practices. By the spring semester it was evident that all fellows had settled into their individual projects and some of them were beginning to draw in non-Wipro teachers into their projects. This growth in leadership was evident among nearly all fellows. To summarize, biggest successes have been growth in leadership, expansion of collaboration, confidence about independent work.

The challenge this year has been similar to the 2020–21 school year, namely, dealing with continued covid-induced isolation among fellows and faculty, and difficulty of forging close relationships with fellows.

### Other Activities

Most of our work in this quarter related to recruiting fellows for the next phase of the Wipro project, or to planning for it with the math and science district coordinators from Columbia Public Schools. They helped us set up criteria to use for collaboration among math and science teachers and helped plan the first (VCCLS) semester.

### Wipro SEF by the Numbers

**Over the course of the initial 4 years of Wipro funding:**

| Name of District | Total student population (K-12) | % high needs students* | Number of fellows from this district |
|---|---|---|---|
| Boonville R-1 | 1509 | 79.2 | 9 |
| Columbia Public Schools | 17,705 | 45.0 | 14 |
| Community R-VI | 312 | 48.8 | 4 |
| Eldon R-1 | 1804 | 46.7 | 5 |

| | | | |
|---|---|---|---|
| Fulton 58 | 2144 | 38.0 | 6 |
| Hallsville R-IV | 1397 | 21.1 | 7 |
| Jefferson City Public Schools | 8582 | 51.2 | 3 |
| Maries County R-2 | 709 | 81.5 | 4 |

***each state reports this differently, please indicate how your state reports this information. For example: % of students on free and reduced lunch**

**District coordinators impacted by Wipro SEF**

13 DCs have participated in the project. In cohort 1we had two DCs from Hallsville, but only one continued. In other districts we had DCs turnover after serving with the project for a few years – due to retirement (Cheryl Mack), promotion to Superintendent (Ty Crain), and resignation (Erik Logan). Below is a listing of all DCs.

| Name | District | Years |
|---|---|---|
| Cynthia Dwyer | Boonville R-1 School District | 2018-22 |
| Mike Szydlowski | Columbia Public Schools | 2018-22 |
| Cheryl Mack | Community R-VI School District | 2018-21 |
| Jessie Mommens | Community R-VI School District | 2021-22 |
| Steve Henderson | Eldon School District | 2018-22 |
| Ty Crain | Fulton 58 Public Schools | 2019-20 |
| Chris Hubbuch | Fulton 58 Public Schools | 2020-22 |
| Bethany Morris | Hallsville School District | 2018-22 |
| Ty Sides | Hallsville School District | 2018-20 |
| Joseph Lauchstaedt | Jefferson City Public School | 2018-21 |
| Gary Verslues | Jefferson City Public School | 2018-21 |
| Erik Logan | Maries County R-2 School District | 2019-20 |
| Alice Taylor | Maries County R-2 School District | 2020-22 |

## **Highlights from the four years of Wipro SEF funding**

Conferences: the four conferences held in May 2019, 2020, 2021 and 2022 were events that got all our fellows excited and motivated them to put together outstanding presentations. These conferences also served as a vehicle for realizing the national nature of the Wipro program, and allowed fellows from Missouri to meet, appreciate, and borrow from the work of fellows in other sites. The 2019 conference was unique in that it allowed Missouri fellows to meet face-to-face with fellows from elsewhere. A couple of them have forged meaningful friendships with fellows from distant sites.

Within our site, fellows have found conversations and collaborations with fellows from other districts to be the highlight of their participation in the Wipro project. Rural teachers, who might very well be the entire science departments in their schools, often feel starved for discussions with kindred spirits. Teachers always love borrowing ideas from others, and the multi-grade collaborations were a new aspect as compared with other PD programs they have attended.

Several GPS projects at the Missouri site chose to work on place-based learning. Being that the Columbia Public School district (and science coordinator Mike Szydlowski) are major proponents of PBL, the expansion to nearby districts was a bonus for the teachers who found a group of experts to consult, while Columbia in turn benefitted from expansion to other districts.

Districts who participated in this first phase of the Wipro project are appreciative of the continuing grant – it gives them a leg up in transitioning seed ideas to the district level.

Further important learning by fellows:

- Teachers learned how to choose research articles and apply them to their teaching.
- Working under the mentorship of faculty, teachers learned about what students are expected to learn when starting college.
- Teachers developed leadership skills (as further described under question 7
- Teachers increased their confidence in making presentations.

### Missouri's view of Teacher Leadership

Our site introduces fellows to the article, "A systematic Approach to Elevating Teacher Leadership," which puts forward 10 assumptions about teacher leadership. This article is visited 4 times, at the beginning and end of their first and second years as fellows. The fourth and last reflection on this article occurred during the April 2022 meeting. Fellows were placed in randomized groups and were asked to examine two leadership assumptions and write examples illustrating the assumption during the 2021-22 academic year. A few selected responses (collected on a Google Jamboard https://jamboard.google.com/d/1i0nwzx539a5JBJn41Ip0BJ4Q9xB_LwEGgj5iu_ZHx5c/edit?usp=sharin) are reproduced below.

- Assumption 1: Teacher leadership impacts student and peer performance.

"The better relationship you build with your students, the better they will perform. It increases their trust in you & fosters an environment of success." Katy, Christie, Melissa, Rex

- Assumption 2: Teachers lead, formally or informally, wherever they are.

"Teacher leaders often have roles outside of the classroom: mentors, coaches, tutors, spectators at a game, on social media, a friendly face in the hall/community, etc." Katy, Christie, Melissa, Rex

- Assumption 3: All teachers have opportunities for leadership.

“We collaborate during PD sessions, expanding our leadership outreach.” Katy, Christie, Melissa, Rex

- Assumption 4: Teacher leadership requires that teachers develop capacity for effective leadership

“Mentoring new teachers, buddy systems for those new to school but not new teacher, Vertical Teams, working with other colleagues on same goal (Jennifer's project).” Jennifer, Josie, Kayla.

- Assumption 5: Teachers develop leadership capacity when they are supported.

“New Teacher Cohort- meet once a month and discuss items such as P/T Conferences, data, establishing routines, positive engagement, celebrations. Team leads can lead or admin leads.”

- Assumption 6: Teacher leadership requires changes in other leaders throughout the school system.

“Leadership committee acts as liaison for "big" and "small" topics of discussions and or decisions, CTA, SWAG, DFAC (with superintendent)”

- Assumption 7: Teacher leaders take responsibility for their own professional growth and the growth of others.

“Mentoring a group of new teachers.” Brandy Albrecht

- Assumption 8: Teacher leadership requires courage, tolerance for ambiguity, and flexibility.

“Being able to get along with everyone even if they disagree with your ideas and thoughts.” Brandy, Nikki, Erin, Tyler

- Assumption 9: Teacher leaders foster collaborative cultures that promote continuous improvement.

“Met 2-3 times each week with content team to improve lessons. Met monthly with school's AVID team to create ways to promote WICOR strategies in our building and provide tangible strategies for teachers to try in their classrooms.” Melanie

- Assumption 10: Teacher leaders collect evidence of impact resulting from their work.

“Observing other teachers with a check-list of our tier 1 priorities as a school and giving feedback.”

### Trends in teachers’ understanding of Teacher Leadership

An overarching theme of Teacher Leadership from all three cohorts is growth. Many teachers felt they grew as teachers in terms of classroom management skills they learned from others in their cohort. Many fellows described the sharing of knowledge, particularly in their first-year collaborations, as vital to their evolution on the spectrum of Teacher Leadership. This focused reflection led teachers to a new awareness of themselves and their potential for different types of involvement in their districts such as being involved in building curriculum that would be shared with their colleagues to aid them in growing as

teachers. The professional development sessions drew directly from fellows' newly found confidence as a peer teacher and mentor. Many reflections conveyed a new sense of purpose and futurity in their careers as a result of the WIPRO program.

**Fellows Reflections**

*Reflection Quotations from Cohort 1:*

"I've learned so much over these last two years. I've met lots of other science educators, from big schools and small schools… I've had to do a lot of critical thinking and decision making and these other educators have helped tremendously. In the beginning, it felt as if I was unsure and not very confident about my decisions. As of now, I feel a lot more comfortable in making decisions and such. WIPRO was a great opportunity for me." (Caitlin Cunningham, Community R-VI district)

"This portfolio supported my growth in science in a vast way. To begin with, I have deepened my understanding in content knowledge and application. First, I began my fellowship studying place-based learning for students. This created more excitement in content because students felt vested in their learning. The fellowship also emphasized collaboration, which I implemented in my classroom on a daily basis between lab groups. Lastly, this year I placed focus on interactive notebooking and claim, evidence, and reasoning. This cultivated deeper scientific understanding and application." (Taylor Mislevich, Eldon R-1)

*Reflection Quotations from Cohort 2:*

"My teaching "toolbelt" had definitely been expanded in the past two years. One of my biggest take a-ways is an expanded, more in-depth understanding of the NGSS science and engineering practices. I was impacted through the research-based articles, the "practice" lessons completed by my V-CCLS and H-CCLS teams. As well as the information and real-life experiences that were shared through the various presentations that I attended (viewed). I now feel both confident and passionate about making sure to provide practice and focus on these practices for my students." (Amy Bartlett, Hallsville R-IV)

"As I reflect over the last 2 years with WIPRO and what I did, my GPS plan will have the greatest impact on my teaching in the future. In learning about different online resources and then beginning to use them, I opened a whole new area where I will be able to impact the learning of students. I have been for most of my career a teacher that used technology when I needed it… This past year with Covid, the students having a school-issued device was paramount to the learning, but it meant my old ways of teaching had to adapt. I had to switch my lessons from paper to computer. This meant either finding digital versions or adapting lessons to a new format. I will continue to use the digital lessons and the online resources I utilized this school year and how I teach will be forever changed. To better serve my student, I need to help them develop the skills to be in this digital world." (Seth Willenberg, Columbia Public Schools)

*Reflection Quotations from Cohort 3:*

"From looking at my first reflection from this year compared to now, I have grown so much and learned so much. I have never focused on something in my teaching for an entire school year like I have for my GPS. It was very beneficial being able to find new tech resources to use in my classroom and to also tie in with our Chromebooks that my district received this year. It has been great finding so many new resources I can use in my classes and also being able to share those with other teachers in my district. I also liked the fact that I have made so many new teaching friends through this program. We have been able to keep in contact, ask each other questions, ask for advice, and bounce ideas off of each other." (Erin Snelling, Hallsville R-IV)

"As I reflect on my two years in the WIPRO-SEF I am very grateful for the experience. I can see how I have grown as a science teacher, as a teacher in general, and as a leader in my district. At the beginning of the program, I was really just focusing on surviving teaching through the pandemic. The first year working with my HCCLS and VCCLS groups gave me an opportunity to observe, collaborate with, and learn from other educators. It was really exciting to be able to observe and get feedback from teachers not only in the same grade-range as me, but from Kindergarten up to high school. This is an opportunity that doesn't come around a lot in a small district. I learned a lot of helpful science education concepts but also just classroom management and teaching skills in general. Because of that first year in the program I ended up getting the opportunity to help select a new science curriculum for our school that really fits our needs and operates off of the 5E model that my group practiced. As I moved into the second year of the program, I got the opportunity to focus on some goals that I had for a while. I'm really excited about how well my framework for integrating science and ELA instruction worked out for me this year and I look forward to improving it and using it this next year and in the future. I also feel like being in the WIPRO SEF has given me confidence to take initiative and be a stronger leader on my team and in my district. The program has definitely had its challenges, mainly in managing time and being able to get my work done. However, I do feel that has also been a growth opportunity and that because of this I am now better able to balance and manage my time. I feel that the lessons and growth I've gained from the WIPRO SEF will continue to benefit me as I go forward in teaching." (Josie Hess, Community R-VI)

## Site Leader Reflections

The Wipro project was a bit different from our previous PD projects, which primarily focused on content and methodology learning, coordinated by MU staff and delivered over several weeks during the summer with academic year follow up. The Wipro project introduced us to a different model, where the learning occurred within collaborative teacher groups or during individual project development, and where MU staff played more of an advisory role. Given the personalities of the MU staff (ahem!) it was a learning experience for us- we had to learn to let go, be less rigid in our week-to-week planning and learn to oversee without being overbearing. Thus, it was learning leadership in a new

model. The university has benefitted from this collaboration, as have the teachers. Many are now newly aware of the resources the university can provide while they are in the field (many of them graduated from MU).

