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

WIPRO SEF

YEAR 11
ANNUAL REPORT
September 2023

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EXECUTIVE SUMMARY

For over a decade, the Wipro Science Education Fellowship (SEF) has provided funding and support to science teachers and school districts across the country. The program has national reach with sites in California, Florida, Massachusetts, Missouri, New Jersey, New York, and Texas serving almost 750,000 total students (approximately 1.5% of US pre-K – 12 students). The original phases of the program focused on developing a cadre of science teacher leaders who lead *from their classrooms*. As the second decade of the program begins a new layer of leadership is being added by engaging more purposefully with school formal district leadership (administration). The goal is to enable district transformation through teacher leadership.

Across the country, our different university sites have completed Year 1 of the Innovation Phase of Wipro SEF. At some sites, there are individual projects, school projects and cross district projects. At other sites, there have been new cohorts of Fellows working on the classic Wipro SEF program while, in others, science teachers are working with math teachers to enhance STEM (science, technology, engineering, math) education. While the teams were summarizing their excellent work and planning for Year 2 of the Innovation Phase, the leadership at the IHEs was busy planning for the activities of next year. A retreat for our university sites was held to look back at last year's successes and challenges and forecast and problem solve issues of the coming year. The program continues to be strong across the country and is facilitating some amazing work by the Fellows and involving many new teachers, thereby expanding the impact of our work.

Keywords: Teacher leadership, collaboration, district transformation, learning communities

INTRODUCTION

Wipro SEF Program Overview

The Wipro Science Education Fellowship (SEF) has two major components. The Wipro SEF Classic 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. After completing the Wipro SEF Classic, universities work with the Fellows and District Science Coordinators during the Innovation Phase. This component uses the talents and energies of past participants in unique ways to support school district transformation through teacher leadership. 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 at the end of year conference.

A District Corps of Teacher Leaders

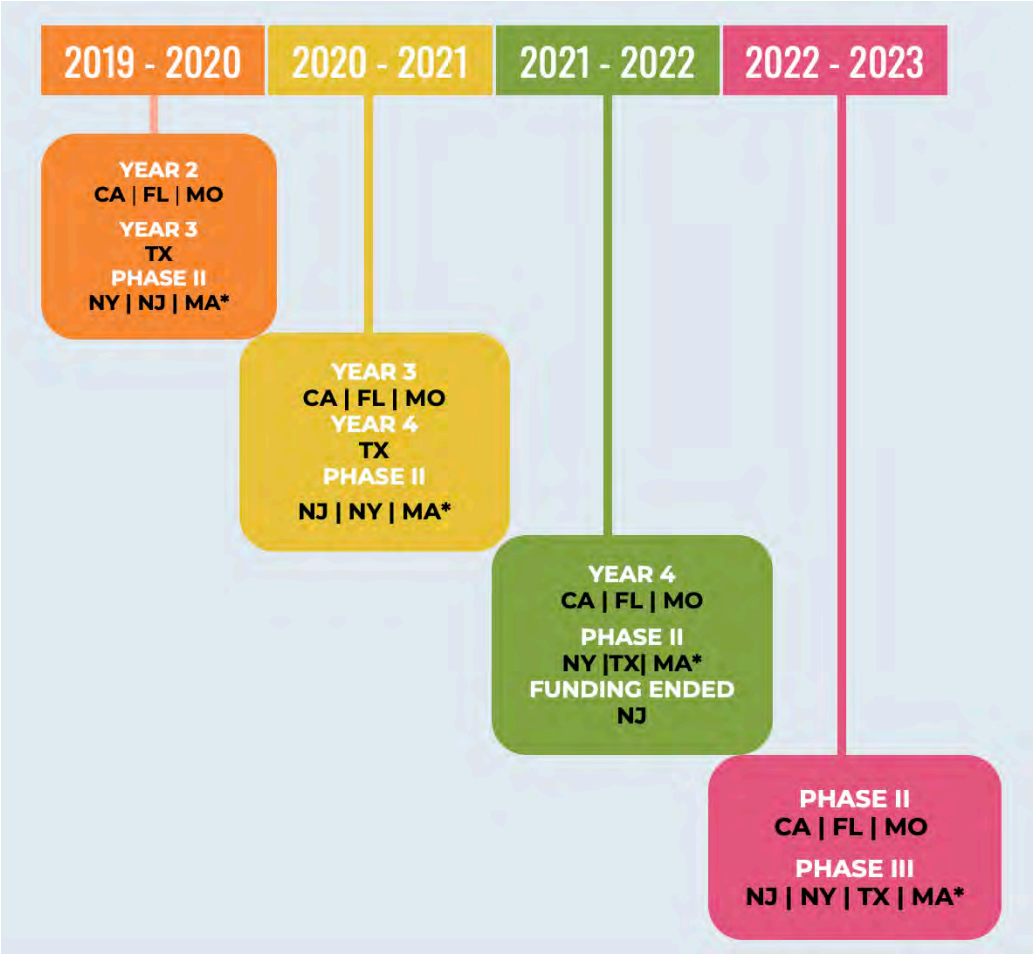
Over a rollout of three successive cohorts of fellows, each participating school district will have as many as 12 fellows who have participated in the extensive 2-year Wipro SEF program. These fellows serve as a leadership group for district science and engineering initiatives. This critical mass of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

Phase II and Phase III – Innovation Phase

After Fellows complete 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 April 2023 thru June 2023. It is the third quarterly report of the newest phase of the program. During this time, all sites met the challenges of maintaining and adapting the Wipro SEF program as they adjust to the new "normal" following 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 the report, you will find remarkable stories of Wipro Fellows supporting their students as teachers and supporting other teachers as teacher leaders.



	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

BY THE NUMBERS

Foundational Phase

Site (Institution)	Districts	Total Students in Districts	Fellows	Non-Fellow teachers involved (e.g. GPS)	District Science Coordinators	Presentations and Publications
California (Stanford)	5	97,288	60		5	7
Florida (U of South Florida)	3	398,960	50		3	16
Massachusetts (UMass – Boston)	5	73,688	58 – Phase I 17 – Phase II	5	18	
Missouri (U of Missouri)	8	34,162	52		13	8
New Jersey (Montclair State)	5	31,486	60 – Phase I 24 – Phase II 31 – Phase III		5	22
New York (Mercy College)	5	33,580	60 – Phase I 60 – Phase II		5	31
Texas (U North Texas – Dallas)	5	83,160	46 – Phase I		5	28

			20 – Phase 2[2]			

Innovation Phase (Include 2022-2023 AND 2023-2024)

Site (Institution)	Projects Submitted	Projects Approved	Alumni Fellow	New Fellows	Non-Fellow Teachers involved	District Science Coordinators
California (Stanford)	N/A	N/A	60	16- cohort 4, year one 15- cohort 4, year two (one teacher left the district)	School Leaders: 12	5
Florida (U of South Florida)	10	6	6	0		3
Massachusetts (UMass – Boston)	8	5	2	0	55	5
Missouri (U of Missouri)	N/A	N/A	2	20		4
New Jersey (Montclair State)	13	13	13	18		5
New York (Mercy College)	10 (2023-24 unknown for all categories →)	6	6	24	162	4 (all districts except East Ramapo)

Texas (U North Texas – Dallas)	14	14	11	22		5

UPCOMING MEETINGS AND MILESTONES

September	October	November	December
	02 – FL Action Research Lessons.	01 – NY Wipro Reimagined project proposals due	01 – NY Award announcements projects begin.
18 - TX Wipro Annual Dinner	12 – NJ Wipro Workshop	06 – FL Action Research Lessons	02 – FL Action Research Lessons
21 – MO Finalize Research Article	12 – CA PL Session	9 – CA PL Session | virtual	
23 - CA Wipro Kick-Off PL Session	16 – TX Teacher Leadership	15 – MO Faculty member presentation	04 – TX
30 – NY Recruitment for Wipro	19 – MO Faculty member presentation		09 – CA PL Session | In Person - Stanford

Dates of upcoming meetings across all sites (note: dates subject to change).

This table highlights the larger and/or culminating events across sites. Additionally, sites continue monthly meetings with Fellows and DSCs as can be seen in the individual site reports.

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

Monthly Leadership meetings

Meetings of representatives from the seven sites in the Wipro SEF program occur monthly to share best practices, plan strategic initiatives, and share progress. The agenda for the July meeting is provided here.

Wipro SEF Monthly Meeting – 18 Jul 2023

Attendees: Meera (MO), Linda (MO), David (FL), Alan (FL), Kristen (NY), Mika (NJ), Tammy (CA), Anne (OR), Arthur (MA)

Agenda

1. Website design and comments
2. Agenda items for August retreat in TX
3. Updates from sites
4. DSC Follow-up to conference
    1. Goody bag
    2. Anne evaluation
    3. Next steps – Kansas City, MO
5. Making your syllabus more inclusive

Wipro SEF Leadership Retreat – Aug 30 – Sep 1 (Dallas, TX)

Attendees at the Retreat

CA	FL	MA	MO	NJ	NY	TX	Evaluation
Stanford University	University of South Florida	University of Massachusetts Boston	University of Missouri	Montclair State University	Mercy College	University of North Texas Dallas	
Tammy Moriarty	David Rosengrant (by zoom due to hurricane)	Arthur Eisenkraft	Meera Chandrasekhar	Emily Klein (by zoom due to Covid)	Meghan Marrero	Ratna Narayan	Anne Gurney
Preetha Menon	Larry Plank		Linda Godwin				

Annual IHE Leadership Meeting

Project-Wide Goals:

- Review and Reflect: To reflect on the overall achievements and challenges faced by the project as a whole in the past year, assessing the highs and lows, and evaluating the lessons learned.
- Strengthening Inter-site Collaboration: To identify and foster opportunities for inter-site collaboration for the coming year, recognizing areas of overlapping efforts and pooling resources.
- Alignment with Project Mission: Ensure all teams' activities align with the overarching project mission and objectives, refining and adjusting our approach where necessary.
- Training and Professional Development: Recognize areas where teams need further training or resources to improve their skills, leading to enhanced project outcomes.
- Feedback Loop Creation: Develop a robust feedback mechanism where all teams can contribute to and inform the larger project strategy, ensuring that on-the-ground insights inform project decisions.
- Future Planning: Create a roadmap for the upcoming year, setting clear goals and milestones for the project as a whole.

Specific Team Goals (for each university site):

- Year in Review: Present a detailed overview of the team's key successes and challenges over the past year, sharing data, insights, and stories.
- Planning Forward: Outline the main activities and objectives for the coming year, explaining their alignment with the broader project goals.
- Resource Evaluation: Analyze current resource utilization and identify any gaps or needs for the upcoming year.
- Team Development: Share any team changes, training undergone, or anticipated professional development needs.

- Opportunities for Collaboration: Identify specific areas where the team sees potential for collaboration with other sites or where they need support.

	WEDNESDAY	
3:00 PM	Opening Remarks	
3:15 PM	Summer/life updates	
3:45 AM	Agenda review	
4:15 AM	District Transformation defined	
		Micro/Macro
		Short term/long term
		How can Ts participate
		How can admin encourage Ts
5:00 PM	Ubers/taxis to Wipro event	
	THURSDAY	
6 - 8:30	Breakfast	
	PRESENTATIONS - PAST YEAR ACHIEVEMENTS AND CHALLENGES	
	- FOLLOWED BY WARM/COOL FEEDBACK AND CONVERSATION	
8:30 AM	Presentation 1	
9:00 AM	Presentation 2	
9:30 AM	Presentation 3	
10:00 AM	Presentation 4	
10:30 AM	Break	
10:45 AM	Presentation 5	
11:15 AM	Presentation 6	
11:45 AM	Summary - Common challenges and successes	
12:00 PM	Lunch	
	PRESENTATIONS - MAIN ACTIVIIES, OBJECTIVES AND CHALLENGES FOR COMING YEAR	
	- FOLLOWED BY WARM/COOL FEEDBACK AND CONVERSATION	
1:00 PM	Presentation 1	
1:30 PM	Presentation 2	
2:00 PM	Presentation 3	

2:30 PM	Presentation 4	
3:00 PM	Break	
3:15 PM	Presentation 5	
3:45 AM	Presentation 6	
4:15 AM	Collaborative Opportunities	
5:00 PM	End of day	
6:00 PM	Gather for walk to King Buffet	
	FRIDAY	
7:00 AM	Breakfast	
8:30 AM	Communications	
	Quarterly reports	How can they be of more value to you and to project
		Generate list for Q1,Q2,Q3,Q4
		Qtrly focus: e.g. Monthly meetings agendas and handouts
	Annual evaluation report	How can we use this as a tool for improvement
	Websites (National and site)	Final products sharing
	Trello project board	Are we using effectively
9:00 AM	Research by Sites/Fellows	
		Core program incl GPS
		Innovation Projects
		What support can we provide? By site? By project?
9:30 AM	Site visits (Arthur/Anne/ cross-site)	Where, when - purpose,goals. Value of cross site.
10:00 AM		
10:30 AM	Break	
10:45 AM	DSC conferences	Fellows as DSCs
		How often?
		Build and support network
11:15 AM	Interactions/contact with past Fellows	
11:45 AM	Wrap-up	
12:00 PM	Carpool to airports	

One outcome of the retreat was to begin communicating on Slack. The Slack account is being used in the following ways:

Channel **Quarterly Reports** – sites posted their quarterly reports here
Channel **Site visits** – sites posted dates when site visits by Arthur Eisenkraft and Anne Gurney would be appropriate. Once site visits are arranged, new "channels" will be created for each site visit.
Channel **Monthly Meetings** – as a result of our evaluation data, it seemed appropriate to take a deeper dive into how sites run monthly meetings. Each site is posting agendas from three monthly meetings in the past year as data to guide our discussions.
Channel – **Dallas Retreat follow-up** – sites posted their power points here. Information is also provided regarding where to upload reimbursements receipts.

