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

WIPRO SEF

YEAR 11
QUARTERLY REPORT
June 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 have 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.

This quarter the theme of the report is looking back and looking forward. Across the country project teams are completing their initiatives for this year. There were celebrations at many sites and other sites have moved their celebrations to the late summer/early fall (a time of renewal and optimism in the educational world). While the teams were summarizing their excellent work, the leadership at the IHEs was busy planning for the activities of next year. Our District Science Coordinators helped organize and attended a five session conference that was a hit. The first year of this newest phase of the Wipro SEF is now behind us and we have learned a lot. The program continues to be strong across the country and is facilitating some amazing work by the Fellows.

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

INTRODUCTION

Wipro SEF Program Overview

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

Year One: Thinking About Teaching

Monthly Fellows Meetings

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

Collaborative Coaching and Learning of Science (CCLS) groups

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

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

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

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

Table of Wipro SEF sites

	Cohort 1	*Cohort 2*	*Cohort 3*	*Phase II*
Year 0	Recruitment			
Year 1	Collaborative coaching and learning in Science (CCLS)	Recruitment		
Year 2	Growth Plan System (GPS)	CCLS	Recruitment	
Year 3		GPS	CCLS	
Year 4			GPS	

Phase II &III				Activities proposed by individual sites.

Key to yearly activities

BY THE NUMBERS

Foundational Phase

Site (Institution)	Districts	Total Students in Districts	Fellows	District Science Coordinators	Presentations and Publications
California (Stanford)	5	97,288	60	5	8
Florida (U of South Florida)	3	398,960	45	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[1]	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 20 – Phase 2[2] 33 – Phase 3, Y1	5	28

[1]Over four years.
[2]Plus 5 Non-Fellow teachers for the WalkSTEM project.

Current Phase

Site (Institution)	Projects Submitted	Projects Approved	Alumni Fellows	New Fellows	Non Fellow Teachers	District Science Coordinators
California (Stanford)	N/A	N/A	60	16	N/A	5
Florida (U of South Florida)	5	3	3	0	6	3[1]
Massachusetts (UMass – Boston)	8	5	2	0	55	5
Missouri (U of Missouri)	N/A	N/A	2	7	N/A	4

New Jersey (Montclair State)	13	13	13	18[3]	N/A	5
New York (Mercy College)	10	6	6	24	162	3[2]
Texas (U North Texas – Dallas)	14	14	11	22	0	5

[1] Plus two district administrators.
[2] Plus nine district administrators.

UPCOMING MEETINGS AND MILESTONES

Jun	Summer	Sep	Oct
1 – NY Mentorship and Final Site Visits	MO – Aug 2 or 9 Elementary Cohort 5 Meeting	MA Kick-off Meeting for New Projects	14 – NY MCCSE K-12 STEM Teacher Conference
15 – FL Phase 2 Cohort 2 Applications Due	MO – Aug 3 or 10 Elementary Cohort 4 Meeting	21 – MO Cohort 5 Presentation	11 – MO Cohort 4 Meeting
20-23 – CA Wipro School Leaders Program – Summer Institute	CA - August Discussion with District coordinators on Year 2 plans	30 – NY STEM Educator Conference	19 – MO Cohort 5 Meeting
MO Conclude Cohort 5 Elementary Recruitment	26 Aug – FL Wipro Celebration	TBD – TX Induction of new Fellows Celebrate Phase 3, Year 1	TBD – TX First In-Person Meeting of Year
FL Individual meetings with cohort teams	31 Aug – TX Wipro Dallas Dinner Event		TBD – FL Wipro Meeting

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 agendas and minutes for the March, April, and May meetings are listed here.

March Agenda

1) Monthly site updates
2) Site visits to TX and NY
    - Comments by Anne, Eric and Arthur
    - Comments by Ratna and Kristen
3) NSTA – Breakfast on Saturday morning?
4) Wipro Leadership Conference
    - Five sessions
        - Latest trends in science education (e.g. phenomenon based teaching)
        - What resources are available (NSTA, etc...)
        - Teaching controversial topics (evolution, climate change, etc...)
        - District transformation - what does it mean to you...
        - Building relationships - DSCs are in a position to "lead from the middle" - relationships with admin and teachers/Fellows
    - Dates/Times
        - Saturday was not a popular choice
        - Best Days-Tuesday, Monday, Wednesday, Thursday
        - Best Times-4 and 5, 12, 6 Eastern
        - If Saturday - Either 11 AM or 12 PM
    - IHE support
        - District transformation – Meera
        - Latest trends – Arthur/Brooke Whitworth/Julie Luft/
        - Controversial topics – Alan/Linda
        - Building relationships – Tammy/Kristen
        - Resources – TBD (maybe a facilitated “share out” type session?)
            1. NSTA, Joni Falk, Betsy, Open SciEd
5) Evaluation report – Valuable comments
6) Quarterly report – thank you
7) Website and Corporate Newsletters