Furthermore, the University continues to benefit from the involvement of a science department in educational programs. We have been appreciative of high-level administrators (the deans, provost, and university president) who visited with the program during induction ceremonies when they were held face-to-face. The same holds for Wipro employees who visited at the same ceremonies and met with the university administrators. These efforts took place during the pre-COVOD era, and we hope that we can revive them in the future.

### Summary of all publications, articles, conferences, presentations, dissertations, or awards that relate to Missouri Wipro funding.

Taylor, J., & Siegel, M.A. (in press). “How Are My Talk Moves:” Supporting In-service Teachers through Coaching and Learning Science Communities. *Innovations in Science Teacher Education*.

Joineé Taylor, MA 2020, Science Education, University of Missouri. Thesis: “How Are My Talk Moves:” Supporting In-service Teachers Through Coaching and Learning Science Communities.

Josie Hess, presentation on WIPRO experience and how I'm using it in my classroom, Community R-VI School Board Meeting Wednesday 9/21/22.

Jennipher Adams, book titled "When The World Was Sick" 2021, Amazon.

Jennipher Adams, "Educator Well-Being", MSTA Leadership Conference, Lake of the Ozarks, 2022

Jennipher Adams, "Educator Well-Being", Maries R-2 Middle School Staff Meeting, Bland Missouri - Fall 2020.

Melissa Milius, Pierce STEAM Grant, $2000, 2021-2022 for expanding GPS project on Brain Bins to other sections.

Arthur Eisenkraft, Katy Canote, Ileana Bermudez Luna, Amanda Lim, and Maria Louisa Soto “How Science and Engineering Practices Enhance STEM Teaching and Further Teacher Leadership” STEM TLNetwork monthly themed PD, Virtual, November 2021.

## Phase II- Wipro Innovation

### A summary of the new project

The Phase II project will expand the teacher network, provide new opportunities for leadership, and focus on collaboration between science and math teachers in middle and high school. Middle and high school teachers from each district will enroll in the Wipro SEF

project as teams of 2-4 teachers, with each team having a math and a science teacher from the grade band. Three cohorts of 15 teachers each will be recruited, with each teacher participating for two years. The project will address the challenges of teaching science and math in a harmonious manner at the middle and high school grade levels. The collaboration between math and science teachers is essential to the implementation of a successful science curriculum. Teachers will collaborate in V-CCLS and H-CCLS teams and devise an implementation plan for restructuring their science/math instruction at the end of year 1 to be more compatible. Working together with their district coordinator and school administrators, they will define how wide the restructuring will be, how it integrates with the district goals, and how they will evaluate it. They will expand and implement the changes in year 2 and report back on their successes and challenges. They will share their plans within and beyond their cohorts. They will be encouraged to disseminate their learnings through professional development, conferences and/or websites.

**Missouri Team**

Dorina Kosztin, Department of Physics and Astronomy, PI
Meera Chandrasekhar, Department of Physics and Astronomy, co-PI
Gay Sturguess, Project Coordinator (0.25 FTE)
Lisa Nieder, District Mathematics Coordinator, Columbia Public Schools
Andrew Kinslow, District Science Coordinator, Columbia Public Schools

We note that Columbia Public Schools is the only district that has dedicated Mathematics and Science coordinators, thus their role will be somewhat larger than that of the other DCs.

**Upcoming events for fall. (September to December)**

| Date | Name of Event | Focus of Event |
|---|---|---|
| August 3, 2022,<br>9 am– 4 pm | Induction Ceremony and opening meeting | All-day meeting; Intro to Wipro, VCCLS setup and practice, Research article search |
| Sep 22, 2022<br>5 – 7 pm | Monthly meeting | Research meeting, VCCLS planning, Teacher Leadership Discussion. |
| Oct 20, 2022<br>5 – 7 pm | Monthly meeting | Research article presentation, Powering a Powerpoint. |
| Nov 17, 2022<br>5 – 7 pm | Monthly meeting | Leadership, Integrating math and science lessons |
| Dec 15, 2022<br>5 – 7 pm | Monthly meeting | VCCLS presentations.<br>Planning HCCLS. |

## NEW YORK -MERCY COLLEGE

### Introduction

### Phase II activities for June 2022 to September 2022.

During this quarter, the Mercy College Center for STEM Education (MCCSE) brainstormed plans for the upcoming Wipro innovation phase. The MCCSE calls this phase "Wipro GPS Reimagined" and envisions this stage as an opportunity for Fellows and participating teachers to collaborate with each other to enact district change in the five existing Wipro districts within the Greater New York area. Central to discussions about this phase was planning for the upcoming MCCSE K-12 STEM Teacher Conference. This year, the conference will serve as the launch for this new phase of Wipro. During the conference, Wipro Fellows, administrators, DSCs, and newly interested participating teachers will brainstorm ideas in one of two sessions dedicated to district change. Throughout September, the MCCSE team reached out to Fellows, administrators, and teachers in other MCCSE programs to drum up interest in this new Wipro phase. Additionally, the MCCSE team compiled portfolios tailored for each Wipro district that highlighted the activities of their Wipro Fellows over the last 8 years. These portfolios will be distributed to district administrators by the end of the month.

### Reflections on the End of the Year Conference

MCCSE did not host an end of the year conference. The MCCSE K-12 STEM Teacher Conference is scheduled for October 1st.

### Yearly Reflection September 2021-22

This year was difficult for Wipro Fellows in the GNY area. Last school year started off with unprecedented flooding due to Hurricane Ida that shut many schools down before school could even start. In addition to dealing with the damages, many GNY Fellows were returning to their classrooms with fewer Covid restrictions for the first time. Returning to "normal" was the biggest challenge for Fellows especially as the pressure of resolving "learning loss" caused by the pandemic was placed on their shoulders.

Yet, Fellows rose to occasion and took on full schedules and even pursued new professional development opportunities. In fact, MCCSE considers Fellows' engagement in professional development as one of the greatest successes for the 2021-2022 AY. MCCSE had four Fellows reconnect with the team as part of Cohort 1 of the Westchester STEM Ambassadors (WSA) in 2021. Their work with WSA enabled them to gain new experiences with engineering, robotics, and computer science to share with their districts. In addition to this, MCCSE had four Fellows apply for mini grants and twelve Fellows attend a GNY Wipro

reunion in May. Reconnecting with Fellows in these new ways was encouraging and motivating for MCCSE and Fellows alike.

### Other Activities

Much of this quarter was devoted to planning Wipro GPS Reimagined, the innovation phase of Wipro at MCCSE. This involved creating the program for the K-12 STEM Teacher Conference, pulling together information from previous quarterly reports to make a tailored district report for each Wipro partner district, and refining the timeline for the new phase.
Recruitment

### Wipro SEF by the Numbers

**Over the course of the initial 4 years of Wipro funding:**

| Name of District | Total student population | % High needs students* | Number of fellows from this district |
|---|---|---|---|
| **White Plains** | **7,004** | **55%** | **11** |
| **Tarrytown** | **2,718** | **54%** | **9** |
| **East Ramapo** | **8,598** | **88%** | **13** |
| **New Rochelle** | **10,602** | **52%** | **12** |
| **Port Chester-Rye** | **4,658** | **74%** | **13** |
| *High needs defined in NY as % of students on free and reduced lunch. Data collected from https://data.nysed.gov/ based on 2016-2017 AY | | | |

***Each state reports this differently, please indicate how your state reports this information. For example: % of students on free and reduced lunch**

**District coordinators have been impacted by Wipro SEF?**

7 in Phase I

### Site highlights from the initial four years of Wipro SEF funding

One of the biggest highlights was enacting the VCCLS work with Fellows. It was evident how much Fellows gained from vertical teaming and studying science content at diverse grade levels. Observing the Fellows' incredible work has led to us incorporating vertical teams into

a variety of other projects, including the STEM Master Teacher Fellows Program and the Westchester STEM Ambassadors.

Additionally, each end-of-year conference was an excellent opportunity for Wipro Fellows to showcase their work. It was inspiring to see the HCCLS presentations as well as GPS posters, which were unique and creative. These experiences highlighted the importance of empowering teachers to lead their own professional development.

**Site view of Teacher Leadership**

The MCCSE considers teacher leadership the driving force for the Center's work. The MCCSE seeks to cultivate teacher leadership with all the teachers in their network. The MCCSE views teacher leadership as an opportunity for teachers to lead from the classroom and as a grassroots method of enacting change and social justice in the community.

**Trends in teachers' understanding of Teacher Leadership from the GPS portfolios**

Trends that emerged showed that fellows engaged in the program benefited in the following ways:

1. <u>Personally</u>

a. Mutual respect and support

b. Appreciation for the work of science teachers at other levels (elementary, middle or high) both in and out of their own district

c. Understanding and appreciation of the learning progressions set forth by the NGSS for students

d. Reinvigorating for more experienced teachers

e. Empowering for less experienced teachers

f. Motivating for all fellows

g. A source of pride and accomplishment

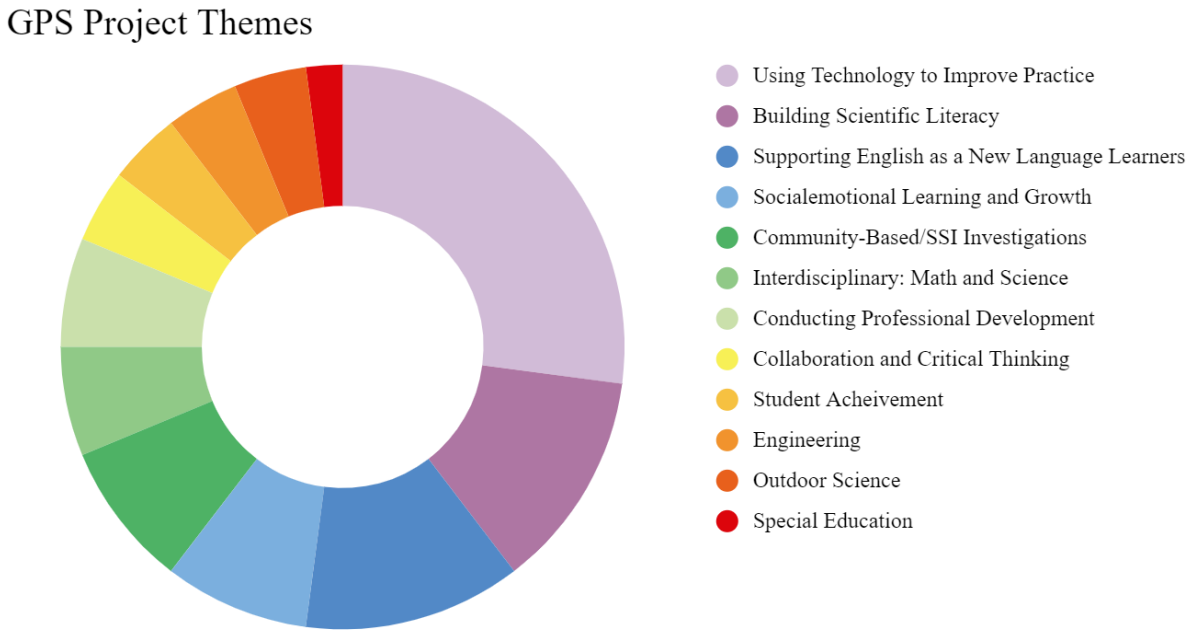
h. Engenders a feeling of respect and worth for the profession of teaching and themselves

2. <u>Professionally</u>

a. Sharing and growth of knowledge in science language, discussion as a way of teaching, using questions to support student acquisition of knowledge and comprehension, supporting ELA students in science, building teacher content knowledge and building efficacy for their content knowledge and student-centered instructional approaches.

b. Developing a community of shared practice to grow knowledge and understanding about their own practice.