Power points from the sites are in Appendix 2

Top row: Arthur, Larry, Tammy, Meghan, Preetha.
Bottom row: Anne, Ratna, Linda
Missing from photo: David, Emily, Meera

Attendance at the Wipro Corporate Event

Coincidentally, the Wipro Corporate Board meeting was being held at the same time as our Leadership Retreat. We were invited to attend the Wipro AI summit along with 500 local Wipro attendees. The event included awards to the student winners of the Wipro science fair that Ratna Narayan helped organize and talks about AI and the cooperative connections between Wipro and major AI firms including Nvidia, Snowflake, Uniphone and Glean. Arthur Eisenkraft was asked to provide an introduction to the Wipro SEF program to those present. These are his brief remarks:

Good evening.

I am Arthur Eisenkraft from the University of Massachusetts Boston.

I'm thrilled to introduce you to the Wipro Science Education Fellowship program. This program isn't just another training initiative or community outreach. It's a groundbreaking innovation that leverages teacher leadership to transform school districts across the United States.

Consider this: Over nine years, 450 Wipro Fellows have impacted 1600 teachers and more than 750,000 elementary and high school students. This isn't just data; it's three-quarters of a million young lives directly benefiting from this initiative. Think of the ripple effects—on families, on local economies, and on the communities you and your colleagues consider home.

Why did we create this program? Picture a school district aiming to elevate science education. Traditionally, governments and administrators used a top-down approach that may not suit the unique needs of their teachers and students. We know that doesn't work. Real change happens when we combine top-down strategy with bottom-up energy. Real change happens when the school's teachers are leading the revolutions. Real change happens when the district hosts Wipro Science Education Fellows.

The Wipro Science Education Fellowship program (Wipro SEF) is a two-year teacher leadership program that helps educators learn about vertical alignment of curriculum across K-12, appreciate the meaning and importance of science and engineering practices, and become leaders in their district while remaining in the classroom. They lead without leaving.

Each Fellow's journey starts with one of our seven University Partners. These universities collaborate with school districts to find passionate K-12 teachers who have the potential to be teacher leaders. The Fellows not only learn from academic

experts but also from each other, gaining practical insights for immediate action. These are teacher-leaders who not only identify problems but also implement solutions. They partner with science coordinators, create professional development programs, and support transformational district science program initiatives.

By supporting our Wipro Fellows, you're not just investing in technology. You're drafting a new blueprint for industry-education partnerships—one that begs to be duplicated. We've begun with seven universities but imagine the potential. Hundreds of partnerships. Thousands of Wipro Fellows. Millions of transformed student lives. Here and internationally.

We owe this blueprint to Wipro and our university partners, some of which are here with us today:

Tammy	*Moriarty*	*Stanford University, CA*
Preetha	*Menon*	*Stanford University*
David	*Rosengrant*	*University of South Florida*
Larry	*Plank*	*University of South Florida*
Arthur	*Eisenkraft*	*University of Massachusetts Boston*
Meera	*Chandrasekhar*	*University of Missouri*
Linda	*Godwin*	*University of Missouri*
Emily	*Klein*	*Montclair State University, NJ*
Meghan	*Marrero*	*Mercy University, NY*
Anne	*Gurnee*	*Other*
Ratna	*Narayan*	*University of North Texas Dallas*

We stand at the cusp of a transformative journey, and Wipro's values align beautifully with our vision. I urge you to share this initiative with your teams so that they can experience the pride in seeing how their company supports local communities and to further ignite the passion for education and the potential for systemic change.
Together, we're not just dreaming about the future of education; we're bringing that future to life in schools across the nation. We know this works. Help us show the skeptics how much a company can improve a local community. Help us inspire other companies to follow Wipro's vision and leadership. Help us make the

transformational educational changes that parents and communities are desperate to see.

Your trust fuels this transformation. Your contribution extends beyond dollars—it's a living legacy. You are not just developing a vision about what the future of education could be, you are making that vision a reality in school districts throughout the country.
Thank you.

Back Row: Preetha, Tammy, Anne, Meera, Meghan, Linda
Front: Ratna

Website Development

With the support and guidance of Wipro, we have been working on a Wipro SEF website. Some sample screenshots are displayed. The next step will be to start populating the site.

wipro Science Education Fellowship

Home | Who We Are | Program Details | Partner Universities | Research Projects | Contact Us

District transformation through **teacher leadership**

wipro Science Education Fellowship

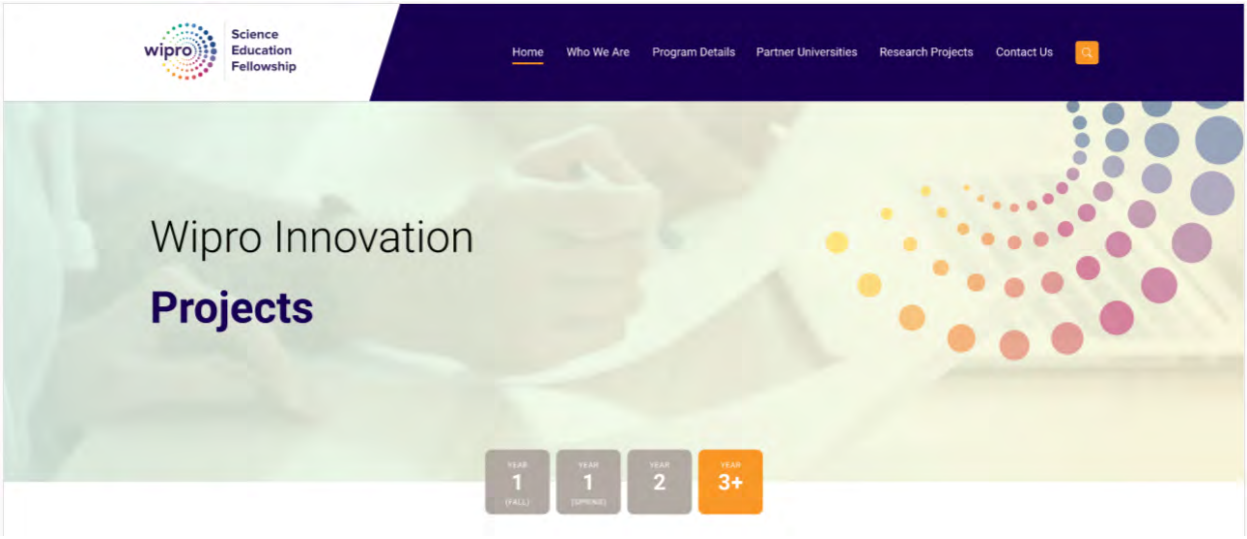
Home | Who We Are | Program Details | Partner Universities | Research Projects | Contact Us

Vertical **Teaming**

1 | 1 | 2 | 3+

The first semester of the Fellows work together is in sharing lessons of the same science content and reflecting on the same research article across grade levels. Vertical articulation of curriculum allows Fellows to better understand the journey of their students from pre K to high school.

Vertical **Collaborative Coaching and Learning in Science (VCCLS)**



Wipro Research Initiative

Professor Brooke Whitworth, Professor Julian Wenner and colleagues are initiating research regarding teacher leadership and how the Wipro SEF program aligns with current knowledge regarding this field. What follows is the September 2023 report summarizing progress on the research questions.

Wipro Research Progress Report
August 5, 2023, to September 6, 2023
Proposed Timeline

Spring 2023
- Amend and Write IRBs as appropriate
- Gain access to current data and contact information for participants
- Familiarize ourselves with the data
- Begin analysis as appropriate; design data collection protocols for additional data as needed
- Begin additional data collection as needed

Summer 2023/Fall 2023
- Finish data collection
- Finish data analysis
- Outline papers
- Submit conference proposals as appropriate (e.g., AERA, NARST, ASTE)

Proposed Research

Study #1: Explore the social networks associated with science education teachers, DSCs and administration. The goal of this research is to understand the network intricacies of science educators which can be used for insight to how new policies, standards and curriculum is disseminated.

Study #2 (REVISED 8/1/2023): Explore the perceived applicability and effectiveness of the Wipro PD in light of basic psychological needs theory (which is a component of self-determination theory). Examine alignment of components of the Wipro PD with components of needs theory (autonomy, competence, relatedness) and explore for relationships (if any) with teachers' perceived applicability and effectiveness of the PD. Could possibly compare site to site.

Study #3 (REVISED 8/1/2023): Examine the relationships (if any) between science education fellows' (SEFs') demographic characteristics and their 1) perceptions of their own leadership, 2) their choice of GPS topic, and 3) experiences of Wipro PD.

Progress 8/5/2023-9/6/2023

General Updates:
● Five weekly meetings (90 min. each) have been held with our group (2 faculty and 4 graduate students)

Study #1 Update:
● 'Waves' for each state are continuing to be sent out as appropriate, and reminders sent to those who have not completed the survey.

Study #2 Update:

● It was concluded that there is not enough data for the study on out-of-field teachers, nor was there enough data for the non-traditionally-prepared teachers.
● We are now considering an 'evaluation' type of study on the perceived applicability and effectiveness of the PD in light of basic psychological needs theory. Roughly, the hypothesis might be that teachers who find PD immediately applicable and effective do so because the PD is meeting their basic psychological needs of autonomy, competence, and relatedness.
● The research plan is to look at existing data for:
○ Alignment of PD components with the components of basic psychological needs theory
○ Any deviations in PD components from site to site that might affect what is being offered in terms of the theoretical components
○ Teachers' perceptions of the PD
● A student is currently categorizing data based on theory for quantitative analysis
○ Planned analysis is to look at degree of needs being met at the beginning and end of the PD
● A student is currently reviewing the literature on the application of this theory to teachers; it appears that this theory is rarely applied to teachers and more typically applied to students. Further exploration into the theories that are typically applied to teachers in lieu of this theory as well as the justifications for the use of these theories is in progress.
● We had hoped to put in for a conference proposal with this study, but with the changes, we will just pursue writing this up and publishing it instead unless another conference opportunity arises that is appropriate for this proposal.
● Brooke is in contact with Anne regarding further information on specific PD activities for each site.

Study #3 Update:

● This study has pivoted back to looking at demographic matches and mismatches given preliminary results of a logistic regression examining factors that are related to fellows' selection of GPS topics related to leadership. The preliminary analysis suggests that there may be a connection between a demographic match and the selection of a GPS topic related to leadership. When a fellow's race/ethnicity identity matched with their DSC, they were more likely to include an instructional leadership component in their
○ We are looking at leadership specifically in relation to instructional leadership and fellows' intentions to share what they have learned with teachers within their school or district or through recognizing their efforts to lead PL or PLCs within their schools.
● We are currently extending our data analysis and incorporating all available fellows who started the program between 2016 through 2022. Matches and Mismatches are being identified for additional analysis. All of the GPS information provided has been coded and is ready for our next analysis.
● We are also pulling demographic data about the school districts related to student populations and teacher populations, at least when it can be found. We are going to look for additional factors that may influence fellows designing GPS related to the coded

themes.
- The following research questions are still being used to guide the study.
  - In what ways (if any) do teacher demographic characteristics influence their perception of themselves as a leader before participating in a PD program?
  - In what ways (if any) do teacher demographic characteristics influence their selection of GPS topic?
  - In what ways (if any) do teacher demographic characteristics impact teachers' experiences of the Wipro PD?