8) Site/District newsletters – Questions to Kristen
9) Research – Brooke

Wipro SEF Monthly Meeting – 21 Mar 2023 – Meeting Minutes

Attendees: Meera (MO), Linda (MO), Ratna (TX), David (FL), Alan (FL), Nancy (FL), Kristen (NY), Monica (NJ), Tammy (CA), Anne (OR), Arthur (MA), Eric (MA)

Site Updates

- FL (David): The Florida team is preparing for their face-to-face meeting on 01 Apr. They are also planning for recruiting and assisting for the 2023-2024 school year projects/cohort. They will be holding two different information sessions, and recording the sessions in case anyone misses the session. They are also planning a session in May to help with proposal writing/completion, particularly around budgeting, based on experience from this year. Lastly - the team is preparing for the year-end event.
- TX (Ratna): The Texas group is working on their websites (one for each project) and has two face-to-face meetings planned. They are eagerly looking forward to feedback on the recent site visit. One upcoming meeting will be focused on working on proposals for CAST. Ratna will share examples and exemplars of previous proposals – those that have and have not been accepted. Planning is also underway for the May 26 year-end dinner.
- MO (Meera): The Missouri teams are well into their HCCLS work. The team is beginning its recruitment for the next cohort of Fellows. Particular focus is being given in this recruiting round to get K-5 educators to complement the current middle school and high school Fellows. The idea of integrating math and science is appealing so far. Because of the small number of Fellows (9), the year-end event may be more like a VCCLS presentation. K-5 educators will be invited to this event to see the work that has been done and aid in recruiting. It was suggested to invite principals from these districts as well.
- NJ (Monica): The group recently met with alumni and new Fellows on 02 Mar. The meeting was focused on both checking in and on goal/objective setting. The doctoral assistants are preparing for conducting network analysis to understand how the Fellows enact leadership. They have held a vignette writing workshop to help develop the project communication skills of the Fellows. In preparation for the year-end event, each Fellow has been asked to invite one administrator from their district to attend. This helps bridge the communications between Fellows and admin and also provides positive PR for the program.

- CA (Tammy): The work in California is occurring on three levels: 1) traditional Wipro, 2) district level work, and 3) a new leadership institute for district administrators. The traditional Wipro work is moving along well, into the HCCLS phase with a focus on multi-lingual learners. District support work is in sustaining DSCs and in a spreading and cross-fertilization of ideas, especially within San Jose where work is occurring with less input from CSET than before. There are 12 applicants for the upcoming leadership institute. A Superintendent has been working with Tammy on this (volunteer). This will be launching in June.
- NY (Kristen): They are in the development stages of planning for the October year-end conference. Projects are active across districts. Kristen is developing plans for publishing the district level newsletters on an annual basis.
- MA (Eric): Small projects are up and running in Boston. Cambridge is also building toward implementing vertical curriculum work across middle and high school. Planning is underway for recruiting for next year – potentially bringing on-board new districts.

During the Florida team update, there was a conversation regarding recruitment and best-practices to recruit many Fellows. Ideas suggested included:

- Sharing current work and inviting people interested in applying for the next cohort to the current cohort year-end event
- Asking Fellows to bring one person with them (NJ) to meetings/sessions
- Getting people from other site programs to join Wipro (NY)
- Inviting principals to year-end dinner (TX) so that they may encourage their teachers to participate.

Site Visits

Arthur, Anne, and Eric shared reactions and thoughts from the recent Texas and New York site visits. Many comments about the energy of the students, Fellows, and principals were shared. Sincere thanks to Ratna and Kristen for their extraordinary efforts in arranging these visits. More formal reports to come.

Mid-Year Evaluation Report

Anne has prepared a mid-year evaluation report. She and Arthur are working on finalizing and then it can be shared. The comments provided by Fellows are very interesting and valuable. They are great sources for cross-site thinking.