**GPS themes**




**Fellows Reflections**

A Cohort 1 Fellow who taught high school science appreciated what he gained from working with teachers at other grade levels. He explained that he now had "a greater appreciation for the challenges posed for teachers of science in the lower grades…I marveled how the teachers of lower grades use multiple activities within a single class and still the class moves seamlessly."

A Cohort 2 Fellow who taught high school physics reflected:
"Wipro has helped me a great deal in developing a better understanding of how to improve my student's learning. From looking at the way I present the objective of a lesson (such as writing an effective AIM on the board that I can measure and offers a high order of thinking for students to strive for) to getting my students to not just answer a question correctly but to have the ability to ask a question that leads to deeper analysis. These are topics that I've heard explained in previous professional development workshops as rather abstract ideas. What Wipro has done is make these concepts much more practical by given my ideas of how to implement them in my classroom. … Working with other teachers and having the opportunity to bounce ideas off each other has been invaluable. In addition, by having us observe each other's teaching methods and provide critical feedback, we're able to reflect on our work in a way that's much more difficult to do in our current working environment."

Similarly, another Cohort 2 Fellow who taught middle school explained how her confidence increased in teaching science:

"This experience has helped me feel much more capable to teach science. I got some valuable ideas from my colleagues' videos on how to structure science lessons and activities. I also received positive feedback as well as good suggestions on how to improve my teaching. I took the opportunity to look more closely at the NGSS standards and understand more about how they are arranged. Working in the vertical group and presenting our work did give me more confidence in my role as a middle school science teacher."

A Cohort III Fellow who taught elementary school shared that she was excited about introducing the NGSS science and engineering practices in her class. For her, this approach gave her "hope":
"I feel very excited and revived to be part of making changes in my classroom with these practices. With so much emphasis on teaching reading, math, and test taking, I saw how it discouraged the students and teachers alike. Reading about these practice and seeing a glimpse of what a real science classroom looks like helped me become filled with hope. My hope is to have these conversations going again in our schools, to reflect how we teach science. As I read the practices for grade 3-5 practices, I realized the expectations are way more complex for most of my students who are just beginning to interact differently with their science learning. Many practices in NGSS builds on K-2 practices, and I cannot help but think about where we are and the road we need to travel."

**Fellows Vignettes**

Since June, the Mercy team has worked with the four fellows who completed their mini-grant projects in 2022. They are all presenting at the October 1st, K-12 STEM Teacher Conference. Their poster titles are below:

Mary Cincotta, *Storytelling with Light: Using Circuits to Illustrate Text*
Cenia Santana, *STEM at the Zoo*
Anthony Patierno, *Hungry for Science*
Maia Starcevic, *School Kitchen for Science*

We will provide a more detailed highlight of Fellows after the upcoming conference.

## Phase II Funding

**Over the course of the Phase II Wipro funding:**

| Name of District | Total student population | % High needs students* | Number of fellows from this district |
|---|---|---|---|
| **White Plains** | **7,069** | **54%** | **11** |
| **Tarrytown** | **2,682** | **56%** | **9** |

| | | | |
|---|---|---|---|
| **East Ramapo** | **9,387** | **86%** | **13** |
| **New Rochelle** | **10,286** | **56%** | **12** |
| **Port Chester-Rye** | **4,775** | **75%** | **13** |
| **White Plains** | **7,069** | **54%** | **11** |
| *High needs defined in NY as % of students on free and reduced lunch. Data collected from https://data.nysed.gov/ based on 2020-2021 AY | | | |

***Each state reports this differently, please indicate how your state reports this information. For example: % of students on free and reduced lunch**

**District coordinators have been impacted by Wipro SEF**

8 DSCs in Phase II

**Estimate the impact of Wipro SEF over the four years:**

ii. **# Districts -** 5

iii. **# Schools -** 31

iv. **# District science coordinators (and other administrators) –** 80 admin overall[1]

v. **# Fellows -** 60

vi. **# Teachers (directly impacted through GPS, for example) –**

Estimated based on number of teachers who conducted PD (at least three Fellows have conducted PD with an average of 10 teachers in attendance in Phase II, some of them twice) or lead a mini-grant project involving other staff (approximately 10 Fellows have conducted projects that involve an average of 5 other teachers).

**PD –** 50

**Mini grants –** 50

**Total –** 300

vii. **# Students –**

Elementary school – 650[2]

Middle school – 1,300[3]

High school – 1,900[4]

[1] [1] Estimated based on number of schools x 2 administrators (principal and assistant principal) + number of districts x 2 administrators (superintendent and assistant superintendent) + 8 DSCs. This is estimate that may not account for other district administrators, such as instructional coaches or supervisors.

[2] Estimated based on number of elementary school teachers x average elementary class size in NY (25 students) x 1 years

[3] Estimate based on number of middle school teachers x 100 students (25 students per class, 4 classes per day) x 1 years

[4] Estimated based on number of high school teachers x 100 students (25 students per class, 4 classes per day) x 1 years

Total – 3,850

## **Highlights from the Phase II Wipro SEF funding**

Phase II Wipro SEF generated teacher-driven project ideas even without the direct guidance from IHE. It was encouraging to see so many Fellows continue their Wipro work even beyond the scope of the foundational program. Some Fellows applied for mini-grants multiple times, some continued important interdisciplinary work, and others continued to conduct professional development for teachers in their districts. It was especially exciting to see Fellows participating in other professional development opportunities provided by MCCSE. Since Phase I, Fellows have continued to be part of the MCCSE family by participating as Saturday STEM Academy instructors, Westchester STEM Ambassadors, and presenters at the annual K-12 STEM Teacher Conference.

## **Reflections of all years of Wipro Funding**

### **Fellows Reflections**

In the 2021 evaluation report, two GNY Wipro Fellows reflected:
"The Wipro Science Education Fellowship has been one of my best life experiences. I am committed to the Fellowship's work as I have been fortunate to be part of a team that brings out the best in me. I would love to share more about my amazing experience thus far with the Mercy College group. Hopefully I can do that soon!"

"The Fellowship was one of the best things I have done in my teaching career and although pandemic forced a bit of a detour at this time, I look forward to the opportunity to resume more active roles in bring more science and STEM to kids and families in my school district."

### **Site Leader Reflection**

The Wipro SEF funding, along with that from other grants, allowed the Mercy College team to find the Mercy College Center for STEM Education (MCCSE). Through the Center's work we have extended our reach to more schools and districts, including incorporating vertical teaming as described above.

## **Summary of publications, articles, conferences, presentations, dissertations, or awards that relate to Wipro funding**

Papers

Gunning, A. M., Marrero, M. E., Hillman, P. C., & Brandon, L. T. (2020). How K-12 Teachers of Science Experience a Vertically Articulated Professional Learning Community. *Journal of Science Teacher Education*, 1-14.

Hillman, P., Coddett, A., Gunning, A., Marrero, M. (2016). *Vertically Articulated Professional Learning Communities: Building Collaboration and Practice Amongst K-12 Science Teachers. Open Online Journal for Research and Education 6(1).* http://journal.ph-noe.ac.at/index.php/resource

Presentations

Gunning, A.M., Marrero, M.E., Nitecki, E., Brandon, L.T., Larson, K.V., (April, 2021). Supporting Elementary Teachers in High-need Schools to Teach STEM. Paper presented at the NARST Annual International Conference, Virtual.

Gunning, A. Hillman, P. Marrero, M. (2017, Apr). *Self-Efficacy for K-12 Teachers of Science.* Presentation at the Annual International Conference of the National Association for Research in Science Teaching, San Antonio, TX.

Hillman, P. Marrero, M. Gunning, A. Homer, K. Garguilo, J. (2017, Mar). *Professional Learning Communities for Supporting NGSS Implementation.* Presentation at the Annual Conference of the National Science Teachers Association, Los Angeles, CA.

Gunning, A., Hillman, P., Marrero, M., Eisenkraft, A. (2016, Mar). *Vertically Articulated Professional Learning Communities: Developing Collaboration and Practice in a K-12 Science Teacher Professional Development Program.* Paper Presented at the Annual International Conference of the National Association for Research in Science Teaching, Baltimore, MD.

Marrero, M., Hillman, P., Gunning, A., Jaksha, A. (2016, Jan). *Intensive Professional Development for NGSS Implementation and Science Teacher Leadership: An Overview of an Effective and Sustainable Model.* Presentation at the meeting of the National Conference of the Association for Science Teacher Education, Reno, NV.

Gunning, A., Hillman, P., Marrero, M., Jaksha, A. (2016, Jan). *Reflection on Science Teaching Practices in the Context of NGSS After Participation in a Vertically Articulated Professional Learning Community.* Presentation at the meeting of the National Conference of the Association for Science Teacher Education, Reno, NV.

Hillman, P., Gunning, A.M., Marrero, M.E. (2015). *Vertically articulated professional learning communities: Developing collaboration and practice in a K-12 science teacher professional development program*. Paper presented at the annual meeting of the Northeast Region of the Association of Science Teacher Educators (NE-ASTE), New York, NY.

## Phase III- Innovation

### A summary of the new project

The Mercy College Greater New York Wipro Science Education Fellowship, in partnership with University of Massachusetts at Boston and other colleges, as funded generously through the Wipro Corporation, has been highly successful in supporting teacher leadership and science teaching in Westchester and Rockland counties in New York. The Wipro Science Education Fellowship (SEF) has uniquely impacted not only the teachers who participated in this innovative program, but perhaps more importantly, Mercy College. Mercy College became one of the Wipro SEF sites in early 2014. Our leadership of the NY site, along with a concurrent National Science Foundation award, positioned us in the NYC metro region as a prominent player in science education, supporting K-12 teacher development in large, local school districts. Our expertise grew in this area as the SEF continued, as did our local reputation. We were able to leverage our contacts and esteem, as well as our external funding streams, to establish the Mercy College Center for STEM Education (MCCSE) in 2016, which is not funded by the college. This MCCSE is the umbrella under which we serve the community through programs for children, families, and teachers. Our reach and impact have been greatly influenced by our participation in the Wipro SEF.

To continue the work of Wipro Fellows in this new iteration, MCCSE aims to support teachers and Fellows in a new round of GPS projects. These projects will be collaborative within districts and receive buy-in from administrators as associate group members, as well as in-district support from DSCs. Over the course of 4 years, MCCSE aims to establish a norm of collaborative action towards district change in our existing Wipro districts. With our eyes set on sustainable change, we plan to equip participating teachers with the tools and practices necessary to carry on transformative efforts even when Wipro funding is gone. Furthermore, MCCSE will insist on administrator buy-in with the support of DSCs to set the foundation for transformation and to hold district administrators accountable for this level of change. This project will require steps at each level of the district to ensure sustainability.

### Mercy Team

Wipro Fellows, new participating teachers from Wipro districts, IHE (Amanda Gunning, Meghan Marrero, Kristen Napolitano), DSCs (from Phase II), and administrators from Wipro districts

**Upcoming events for fall. (September to December)**

| Month | Persons | Action |
|---|---|---|
| September | MCCSE Team<br>Wipro Fellows<br>Administrators | Organize district-specific Wipro reporting materials to give to administrators<br>Meetings with admin to discuss the new funding and initiative<br>Recruitment and planning<br>Organizing Wipro strand for K-12 STEM Teacher Conference |
| October | MCCSE Team<br>Wipro Fellows<br>Invited Teachers | Initial workshop at the MCCSE K-12 STEM Teacher Conference: Brainstorming for District Change |
| November | MCCSE team<br>Wipro Fellows<br>Invited Teachers<br>Administrators | Follow up virtual meeting |
| December | MCCSE team<br>Wipro Fellows<br>Invited Teachers | Individual group meetings, mentored<br>Planning of group GPS<br>Group log reporting |

## NEW JERSEY MONTCLAIR STATE UNIVERSITY

### Introduction

**Phase II activities for June 2022 to September 2022**

The NJ site spent the summer mentoring Alumni Fellows for their upcoming teacher leadership projects for Phase III. The NJ site is just starting Phase III and did not have Phase II activities over the past year.

**Other Activities**

Primarily Spring 2022 involved recruiting Alumni Fellows for Phase III. This involved a spring information session where expectations for Phase III were shared. There was also an application process and due dates. Finally, accepted Alumni Fellows were told who their university mentors would be.