CALIFORNIA- STANFORD UNIVERSITY

Authors: Preetha Menon, Tammy Moriarty

Statement:
The CA Wipro Team's vision for developing teacher leadership in the Wipro SEF Program focuses on developing leadership practices and broadening educators' perspectives beyond the classroom by applying their leadership skills within their school and district contexts. To meet these goals, the CA Wipro Site will continue to offer the traditional Wipro SEF Program to two more cohorts of science teachers from our partner school districts.

In addition, the CA Team is investing in the five partner school districts by creating specific plans that meet the needs of each district. These plans have been co-constructed with District Coordinators and often include the participation of past Wipro fellows. The goal of this work is to develop each team's collective capacity to advance high quality science teaching and learning in their districts that align with NGSS and reduce the persistent inequities that pervade science education.

Finally, the CA Team is launching its first Wipro School Leaders Program which will bring together school leaders from across the five districts and build their capacity to support high quality teaching and learning, increase equitable opportunities, and support the goals of the

Wipro Program. By addressing the work from these three levels- teachers, district teams, and administrators- the CA site is working towards the goal of district transformation.

Summary of Current Project(s) and Goals

The CA site continues to build the capacity of 15 science teacher leaders (note: one teacher left the school district and had to drop out of the fellowship program) across 5 districts to further excellence in science teaching and learning. Our goals have been to integrate the NGSS dimensions along with an emphasis on the nature of science as well as address equity in science classrooms by focusing on multilingual learners, who comprise a large percentage in our partner districts. The structure of the CA Wipro SEF Program for the fellows follows the traditional Wipro model, with an emphasis on doing the V-CCLS and H-CCLS reflective practice work in the first year and GPS Projects in the second year. The 2023-2024 school year will be the second year for our Cohort 4 fellows.

The CA site is also working with district teams from our partner school districts with the aim of developing their collective capacity to advance effective science teaching and learning in their districts that highlight NGSS, address the needs of multilingual learners and support science teachers' commitment to maintaining rigor in their science classrooms.

Concurrently, the CA site is developing a program specifically for school leaders (principals, assistant principals, and other district roles). The goal is to build instructional leadership capacity and create strong district teams that will support the overall goals of the Wipro SEF program. Building capacity at all levels of the system - classroom teacher, school leader, and district - can lead to transformational changes at the site and district levels and address persistent inequities that pervade science education. This past summer in June, 2023, the Wipro School Leaders Program launched with a four day summer institute. Eleven school leaders met during this time to consider how they are leading their schools and building learning communities. During the school year, the program will shift towards science instructional leadership.

Progress and Highlights

In our pursuit of district transformation, our site has adopted a comprehensive three-pronged strategy to catalyze change in three participating districts. Through these three ways, Wipro Science Teacher Fellowship (traditional), District Partner work and Wipro School Leaders program, we envision a way to showcase how distributed leadership, collaborative endeavors, including professional learning, and science teaching coalesce to steer districts towards transformational progress.

The journey commenced with our cohort of 16 active fellows, a thriving community of

teachers who used the VCCLS and HCCLS as frameworks for aligning their educational practices and Wipro's course of study, such as the nature of science and supporting equity of voice for all students especially multilingual learners. The Wipro Professional Learning Sessions cover a spectrum of critical topics, including the nature of science, support for multilingual learners, fostering effective science discourse, and advancing equity in education. Through these sessions, we equip our educators with the knowledge, tools, and strategies needed to drive meaningful change in their classrooms. Recognizing the unique needs of our educators, we have been deliberate in providing differentiated support. Whether nurturing the talents of newer teachers or harnessing the wealth of experience possessed by seasoned educators, our approach is tailored to empower each teacher to thrive in their role.

Next was the launch of the Wipro School Leaders Summer Institute, with 11 active participants and a superintendent partner, setting the stage for district level change. The goal of the Wipro School Leaders Program is to build the capacity of a cross-district cohort of school site leaders who are ready to create strong learning communities at their school sites, improve the quality of teaching and learning for all students, particularly for historically marginalized and underserved students and create environments where teachers continue to improve instructional practices so that all students have access to high quality instruction. Building on this foundation, leadership coaching is already in motion. This month also marks the commencement of the monthly Professional Learning (PL) sessions for school leaders, a space for continuous development with an emphasis on supporting science instruction.

Further our District Partner Work, across three distinct districts, is a compelling narrative of transformation. In Moreland, the focus sharpens on empowering educators to support newcomer multilingual learners in the realm of science education. Notably, Wipro fellows have joined forces with the elementary district team, aligning their expertise to bolster science teaching through the newly adopted Next Generation Science Standards (NGSS) aligned curriculum. In Mountain View Whisman School district, the CA Team is engaging in site visits and as mentors in district level professional learning sessions with the District Coordinator in order to foster a deep understanding of the district's unique dynamics and needs and further enhance our role as catalysts of transformation. Across the spectrum in San Jose Unified, the district's partnership extends to a collaboration with Diane Aronson, the Wipro District Coordinator, where ideas and strategies are co-constructed. In Diane's role as the District Science Instructional Coach, Diana has had significant power and influence to involve Wipro teacher fellows in furthering the goals of their district science initiatives. This has resulted in Wipro fellows being integrated into significant facets of the district's operations, infusing perspectives and innovative approaches from Wipro professional learning sessions.

Plan for the Next Two Quarters

People	Activity
Cohort 4 Teacher	In June 2023, Cohort 4 fellows were introduced to the GPS Projects through participating in the End of Year Conference. The

Fellows	Wipro CA Team asked fellows to think about GPS project ideas over the summer. During the fall Kick-Off Session in September 2023, fellows will brainstorm ideas for a possible project, spend time writing about their personal goals, and meeting with their district teams to discuss district science goals. Fellows will be given a GPS Project Idea Template (LINK)) and will be meeting with their mentor in the coming weeks. Ideally, all fellows will have a final project idea finalized by early October. By connecting their GPS projects with their district goals, the fellows are engaged in efforts coalescing towards district transformation.
District Teamwork	We are collaborating with the Moreland School District to expand our efforts in supporting multilingual learners in science, with an explicit focus on newcomers in middle school where we meet participating teachers after school. Using TORSH talent videos, we provide feedback on their lessons and engage in collaborative learning sessions. We are also holding a full day PL session with all middle school (grades 6-8) teachers in the district on October 6, 2023. This session will focus on how to integrate science and language learning, particularly with newcomer multilingual learners, using their district science and math curriculum.
Wipro School Leaders	After a four-day summer institute, school leaders are continuing their learning via follow-up professional learning sessions. These learning sessions are 2 hours each and will occur seven times across the school year, with most of them taking place in-person at one of the school district locations. Big ideas about leadership have been introduced, including how to develop stronger, more effective school teams. The focus of the sessions will now shift towards supporting science instruction and leveraging science teacher leadership.

Vignettes

Brenda Valine,
5th Grade Teacher, Baker Elementary School
Moreland School District

Teaching is a roller coaster. Every year has ups and downs that take us through a range of experiences and emotions. I am now in my ninth year of teaching, and one constant theme while riding the roller coaster is my desire to reflect on my teaching practice and grow as an educator. I strongly believe that teachers should learn alongside their students and evolve as the years go by. Naturally, the Wipro fellowship at Stanford University was calling my name.

In my first year of the Wipro Fellowship, I was able to work with so many amazing educators from a range of grade levels and backgrounds. One highlight that stands out to me is our V-CCLS groups. I was on a team with a 7th grade teacher, a high school teacher, and a K-5 STEM teacher. Our vulnerability was tested when we had to share a video from a science lesson in our classroom. Watching and discussing each person's lesson was so enlightening! We found that we shared a lot of the same struggles, and brainstormed solutions to them in a non-judgmental space. One common problem that kept coming up in our discussions was the quality of student work on Claim-Evidence-Reasoning tasks. Our group came up with the idea of doing a unit during the beginning of the year on the basics of doing science. This would include how to fill out and record observations, how to do CER tasks, and proper behavior during hands-on Science activities.

Another highlight was every single one of our Saturday in-person sessions at Stanford. At first the idea of having to be in a full day of professional development on a Saturday sounded tedious. After my first session, I was blown away with how wrong I was. The activities were engaging and led to beneficial discourse. During every single session I had an "aha moment" where I was able to make connections and come to realizations about how to better my practice in the classroom. An activity that stands out to me was the termite experiment. Participating in a hands-on activity gave me so many ideas to use in my own classroom. I now look forward to every Saturday session, because I know it will be worth my time (the food is also amazing).

As I embark on my second year as a Wipro fellow, I am eager to tackle my Growth Plan System project and look forward to all the meaningful conversations that will be had.

Sierra Vance,
1st Grade Teacher, Baker Elementary School
Moreland School District

I joined Wipro during my fifth year of teaching first grade. I was hesitant at first to add something else to my plate, but it ended up being a very useful, rewarding experience. The program changed the way I taught science. Before Wipro, science was something that I just tried to fit into my schedule when I could. It was never a priority. However, Wipro changed my outlook on the importance of science and how fun it can be to teach and to learn. One of the highlights of Wipro were the other educators in the program. I loved being in a community of teachers who were passionate about what they were doing and willing to share their ideas and talk through problems. It was a very supportive, collaborative atmosphere. My first year of Wipro was during distance learning. It was nice to set aside time each month to talk to other teachers who were in my same situation. We all were struggling with how to teach online. Not only were we able to support each other in science, but also in managing a new system and way of teaching that no one had done before. The facilitators of the program were also more than willing to help and share their expertise. I was especially appreciative of our V-CCLS collaboration time. It was empowering to see how what I taught in first grade was built upon year after year all the way through high school. It really made me realize how important it is to build the foundation. Overall, I am very thankful for my time in Wipro, and I think my students benefit because of it.

Calendar

Please provide dates for all upcoming meetings for the 2022-2023 year. Note the place, date and time and whether the meeting will be virtual or face-to-face.
Please also provide possible dates for Anne and me to make a site visit (e.g. visits to schools). Assume a 2-day site visit. (TX and NY needn't complete this.)

Master Calendar for 2023-2024 Academic Year - Wipro SEF

Please see a PDF version of the calendar HERE.

September 23	9:00 AM - 2:30 PM	Wipro Kick-Off PL Session | In Person-Stanford
October 12	4:30 PM - 6:00 PM	PL Session | virtual
November 9	4:30 PM - 6:00 PM	PL Session | virtual
December 9	9:00 AM - 2:30 PM	PL Session | In Person - Stanford
January 18	4:30 PM - 6:00 PM	PL Session | virtual

February 10	9:00 AM - 2:30 PM	PL Session | In Person - Stanford
March 14	4:30 PM - 6:00 PM	PL Session | virtual
April 20	9:00 AM - 2:30 PM	PL Session | In Person - Stanford
May 16	4:30 PM - 6:00 PM	PL Session | virtual
June 1	9:00 AM - 2:30 PM	End of Year Conference| In Person - Stanford

Master Calendar for 2023-2024 Academic Year- School Leader Program

September 13	4:30 PM - 6:30 PM	PL Session | In Person-Moreland District Office
October 25	4:30 PM - 6:30 PM	PL Session | In Person-Moreland District Office
November 29	4:30 PM - 6:30 PM	PL Session | Virtual
January 10	4:30 PM - 6:30 PM	PL Session | In Person-Moreland District Office
March 6	4:30 PM - 6:30 PM	PL Session | In Person-Moreland District Office
May 1	4:30 PM - 6:30 PM	PL Session | In Person-Moreland District Office

FLORIDA- UNIVERSITY OF SOUTH FLORIDA

Author:
David Rosengrant, Allan Feldman, and Nancy Islam

Statement:
Our goal in this project is to continue our empowerment of the Wipro Fellows. It is unusual for educators to choose their professional development path much less spearhead a project with it. In this phase, fellows are able to further enhance what they have learned from Phase 1 to increase the district wide impact. The continued personal vested interested in their Phase 2 projects make them the champion for it, as well as involving other individuals (administrators and additional teachers) to help them work towards the overarching goal of district transformation. We have increased the number of projects in our second cohort which has also resulted in every district having a project which helps us achieve the desired district transformation.