NSTA Breakfast

About 15 people associated with the Wipro SEF program across the country will be attending NSTA in Atlanta this week. Arthur will be hosting a breakfast on Saturday morning.

Action: Eric to send out invitation to breakfast to gauge availability/interest.

April Agenda

1) DSC Leadership Retreat
2) Cross-Site Visits
3) Site Updates

Wipro SEF Monthly Meeting – 18 Apr 2023 – Meeting Minutes

Attendees: Meera (MO), Linda (MO), David (FL), Allan (FL), Kristen (NY), Colette (NJ), Tammy (CA), Anne (OR), Arthur (MA), Eric (MA)

Our first order of business was a brief update on our friend and colleague Ratna. She had a bad fall recently and had surgery. We are all wishing her a speedy and full recovery.

DSC Leadership Retreat

We began the meeting discussing the upcoming DSC virtual leadership retreat. The first session is next Monday, 24 Apr 2023. The sessions are coming together. Allan mentioned that a former graduate student of his, Molly Nation, is available to assist with the session on teaching controversial topics. At this point, DSC support is set for the first two sessions. Additional support could still be lined up for the remainder of the sessions.

Action: Eric to follow up with DSCs invited to help with sessions that have not replied.

Action: Eric to send IHE leaders names of DSCs who have agreed to help.

Cross-Site Visits for Year-End Events

Our next discussion was around year-end event planning and cross-site visits. Many of the Fellows that have been invited to travel to other sites to present their work have stated that it is a very difficult time of year to travel. Some progress has been made. Each site is working with their Fellows on this.

Our new Wipro lead contacts, Avinash and Chirag, have indicated that they are intending to get Wipro employees involved and are hoping to get someone to each site's year-end event.

Site Updates

- FL (David): The Florida team recently had a session focusing on action research. Teams are continuing their data collection. The Florida team is preparing for their next meeting in May and recruiting the next cohort of Fellows for participation. Applications are due mid-June. The intention is to be able to coincide project kick-off for the next cohort with the celebration for the current cohort at the August meeting.
- MO (Meera): The Missouri teams are planning for the year-end event on 16 May. Each Fellow and DSC has been asked to invite an administrator. In Columbia, the DSC is specifically inviting the elementary math and science coordinators. They are also inviting alumni Fellows to the event.
- NJ (Colette): The NJ team has sent out the templates for the May 2 year-end meeting. The agenda is set for the meeting. Regina Boriello is applying some new social media publicity skills she gained at a recent conference to promoting the event. Publicity for the Wipro SEF program is her project for this year.
- CA (Tammy): The CA team is planning for a full day PD this Saturday. This will be focused on applying skills related to multi-lingual learners (a strategic focus this year). The administrator leadership academy is well planned with 14 participants signed up. This is a four-day event in June.
- NY (Kristen): The team is planning for the virtual meeting in May. They are emphasizing recruiting for next year and sustainability of the program.
- Eval (Anne): "It's eval season." Anne will be distributing surveys and following up for participants for interviews. Much of the heavy lifting on the evals will be late May/June this year.

Allan shared this his newest action research book is available for pre-order. The link is here.

We once again wished Ratna a speedy recovery.

May Agenda

1) events at your sites,
2) the DSC workshops,
3) template for June qtrly report
4) summer plans
5) future cross site meetings of Fellows, etc
6) chat GPT

Wipro SEF Monthly Meeting – 16 May 2023 – Meeting Minutes

Attendees: Meera (MO), Linda (MO), David (FL), Kristen (NY), Colette (NJ), Tammy (CA), Arthur (MA), Eric (MA), Ratna (TX)