### Initial 4 Years of Wipro funding

| Name of District | Total student population | % high needs students* | Number of fellows from this district |
|---|---|---|---|
| Kearny | **5360** | **55.8** | |
| Clifton | **10621** | **56.4** | |
| Montclair | **6673** | **15.9** | |
| Orange | **5061** | **75.3** | |
| Paramus | **3771** | **6.4** | |
| | | | |

***Each state reports this differently, please indicate how your state reports this information. For example: % of students on free and reduced lunch**

## Phase II Funding

**Phase II Wipro funding:**

a. **How many districts were involved? Please list.**

| Name of District | Total student population | % High needs students* | Number of fellows from this district |
|---|---|---|---|
| Clifton | 10514 | 42.3% https://www.usnews.com/education/k12/new-jersey/districts/clifton-public-school-district-105462 | 7 |
| Montclair | **6441** | **10%: https://www.usnews.com/education/k12/new-jersey/districts/montclair-public-school-district-106218** | **6** |
| Orange | **10072** | **65.9%** https://www.niche.com/k12/d/orange-board-of-education-school-district-nj/ | **3** |
| Paramus | **3648** | **13.8 % https://high-schools.com/di** | **3** |

| | | | |
|---|---|---|---|
| | | **rectory/nj/cities/paramus/**<br><br>**(but US News and World report puts at 4% so the 13.8. might just be the hs_** | |
| Kearny | **5251** | **46.9% https://en.wikipedia.org/wiki/Kearny_High_School_(New_Jersey)#:~:text=As%20of%20the%202020%E2%80%9321,eligible%20for%20reduced%2Dcost%20lunch.** | **5** |
| | | | |

***Each state reports this differently, please indicate how your state reports this information. For example: % of students on free and reduced lunch**

Families who are at 185% of the federal poverty level currently qualify for free school lunch. Under the current federal program, a family of four would have to earn less than $51,338 a year to qualify for free lunch. The minimum income levels vary based on how many people are in a family.
Source: https://www.nj.com/education/2022/06/universal-free-lunch-is-ending-in-schools-this-plan-could-bring-it-back-for-some-nj-kids.html#:~:text=That%20means%20a%20family%20of,to%20qualify%20for%20free%20lunch.

**District coordinators have been impacted by Phase II Wipro SEF**

5

**Estimate the impact of Wipro SEF at your site over the four years:**

i. **# Districts:** 5
ii. **# Schools:** 12
iii. **# District science coordinators (and other administrators):** 5
iv. **# Fellows:** 27
v. **# Teachers (directly impacted through GPS, for example):** 50
vi. **# Students.** 4,545

**<u>Highlights</u> from the Phase II Wipro SEF funding**

Some of the reflections from the fellows at the end of Phase II were:

1. WIPRO was my first formal partnership with everyone here at PRISM. You all are equally excited to support teachers and be rejuvenated and refreshed and support us with the things we are passionate about. The program gave access to other programs as well to get involved or the support/resources needed.
2. It remains the best professional development experience I have ever had. It allows me to have my voice heard and be with like minded people. To be seen as a professional.
3. As a 3rd grade classroom teacher - you do not have connections with people outside of the district and with people outside of the district and with WIPRO I was able to do that and go all over like the rainforest and Nashville to teach - I could never have gotten to do that. You are going to connect with a lot of people. Teacher leadership was a new thing back then and now. I feel part of the professional community. I was resistant to applying at first.
4. I have been a teacher for a long time and thought I knew everything about it and then I was able to look at teaching differently.
5. I liked the idea of it because it gave me the space to get connected with people so that we could create teacher leaders since I can't spread myself thin. I knew they were doing good things and that it was something good. Gave the opportunity to connect people in his professional world with the development/resources they needed and were not getting. As a supervisor you can feel spread very thin to support your teachers, but this program was able to directly assist with that. Helped to create a network and within that network to share useful protocols and quality development for his educators.
6. I think that it has been hard to find something similar with what I am dealing with right now but one thing that stands out is that role of providing insight, reflection, practice, and leadership and support for the newer teachers - one thing is they are overwhelmed and although i introduce new ideas to them they are just trying to figure out how to teach.

7. By far the most impactful professional development experiences I ever had. It gave me the leadership skills I needed where I could be in PLC meetings and supporting teachers and being able to take a new job at a new district and bring WIPRO there. Helped me to transfer into a new role as a supervisor.
8. Being part of the WIPRO gave me a toolbox and gave me the space for change and the support and being heard and having your ideas considered instead of being that one teacher in their room with their door closed. I met Dr. Lewis here at those Saturday programs with my own kids and to come back and be part of this and go to Panama with Dave and because I had the professional development and support I was able to move into a new role - I teach robotics now and would have never thought that earlier in my career. I feel part of a community.
9. I got to connect with teachers from other districts that were not Montclair and that was really valuable. I thought that was very important for my own development. I thoroughly enjoyed meeting people from other districts and thought that was very important. Vertical and horizontal articulation program was life changing.
10. The WIPRO program has helped me to grow professionally and gave me hope that my district will not give up on science yet. It helped me to bring new and exciting things to elementary science. It also gave me the space to present at national conferences to present my leadership projects. It brought clout and the support from WIPRO helps me to support my colleagues. Gave me self-confidence. Backed up my risk taking.
11. What I like the most about my experience is the comradery - there is no judgment. I always find myself practicing that cold and warm feedback. And I do this with my colleagues from work. When I have an idea I don't run with it without reading the research first - I check to see what can we do with it and how can i do this and will my students grasp this information - I realized that science is my hook but art is also my hook
12. There isn't much science PD at the elementary level. science was definitely not in my wheelhouse so when there was science PD i was in, there was no judgment and i could reach out to you science people without judgment.
13. I think I was the typical teacher at xxxx school and how the elementary school teachers thought of science - we really didn't have a lot of PD around science. They push math and ELA in the elementary school and if you run out of time you push into science. So when my coach came in to teach with me she said you ask the questions but you need the empowerment and she suggested I apply to the program and I was nervous because I would be around science educators. and when we met, the first meeting I felt empowered, and I felt their knowledge pouring into me. and Ileft feeling like superwoman and going into my district helping….I didn't feel like the small person in the room - I felt empowered and WIPRO helped me to connect

and to really be the close knit family. to walk in and feel the energy it feels good to be back.

## Reflections of all years of Wipro Funding

### Fellows Reflections: See additional testimonials above

Regina Boriello, a Biology teacher at Clifton High School:

While saying "This experience changed my life," sounds like hyperbole, the Wipro SEF program truly has brought me unique experiences and grew my skill set in a way I simply did not think was possible. The support provided by the Wipro SEF grant and the faculty at Montclair State University was essential to the success of the projects I completed at Clifton High School. I created a professional learning group of science content area and special education inclusion teachers to work through the specific problems of practice that come with co-teaching in a large district. The next year, I was able to apply the information I learned to a half day professional development session for high school inclusion teachers in multiple content areas. In cooperation with another Wipro colleague, we facilitated HCCLS groups at the elementary and high school levels. I also traveled to several NSTA conferences and presented the work I accomplished with the support of the Wipro SEF program.

This past school year, I recruited ninth grade biology and algebra I teachers to work on a multidisciplinary STEM project to complete in our classes. Unfortunately, Covid-19 prevented us from executing the project with our classes. However, I was provided with a different opportunity to lead in my district instead. After last spring, my frustration with my lack of understanding about best practices in online learning led me to attend many webinars and classes in July to increase my knowledge. I noticed that my district did not seem to be providing any professional development opportunities for teachers about integrating technology into their teaching. I reached out to our district Technology Facilitator/Trainer, and she provided me with the platform to create "Blended Learning 101" as a summer technology class. I presented twice during August to over 50 teachers, grades 3 through 12. Additionally, I had the presentation document uploaded to the Clifton High School's digital resources page. Currently, I am working on creating short videos to complement the presentation and answer common questions that have come up while preparing with my colleagues for the 2020-2021 school year. Without the experiences and support provided by my Wipro fellows and the Montclair faculty, I don't know that I would have had the opportunity or confidence to initiate and follow through on this project.

Megan Graziano

Being a member of the WIPRO fellowship program at Montclair State University for the past six years has been one of the most fulfilling, inspiring, and empowering

experiences of my professional career. This program provided me with the unique opportunity to collaborate with a broad network of science educators from various districts and the support necessary to pursue personal passion projects within science education. Everything we did in this program has helped me to improve as an educator and develop into a true teacher-leader within my district. Some of my favorite experiences from this program include reflecting on classroom practices through participation in the VCCLS and HCCLS groups, designing and carrying out action research projects, presenting to other educators at our end of year conferences, and leading the development of a summer STEM program for my district! What I will miss most, however, is our regular WIPRO group meetings. No matter how tired or overwhelmed I felt walking into those events, I would always leave feeling energized and inspired to do something great! I am incredibly grateful to have had the opportunity to be a part of the WIPRO fellowship program and for the lessons I learned, the relationships I developed, and the confidence I gained throughout. I will carry them with me throughout my career.

### Site Leader Reflection

The NJ Wipro leadership team remains committed to working with SEF Fellows on their leadership initiatives. The project has brought not only faculty, but also doctoral students from three departments—Educational Foundations, Teaching and Learning, and Mathematics—together both on programmatic and research-related endeavors.

### Summary of publications, articles, conferences, presentations, dissertations, or awards that relate to Wipro funding

Over the past eight years we have shared our WIPRO SEF work in a variety of ways, from board meetings to scholarly presentations at 11 national and international conferences, as well as through scholarly publications in four peer-reviewed journals and two chapters in books. Many of our presentations included Fellows and District Coordinators, where together we reported research on the Wipro SEF model and have shared the innovative PD model with other teacher educators. Please see below for a complete list of our dissemination efforts.

### A.) Newspaper articles

- https://www.montclairlocal.news/2017/06/22/montclair-science-teachers-take-part-in-wipro-fellowship-program/
- http://thejerseytomatopress.com/stories/meet-owen-ambrose-montclair-teacher-of-the-year,14275
- https://www.orange.k12.nj.us/site/default.aspx?PageType=3&DomainID=0&ModuleInstanceID=27906&ViewID=6446EE88-D30C-497E-9316-3F8874B3E108&RenderLoc=0&FlexDataID=32786&PageID=1
- https://njsecretaryhighereducation.com/2017/04/20/apr2017-montclair/
- https://www.montclair.edu/magazine-archive/fall-2013/features/meeting-the-challe

Limbere, A.M., Munakata, M., Klein, E.J., & Taylor, T. (2022) Exploring the tensions science teachers navigate as they enact their visions for science teaching: what their feedback can tell us. International Journal of Science Education, DOI: 10.1080/09500693.2022.2105413

Taylor, M., Klein, E. J., Trabona, K., & Munakata, M. (2022). Feminist teacher leadership: Disrupting the patriarchal binary. In N. Bond (Ed). *The power of teacher leaders: Their roles, influence, and impact. 2nd edition* (pp. 213–225). Routledge.

Taylor, M., Klein, E. J., Munakata, M., Trabona, K., Rahman, Z., & McManus, J. (2019). Professional development for teacher leaders: using activity theory to understand the complexities of sustainable change. *International Journal of Leadership in Education*, *22*(6), 685–705. DOI: 10.1080/13603124.2018.1492023

Trabona, K., Taylor, M., Klein, E., Munakata, M. & Rahman, Z. (2019) Collaborative professional learning: cultivating science teacher leaders through vertical communities of practice. *Professional Development in Education*, *45*(3), 472-487, DOI: 10.1080/19415257.2019.1591482

Klein, E. J., Taylor, M., Munakata, M., Trabona, K., Rahman, Z., & McManus J. (2018). Navigating teacher leaders' complex relationships using a distributed leadership framework. *Teacher Education Quarterly*, *45*(2), 89–112.

Rahman, Z .G., Munakata, M., Klein, E. J., Taylor, M., & Trabona, K. (2018). Growing our own: Fostering teacher leadership in K-12 science teachers through school-university partnerships. In J. Hunzicker (Ed.), *Teacher Leadership in Professional Development Schools* (pp. 235-253). Bingley, UK: Emerald Publishing.