Summary of Current Project(s) and Goals

Cohort 1: 2022-2024
Title: BSCS 5E Instructional Model at Jule Sumner High School
This two-year project aims to deepen participants' understanding of the BSCS 5E Instructional Model to support planning for instruction and assessment aligned with the Next Generation Sunshine State Standards (NGSSS) and A Framework for K-12 Science Education. The project's goal is for participants to learn how to develop phenomena-based 5E instructional sequences to support coherent storylines and conceptual flow aligned with the NGSSS and A Framework for K-12 Science Education. The team consists of Nicole Holman, Phase 1 Fellow and Science Coach, Julie Nelson, classroom teacher, and Jessica Novack, Science Department Head. They have begun to disseminate their work through this website: https://biologyhcps.my.canva.site/google-23-24-florida-biology-eoc-5e-instructional-model and will be making a presentation at the annual meeting of the Florida Association of Science Teachers to be held in October 2023.

Cohort 2: 2023-2024
Title: Working Across Grade Levels to Improve Grades 3-5 Science Teaching
This two-year project brings together grades 3-5 teachers in a V-CCLS to improve the teaching of science at their school. The team is led by Tara McClintick, Phase 1 Fellow
Floyd Howze, classroom teacher, and Nicole LeGrant, Assistant Principal. The team will work together to establish a science progression for the three grades, identify appropriate curriculum materials, and implement them. They will disseminate their work to other elementary schools in Pinellas County, and through conference presentations.

Title: Gifted but 'Off Track': Serving the Gifted Students of a Title 1 High School Team
In this two-year project Jacqueline Bromley, Phase I Fellow, Carolyn Graham, classroom teacher, and Aaron Melvin, Assistant Principal, is establishing an after-school club to support gifted students who have been designated either 'at-risk' or 'off track' according to Early Warning Intervention data. They will disseminate their work to other high schools in Pasco County, and through conference presentations.

Title: The Cross-Curricular Argumentation Routine (CCAR) PLC Project
This two-year professional learning experience is creating a professional learning community help teachers implement the Cross-Curricular Argumentation Routine with their students. The team consists of Sarah Swoch, Phase 1 Fellow, Ashley Graney and Calvin Denecke, classroom teachers, Stephanie Hornick, Middle School Science Specialist, and Fawnia Schultz, Pinellas Wipro DSC and CCAR Coach. They will disseminate their work to other middle schools in Pinellas County, and through conference presentations.

Title: Flipped classroom in advanced courses in Hillsborough County High Schools
This project is an extension of Bhagyashree Kulkarni's Phase 1 GPS project. She and the other team members (Chelsey Swat, Phase 1 Fellow, Steven Velez Hernandez and Alan Sherburn, classroom teachers, and Khadijah Gaskins-Jones, Science Coach) are implementing flipped classroom strategy by using available videos or videos made by the teachers. The focus is

advanced courses like AP, AICE and Honors classes for this upcoming year and a goal to extend this to other classes in year 2. They will disseminate their work to other high schools in Hillsborough County, and through conference presentations.

Progress and Highlights

Cohort 1 had 3 groups (all 2 year projects)
Melissa Triebwasser – Integrating Engineering by Design into NGSS while fostering inquiry based environment via phenomena – based learning.
Michele Wiehagen – Joint project in that they are using the same curriculum integration but also initially was going to use LEGO Spike Prime with its technology.
Due to a change to becoming a vice principal, these two projects are not continuing into their second year.

Nicole Holman – Check out the website to best understand their work:

https://biologyhcps.my.canva.site/google-23-24-florida-biology-eoc-5e-instructional-model

Cohort 2 had 5 groups (all counties represented), adapted submissions to allow for 2 years again.
Tara McClintick – 2 years – Vertical Alignment CCLS groups within elementary school. Develop model to share out to others.
Sarah Swoch – 2 year – Creation of Professional Learning Community for Cross-Curricular Argumentation Routine
Jacqueline Bromley – 2 year – 70% of Gifted students are at risk or off track in her school. Creation of club to support Title 1 gifted students.
Shree Kulkarni– 1 year – Creating and implementing a series of flipped videos to use in multiple disciplines in different schools.
Chelsey Swats – 1 year – was going to model Nicole's work but is sticking with original submission of having a similar project with Shree's.

We had decided to allow two year submissions again this year since we had a small number in the first cohort, thus had the funds to support additional ones. This resulted in three additional 2 year projects.

Plan for the Next Two Quarters

Date	People	Activity
September	Leadership	We are going to be having a leadership meeting to plan out some key events for the second quarter (possibly coordinating with the science festival).
October 2nd, 6-8 PM (Virtual)	All	This will be a virtual meeting with our second cohort. We will be going over projects as well as beginning our Action Research Lessons.
November 6th, 6-8 PM (Virtual)	All	This will be our November and though the goal was to be in person, many issues turned this one into a virtual

		event with the on-site event in December. We will continue our action research lessons
December 2nd, 9-12	All	This will be an in-person event (STEM Lab at USF St. Petersburg) and will focus on how the first semester went and then what are the goals for the second semester. Part of this includes a continued lesson on Action research.

In addition to the above meeting dates, the authors of this paper meet every week. This team then meets with the DSCs and other senior leaders monthly. We are going to be discussing the second quarter at our next meeting of this type (within the next two weeks). One thing specifically is the St. Petersburg Science Festival may provide a venue for us to share about the work we have done with this project.

Furthermore, to increase interaction with the entire team for the cohort, we are going to try and send at least one leadership team member to the individual cohort team meetings to be a sounding board/resource as well as a way for leadership to interact more with the entire team.

Vignettes

Shana Tirado

My name is Shana Tirado, and I am the K-5 Science Supervisor for Hillsborough County Public Schools. I began my educational career in Hillsborough County 34 years ago. Serving the district as an elementary classroom teacher, science coach, Magnet Lead Teacher, teacher of gifted, Assistant Principal and content supervisor, my experiences remained connected to science and STEM. My passion for inspiring students in science began my first day in my own classroom. The natural curiosity of students to explore and discover the world around them engages all learners regardless of ability or language. I had the unique opportunity to open Cahoon Animal Science Magnet in my role as Assistant Principal. The first of its kind in our district allowed me to lead curriculum development that focused on animal studies in various biomes around the world. With a live animal interactive lab, students learned how to care and respect animals while mastering standards resulting in our school letter grade rising in the first year from a F to A. Entering my fifteenth year as K-5 Science Supervisor, there is not one day that I do not love my job. My district role affords me the ability to work side by side with fellow educators and administrators creating meaningful opportunities for teachers and students in science and STEM.

My membership and involvement with NSTA, FASS, and NSELA has allowed me to grow professionally connecting with educators across the nation to refine my practices. Through our district's participation in the Wipro fellowship, I have supported elementary educators as they developed and implemented their research projects. The impact I have observed on teaching practices through the involvement with Wipro is one of growth, reflection, and success. I look forward to serving as the DSC for Hillsborough County Public Schools. This will be a great year of continued personal growth as I am inspired by the cohort of fellows I have the privilege to work with.

Bhagyashree (Shree) Kulkarni, Phase 1 Fellow, Chelsey Swat, Phase 1 Fellow, Steven Velez Hernandez and Alan Sherburn, classroom teachers, and Khadijah Gaskins-Jones, Science Coach

Our project is an extension of Shree's Phase 1 GPS project. She has teamed up with another Phase 1 Fellow, Chelsey Swat. We are going to continue Shree's work to implement the flipped classroom strategy by using available videos or videos made by our team or other teachers. For year 1 we are focusing on advanced classes,e.g., AP, AICE and Honors classes. In year 2 we want to extend this to other classes. Our goal is to involve and extend this teaching strategy to other teachers in our school and district by conducting training sessions for teachers.

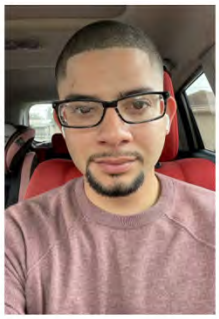
Students in the flipped classroom will view video or online lectures as homework and take notes and will have to answer questions within the video using apps like Edpuzzle or Nearpod. This will ensure students accountability. In class, students will be involved in active learning experiences such as discussions, peer teaching, presentations, labs, hand-on activities projects, problem solving, computations, and group activities. Based on what Shree learned in her GPS project, we believe that using this method can help in implementing science and engineering practices effectively and consistently in the classroom. This will help students develop cognitive and problem-solving skills which are very important for students' success in these advanced and honors courses.

Khadijah Gaskins-Jones

Admin Support

Bhagyashree Kulkarni

Wipro Fellow



Steven Velez-Hernandez

Teacher

MISSOURI- UNIVERSITY OF MISSOURI

Author: Meera Chandrasekhar and Linda Godwin

Statement:
As we start our second year of Phase II, we welcome 6 elementary teachers to Cohort 4, bringing the total number to 15. The elementary teachers will participate in the project for one year, collaborating with the 9 secondary teachers who started in fall 2022. All Cohort 4 fellows will be working on their own lesson plans that they will disseminate among their buildings and districts. Cohort 5, consisting of 5 secondary teachers, has just begun in August 2023, and will work on CCLS collaboration in this first year of participation. The goal for both cohorts is to harmonize the teaching of science and math so that students and teachers see them as complementary subjects.

Summary of Current Project(s) and Goals
The current project is an expansion of the teacher network, providing opportunities for collaboration and leadership, and focusing on collaboration between science and math teachers in middle and high school. The project will address the challenges of teaching science and math in a harmonious manner at the middle and high school grade levels. Students often think of math as a set of rules used to manipulate abstract concepts. Several factors contribute to this thinking. For example, terminology used in math vs science, the sequencing of math units with relation to science, the infrequency of discussion about the relevance of science topics in math units, and the differences in graphing methods used in math and science classes. The collaboration between math and science teachers is essential

to the implementation of successful science and math curricula. This project will focus on having teachers develop such a culture in a systematic manner using appropriate research articles and paired Science and Engineering Practices and Common Core Math Practices.

In the first year of a fellow's participation, the project will enroll middle school math and science teachers in teams from previous and new school districts. A team can be either from a middle (6-8) or a high school (9-12) grade band. A team will consist of 2 to 4 teachers, with at least one science and one math teacher. Members of a given team will participate in the project in the same cohort. Grade 6-12 fellows will work with the project for 2 years. Three cohorts of fellows will be recruited in 2022, 2023 and 2024, with up to 15 fellows per cohort. Fellows will work in V-CCLS and H-CCLS teams in Year 1 and will each develop one lesson plan that integrates math and science. In Year 2 they will work within their teams and develop 3-4 lesson plans or a module of lesson plans that they will disseminate to their and other school districts.

In Year 2 of each cohort (beginning fall 2023 for cohort 4) elementary teachers will be recruited from Year 1 fellows' districts as associate fellows. Elementary teachers typically teach both math and science. The purpose of having them work with middle and high school teachers is to have them learn content and methods as well as work on vertical collaboration across the K-12 spectrum so that they can integrate science into their math classes and vice versa.

Highlighted Project

Susan Elliot, from Columbia Public Schools, used a hands-on science experiment in her 7th grade math class. Titled "On Top of Spaghetti," students used pasta to construct a bridge and test its strength by adding pennies to a dangling Dixie cup. Students made predictions, took data, constructed a bar chart, and calculated averages. The introduction of an inquiry-based science activity in a math classroom is an example of the harmonization of the teaching of math and science. Since Susan's middle school Wipro team works together year-long, we expect that such crossover activities will become more frequent and have a good prospect of being embedded in their school's culture. This team addressed the following practices: ***Math #3 Construct*** *viable arguments and critique the reasoning of others*; ***Science #6*** *Constructing explanations and designing solutions* The picture shows the audience repeating this experiment during V-CCLS presentations in Dec 2022.

Our highlights and successes include:

- Collaborations among math and science teachers have been productive and have created good learning opportunities.
- Fellows have learned a lot about applying math and science practices and keeping the practices consistent during their lessons.
- The lessons taught during V-CCLS and H-CCLS collaborations have been diverse in their choices of math and science practices and showed evidence of the variety and depth of their learning.
- Math teachers have embraced using hands-on activities in their classes and having students describe their learning using multiple representations, specifically verbal, pictorial, graphical, and mathematical representations frequently used in modeling methodology. In parallel, science teachers have used mathematical tools that are frequently used in math classes.
- Teams have begun conversations about expanding the math-science collaborations to other teachers in their school, which bodes well for a change in the culture of how math and science are regarded in their schools, leading to an impact on district transformation.

Cohort 4, which started in the project in Fall 2022, was comprised of 9 grade 6-12 fellows from Columbia, Boonville, and Hallsville school districts. These fellows will participate for two years, 2022-24. In year 1 they focused on V-CCLS and H-CCLS collaborations. The district teams consisted of at least one math and one science teacher from their middle and high school grade bands.