Recording Link: Here is the link, passcode is: D!%6tcJh

Site Updates

- MO (Meera and Linda): The Missouri teams have their HCCLS conference tonight. Each Fellow has been asked to bring an administrator. The first 20 or so minutes of the conference will be time for Fellows and administrators to meet and chat. The Missouri team also shared that Linda recently gave a presentation at a Saturday morning science session that was very well received.
- FL (David): The Florida team recently had a session at the museum of science and industry. They are also planning for a June session which will be a little different where the USF staff will have a chance to meet with each team individually. They are also gearing up for the second recruitment session.
- NJ (Colette): The event on 02 May was a great success! It was attended by 28 Fellows, ten administrators, three graduate students and four staff. The strategy of having each Fellow "bring" an administrator really paid off. The discussions and presentations were all well done and the administrators were able to hear about and think about how they can help sustain the Wipro efforts long into the future.
- CA (Tammy): The CA team is planning for their year-end session in three weeks and gearing up for the summer leadership academy. David Kleiner from NJ will be at the year-end celebration and presenting. The team has provided an email template for Fellows to send to their administrators to invite them to the meeting.
- NY (Kristen): The team is planning for the virtual meeting on the 23rd. They are building in time for Fellows and administrators to meet and have discussions. The fall event had to be moved to 30 Sept.
- TX (Ratna): The Texas year-end event has moved to September and will include posters to recognize and celebrate this year's work along with welcoming the next cohort of Fellows. Texas will be continuing the theme of including admin in the meetings. Additionally, teams have made their CAST submissions. CAST is in Houston this year.
- MA (Eric and Arthur): The MA group is preparing for recruiting events over the next two weeks. The Cambridge district already has a proposal for the fall. Boston projects are moving along. Arthur will be teaching a course/seminar over the summer for Fellows and area teachers on the use of ChatGPT in education. Ten people have already signed up for the course. The course will include 5 days over the summer and monthly call backs throughout the year.

DSC Virtual Leadership Retreat

The DSC sessions have been going very well thus far with one more to finish the series. Next month we should be able to look at evaluation results from the post-session surveys.

Lastly – Arthur reported that we have pulled together an advanced draft of the operations manual for the Wipro SEF and submitted to Corwin and ASCD. We have already received word from Corwin that they do not think it fits their needs currently. Arthur is having a meeting with them on Monday to follow up and get feedback.

We shared summer plans and adjourned the meeting.

DSC Virtual Leadership Retreat

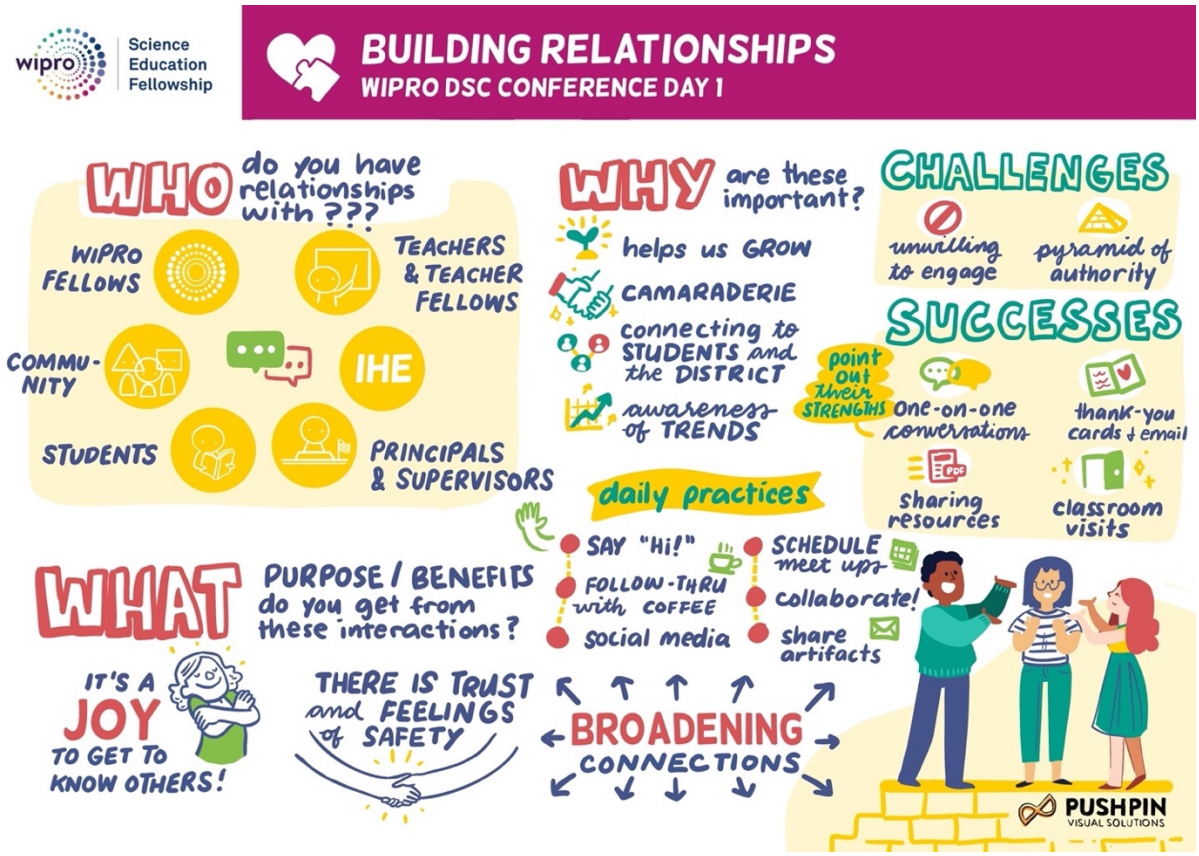
Five virtual leadership retreat sessions were held in April and May. The sessions were well attended and well received. Across the five events, 19 different district science coordinators (DSCs) were able to attend. Six DSCs were able to attend one event and six other DSCs were able to attend two events. Five DSCs were able to attend three events, one DSC was able to attend four events, and one DSC was able to attend all five events. Additionally, eight different DSCs were involved with planning these sessions.