## C.) Presentations

Limbere, A., Munakata, M., Klein, E. J., & Taylor, M. (2021, Apr. 9). Exploring experienced science teachers' vision for science teaching. National Association of Research in Science Teaching (NARST) Annual International Conference, online.

Limbere, A., Munakata, M., Klein, E. J., & Taylor, M. (2021, Apr. 12). Teacher noticing and leveraging of student thinking in science lessons and debriefs of classroom videos [Conference session]. Annual Meeting of the American Educational Research Association (AERA), online.

Taylor, M., Klein, E. J. , Mazol, D., & Goffredo, M. (2018, June 4th). Science Teacher Leadership. New Jersey Teacher Leadership Network, New Jersey Department of Education. Trenton, NJ.

Taylor, M. & Klein, E. J. (2018, May 7th). The Complexities of Teacher Leadership Within A Distributed Leadership Framework. Keynote address at BUILD convening conference at Montclair State University, Montclair, NJ.

Munakata, M., Rahman, Z., Taylor, M., Klein, E. J., & Trabona, K. (2018, Apr. 16). What Do Emerging Science Teacher Leaders Talk About? Unpacking Feedback in a Vertically Aligned PLC. Annual Meeting of the American Educational Research Association (AERA), New York City, NY.

Trabona, K, Rahman, Z., Taylor, M., Munakata, M., & Klein, E. J. (2017). Navigating teacher leader identities through vertical teams. Paper submitted to the International Teacher Leadership Conference, Miami, Fl. *Received Award for Best Academic Paper.

Munakata, M., Klein, E. J., Taylor, M., Trabona, K., & Rahman, Z. (2017, Apr. 22). Supporting and Developing K-12 Science Teacher Practice, Knowledge, and Leadership Through Vertically Aligned PLCs. National Association of Research in Science Teaching (NARST) Annual International Conference, San Antonio, TX.

Taylor, M., Munakata, M., Klein, E. J., Rahman, Z., & Trabona, K. (2017, Apr. 28). Collaborative professional learning: Cultivating science teacher leaders through vertical learning communities [Conference session]. Annual Meeting of the American Educational Research Association (AERA), San Antonio, TX.

Klein, E. J., Taylor, M., Munakata, M., McManus J., Rahman, Z., & Trabona, K. (2016). Nurturing teacher leaders through actions and agency: A differentiated science teacher leadership program. Paper presented at the American Educational Research Association, Washington D.C.
Taylor, M., Klein, E. J., Munakata, M., McManus, J., Rahman, Z., & Trabona, K. (2015, Apr. 18). Fostering Science Teacher Leadership for Sustainable Change. Annual Meeting of the American Educational Research Association (AERA), Chicago, IL.
Klein, E. J., Taylor, M., Boriello, R., Costello, C., Mahfouz, A., & Weeg, J. (2015, February). Owning our professional development: Becoming science teacher leaders. Paper presented at the Ethnography in Education Forum, Philadelphia, PA.

## Phase III- Innovation

### Summary of the new project

Based on our research findings, we propose a model for Phase III that will leverage our partnerships with our current districts in order to expand the program to new districts and teachers. In line with a major goal from Phases I and II, we will support experienced Fellows to continue to flourish as teacher leaders and to become leaders for the program. Our specific plan includes:

- Recruiting 2 cohorts of Wipro SEF Fellows over four years. Each cohort will participate for 2 years and will include 15 Wipro SEF alumni and 15 new Wipro SEF Fellows.
- Supporting the alumni Fellows to undertake project that
    - is GPS-like in nature and supports a district initiative and helps them grow as teacher leaders. They would do this in collaboration with a new Fellow who they recruit.
    - helps expand Wipro efforts by recruiting new Fellows. For example,
        - A teacher from a different district/school;
        - A teacher from another subject area (e.g., math or special education);
        - An administrator or non-faculty colleague (e.g., librarian or curriculum coordinator).

We believe that our proposed model builds on the foundation set in Phase I/II and expands and disseminates the model in a way that is both manageable and sustainable. Our overarching goal is to support our experienced Wipro SEFs as they continue to deepen their leadership capabilities and branch out to new teachers and districts.

We anticipate that this model of expansion will lead to the following outcomes:

- Stronger university/district partnerships that includes an expanded list of districts;
- Participation of up to 60 new teachers including those in other content areas;
- Support of district initiatives.

- Professional development experiences in the areas of diversity/equity/inclusion; interdisciplinary curriculum and pedagogy (particularly focused on science and math); teacher leadership.
- Continued engagement of Fellows with larger professional community at all levels (school, state, national, global);
- Continued dissemination of Wipro SEF model and resulting research.

**NJ Team**

The NJ site has recruited 12 Alumni Fellows. Each will be recruiting New Fellows to include in their leadership projects. The numbers will be determined after the first fall meeting.

**Upcoming events for fall. (September to December)**

| Date | Name of Event | Focus of Event |
|---|---|---|
| **September 13, 2022** | **Kick-off meeting** | **Making sure Fellows are prepared to embark on their leadership project.** |
| **November, 2022 (TBD at Sept meeting)** | **Touch-base meeting** | **Meet new Fellow recruits, touch base.** |
| | | |

## Introduction

### Phase II activities for June 2022 to September 2022

All Phase 2 projects were completed by June 2022. During June to September, most of the activity focused on the following events:

- The third Collaborative Southwest Professional development conference on June 13th and 14th
- Preparing for the commencement of Phase three. This included getting the Request for proposals ready and circulated among the fellows and the districts, talking to administrators and DSCs about the different types of projects for Phase three
- Talking to the fellows about project ideas and providing feedback on their grant proposals
- Getting Phase 3 proposals sent to the reviewers and communicating feedback to the fellows

### Reflections on the End of the Year Conference

The end of the year conference was not specifically a Wipro Conference, it was the third Southwest Collaborative online Professional Development Conference held on June 13th and 14th. The conference was a collaboration between UNT Dallas, the 5 Wipro partner districts, STEMScopes and Region 12. All the Wipro Phase 2 participants presented at the conference. Wipro offered 42 sessions over 2 days. Participants received PD credit for every session they attended and received a certificate on completing the evaluation for the session.

Each session was facilitated by a Wipro Fellow. Presenters received a certificate of presentation for their session.

The Conference was hosted on Plan Hero at the link below

https://app.planhero.com/gatherings/13246-2022-southwest-dallas-collaborative-virtual-professional-development-conference?guest_digest=hjEd2Y_HZKpiC_fSxx_gCg



The conference went off without a hitch, only 1 session was canceled because a presenter did not show up. The conference was well received by attendees.

The PI of Wipro@UNT Dallas would have liked to have more presentations from each district. In 2023, the PI and DSCs are considering having a face-to-face conference. The PI plans to ask each district to make sure they offer at least 5 presentations each for the conference to be a true collaboration.

**Yearly Reflection September 2021-2**

The biggest challenge has been keeping everyone efficiently organized online. Being online challenged everyone in coordinating schedules. The constant shuffle in the higher administration of some districts and the lack of communication is a huge problem. Desoto ISD has a new superintendent, the third in three years, a new DSC needs to be appointed in DeSoto. Even though all the information and deadlines with regards to Wipro Phase 3 has been communicated face to face as well as via documents to the Chief Administrative officer and the Superintendent by the PI and the President of UNT Dallas, no response has been forthcoming from that district regarding their participation in Wipro Phase 3.

Our biggest success was being able to complete the Phase 2 projects without any major disasters.

**Other Activities**

The UNT Dallas team is preparing for the CAST presentations in November.

**Wipro By the Numbers- Initial 4 Years of Wipro funding**

| Name of District | Total student population | % high needs students* | Number of fellows from this district |
|---|---|---|---|
| **Irving** | 32,660 | 72.5% | 18 completed, 4 dropped after year 1 |
| **Lancaster** | 7,176 | 57.6% | 5 completed |
| **Cedar Hill** | 7,253 | 39.9% | 6 completed 1 dropped after year 1 |
| **Grand Prairie** | 28,145 | 63.8% | 6 completed 1 dropped after year 1 |
| **DeSoto** | 7,926 | 44.5% | 5 completed |

**Estimate of the impact of Wipro SEF at UNT Dallas**

These are really tough to guesstimate

i. # districts: 5
ii. # schools: 12
iii. # District science coordinators (and other administrators)

13 DSCs, multiple superintendents (2-3 per district) and other administrators.

iv. # Fellows 47
v. # teachers (directly impacted through GPS, for example) 47
vi. # students innumerable

**<u>Highlights</u> from the initial four years of Wipro SEF funding**

*Wipro@UNT Dallas had three themes to their GPS projects not two like other sites, the project with the informals was very unique and when Covid hit, the informal project was replaced by a collaborative Leadership project

*Using Wix as a website for Fellows to collaboratively present their HCCLS, and VCCLS projects and their individual GPS projects.
*Putting together two collaborative PD online conferences
*Rising up to every challenge to the best of the teams' abilities**.**

### Site view of Teacher Leadership

Wipro@UNT Dallas treads with care especially as some of the leadership styles of the partner districts can tend to be somewhat dictatorial and good intentions are sometimes perceived as interference. Moreover science, and science teachers, especially at the elementary level, get the short shift as the focus is mainly on math and reading and those are the subjects and teachers given precedence.

However, at Wipro@UNT Dallas, all teachers are potential teacher leaders who possess sets of skills that not only allows them to be effective in the classroom, but also permits them to exert influence beyond their classroom. The word "potential" is very deliberately used as many teachers are in situations where they merely go through the motions of teaching. They don't even realize that they have leadership skills latent in them. Moreover, many science teachers do not have the opportunities to exercise and / or develop these skills. Wipro@UNT Dallas provides opportunities to support and encourage the Fellows and other science teachers involved in Wipro Projects. They are recognized and called on to develop their leadership skills, and start growing as Teacher Leaders to impact students and teachers around them, and eventually, the district.

The original Wipro SEF program facilitated the leadership development of many Wipro Fellows, and science teacher leaders from our partner districts. Many of them have ascended the leadership ladder at their districts, and with the Wipro Phase 3 school project, are now taking on roles of mentors to new Wipro fellows and are actively seeking new leadership roles. Wipro@UNT Dallas is proud of this outcome and is happy to be the stimulus that facilitated their development as teacher leaders

### Reflections on growth as a Teacher Leader from the GPS Portfolios

One of the C2 Fellows, Mr. Matthew Gaines, provided an excellent example in his GPS Teacher Leadership statement. He gave his permission to share the document to explain some of the trends seen in teachers' understanding of Teacher Leadership.

https://matthewgaines.wixsite.com/website-24/teacher-leader-continuum


Teacher leadership at Wipro@UNT Dallas is very much a continuum.
Initially a few of the teachers were much like the novice teachers, as the 'Cane Pole fishermen' that Mr. Gaines describes. They are in survival mode; they do as they are told and don't diverge from that. They don't recognize themselves as teacher leaders, their inexperience and lack of faith in themselves is their biggest enemy.

Several teachers were at the Zebco33 and spinning reel stage as well. They had more years of experience being a teacher with established methods of instruction and management. They have sizable banks of knowledge that they would share when asked. While some of them believe they can handle any situation, most of them doubt it mainly because of the lack of opportunities to do so. However, they are unwilling to leave the safety of the land and get on the boat, let alone rock it!
While sometimes the teachers showed glimpses of bait casting reel and boat fishermen, these were fleeting and far between.

The Wipro SEF program provided the impetus for these fellows to move from one side of the continuum towards being a Master teacher. It provided the means, the opportunities, and the safety net for the Wipro fellows to identify and evaluate their own leadership abilities, develop and apply them. While some fellows moved swiftly down the continuum, others moved, albeit slowly. What is encouraging is there was a definite shift towards the Master teacher leader end of the continuum and most of the landlubbers are willing to become Bait casting and reel fishermen secure in the knowledge that they can grow and develop further into highly effective science teacher leaders, and also secure in their awareness of the impact they have on their students, peers and eventually the district.