In Fall 2023, 6 elementary school fellows joined the 6-12 fellows for a one-year stint in the project (2023-24). These six teachers were recruited from the same districts as their 6-12 counterparts (4 from Boonville and 2 from Columbia). The goals of the 6-12 and K-5 science and math collaboration were:

1. To build collaboration among K-5 and 6-12 fellows.
2. To have K-5 fellows work with 6-12 fellows on a vertical topic.
3. To harmonize teaching of math and science throughout the K-12 spectrum.
4. To work within the K-5 team on integrated math-science lessons/activities.
5. To contribute to district transformation.
6. To further leadership skills on a local, regional, and national level.

The expectations of the K-5 fellows were:

- Develop relationships with fellows across math and science content areas, grade levels, and districts.
- Collaborate with middle and high school Wipro SEF fellows on one to three chosen topics, with the goal of implementing learning in elementary classrooms.
- Each fellow creates at least one math/science lesson that includes the math and science practices chosen by the K-5 district team.
- Present work at Wipro and other conferences (Interface, STOM, NSTA, NCTM etc).

The expectations of the 6-12 fellows in year 2 parallels that of the K-5 teachers above, with the additional expectation that they:

- Create at least 4 lessons this academic year, where they

- Use a COS (Math Practice, SEP, and research article) as they create the lessons. HCCLS COS or other are acceptable.
- Lesson plans created by a fellow should form a coherent set/ module across the team.

- Make a professional development presentation of these lesson plans to other teachers in their building and district. Video record and post it on google drive.

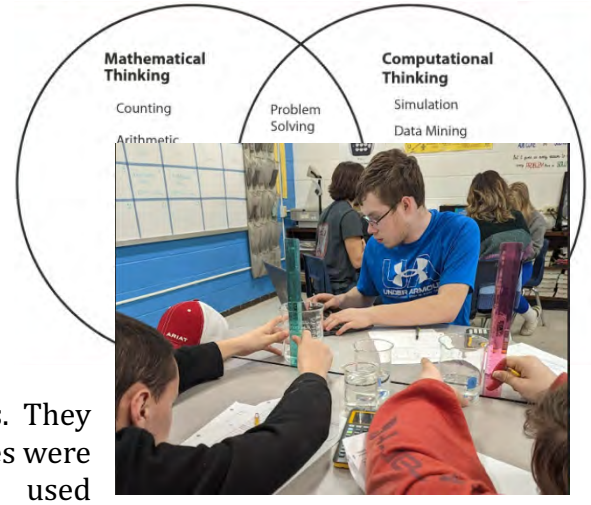
To achieve these goals and expectations, 6-12 and K-5 fellows will meet at the same times for bimonthly meetings at MU, with half the time spent in K-12 district groupings and the other half in their K-5 or 6-12 groupings. They will also meet monthly on their own schedules to work on their collaboration topics or lesson plans. The full Cohort 4, consisting of 15 fellows, met in August for a whole-day meeting. During that time, they discussed their course of study, chose their collaboration topics for the year and scheduled meetings.

Evidence of transformation in Year 1 Cohort 4 collaboration:

The district transformation goal for this project is to instill a culture of collaboration across math and science in all grades, both horizontally and vertically. While this is only year 1 of this math-science collaboration, there are encouraging signs of learning crossing the borders between teachers from these two subject areas.

In addition to the project highlighted earlier in this report, we observed the following examples during H-CCLS presentations in May:

Erin Snelling and Melissa Hough from Hallsville High School, focused on Computational Thinking via Simulations in their biology and pre-algebra classes. In the process they delved into what mathematical thinking and computational thinking mean, beyond the obvious use of more quantitative work in science and more contextual thinking in math. They included a Venn diagram in their presentation, exhibiting various nuances of mathematical and computational thinking, and interestingly, the intersection, which closely aligns with various aspects in science practices. They then went on to explain how several of the nuances were present in their classroom activities, which used Pigeonetics (pigeon genetics) and Desmos simulation packages in science and math classes, respectively.



Melissa Hundley, the math teacher from Boonville High School, had students perform a hands-on lab in her math class to investigate "How does the area of the base affect the height of a column of water?" Using the modeling methodology, which is typically used in science classes, she had students make predictions, then take data and present it using verbal, graphical and mathematical representations, finally coming up with an equation that connects the area of the base to the height of the column. Interestingly, students started out expecting an exponential relationship (from the shape of their graph), but eventually realized that the two variables (for a fixed volume of water) had an inverse relationship. This math teacher has clearly embraced a science methodology in her classroom!

Karen King and Vera Reichlin, Rock Bridge High School, Columbia, focused on argumentation in math and science. In their presentation, titled Quality Talk for Sense-making of Math, they investigated the question "Why do air bags have holes?" The set up a methodology that used a discussion of a framing question, a demo and exploration of throwing an egg and a ball, then used an investigation of the impulse equation together with ranking tasks and concluded with a short answer test. Throughout the process, students worked in collaborative discussion groups using the World Café Principles (https://theworldcafe.com/key-concepts-resources/design-principles/). Karen, Stephanie Harman (cohort 2 fellow) and a third teacher, Jamie Foulk (one of our Physics First teachers) are presenting this work at this October's NSTA conference in Kansas City. Thus, just after Year 1, this team is expanding their influence in their school, as well as disseminating the work at a national conference.

Below is listed the course of study used by Cohort 4, both in Years 1 and 2.

Cohort 4 Year 1 (2022-23) – Course of Study	
VCCLS Teams	**HCCLS Teams**
Team 1: Karen King, Matt Wightman, Melissa Hundley, Mary Melissa Hough, Nicole Campbell Effectiveness of Mayer's Problem Solving Model with Visual Representation Teaching Strategy in Enhancing Year Four Pupils' Mathematical Problem Solving Ability. Author(s): S. Palanisamy, N. B. M. Nor, Source: Malaysian Online Journal of Educational Sciences April 2021 M1. Make sense of problems and persevere in solving them. S5. Using Mathematics and Computational Thinking	*Middle School (CPS): Susan Elliott, Matt Wightman, Nicole Campbell* Preservice Secondary Science Teachers' Implementation of an NGSS Practice: Using Mathematics and Computational Thinking Author(s): W. Aminger, S. Hough, S. A. Roberts, V. Meier, A. D. Spina, H. Pajela, M. McLean & J. A Bianchini, Journal of Science Teacher Education September 2020 M3. Construct viable arguments and critique the reasoning of others. S6. Constructing Explanations & Designing Solutions
Team 2: Brea James, Erin Snelling, Susan Elliott and Vera Reichlin Mathematical Modeling: Issues and Challenges in Mathematics, Education and Teaching, R.S. Asempapa and D. J. Sturgill, Journal of Mathematics Research; Vol. 11, No. 5; October 2019, ISSN 1916-9795 E-ISSN 1916-9809, Published by Canadian Center of Science and Education M4. Model with Mathematics S4. Analyzing & Interpreting Data	*High School (CPS): Karen King and Vera Reichlin* "Fostering high school students' conceptual understanding and argumentation performance in science through Quality Talk discussions," P. K. Murphy, J. A. Greene, E. Allen, S. Baszczewski, A. Swearingen, L.Wei, A. M. Butler, Science Education. 2018; 102: 1239–1264, Wiley Periodicals, Inc. M3. Construct viable arguments and critique reasoning of others. S7. Engage in argument from evidence

	High School (Boonville): Brea James and Melissa Hundley Zheng, R., Cordner, H. & Spears, J. The impact of annotation on concrete and abstract visual representations in science education: testing the expertise reversal effect. RPTEL 17, 18 (2022). https://doi.org/10.1186/s41039-022-00194-y M2. Reason Abstractly & Quantitatively S5. Using Mathematics & Computational Thinking
	High School (Hallsville): Erin Snelling and Mary Melissa Hough Swanson, H. Computational Thinking in the Science Classroom. International Conference on Computational Thinking Education 2017, Retrieved from https://par.nsf.gov/biblio/10026244. M1. Make sense of problems and persevere in solving them. S5. Using Mathematics and Computational Thinking

Cohort 4 Year 2 (2023-24) – Course of Study	
6-12 Teams (same COS as H-CCLS)	**K-5 Teams**
Middle School (CPS) M3. Construct viable arguments and critique the reasoning of others S6. Constructing Explanations & Designing Solutions	K-5 (CPS) M4: Models with Mathematics S2: Develop and Use Models
High School (CPS) M3. Construct viable arguments and critique reasoning of others S7. Engage in argument from evidence	
High School (Boonville) M2. Reason Abstractly & Quantitatively S5. Using Mathematics & Computational Thinking	K-5 Boonville: M4: Models with mathematics S4: Analyze and interpret data

High School (Hallsville) M1. Make sense of problems and persevere in solving them. S5. Using Mathematics and Computational Thinking	Since no elementary teachers from Hallsville joined Cohort 4, the two 6-12 Hallsville teachers will work with the Columbia and Boonville teams

Cohort 5 had their first meeting in August. We have 5 fellows in this cohort. (We started with seven, but two teachers dropped out after the first meeting, citing additional responsibilities in their high school.) The five fellows have chosen their math and science practices and have been working on choosing their research article. Fellows are from Columbia and Hallsville districts.

We will begin recruiting Cohort 6 in October. This is earlier than our usual schedule, but given the challenges of recruitment, it made sense to start at the statewide Interface conference on math and science which takes place on October 4. We have reserved a booth at the conference and will provide in-person information while we encourage them to submit an intent-to apply form. Following this meeting we will plan on visiting school districts that have an interest in the project.

Visit to the Hallsville R-IV School District

Award plaques for fellows, coordinators, and districts for Cohorts 1-3 were mailed to all district coordinators in the spring semester of 2023. Meera Chandrasekhar and Linda Godwin were able attend a school board meeting for the Hallsville district on May 17, 2023, where plaques were presented. Dr. Chandrasekhar had an opportunity to provide information on the Wipro Science Fellows program to the school board and other members of the community. Wipro fellow Erin Snelling, coordinator and Hallsville Middle School Principal Ty Sides, and coordinator and Hallsville Intermediate Principal Bethany Morris attended the presentation.

Pictured: Ty Sides (DC 2018-20), Meera Chandrasekhar, Erin Snelling (Cohort 2 fellow), Bethany Morris (DC 2018-22), Linda Godwin

Meera Chandrasekhar explains the Wipro project and accomplishments of the Wipro fellows.

Looking Back at Challenges in 2022-2023

While the quality and work of our 2022-2023 Cohort 4 Wipro Science Fellows was excellent, in retrospect several challenges were encountered. These continuing challenges are:

1. Recruitment is hampered by teacher shortage, turnover, and stress. Many math teachers are leaving teaching altogether.
2. Complexity of project produces "sticker shock." Finding a balance in providing sufficient support and structure without becoming a mother hen is crucial.
3. Scheduling within teams seems difficult, likely hampered by time challenges for fellows.
4. Teacher time crunch, post-pandemic stress, low morale are issues for educators.
5. Coordinator and Principal involvement is difficult to maintain due to their schedules.

In addition to being a personal loss for the entire team, PI Dorina Kosztin's untimely passing in January 2023 had a large impact on our program. She was a major part of our Wipro family, and her presence is greatly missed.

Plan for the Next Two Quarters (Fall 2023)

Date	Cohort	Activity
Aug 2, 2023	Cohort 5	Introductory meeting and induction ceremony. Wipro overview, begin searching and reviewing science & math research materials, leadership discussion, setup up schedule. DCs attend.
Sept 21	Cohort 5	Finalize research article. faculty presentations: Upcoming eclipses and connecting sky observation with math, PowerPoint can kill your presentation – or not.
Oct 19	Cohort 5	Faculty member presentation – Math in Physics First. Research article presentations.
Nov 15	Cohort 4	Faculty member presentation – Math in Physics First. K -12 collaborative work; 6-12 lesson plan collaboration; Report back and continue K-5 lesson plan collaboration.
Nov 16	Cohort 5	Outside speaker, continue work getting ready for VCCLS presentations
Dec 6	Cohort 5	End of semester V-CCLS presentations District coordinators, phase I fellows and Cohort 4 fellows are invited.