Building Relationships

The first of the sessions centered around building strong relationships – with Fellows, with administration, with each other, with students and their families, and with our partners (IHE, Wipro, etc…). The agenda for this session was:

- Defining relationships
    - We want to hear what works from you!
- Which relationships are the most challenging?
- Tips on how to weave relationship-building into your everyday routine.
- Mapping out our network.
- Actions steps.

Everyone was actively engaged in discussion throughout the session. The slides from the meeting and a video of the session can be found here.



Resources

Our second session was focused around what resources are available to us all to help implement strong leadership practices and enable educators. The agenda for the session was:

Agenda:

- **Who are we? Brief Introduction by facilitators**
- **Who is with us? Participant Introductions & Sharing**
  - **Please share one question or concern you have about supporting teacher leadership in your district.**
- **Carousel Brainstorm - Interacting with the Quotes**
- **Whole Group Discussion**
- **Q & A**

There was great discussion and engagement about building strong leaders in the districts. More resources from this session can be found here.

Latest Trends in Education

Our third session welcomed Clemson University professors and researchers Brooke Whitworth and Julianne Werner and two of their graduate students. This team is currently conducting research on the Wipro SEF program. The goals for this session were:

1. Explore the current state of science and education in the United States.
2. Consider our CALL TO ACTION and how we can advocate for science education.
3. Reflect on our next steps for advocating for science education in our context.

The team took the group through some staggering statistics highlighting the inequity in science education around the US. The statistics largely came from a report from the National Academies of Science, Engineering, and Medicine. The report can be found here. The session involved group brainstorming and sharing such as:

Group 1 - Together craft a vision statement for science education

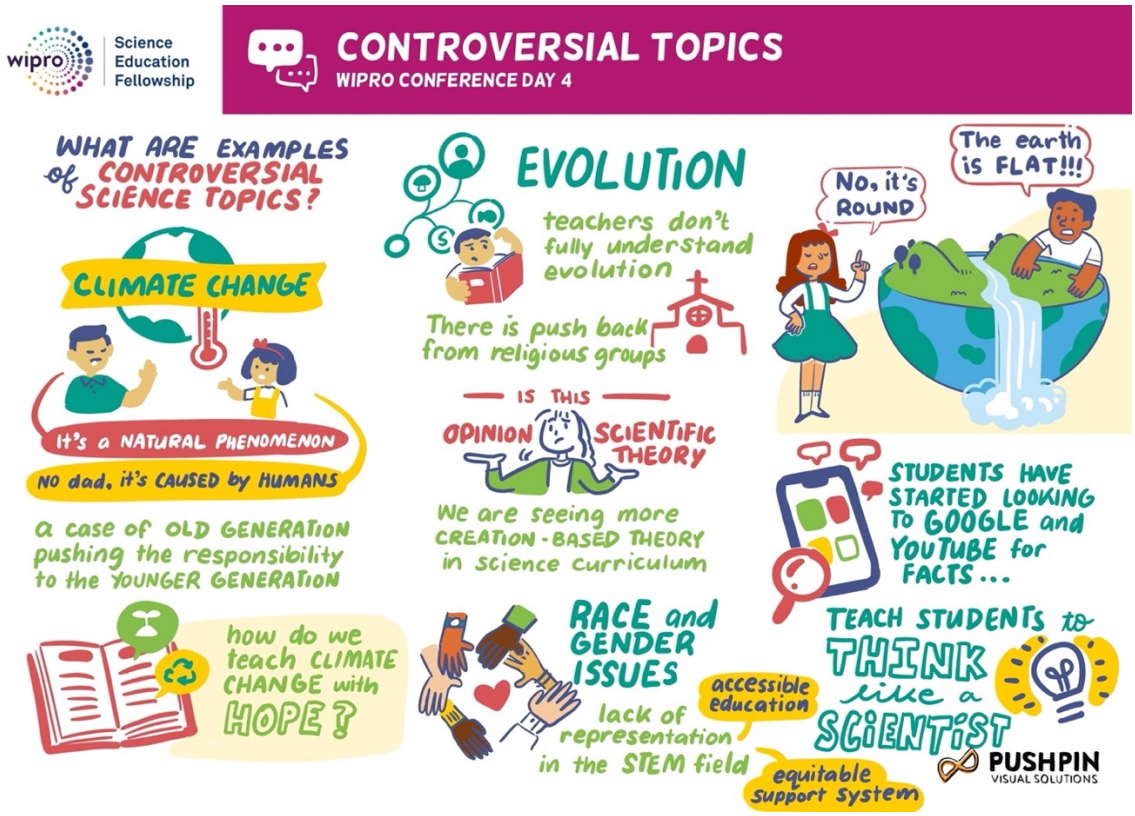
To engage all students in exciting scientific explorations which encourage curiosity through data analysis and communicate understandings in order to empower them to become problem solvers and active citizens.

- Empowers students to solve problems in the world around them.
- Everyone can access
- Engaging, Exciting, Exploration
- Encourages curiosity
- Emphasize analysis and explaining thinking in different ways (speaking, writing, modeling, etc.)
- Effective and efficient Communication (receiving & sending)
- Experiences from individuals are valued

The session was very successful. Additional information from the session can be found here.

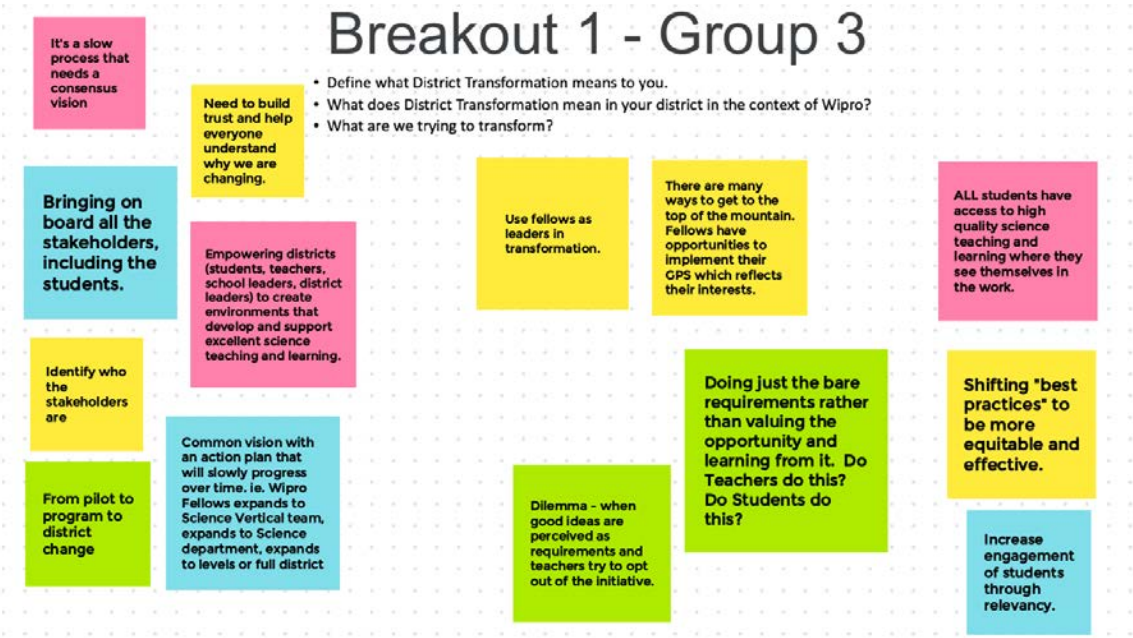
Teaching Controversial Topics

The penultimate session delved into teaching topics that can be socially controversial. These topics have a scientific consensus that is often at odds with people's personal and/or religious beliefs, such as evolution, climate change, and vaccines. These topics also have a plethora of misinformation and disinformation available on the internet. A resource guide for dealing with these topics in the classroom was provided and can be found here. These resources will be very helpful to our DSCs and to share with our Fellows, particularly in parts of the country where public officials have been taking a heavier hand in education and what topics can and cannot be taught. Additional information on this session can be found here.