## Fellows Reflections

Six testimonials are provided below, 2 from each of the three cohorts and 4 participating school districts

My two-year experience as a Wipro Science Education Fellow will continue to influence my teaching and leadership for years to come. During the first year, I learned first-hand the benefits of collaboration with other experienced teachers. My partners brought experience, fresh perspectives, and new ideas to our project work. My relationship with my partners and the work we produced together had a positive impact on the instructional strategies I used in my classroom. The second year of the fellowship required me to improve my leadership skills and to impact students beyond my classroom. I expanded my reach to more students and their teachers on my campus and beyond. My campus goal of starting an after-school science club for girls (GEMS) allowed me to teach third, fourth, and fifth graders. I also interacted with more teachers on different grade levels. At CAST, I presented concept mapping with other fellows to several dozen teachers from other Texas districts. I also designed and led professional development on my campus, sharing my research about supporting girls in math and science. I created a self-guided tour "enhancer" and scavenger hunt for the Frontiers of Flight Museum. These resources could help make the field trip experience better for an unknown number of teachers and their students. I hope to extend the success of my Wipro experience for years to come. **James Mining, Cohort 1, Irving ISD**

The greatest impact from the fellowship was the GPS Portfolio and Poster. I have the habit of overthinking, but the GPS allowed me to stay focused and centered on one idea. Not wanting to put too much on my plate, I started to think of how I could link my personal goal to the district goal. Then I came with the idea of STEM in upper elementary. Since I've been with the district, we have been known as a STEM district. But it bothered me that STEM was only seriously implemented at the secondary level. So, I jumped at the opportunity to pilot a STEM after-school club to test out my ideas of STEM and traditional science instruction. Because of this initiative, I am campus STEM ambassador and STEM advisory lead; I represent the campus on all district STEM initiatives and events. The GPS has turned me into an advocate for STEM in elementary, especially in upper elementary. Research shows if we catch youth early in elementary, they are more likely to pursue a STEM related major and career in their future. I continue to advocate for STEM campus and district wide. When it comes to STEM and science instruction, I am well-known across the district therefore I'm sought out to lead professional developments. My principal has informed me to expect to lead more this coming school year. I don't know what it entails, but I expect the journey to be good. My principal has already tried to help me transform my classroom into a STEM Lab. I will be applying for more grants throughout the school year to get funding for more science lab experiments and resources. The GPS taught me that hard work pays off;

and I am only limited to the limits I put on myself. NO LIMITS, NO BOUNDARIES! **Miesha Medford, Lancaster ISD, Cohort 1**

Before this experience, I did not have much confidence as a professional due to lack of support from peers and administrators. The two aspects of the HCCLS and the GPS Project has impacted my teaching and leadership. The experience of collaborating with my peers in the HCCLS work group introduced me to a whole new world of what research evidence teaching should look like. In addition, the reflection of my instruction, by way of research, planning, implementation, data, reflection, student work and thinking about how the experience has impacted me has been of great benefit in many ways. The GPS Project has been motivational in the respect that I will continue the work with my students to observe if the same results are yielding. This will provide real-time evidence that it is a proven strategy based on the data collected in comparison to the previous year's. The culmination of the growth from year 1 in 2018 to now 2020 has been a wonderful journey that I will never forget. It will continue to have a positive and continual impact on my life. In fact, the experience has encouraged me to think about how I can have more of an influence on adult learners. I hope to continue on this journey to eventually obtain a Ph.D. in Higher Education and facilitate the learning of new preservice and in-service teachers. This will ensure that the next generation of students will have effective and impactful teachers that are ready to build both academic and personal experiences for students that will become productive and active global citizens. **Candace Edmerson, Cohort 2, Grand Prairie ISD**

Joining the Wipro program has without a doubt changed how I approach my future teaching endeavors. Two years ago, I barely saw myself as a competent teacher. I felt my early successes came from my dedication and hard work ethic. The Wipro program not only helped me see my strengths and weaknesses but also how to see my potential. I also developed a sense of confidence. This confidence is important because as previously stated, I did not see myself as an effective educator. The development in my confidence is obvious to anyone who observed me in the past.

There were several aspects that lead to the development of my confidence in the classroom. Some of that growth in confidence would not have happened without learning how to work in cooperative groups with my peers in a more professional and efficient way. Wipro fellows had to record themselves often throughout the two-year experience. This was a troublesome feat for a teacher with little to no confidence in the classroom. This troublesome feeling was magnified due to it being shared with peers I felt were teaching on a much higher level of expertise than myself. We had to come together as a group often and discuss lesson videos and presentations. I was originally very concerned by this, but I quickly learned and embraced the process. The teachers who I felt were much more qualified saw and pointed out the great things they saw in my recorded lessons that I never noticed.

They provided feedback that was constructive, genuine, and real. I could no longer deny my talent in the classroom. The process helped me realize that I had several strengths that I never saw within myself. I transferred what I learned in these group meetings to my campus. There is now a sense of obligation to help other teachers see what they do well and also help them identify what they can improve with.

Confidence in myself also grew from identifying my strengths and incorporating my passion for fishing in the classroom. I used fishing to help my students comprehend the science content taught in 5th grade. I wanted to bring the sciences to life. I also had the opportunity to work with the Texas Freshwater Fish Hatchery in Athens, Texas. Both projects helped me translate the content I was trying to teach to my students into relatable, interesting, and passionately delivered instruction. Teaching became fun because I was able to turn traditional science from a book into something real-world applicable and relatable. I had an absolute blast learning how to effectively combine both passions of fishing and teaching. I will continue to incorporate these ideas and also plan to expand the concept in the future. **Matthew Gaines, Cohort 2, Cedar Hill ISD**

The Wipro Fellowship program is advantageous for those who are seeking to expand "beyond their boundaries!" I was extremely privileged to work with phenomenal science fellows throughout this program. It was this relationship building that created a crucial impact to successfully complete my obligation to the University of North Texas - Dallas and the partnership with DeSoto ISD. The two years that I have spent in this program will greatly impact my future in many ways. First, it has grounded me in confidence. Prior to participating, I overlooked my talent, skills, and knowledge as I was always pushing others to envision the greatness in themselves. Wipro taught me to analyze my offerings in the field of education and beyond. This task was accomplished by collaborating with fellow teachers from various districts. The initial project included the vertical alignment of a specific TEKS across various grade levels. Each member was allocated a leadership role to contribute to the final outcome. This stretched my comfortability as I typically had not taken on such experiences. As a result, this has made me eager and willing to accept challenges more than ever before!

Another impact of mention are the leadership conferences that we attended as both observers and facilitators. These conferences included CAST, Wipro Missouri, and SW Collaborative. We had the opportunity to observe the knowledge of fellow teachers through the lens of a classroom activity selected to analyze an educational pedagogy. This experience has equipped me with tools that have been added to my knowledge base to be easily accessed and applied within my classroom. We also networked with others in our field, including universities, informal educators, research, governmental institutions, etc while creating lifelong friendships and partnerships.

Going forward, I see myself as being an example of stamina and encouragement to others in the implementation of my GPS. This project has shown that I can accept and overcome obstacles, one feat at a time. It has also proved that nothing is impossible if you put your best effort forward. **Marquita Muhammed, Cohort 3, DeSoto ISD**

The work from these past 2 years has allowed me to grow as an educator by networking with like-minded colleagues while challenging my 4th and 5th grade students. I will continue to think about projects that my students will be able to reflect on years down the road and make a connection to my classroom being the beginning of when they developed a love for science or inspired to have a career in the science field. I want to continue to provide opportunities that stretch their thinking, allow them to be creative as well as develop a skill set that provides for individual thinking as well as collaboration with others that have a different way of thinking.

By attending conferences and presenting my work and sharing my experiences, I may inspire others to put in the effort and create these amazing learning opportunities for their students. Meanwhile, on a campus level, I will continue to share with my grade level the process of how I created these lessons for my students and be hopeful they will want to get on board. I will assist with finding ways to adapt this to their students' needs and meet them where they are. Being a WIPRO fellow has exceeded what I thought about this program in the beginning. I enjoyed watching the bigger picture develop piece by piece. **Sherry Thompson, Cohort 3, Irving ISD**

## Fellows Vignettes


### Tracey Craft: C2 Fellow

My name is Tracey Craft and I am a second-grade teacher in Irving ISD. This is my ninth-year teaching. I was honored by my peers who chose me as teacher of the year at Barton Elementary in 2014. I have two very dear friends in Wipro Cohort 1 at UNT Dallas. They were so excited to be included in the Wipro fellowship and their excitement was infectious. I spent months watching them research, work, and explore. I applauded them for going out and challenging themselves. They encouraged me to apply. I said, "There's just no way I'll go back to school! I'm too busy. I'm in school all day already!" Who knew I would now be hip deep in a graduate level course? Science is amazing and it's wonderful to be able to connect with other people who love it. During the first portion of year one, we were partnered with a vertically aligned team of teachers. My group consisted of two 9th grade teachers, a 6th grade teacher and a 2nd grade teacher-me. We read various articles and chose to research ways to encourage students to ask their own questions to spark and expand their understanding of science topics and their learning across subjects. We hope to get our districts to include "questioning" as a part of our curriculum. My understanding of the goal of the Wipro program is to build better science teacher leaders. The expansion of

knowledge will ultimately be shared with other educators and then passed on to countless students. Each member of my cohort (C2), and the first cohort, is being pushed to improve their own teaching pedagogy and their communication skills. I can't wait to see what the next year and a half brings.

**James Mining: C1 Fellow**

My name is James Mining. I am a second-year fellow, and for 14 years, I have taught fifth grade math and/or science in Irving I.S.D. My experience with Wipro has been both challenging and rewarding. I have invested more time and energy than initially expected, and I have been lucky to have a patient and talented wife supporting my endeavors. I have done things that I had talked about doing for years but had made excuses not to do I presented at C.A.S.T., won a grant to achieve a goal, and started an after-school S.T.E.M. program for girls. I have also taken on a greater role on my campus: leading the Science Committee and planning our campus Science Night, working with teachers and students from different grade levels to make my S.T.E.M. program successful, and creating and teaching a professional development session. Furthermore, I have gained valuable friends, connections, and resources. The teachers, district coordinators, and informal science leaders have brought new, impactful ideas to my classroom and engaging experiences inside and outside my campus that would not have been possible without Wipro.

## Site Leader Reflection: How has Wipro SEF funding impacted UNT Dallas leadership

**Reflection from Dr. Narayan**

"Yay! I was hoping there would be a space where I could talk about this. I have been reflecting on this a lot. I do not think it is an understatement if I say that as the Wipro SEF program progressed, I have also grown and honed my skills as a leader. I actually have a theory about this and it focuses around 2 important things: Belief and Encouragement. Let me explain:

I was a grant newbie till the Wipro SEF grant. Dr. Eisenkraft and Wipro always believed in me and everything I wanted to do with the Wipro SEF grant. No idea was dismissed out of hand and there was always a lot of encouragement. This boosted my confidence and creativity. More importantly, it showed me the path I should take when dealing with my Fellows.

My Fellows are just like I was ~2017, they need someone to believe in them and encourage them and push them to achieve all they are capable of. Yes, sometimes they need a poke in the rear with a cattle prod! I have built an individual relationship with each one of them

and they know that I believe in them and I will encourage, push, support them in their endeavors to maximize their potential. It is my hope that they also realize the impact they have on their own students and in creating more leaders.


**List of publications, articles, conferences, presentations, dissertations, or awards that relate to UNT's Wipro funding**

**Exxon Mobil Science Day at the Dallas Zoo on sept 22nd 2018.** This is an annual event held at the Dallas Zoo, Cohort 1 fellows designed and presented hands-on activities at elementary, middle, and high school levels.

**Presentations at CAST 2018:**
Concept Map Presentation Thursday Nov 1st from 8 am - 9 am. 4 C1 Fellows James Mining, Maria Soto, Lindsay Reeves and Tamara Butler presented.
The Total Physical Response Presentation Saturday Nov 3rd 12:30 - 1:30.. The presenters were Raino Bhatti, Jenny Morales, La'Tanya Spragin and Kelly Hancock (C1 Fellows)
ISEA Presents Friday Nov 2nd 1-4 pm. Translation of Formal Science into informal science sites. This presentation involved all 15 C1 fellows and their informal science partners

**Florida H-CCLS presentation** 18th May 2019, 8 C1 fellows, Kendra and Eileen went to Florida to present at their H-CCLS conference.