Vignettes

Susan Elliott has been a middle school/junior high math teacher since 2003. She started her teaching career teaching 7th – 9th grades in Denver and Minneapolis, and now teaches 6th and 7th grade math at Smithton Middle School in Columbia. She is also her building's math department chair. Susan has enjoyed participating in the Wipro fellowship with her 7th grade teammates: Nicole Campbell and Matt Wightman. The three of them have worked together for the last 10 years but have never participated in professional development together or had the opportunity to watch each other teach. She has enjoyed reflecting with Nicole and Matt and brainstorming ways to incorporate Wipro learnings in their classrooms. One area she is focusing on is the use of inquiry in the math classroom following training by Peter Liljedahl, the author of "Building Thinking Classrooms in Mathematics". She sees many parallels between Peter's research and the research she and her Wipro colleagues are applying in their classrooms. The big benefit she sees is that kids are more engaged in class when they are presented with inquiry-based activities that require to them to think and problem solve with peers.

Melissa Hough is a high school math teacher at Hallsville High School. She currently teaches Pre-algebra, College Algebra, Trigonometry, Statistics, and Calculus. She has taught a wide variety of math classes ranging from 7th grade math to Calculus 2 and understands the struggles that many students face with math. One thing her team learned through the research she used for her Wipro CCLS work is how important it is for students to visualize mathematics. Students understand mathematics better when they can use models, pictures, simulations, etc. to picture the mathematics. In her Pre-algebra class last year, the students used an online computer simulation along with paper fraction strips to help them understand how to add and subtract fractions. Both the simulation and the paper fraction strips helped the students realize that a common denominator is necessary for adding and subtracting fractions. This is a concept that is often difficult for students to remember. The Wipro project has helped her become a better teacher and she is thankful for it!

Calendar

All the meetings and events listed are in-person, located in the physics building on the MU campus.

Fall semester:

Cohort 4:

August 14: Meeting and K-5 fellows introduction
November 15: Meeting

Cohort 5:

August 2, 2023: introductory meeting and induction ceremony.

September 21: Meeting
October 19: Meeting
November 16: Meeting
December 6: V-CCLS presentations. This is a good date for a site visit.

Spring semester (dates are tentative):
Cohort 4
January 10, meeting
April 8, meeting
May 24, Wipro conference (with Cohort 5). This is a good date for a site visit.

Cohort 5
January 18, Meeting
February 15, Meeting
March 14, Meeting
April 11, Meeting
May 24, Wipro conference (with Cohort 4). This is a good date for a site visit.

NEW JERSEY MONTCLAIR STATE UNIVERSITY

Author:
Mika Munakata, Monica Taylor, Emily Klein, Colette Killian

Statement:
The Montclair State University site has made progress through the initial stages of its Phase III project. As stated in the previous report, the project involves 12 Alumni Fellow working on district-related initiatives and one Fellow working on publicizing the program. Each of the alumni Fellows has recruited a team of district teachers. Together, these teams will work towards their respective goals as a new cadre of teacher leaders are nurtured.

Summary of Current Project(s) and Goals
Our first meeting with the Fellows will be October 12. We are currently collecting data on new initiatives and collaborators. We will report on their projects in the next quarterly report.

(This is from our June report—the most recent information we have.)
The current projects being undertaken by the Fellows range from VCCLS/HCCLS type activities to partnerships with local community programs. The table below offers a

snapshot into the Fellows' work. These are the titles of the presentations they gave at the May 2 culminating event.

Mary	Goffredo	Expanding Data Literacy and Increasing Collaboration Among Math and Science Teachers
Kristen	Trabona	Gaining The Buy In - Teacher Leadership
Susan	Bartol	Assessing Science PD needs
Patricia	Hester-Fearon	STEMtastic Student Engagement Liaisons Seeking Solutions
Jessica	McMasters	Follow the Light.
Frances	Carlo	School 17 STEAM Club
Delia	Furer	Removing the Barrier of Language from Science Instruction
David	Kleiner	Facilitating Math Stations in the Elementary Classroom
Kristen	Scrivens	Wipro Number Strings
Janine	Hogel	Getting Involved through STEAM
Jayme	Tchalabi	Garden Expansion Project

Progress and Highlights

We have not met the Fellows since our last quarterly report was submitted in June, because it was summer break for them. Our first meeting is on October 12, so we expect that we will be able to report on their progress in that report.

During the summer, the leadership team worked with four doctoral students and a Fellow on the submission of three proposals to present at AERA and NARST. The following are the titles of the proposed presentations:

- Title: Mapping Their Terrain: Using Social Network Analysis to Support Feminist Teacher Leadership Development (AERA Division K)
    - Shanna Anderson, Timothy Aberle, John O'Meara, Ursula Derios, Emily J. Klein, Monica Taylor, Mika Munakata
- Reimaging Teacher Leadership through Social Network Mapping: A Collaborative Self-Study. (Self-Study SIG, AERA)
- Developing a social network tool to support and characterize STEM teacher leadership (NARST)

- John O'Meara, Shanna Anderson, Timothy Aberle, Ursula Derios, Mika Munakata, Monica Taylor, Emily J. Klein

Plan for the Next Two Quarters

Date	People	Activity
September	Alumni Fellows	Meet with MSU mentors about projects
October 12	Alumni+new fellows	Wipro workshop at PRISM 4:30—6:30
TBA	Alumni+new fellows	Meeting 2 and 3
TBA/May	Alumni+new fellows	Culminating event

Vignettes

Alison Mahfouz, Paramus School District

Since the last meeting I have shifted my focus to analyzing the Number String practice and providing tasks to my students that require them to think flexibly and deeply about numbers and computations. I'm focusing on my skills facilitating number strings and rich tasks so that in other work outside of my classroom I have personal experience and anecdotes to bring to the conversations with Justine, Kristen, and Jess. I am leaning on them as colleagues in this way given that the other teachers in my school have not started implementing the practice. I still am committed and passionate about providing students with opportunities to become thinkers and problem solvers. Providing time for this during our lessons once each week feels like a valuable way to spend our time. I have observed that students have started to ask questions about the way they are thinking rather than about being correct. This feels like a win to me, because I truly hope to create confident,

independent thinkers. By engaging them with tasks that have multiple points of entry, and letting them see and understand that there are a variety of ways to approach a task and still be successful, will hopefully promote their sense of agency in math class. About once every two months I am able to meet with the 5th grade teachers in my building for a short amount of time. During these brief meetings (30 min), we discuss ways that we can incorporate rich tasks with the students that promote problem solving and computational fluency and flexibility. I have been utilizing a lot of resources from Number Talks Fractions, Decimals, and Percentages Reproducibles to assist the teachers with options for ways to get the students thinking.

Kristen Trabona, Hawthorne School District

Hawthorne has continued to make great strides in the WIPRO SEF phase three project. A brief recap of the work achieved this quarter are weekly school level meetings by the fellows, bi-weekly meetings as a whole group (fellows and myself), video-taped lesson with analysis, and next steps for third quarter.

During the weekly school level meetings, the four new participants are meeting within their grade bands (middle school and high school) to reflect on different aspects of their phenomena-based teaching. Specifically, the middle school teachers are honing in on how to provide enough questions and guidance without directing students toward an answer around phenomena. They discussed the struggles of guiding too much, not allowing for student error or misconceptions as the most challenging part of this work. The high school teachers have centered their work on having students be able to write written explanations linking the phenomena to what content they are learning in the physics classrooms. I have attended some, but not all of these meetings, because I truly want this to be a safe space for them. As much as we have the safe space atmosphere it is taking some time to break down the barrier of my title as Director of Education. One of the teachers, a non-tenured alternate route teacher, definitely has shown the need to please or answer how she believes I want. I continue to try to build these relationships and truly work alongside the teachers to show we are in this together, and learning together. I often remind them how

long I have been out of the classroom and commend them on their actions with the shift in teaching and learning.

As this is occurring and sparking discussion, the group including myself have continued to meet as a whole every 2-3 weeks for the VCCLS. As stated in the first quarterly report, the teachers spent the month of November and December planning lessons and videotaping such lessons in order to debrief as a whole group using the Lesson Tuning Protocol and Observation Protocol for Video Lessons. With the help of Technology Director and the technology department, cameras were set up for teachers and videos were uploaded into a common google folder for us all to view. The teachers were very open to this process, but nervous for what we called our first viewing party. Participant, Stephanie Donatello, a veteran sixth grade science teacher had volunteered to be the first and requested we view as a team with the initial protocol at our next meeting. During our January 11, 2023 meeting, I shared the observation protocol for video lessons used during Phase 1 of WIPRO and the tuning protocol. The group dissected this to set the plan for how we as a group were going to tackle the videos. Using one of the fellows, Stephanie's video of 6th grade Earth Science class, we silently watched together and took notes on the tuning protocol. The group found it difficult to watch and observe with out any context or background for the lesson. I explained how we were not going to share our comments, but use these as part of our tuning protocol moving forward at future meetings. Furthermore, I shared the Lesson Tuning Protocol, adapted from "tuning Protocol" by Joseph McDonald and David Allen to discuss how the next part of our worked. We left with the task that Stephanie and Jeanna were going to prepare for the tuning protocol to present their lesson background and context at our next formal meeting on January 23, 2023. Additionally, all participants were going to watch Jeanna's video and complete the video observation protocol prior to the January 23, 2023 meeting. During the next meeting, we as a group went through the tuning protocol with both Stephanie and Jeanna. The group found it very interesting once context to lessons and plans were shared. Clarifying questions were asked and warm and cool feedback was given. I was extremely impressed at the depth of the feedback provided to both participants. Warm feedback included:

- The stop, reflect, and adjust strategy
- Displaying each classes questions
- The constant redirecting
- Use of TASKS to focus students.

Cool feedback included:

- Addressing the big take away you want the students to leave with
- Wondering how you know if the students grasped and mastered the concept
- Using the CER model for the weather and erosion summative task
- Making sure to tie the phenomenon back to the direct content.

We left the meeting with the intent to view the two high school videos using the observation protocol prior to the February meeting. Our high school participants were preparing for the tuning protocol. Due to absences we have rescheduled our February meeting for the second week in March.

Overall, the participants have actively engaged in the process of the VCCLS and are beginning to question their own teaching practices and become more reflective in their own work. A big takeaway is how they can transfer this to their colleagues who they see are teaching in a much more traditional manner. As a fellow, I explained baby steps are needed, and for us to hone in on our own work to ensure mastery before "spreading" the word.

Calendar

Please provide dates for all upcoming meetings for the 2022-2023 year. Note the place, date and time and whether the meeting will be virtual or face-to-face.

Date	People	Activity
September (online)	Alumni Fellows	Meet with MSU mentors about projects.
October 12 (face-2-face)	Alumni+new fellows	Wipro workshop at PRISM 4:30—6:30. All other meeting dates to be confirmed with Fellows on this day
TBA (face-2-face)	Alumni+new fellows	Meeting 2 and 3. This may be a combined half-day workshop.
TBA/May (face-2-face)	Alumni+new fellows	Culminating event

NEW YORK -MERCY COLLEGE

Author: Kristen Napolitano

Statement:
Since last quarter (June), Fellows have been on their summer break. The first cohort of Wipro Reimagined Fellows completed their projects and prepared their presentations for the Mercy Center for STEM Education's Annual STEM Educators Conference (September 30th). Conference presentations will showcase how Fellows helped push their districts towards change in a) increased community/family relationships with and involvement in STEM; b) increased time and resources for STEM curriculum at the elementary school level, and c) increased online presence and dissemination through digital, teacher-created STEM lessons. This event will also serve as a space for recruitment and brainstorming for Cohort 2.

Summary of Current Project(s) and Goals

The Mercy University Greater New York (GNY) Wipro Science Education Fellowship, in partnership with University of Massachusetts at Boston and other colleges, has successfully supported a new branch of Wipro, that the Mercy University Center for STEM Education calls, "Wipro Reimagined." This innovation phase of Wipro involves teacher led, collaborative projects that are designed to enact district change in STEM education. These projects, created by Wipro Fellows and newly participating teachers, receive buy-in from administrators as associate group members, as well as in-district support from DSCs. Over the course of 4 years,

MCSE aims to establish a norm of collaborative action towards district change in the five existing Wipro districts. Year 1 was largely successful as 30 teachers and 1 retired teacher worked with 11 administrators to increase accessibility to and interest in STEM education across the New Rochelle, Port Chester, and White Plains school districts. These Fellows implemented leadership projects including designing STEM instructional materials and resources for elementary school teachers, creating outdoor learning units focused on increasing student access and participation in community green spaces, and providing professional development to teachers on integrating engineering into their STEM curriculum.