**Annual Wipro conference 6/8/19** : Attendees included C1 and C2 fellows from UNT Dallas, the 5 DSCs and Informal Science Educator partners, administrators from all 5 partnering school districts, external presenters, the IHE and C1 fellows from Stanford, and

faculty and staff from UNT Dallas and representatives from Wipro. H-CCLS presentations and poster session.

Cohort 1 Fellows La'Tanya Spragin and Miesha Medford of Lancaster Independent School District honored by their school district. 8/8/19

**CAST 2019**

List of presentations by the Wipro C2 Fellows at Cast 2019.

Thursday 9 am - 10 am Create Make and use Models: Tabitha Moreno, Ana Belmonte, Rocio Avila and Tracey Craft

Thursday 12 - 1 pm Question Formulation Technique: Julia Glowacki, Tracey Craft, Brittney Preston

Thursday 1:30-3:30 Dr. N

Friday: 8:30 - 9 am: Physics in the playground Angela

Friday: 10:30-11:30 James Mining Challenging girls to excel in STEM

Friday: 2:30 - 3: 30 Talking it out Matthew Gaines, Billy Johnson, Brittney Preston, Mary Davis

Friday 4-5 pm James Mining: How I survived starting a STEM club

Saturday 11:00-12:00 Concept Mapping & Student Understanding -- Raisha Allen, Richard Anderson, Tabitha Moreno, Mary Davis

Saturday: 12:30 - 1:30 Teaching argumentation structures to all learners Richard Anderson, Raisha Allen, LaQuaesha Williams, Myesia Morrison

**Wipro CAST Booth Presentation Schedule**

Thursday Nov 21st

| Timing | Name of Fellow and Informal Science Educator | Name of Fellow and Informal Science Educator |
|---|---|---|
| 11 am-1 pm | Matthew Gaines/Athens Fish Hatchery | Rocio and LaQuaesha Danielle Hatch - Cedar Hill State Park |

| | | |
|---|---|---|
| 1 pm - 3 pm | Billy Johnson/ Perot Museum | Mary Davis, Myesia Morrison, Mark Broughton -- DISD Stem Center |
| 3 pm - 5pm | Candace Edmerson/Colin Johnson/Dallas Zoo | Tracey Craft - Ray Roberts State Park - Isle du Bois |

Friday Nov 22nd

| Timing | Name of Fellow and Informal Science Educator | Name of Fellow and Informal Science Educator |
|---|---|---|
| 9 am - 11 am | Julia Glowacki/JBS Wetland Center | Ana Belmonte/Anne Fayen- Dallas Arboretum |
| 11 am- 1 pm | Brittney Preston Rosalie Wade, Juan Morel | |
| 1 pm - 3 pm | Raisha Allen/ Ray Roberts Park | Tabitha Moreno & Erin Shields (Tx. Discovery Gardens) |

Saturday Nov 23rd

| Timing | Name of Fellow and Informal Science Educator | Name of Fellow and Informal Science Educator |
|---|---|---|
| 8 am - 10am | Richard Anderson and Katie Christman | |

**Wipro Leadership Conference** on February 7th - 9th, 2020

**Presentations at the Informal Science Education Association 2020 Annual conference:**

Six of the C2 Fellows will be presenting in the poster session of the 2020 Informal Science Education Association annual conference at Waco, Texas on Feb 27th 2020 along with Dr. Narayan.

Brittney Preston: Frontiers Flight Museum: Teacher Led
Program Guide Tracey Craft: Science classroom in the Park –
Ray Roberts State Park Mary Davis: Technology Integration in
the Outdoors
Ana Belmonte: Solving a rock mystery ( will be submitted today)
Ratna Narayan: Integrating Formal Science Concepts into Informal Spaces

**June 30th - July 1st SW Collaborative online PD conference:** We offered 36 session over 2 days

**October 17-29th Wipro online conference**

**CAST 2020**

CAST 2020 was scheduled to be a face-to-face conference in Houston in November 2020. Wipro submitted 9 proposals for presentation at the conference in April 2020. Post covid, the conference is being offered online and 4/9 presentations were accepted for presentation. This is a rather good number considering only 150 proposals from over a thousand were accepted.

1."Oh My Gosh! How did that Happen" Julien Yacho, Olaide Ajakaye, Sherry Thompson, Shelby Allen and Tiffanie Johnson. Accepted. (HCCLS Project)

2. Mnemonics: Making new education more obtainable by noticing interesting connections

Marquita Muhammed, Julien Yacho Accepted (VCCLS Project)

3. Taking the sting out of CER Accepted (HCCLS Project)

Linda O'Bryan, Amanda Cortez, Marquita Muhammed

4. Hands-on Learning with Project Based Learning Accepted (VCCLS Project)

Marsha Bolden, Tatyanda Younger, Shelby Allen, Olaide Ajakaye

## Phase II Funding

.

| Name of District | Total student population | % high needs students* | Number of fellows & DSCs from this district | Number of non Wipro Fellows from this district |
|---|---|---|---|---|
| **Irving** | 32,660 | 72.5% | 4 Fellows<br>1 DSC | 1 Teacher for WalkSTEM |
| **Lancaster** | 7,176 | 57.6% | 4 Fellows<br>1 DSC | 1 Teacher for WalkSTEM |
| **Cedar Hill** | 7,253 | 39.9% | 1 Fellow<br>1 DSC | 1 Teacher for WalkSTEM |
| **Grand Prairie** | 28,145 | 63.8% | 1 DSC | 1 Teacher for WalkSTEM |
| **DeSoto** | 7,926 | 44.5% | 1 Fellows<br>1 DSC | 1 Teacher for WalkSTEM |
| **Wipro Fellows moved to another district** | | | 1 (Marshall ISD)<br>1 (Arlington ISD) | 1(Marshall ISD) |

**<u>Highlights</u> from the Phase II Wipro SEF funding**

- We had the WalkSTEM project for the DSCs and a partnering teacher from all 5 ISDs
- We successfully offered the Southwest collaborative Online Professional development conference in June
- All 7 collaborative / mini grants were successfully completed
- Each of the 8 projects sent a proposal to be presented at CAST 2022 and 5 proposals were accepted for presentation at the conference.

## Phase III- Innovation

### A summary of the new project

For each year, the grant will consist of three components targeting different groups of science educators and students.

1. The School Projects, focused on one school per collaborating district per year,
2. The District Science Coordinator collaborative project where each DSC and an ISD teacher partner work together with other DSCs and their teacher partners; and
3. The Collaborative/ Mini grants led by Wipro fellows, collaborating with Wipro and non-Wipro teachers within or between schools and district.

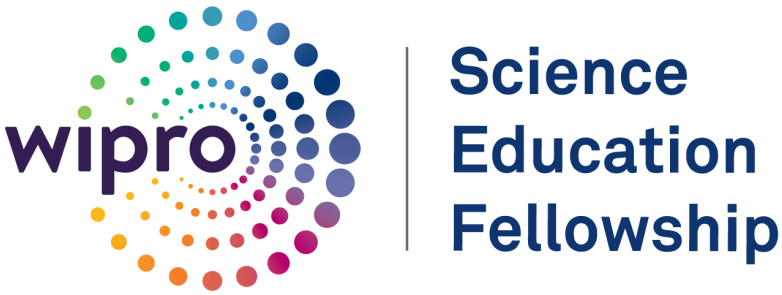
### UNT Dallas Team

Existing Wipro fellows, DSCs from all 5 collaborating districts and new teachers who will be inducted as Wipro fellows.

### Upcoming events for fall. (September to December)

| Date | Name of Event | Focus of Event |
|---|---|---|
| Sept 21st | Preparation for CAST | Preparation for the CAST presentation in November |
| Sept 26th | First meeting of Wipro Phase 3 | Welcome and induction of new fellows, expectation of grant |
| Dec 5th | Second meeting of Wipro Phase 3 | Principals of the project participants will be invited as well |

A summary of the evaluation report follows.




# 2021-2022 Evaluation Report Summary

**October 5, 2022**

*Prepared by:*
Anne Gurnee, M.Ed., Founder
& Brian Garrison, M.A., Research Assistant
Anne Gurnee Consulting, LLC

*Submitted to:*
Center of Science and Mathematics in Context (COSMIC) at the University of Massachusetts Boston

# Executive Summary

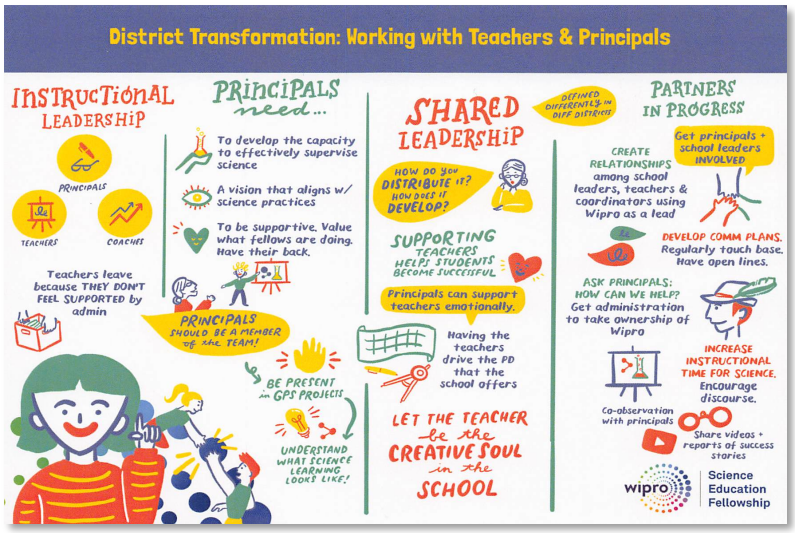
With financial support from Wipro, the University of Massachusetts Boston's Center of Science and Mathematics in Context (COSMIC) launched an initiative to prepare teacher leaders in partnering school districts. This initiative, the Wipro Science Education Fellowship (Wipro SEF), was built on the success of the Boston Science Partnership's Science Education Fellowship, a project funded by the National Science Foundation from 2009-2012. Since 2012, the Wipro Science Education Fellowship program expanded to include partnering school districts from New Jersey and New York, in collaboration with Montclair State University and Mercy College. In 2017, the program added a new state, Texas, with a new university partner, the University of North Texas at Dallas (UNT), and in 2018, three more universities, Stanford University in California, University of South Florida and the University of Missouri, joined Wipro SEF.

A major goal of the Wipro Science Education Fellowship is to develop a cadre of teacher leaders in each partnering district who deepen their practice and lead from their classrooms. The goals of the program are met by focusing the Fellows' professional development in three specific areas or the "Pillars" of Wipro SEF: Reflective Practice, Leadership with Peers, and Adult Learning. Key elements of the program include encouraging the use of current research to improve science teaching, reflective teaching and improving districts through teaching leadership. Each year, Wipro SEF supports cohorts of teachers and district science coordinators from approximately five school districts in each of the regions who participate in the program over two years. Key tenets of the program in year one include vertical and horizontal professional learning communities, lesson observations and debriefings as well as action research. In year two, Fellows develop a growth plan system (GPS) that includes opportunities for individual growth that also demonstrate their leadership skills while advancing a district-wide initiative.

This year (2021-2022) marked the fourth year of funding for California, Florida and Missouri, and their final year with their third cohort of Fellows. Additional funds supported the continuation of the program in Texas, New York, New Jersey and Massachusetts. These sites continued to work with a subset of Fellows to provide additional support and development to Fellows, DSCs and districts related to the Wipro SEF overall goals. In fall 2021, Wipro awarded additional funds to continue the program in all seven states over the next four years.

The Wipro Science Education Fellowship program leadership contracted with Anne Gurnee Consulting, LLC (AGC) to serve as a research and evaluation consultant for 2021-2022. The evaluation work this year focused on the continued data collection from the final cohort of teachers in California, Florida and Missouri, and the beginning of long-term tracking of the former Fellows in Texas.

This report summarizes findings from the cohort-specific and long-term data collected to date for the 2021-2022 academic year. As this was the final year of the second round of Wipro SEF funding, this report also includes summative data on the program, some specifically from this round of funding (since 2017) but also some from all cohorts since 2014. Elements of the evaluation study included surveys, interviews with Year Fellows, interviews with local district administrators and program leadership (higher education faculty and staff), observations of meetings and virtual conferences, and review of program artifacts and Fellows' work. This year, the program in all states continued to be disrupted by the global pandemic. The evaluation's goal was to continue to assess the extent to which the Wipro Science Education Fellowship model was implemented with fidelity in each region while also measuring the achievement of identified aims and goals and to chronicle the effect of the pandemic-related disruptions on the program and its participants. In addition, this report documents outcomes and strategic impacts of the program, to provide program leadership with data-driven recommendations for the iterative improvement and continued implementation of the program. The evaluation team also participated in several leadership planning meetings to set the stage for the future funding and evaluation work in all regions.




*Graphical notes captured from one of the virtual sessions on district transformation offered during the Wipro SEF DSC Leadership Conference, March 2022.*

# Key Findings – 2021-2022

In 2022, there continued to be broad agreement among the key stakeholders (e.g., Fellows, District Science Coordinators, higher education faculty and staff) involved with the program that the Wipro Science Education Fellowship was successfully implemented at all sites (California, Florida, Missouri, Texas, New York, New Jersey and Massachusetts). The data from this evaluation study indicated that the program was positively received by participants and resulted in numerous outcomes and impacts for Fellows, District Science Coordinators and their associated schools and districts. Data collected from Texas showed that the Wipro Science Education Fellowship continues to have positive impacts on the Fellows years after their initial participation. The ongoing pandemic continues to have some impacts on the program this year as all sites experienced some level of education system disruptions. This year also marked the completion of the second round of Wipro funding, and some findings are more summative in nature, capturing the effect of the program over the years.

**Key findings from the 2021-2022 academic year include:**

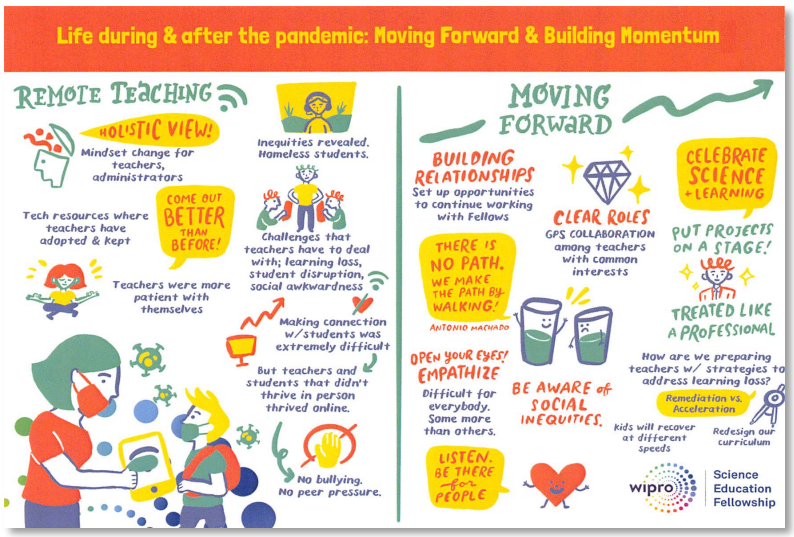
- Nearly all of Year 2 Fellows (94%) and District Science Coordinators (92%) reported that they were satisfied or very satisfied with the Wipro Science Education Fellowship.
- Nearly all of Year 2 Fellows (92%) and District Science Coordinators (83%) felt their expectations of the Wipro SEF program were mostly met or exceeded.
- Nearly all of Year 2 Fellows (92%) agreed or strongly agreed that the Fellowship was worth the time they invested.
- Year 2 Fellows this year experienced:
  - Significant growth in their confidence in science-related content and practices.
  - Significant growth in their leadership self-concept and leadership communication behaviors.
  - Moderate growth in their reflective practices.
  - Continued recognition of the importance of the collaborative network of science educators created by Wipro SEF.
  - Acknowledgment of the value of the GPS experience.
- Year 2 Fellows specifically mentioned the following aspects of the program as being the highly successful aspects of the program:
  - Collaborative network of science teachers (33%)
  - GPS experience (31%)
  - University mentorship and support (24%)
  - Improved teaching practices (20%)
- More than three-quarters of this year's Fellows (80%) see themselves as teacher leaders in their schools, and a quarter (26%) see themselves as teacher leaders in their districts.
- Most of Year 2 Fellows agreed that staying involved in Wipro SEF during the pandemic:
  - Made a positive impact in their classrooms (4.44 on a 5-point scale)
  - Made a positive impact in their schools (4.10)
  - Provided skills that made this challenging time in education easier (4.10)
- The majority of Year 2 Fellows (62%) cited the network of like-minded science educators created by Wipro SEF as a key source of support during the pandemic.

- Former Fellows in Texas continued to demonstrate numerous impacts from their participation in the Wipro Science Education Fellowship including:
  - Using reflection to improve their professional practice
  - Giving, receiving and actively soliciting feedback from colleagues
  - Using research to guide their professional practice
  - Regular communication with other former Fellows in their school/district
  - Continued improvement of teaching skills and leadership
  - The value of a professional community of collaborative and similarly trained science educators
- District Science Coordinators noted several key impacts of the Wipro SEF program on their Fellows:
  - A growth in teacher leadership and confidence
  - Improvement in science teaching skills
  - The elevation of the importance of science teaching in their districts
  - Building a collaborative group of science teachers
- District Science Coordinators felt the Virtual Leadership Conference was a valuable or very valuable experience (82%).
- District Science Coordinators and district administrators in California, Florida, and Missouri Texas and former Fellows in Texas noted a number of impacts on districts involved with Wipro SEF including:
  - Increased teacher leadership
  - Improved opportunities for teacher leaders
  - Growth in cross-grade, cross-subject area and cross-district teacher relationships
  - Improved science teaching
  - Greater focus on & support for science/STEM initiatives
- Wipro SEF higher education leaders continue to be pleased with the program overall. All again made modifications to the program this year to accommodate Fellows' needs during the pandemic. All plan to continue to participate in the next round of Wipro SEF funding with innovative program elements that will continue to increase our collective understanding of how best to develop and support teachers and effect district change.

**Key findings from overall data include:**

- Since 2014, 93% of Year 1 Fellows, 85% of Year 2 Fellows and 90% of District Science Coordinators reported that they were satisfied or mostly satisfied with the program.
- Since 2014, 91% of Year 1 Fellows, 76% of Year 2 Fellows and 89% of District Science Coordinators felt that the program mostly met to exceeded their expectations.
- Reliably top-ranked program features of Year 1 Fellows since 2014 include the monthly and debrief meetings with their CCLS teams, the protocols and the research articles (>86%).
- Reliably top-ranked program features of Year 2 Fellows since 2014 include the GPS experience, their work with their advisor and their meetings with other Fellows (>83%).

- When performing an all-cohort comparison since 2017 (the beginning of the most recent round of funding for Wipro SEF), Fellows experienced significant growth in their:
  - Confidence in science-related content and practices
  - Leadership self-concept, several specific leadership behaviors and leadership communication behaviors.
  - Frequency of using reflective practices such as reflecting on how to modify a lesson and maintaining a professional journal
- Most Fellows from 2020-2022 agreed that remaining involved in Wipro SEF made a positive impact in their classrooms (4.01 on a 5-point scale).
- Former Fellows from 2018-2022 reported using the following Wipro SEF-related behaviors 1-2 times/month or more frequently:
  - Using reflection to improve their professional practice
  - Giving, receiving and actively soliciting feedback from colleagues
  - Using research to guide their professional practice




*Graphical notes captured from one of the virtual sessions on life during the pandemic offered during the Wipro SEF DSC Leadership Conference, March 2022.*

# Recommendations

While the Wipro Science Education Fellowship continues to be successful, input collected from participants (e.g., Fellows, District Science Coordinators, and program leadership) indicated potential areas for continued refinement of the model. As the program continues to evolve and grow, and especially in light of the additional funding provided by Wipro for an additional four years of programming in the seven states, AGC offers these recommendations help to inform the future phases of program growth and expansion:

**1. Facilitate conversations with all program partners about district change.**

As the program continues to develop and district change becomes a more prominent goal of the program, Wipro SEF leadership should become transparent and explicit with all program partners about its interest in effecting positive change in the involved districts. Fellows, IHE leaders, principals and DSCs should all be part of these open conversations. Use curiosity to guide these discussions asking questions such as:

- What change is needed/desired for their district? (e.g. Science/STEM increase/improvement? An improved organizational culture? Teacher leader development and opportunities?)
- What is each groups' role in district change?
- What further training is needed by each group to become effective change agents?

**2. Leverage Leadership Conference to continue DSC development and support their partnership with the cadre of teacher leaders built in the districts and to effect district change.**

With the new round of funding and existing plans to continue to include a DSC Leadership Conference, the opportunity exists to provide even more explicit training about how DSCs can partner with teacher leaders to effect change. The Wipro SEF DSCs have a wide variety of experiences and training collectively, but Wipro SEF leadership should not assume that they know about how complex systems, like school districts, effectively change. Use the DSC training opportunities to provide high-level training in how to manage teacher leaders, systems theory, and effecting change in complex systems.

**3. Bring back in-person meetings when possible and use virtual options to ease time and transportation challenges.**

All participants missed in-person meetings during the pandemic. As we all discovered, the ease of virtual communication options, while sometimes helpful, lack the vitality and deep engagement and community building options that in-person meetings provide. This community-building has been a hallmark of Wipro SEF, and as in-person meetings come back, AGC encourages program leadership to meet in-person when possible. However, the ability to meet virtually does ease some of the concerns about time and transportation that are and were regular complaints for program participants in the past. Meeting virtually also provides and unique to connect this geographically diverse program more regularly.

**4. Continue to use equity as an important lens for the Wipro SEF program and teacher leadership growth.**

Although there was less mention of equity this year by participants, equity remains a critical issue in education overall and science education specifically. Fellows and DSCs are having the deal with a variety of issues related to race and ethnicity (e.g. Critical Race Theory and the variety of ways this issue is being handled legally and within education systems), and Wipro SEF can provide a safe forum for discussion and strategy development. AGC would again strongly recommend that Wipro SEF leadership initiate discussions around equity with the IHE leadership and to look for well-qualified outside support if needed.

**5. As plans evolve for the next phase of Wipro SEF, continue to support and grow the successful hallmarks of the Wipro SEF program.**

All the Wipro SEF IHE leaders are remaining involved in Wipro SEF in this next phase. All have seen the value of the program for the Fellows, District Science Coordinators and the districts involved, and they are looking forward to continuing their work with districts and Fellows. AGC recommends that the collective leadership work to identify the core values of the program and to work specifically to enhance and grow the components of the program that have been most successful including:

- Supporting the collaborative network built by the program including continued opportunities for cross-site interaction and partnering
- Improving science teaching through sharing of knowledge and practices, increased understanding of NGSS, and creating reflective educators
- Continuing district impact through teacher leadership that involves both improved skills in feedback and presentation but also increased advocacy about the importance of science for all students

**6. Continue to explore ways to tell the story of Wipro SEF to a broader audience in order to inform and inspire others to improve science education through comprehensive professional development.**

AGC is compelled to repeat this recommendation as the data continues to grow about impact of the Wipro SEF program on Fellows, schools, and districts. As was mentioned last year, the additional challenge of a global pandemic overlaid on the previous years has produced even more stories to tell about the value of a program that creates collaborative networks of science teachers, improves science instruction, creates reflective educators, and builds teacher leaders. The new funding from Wipro allows the possibility to broadcast more broadly the impacts and success stories of the Wipro SEF program. As has been mentioned before, there are a number of ways to tackle this goal including publications (large and small), conference presentations, and a comprehensive, user-friendly website. Working toward a more external presence for the program will recognize the hard work done by all the current program participants but also will inform and inspire others in the broader education community that intensive professional development of science educators can create real change in schools and districts.