With their eyes set on sustainable change, MCSE plans to equip participating teachers with the tools and practices necessary to carry on transformative efforts even when Wipro funding is gone. In Year 1, Wipro Reimagined Fellows and the MCSE team established and strengthened relationships with district administrators to ensure sustainability. Year 2 will continue to foster these relationships to help both Fellows and administrators to meet district goals. Mercy intends to reach teachers in more grade levels (expanding from Year 1 to include secondary level teachers) and in all five partner districts.

District	Teachers	Project Title/Description
Port Chester	Marcia Manzueta (foundation Fellow), Kelly Budde, Lovely Grant, Diana Santiago	Edison's Kindness Garden - Provided green spaces for scientific observation, inquiry and experiments. Engaged K-5 students in every stage of the garden project: design, planting, caring and harvesting. Planted a variety of sensory rich vegetables, herbs and plants in thematic raised garden beds. Increased parental engagement and provided an opportunity for the entire learning community to experience the joys of gardening activities.
New Rochelle	Ann Marie Manganiello, Ali Abramo, Maria Torres, Melody Castiglia, Jill Ritacco, & Johanna Vasquez	Vertical Integration of STEAM in Elementary School - The purpose of this project was to build a foundation of engineering vertically and horizontally using an interdisciplinary approach. The goals were for the students to be able to understand the engineering method: designing, researching, hypothesizing, testing, and drawing conclusions.
Port Chester	Colleen Cahill Ed.D., Georgina	Eggceptional Bridges: 4th and 5th Grade Engineering Investigations - Through a hands-on approach, students engaged in experiments,

	Diaz-Luz, & Carrie Poulos	creating hypotheses and testing their theories with various materials. Fourth and fifth-grade students worked with teachers over six months and explored material science and basic engineering. These lessons gave students a greater understanding of the materials and engineering needed to build a small bridge for a shared school garden.
White Plains	Marisa Barzelatto, Pamela Del Balzo, Susannah Genty-Waksberg, Carmen King, Mary Kubat, Grizel Marquez, Meera Rajani, & Elcilia Taveras	STEM Hub: Authentic Experiences in Science and Engineering for Young Learners - A group of educators created authentic STEM investigations that are culturally and historically responsive using pedagogy of Dr. Gholdy Muhammad, Dr. Eugenia Etkina's ISLE model, and the 5E instructional model for inquiry teaching.
New Rochelle	Aimee Artis, Marsha Belton, Gillian Roshinko, Alicia Ricks, Vittoria Condello-Vessecchia, Ashley Ramirez, Michelle Memoli	New York State has new Computer Science and Digital Fluency standards. As a result, the Jefferson Wipro Team thought about ways to bring all stakeholders up to speed by considering these standards while infusing Social-Emotional Learning. This group hosted: tinkering events, professional development on standards, reading materials for adults and children, assemblies, lunch clubs and parent workshops.
New Rochelle	Anny Vanegas, Maia Starcevic	This group expanded an existing program for K-1 graders (FLORES) to include grades 2 and 3. This series of workshops brought together families in the Columbus school community with the objective of empowering parents to become science facilitators and to excite students about more advanced coding, engineering, and vermiculture.

Progress and Highlights

Wipro Reimagined:
Teams of Wipro Fellows and new participant teachers to work on new GPSs as group projects . Work towards increased district transformation in existing Wipro districts
Involves MCSE, existing Fellows; and new participant teachers; administrators; and support from district science coordinators (DSCs).

Key Successes:
Each of the 6 groups (30 teachers) was successful in developing and implementing their STEM-related projects.
Buy-in from New Rochelle, White Plains, and Port Chester has been strong. Some groups received matching funding, some received time, and others were given materials/supplies from their district/school administrators. Additionally, over the course of the year, many administrators took time to visit the Fellows' events. At the final MCSE Wipro Meeting in May, every district sent at least one administrator to listen to and mentor Fellows.

There are no projects in progress for 2023-24 AY. These will be announced in December 2023.

Plan for the Next Two Quarters

Date	People	Activity
September 2023	MCSE Team	Recruitment for Wipro Reimagined Fellows Cohort 2 Follow up with Wipro Reimagined Fellows Cohort 1 – summer updates? Project sustainability? Virtual (email)
September 30, 2023	MCSE Team	MCSE Annual STEM Educators Conference Wipro Reimagined Inspiration/Brainstorming Session In-person, Dobbs Ferry Campus
October 2023 (TBD)	Kristen Napolitano	Follow up Wipro Reimagined info session Virtual (zoom)
November 1, 2023	Fellow candidates	Wipro Reimagined project proposals due Virtual (email)
December 1, 2023	MCSE Team	Award announcements / projects begin Virtual (email)
January 2024 (TBD)	MCSE	Wipro Reimagined Meeting 1 Virtual (zoom)
February – April	Kristen Napolitano	Site visits, group mentoring In-person, zoom, and phone (participant preference)

May 2024	MCSE	Wipro Reimagined Meeting 2, final site visits Virtual (zoom)

Vignettes

Port Chester, Edison's Kindness Garden, team project. Kelly Budde and Marcia Manzueta (right) inspired many teachers, community members, and families to join them in the gardening project. New Rochelle, Jefferson's Computer Science – Social Emotional Learning Infusion, team project.

Starting in December, the teachers at Edison Elementary School worked with their students and community members to create a school garden. Through this work, they incorporated STEM lessons for their students and increased student awareness of ecology, sustainability, and engineering. Below is their reflection from this work: "This project was a labor of love that began with one tiny seed and flourished into a schoolwide initiative that spanned all grade levels: School-wide daily announcements with mystery clues about what was coming to our school Involved administrators, community members, parents, building principals, teachers, local colleges and garden organizations as well as multiple staff members. The entire community of Port Chester and School community was impacted by this project Students used Chromebooks, seeds, soil, greenhouses, grow lights, gardening tools, and much more! We used a hands-on learning approach and provided unique STEAM lessons in and out the classroom. These included science, art, and music teachers into the project with theme-based lessons
The project happened in classrooms, cafeteria, and in the outdoor areas of the school's playground. A school garden project is a major undertaking with many moving parts…but oh, so worth it!! We had to think outside the box to make things happen when there were many hurdles and speed bumps along the way. We learned that being flexible and patient but persistent will get you where you need to be. Others can learn from our experience that teamwork truly does make the dream work!
"Pro Tips": Get all stakeholders involved, have multiple support systems in place, get people to step out of their comfort zone, take risks, and put your students first.
Next Steps:
We are now working on creating perennial garden spaces with native plants that would beautify our school and attract pollinators. We want to have our school be part of the

Pollinator Pathway Project. Continue to encourage and support our parent volunteers in planting early spring flowering bulbs as a family event. Students will learn all about bulbs with hands on experiment. We are planning a "Garden to Heart" cooking celebration where students make salads using the produce, they grew in the garden."

Vittoria Condello-Vessecchia with students at a Tinkering Event

Seven teachers at Jefferson Elementary School came together to increase STEM teaching across grade levels and to increase family awareness of STEM. Specifically, each team member focused on different aspects of STEM including computer science, STEM literacy, and robotics. Below is a brief description that they provided:

New York State has new Computer Science and Digital Fluency standards. We are now in the initial implementation phase and soon will move to the full implementation phase in 2024. As a result, the Jefferson Wipro Team thought about ways to bring all stakeholders up to speed by considering these standards while infusing Social-Emotional Learning. A variety of events have taken place to make sure we are reaching the masses. Such Computer Science activities included: tinkering events, professional development on standards, reading materials for adults and children, assemblies, lunch clubs and parent workshops. [This is the story] of 7 curious individuals [who] came together to make science meaningful for all."

UNIVERSITY OF NORTH TEXAS - DALLAS

Author: Dr. Ratna Narayan

Statement: Phase 3 is underway at UNT Dallas with the specific goal of achieving District Transformation through Teacher Leadership. Towards this end, during year 1, we funded three types of projects: school projects, collaborative projects and individual projects, The school projects were designed to address a specific need of the school or district. Of a total of 14 projects funded, there were 9 school projects. I am especially excited during year 2, 2 of the participating ISDS are actually expanding on their year 1 school projects to other grades and subjects.

I apologize I was unable to achieve all I planned this year. I fell and broke my foot in April requiring surgery and rehab. I had to go on complete FMLA from April 10-June 5th during which time I was not allowed to work all. From June 5-July 12, I was on reduced FMLA, working 3-4 hours a day . July 12th I received clearance to work full time.

Summary of Current Project(s) and Goals

These were the projects we funded for Phase 3, Year 1

I	**School Projects**				
	District	Title and focus of project	Grade level	New Fellows	DSC/Alums involved
a	Lancaster ISD	5th Grade Science Teacher PLC	5	1	1 DSC participant 2 Alums
b	Cedar Hill ISD	Effects of Collins Writing in 8th grade Science	8	4	1 DSC participant
c	Irving ISD	STEMing to Staar	5	0	2 Alums 1 DSC advisor
d	Grand Prairie ISD	Which Properties Matter?	2-3	3	1 DSC advisor
e	Grand Prairie ISD	GFAA ST*Arts* Club! students	3-5	3	1DSC advisor
f	Desoto ISD	Preparing students for Staar 2.0	6-8	1	1 DSC Advisor
g	Grand Prairie ISD	STEMtastic Morning	6 - 8	4	
h	Grand Prairie ISD	Edible gardening	K - 5	2	1 Alum
i	Grand Prairie ISD	NSEC Enrichment for middle school	8	2	2 Alums advisors
II	**Collaborative Projects**				
a	Irving ISD Lancaster ISD	Exploring Science concepts using social studies in a cross curricular research study	9	1	1 alum
b	Advantage Academy Lancaster ISD	All Hands on Deck: Importance of Hands-on activities for Science Instruction	5	1	2 Alums

III	**Individual Projects**				
a	Lancaster ISD	Science Staar Bootcamp 2.0	5		1 alum
b	Denton ISD	Classroom Educational Website for Science content	5		1 alum
c	Duncanville ISD	I CER You	Honors biology		1 alum

Highlighted Projects

https://sites.google.com/d/14vSCXVxBXyO9H4uSkHmCtWe0Az3awYNL/p/1p5fsASr8ParaLxpb5CBAYN_jLysKUN4o/edit?pli=1
This is the website for the Cedar Hill ISD school project. Collins Writing is a district initiative to increase writing and reading comprehension. Since Covid, their scores had fallen and the introduction of short new response type questions in the 5th and 8th grade STAAR exams made it more imperative students writing scores improve. The project for year 1 focused on 4 middle school teachers from different middle schools in CHISD implementing Collins writing in their classrooms. As per their results, after teaching implementing the written language for receptiveness, 8th grade scholars in Cedar Hill Independent School District broke records with common assessment growth throughout the school year in.
What is particularly exciting is the district is so happy with the results that they are extending the project for year 2 to other grades, teachers, and subjects like Math.

Progress and Highlights
CAST 2022:
CAST is the Conference for the Advancement of Science Teachers, an annual, regional conference hosted by the Science Teachers Association of Texas. It is a requirement of our grant that all participants submit a proposal to present at CAST or a conference of their choice. All the Phase 2 participants submitted proposals to present at CAST. Few were not accepted. The following conference proposals were accepted for presentation at CAST 2022, Nov 10-12 at the Anatole Hilton, Dallas, TX. A total of 22 Wipro Alums and new fellows presented at CAST 2022. I was very happy Dr. Eisenkraft attended CAST 2022

Wipro Title	Presenters	Date	Time	Room
All Hands-on Deck: The Impact of Hands-on Activities on Science Instruction	Tamesha Brown, Markus Burkhalter, Beverly Moore	11/10/22	08:00 AM - 09:00 AM	Stemmons C

Science Text Comprehension Through Note Taking	Maria Louise Soto	11/10/22	04:00 PM - 05:00 PM	Sapphire
STEM & Informal Writing Tasks Build Writing Skills	Maria Louise Soto, Tracey Craft, Courtney Silverberg	11/11/22	08:00 AM - 09:00 AM	Topaz
STEM Collaboration Across Classrooms and Beyond	Sherry Thompson, Tiffanie Johnson, Shelby Allen, Julien Yacho	11/11/22	11:00 AM - 12:00 PM	Stemmons A
Using WalkSTEM to promote student inquiry in the real world.	Jeremy Hesse, Faith Milika, Tamara Majors, Chris Dazer, Danielle Moore	11/11/22	12:30 PM - 01:30 PM	Cardinal
Science! It's Elementary!	Ratna Narayan and expert Wipro and non-Wipro teachers	11/11/22	02:00 PM - 04:00 PM	Imperial
Investigating Climate's Impact on the Environment	Rhenett Ingram, Marquita Muhammed, Vickie Hines, Danielle Moore	11/12/22	08:00 AM - 09:00 AM	Cooper
Science! It's Elementary!	Ratna Narayan and expert Wipro and non-Wipro teachers	11/12/22	09:30 AM - 11:30 AM	Imperial

For the session "Science! It's Elementary", CAST requested me to organize and present twice on two different days. The sessions were run round robin style and were very interactive and hands-on. The session also gave some Wipro Fellows the opportunity to present at CAST. Wipro Presenters and their presentation topics are listed below:

- Jeremy Hesse, DSC, Cedar Hill ISD, "Sprout House Activity"
- Chris Dazer, DSC, Irving ISD, "Carbon Footprint"
- Faith Milika, DSC, Lancaster ISD and Jennifer Mosely, Lancaster ISD, "Periscope"
- Tamara Majors, DSC, Grand Prairie ISD, "Dig In"
- Raisha Allen, DSC, DeSoto ISD and Danielle Moore, "Mouse Trap Cars"
- Ana Belmonte, Irving ISD, "Life Cycles, From Egg to Adult"
- Julien Yacho, Irving ISD, "Apparent Movement of the Sun"
- Tiffanie Johnson , Cedar Hill ISD and Sherry Thompson, Irving ISD, "Food Chains and Food Webs"
- Maria Soto, Arlington ISD, Tracey Craft, Irving ISD, Courtney Silverberg, Irving ISD, "Slow changes to the Earth's surface"
- James Mining, Irving ISD. "Electricity in Circuits"

Prior to the conference, I emailed each Wipro Presenters' Principal, superintendent, administrators that the Wipro fellow would be presenting at CAST 2022, the name, date and title of the presentation and that we would be registering the fellow for the conference.

After the conference, I emailed them once again and attached a certificate of participation for presenting at the conference (see below)

The Wipro Science Education Fellowship at the
University of North Texas at Dallas

Certificate of Participation

Marquita Muhammed, Marshall ISD, was a presenter at the Conference for the Advancement of Science Teaching (CAST) Professional Development Conference, Dallas, TX, Nov 10-12.

Session Title: Investigating Climate's Impact on the Environment
Dates of Presentation: November 12, 2022

Dr. Ratna Narayan, PhD
Associate Professor of Science Education
University of North Texas at Dallas

wipro

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UNIVERSITY OF NORTH TEXAS AT DALLAS

Certificate of Participation *Investigating Climate impact session*

WalkSTEM Presentation *All Hands on Deck Presentation*

Cross District STEM Initiative Presentation *STEMbins Presentation*

CAST 23

13 Project proposals were submitted to CAST for the Nov 2023 Conference in Houston. 8 Proposals were accepted for presentation. One of Phase 3, year 1's proposals were also submitted and accepted. The accepted project proposals include:

Ian Talmantes, Guillermo Lozano, Tamara Majors	Which Properties Matter?
Tammy Butler, Lindsay Reeves, Megan Hunt, Deanna Chapman	NSEC Enrichment for middle school
Donna and Marsha Bolden	Exploring Science concepts using social studies in a cross curricular research study
Tamesha Brown, Markus Burkhalter, Jennifer Mosley, Beverley Moore	All Hands-on Deck: Importance of Hands-on activities for Science Instruction
Megan Hunt, Kristin Martinez, Ragina Taylor	STEMtastic Morning
Brittney Preston	Science Staar Bootcamp 2.0
Shelby Allen	Classroom Educational Website for Science content
Raisha Allen , Gayla Davidson	Preparing students for STAAR 2.0
Marquita Mohammed (from Phase 3, year 1)	Investigating Climate's Impact on the Environment

Collaboration of UNT Dallas and Wipro Dallas:

After we published an article about Wipro @ UNT Dallas in the Dallas Morning News, I was contacted by a VP from Wipro in Dallas, Mr. Erik Newlin who read the article. In conversations, I introduced Mr. Newlin to Dr. Eisenkraft and invited Mr. Newlin to UNT Dallas, (had to cancel because of my broken leg). During the summer, Mr. Newlin invited us to attend an event he was hosting for Wipro Dallas attended by all the Wipro leadership. During this event, he said he would be featuring the Wipro SEF Program at UNT Dallas and invited us to attend (the event overlapped with the Wipro SEF Leadership conference and all the Wipro PIs were attending).

During one of the meetings, he told me that they were organizing a science fair and needed help. Along with my DSCs , we met with their team several times and provided a advice, help and documentation for the science fair. My DSCs, and I and some fellows that lived in North Dallas volunteered as Science Fair judges.

I was very happy we attended the event and dinner, and that Dr. Eisenkraft and the other IHEs from the other Wipro Universities could attend the event as well. Thank you to Wipro Dallas for collaborating with me on the Science fair and giving us a platform for Dr. Eisenkraft to talk about Wipro SEF. I must say, thank you to Dr. Eisenkraft, He described the program and what we were doing so succinctly and beautifully and mentioned all the universities and their PIs. What an honor! Thank you Dr. Eisenkraft and Wipro.

The event went off well, and we know what to do differently next year to avoid any errors that were made. The date Aug 30th was not favorable to getting many entries because schools opened on Aug 16th which didn't give them/us much time. Though it was a collaboration with UNT Dallas and Wipro, none of the Wipro @UNT Dallas partnering districts were involved save for a Wipro fellow from GPISD volunteering her children to participate. The location, Frisco was too far for our students to travel.

However, despite these problems, Wipro Dallas have said they are interested in holding a science fair as an annual event and would like to collaborate with UNT Dallas on this project. We are very excited to partner with Wipro on this endeavor.





Wipro SED Leadership Retreat: Dallas Aug 30-sept 1st

I attended the Leadership retreat with the other Wipro PIs in Dallas. It was a very good meeting, and I learned a lot of it. I am looking forward to the next leadership retreat in Dallas in a few months.

Plan for the Next Two Quarters

I plan to ensure the year 2 projects are carried out with fidelity. I have changed a few things from year 1:

- There will be more face-to-face meetings with the fellows
- We used google sites as project websites, I do not like this, so we will go back to using Wix for the purpose.
- Two optional workshop sessions will be offered in February and June to help project participants with the website

Quarterly progress reports from Project participants are due on the following dates: October 1,2023, December 10, 2023, March 10, 2024, and May 10, 2024
The Wipro Phase 3 Collaborative grant project Stipend of $1200 will be paid in three instalments of $400 each on Dec 20th, 2023, and April 31st, 2024, and July 1st, 2024.

The final stipend will not be paid out if participants do not meet the requirements of the grant such as timely submission of quarterly reports, CAST proposals and project Website. Moreover, participants who **leave the district and take a job elsewhere, are still required to let me know asap and complete the requirements of the grant prior to June 15th or they will not receive the final installment of their stipend.**

Calendar

- Monday September 18th, 2023, 5:30-8:30 pm Campus Hall, UNT Dallas. This is the Wipro annual dinner and meeting postponed from May22nd 2023
- Monday October 16th, 5:30-8:30 pm UNT Dallas, Room FH 136A.B The Provost Dr. Betty Stewart will be talking about Teacher Leadership
- Monday Dec 4th 5:30-8:30 pm, UNT Dallas, Room TBA
- Monday Jan 29th 5:30-8:30 pm, UNT Dallas, Room TBA

- Monday March 4th 5:30-8:30 pm, UNT Dallas, Room TBA
- May/ June Annual Wipro Meeting and dinner, UNT Dallas, Room TBA
- Two optional workshop sessions will be offered in February and June.
- **Quarterly progress reports** from project participants are due on the following dates: October 1,2023, December 10, 2023, March 10, 2024, and May 10, 2024

Rooms are at a premium at UNT Dallas, we are working with Events to secure rooms for our meetings, and I will update the room number when they have been confirmed. All our meetings are face to face.

See Next Pages

2022-2023 Evaluation Report Summary

September 21, 2023

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.

Since its inception, 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. As the program has remained active in each state's partner districts for four or more years, a new goal has arisen: district impact. Defined individually by each state and their partner districts, the goal of district impact has become an equally important outcome of the program in addition to the continued development of high-quality teacher leaders.

In 2022-2023, a new phase of funding of the project began, Wipro SEF Innovation, which allowed for each site to grow and modify their program while keeping the two prime goals of teacher leadership and district impact at the core. Here is a brief summary of each state's Wipro SEF Innovation plans:

- California – Two more cohorts of Fellows from their existing partner districts will go through the "classic" Wipro SEF program; School Leaders Program will provide leadership professional development for selected leaders from their partner districts
- Florida – Fellows from partner districts will propose extended GPS one- or two-year projects that involve new Fellows.
- Massachusetts – Program in development: Districts as a whole and/or individual Fellows will engage in selected projects such as Vertical Teaming; professional development seminars will be offered to interested Fellows.
- Missouri – Three more cohorts of Fellows from their existing partner districts (and possibly new districts as well) will engage in a Wipro SEF "classic" program with a focus on science and math educators at the 6-12 level.
- New Jersey – Fellows from partner districts develop and implement two-year district goal-aligned projects involving new Fellows.
- New York – Fellows from partner district will engage in new GPS projects that are generated, in part, at an annual K-12 STEM Teacher Conference each fall.
- Texas – School-based projects will begin in each partner district annually; collaborative mini-grants will be offered that involve at least one Fellow and one other district personnel.

The Wipro Science Education Fellowship program leadership contracted with Anne Gurnee Consulting, LLC (AGC) to continue an evaluation study of Wipro SEF Innovation during the 2022-2023 academic year. The goal is to document outcomes of participation on the Fellows and the participating school districts. Specifically, the evaluation seeks to gain insight regarding the effects of the program on the development of teacher leaders within the districts, the growth in the DSCs leadership and how they engage the cadres of teacher leaders, and to the extent possible, the type and amount of district impact that results from the Wipro SEF Innovation program.

During the year, the evaluation team submitted several interim reports on the Fall DSC Conference, the Fellows Mid-Year Survey 2023, and the site visits . The focus of this report will be to summarize the key findings from program activities in spring 2023, to present overall findings of note and to offer data-driven recommendations on next steps for program growth and refinement.

Key Findings – 2022-2023

In 2023, there continued to be broad agreement among the Fellows involved with the program that the Wipro Science Education Fellowship was successfully implemented at all sites with active Fellows (California, Florida, Missouri, New York, New Jersey and Texas). The data from this evaluation study indicated that the program was positively received by participants and resulted in numerous outcomes and impacts for Fellows early evidence of district impact.

Key overall findings from the 2022-2023 academic year include:

- Nearly all of Fellows (93%) reported that they were satisfied or very satisfied with the Wipro Science Education Fellowship Innovation.
- Nearly all of Fellows (95%) felt their expectations of the Wipro SEF Innovation program were mostly met, met or exceeded.
- Nearly all of Fellows (91%) agreed or strongly agreed that the Fellowship was worth the time they invested.
- A large majority of Fellows agreed or strongly agreed that their involvement in the program had a positive impact on their school (87%), their classroom (84%) and their district (73%).
- The majority of Fellows (84%) cited the network of like-minded science educators created by Wipro SEF as a key source of support.
- More than three-quarters of this year's Fellows (77%) see themselves as teacher leaders in their schools, and a fifth (22%) see themselves as teacher leaders in their districts.
- Fellows in all states with active Fellows experienced small and/or moderate growth in indicators of teacher leadership and attitudes or behaviors related to district impact.
- Fellows cited lack of time and fatigue as the prime barriers to their growth as teacher leaders.
- Overall, three-quarters of participants (75%) in the District Science Coordinators Virtual Leadership Conference were very satisfied with the experience, and 88% felt the experience met or exceeded their expectations.
- Overall, the majority of participants in the School Leaders Program (5 out of 6 responding) in California were very satisfied with the program, and all felt their leadership skills were improved and they had new ideas about developing teacher leaders because of the program.

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 this year marks a significant shift in the program's implementation as each site modifies the program to meet the needs of their partner districts, the evaluation team provides the following recommendations to help to inform the future program growth and expansion:

1. **Prioritize flexibility in all program plans to accommodate for the needs of Fellows who are experiencing professional fatigue and time poverty at high levels nationwide.**

2. **Protect the Wipro SEF brand in the partner districts by continuing to provide the same or similar levels of support as in previous years even if this means serving fewer Fellows overall.**

3. **Communicate explicitly and often about teacher leadership and district impact.**

4. **Prioritize fostering connections between Fellows and between District Science Coordinators.**

5. **Consider changes to the Virtual DSC meetings to promote connection and increased participation.**

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