District Transformation

Our final session could be described as a reflection and refocusing on our core mission in this phase of the Wipro SEF – district transformation through teacher leadership. District transformation has many and varied meanings for all of us depending on our context. The session involved several breakout and report back sessions typified by this JamBoard:



The session had high engagement from all participants. There was a feeling of refocus and renewed energy around the work we are doing in the districts after the session. Additional information on this session (including all of the JamBoards from the session) can be found here.

Invited Papers and Presentations

Arthur Eisenkraft presented a paper at ETE IV conference on STEM and Open Schooling for Sustainability in Leiden, Netherlands.

CALIFORNIA- STANFORD UNIVERSITY

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 16 science teacher leaders 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 CA site is also currently working with district teams from the five 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.

Progress and Highlights

Wipro Incentives

The CA site is offering incentives to the current Cohort 4 fellows to work with other teachers at their site to address the need for more collaboration with other teachers around science teaching and learning, outside of what their schools and districts provide.

Professional Learning Sessions

The CA site continues to facilitate monthly professional learning sessions for Cohort 4 Wipro fellows. The focus of the sessions align with the following ideas:

a) Next Generation Science Standards- What does this look like in practice?
b) Equity & Social Justice- Who are we serving?
c) Leadership - What does it mean to be a teacher leader?

H-CCL Group Work

H-CCLS groups have been established and fellows have chosen their NGSS Practice and Course of Study for their H-CCLS work. The CA Team continues to have fellows choose an NGSS Science and Engineering practices as a focal area of their work. For their Course of Study, fellows chose one of the following tenets that support science learning of multilingual learners.

- Tenet #1: How do you provide multiple meaning making resources for your students and help your students communicate their understanding through both text and other modes?
- Tenet #2: How do you enhance the participation of your students by bridging their cultural and linguistic resources with the science activities?
- Tenet #3: How do you support your students to use SEP to engage in productive and receptive language functions and develop metalinguistic awareness?

End of Year Conference, June 2023.

Fellows presented their learnings at the Wipro End of Year Conference on June 10, 2023. The Wipro End of Year Conference for year 1 was designed to showcase and engage others in the work that Wipro fellows have been doing in service of their professional learning. This year, the conference focused on CA Cohort 4 Wipro Fellows and their work in Horizontal Collaborative Coaching and Learning in Science (H-CCLS) teams. Each collaborative group identified a particular NGSS Science and Engineering Practice as well

as an action-research topic that the entire team explored via research articles, observations, and examining student work. The summary below shows the abstracts of the presentations of the five H-CCLS groups who presented this year. Another goal of the conference was to introduce the idea of a GPS Project by inviting past Wipro Fellows as well as a guest fellow from Wipro New Jersey, Cohort 1 to share their work. All of these components helped to provide an environment for the fellows to share what they have learned in the Wipro SEF Program and how their learning has impacted their classroom practice. It also highlighted research-based science teaching practices and helped fellows develop a stronger sense of professional community with other Wipro fellows.

H-CCLS Abstracts

H-CCLS Group 1 (High School): Anjana Amirapu, Bety Camacho, Kendrick Chow, Sarah Lofgren
Title: Incorporation of Inquiry-Based Model Making Leads to Increased Scientific Language Acquisition
Abstract: Rote model making requires memorization without meaningful understanding of process or language. Inquiry-based models encourage students to incorporate their everyday language as they gain meaningful process knowledge concurrently with scientific language development. Models help multilingual learners to interact with and understand complex scientific concepts by allowing them to explain the model using self-prescribed language unique to each individual and building confidence, ownership, and familiarity with the scientific vocabulary that is widely accepted by a larger community of scientists.

H-CCLS Group 2 (Middle School): Charmaine Benham, Lisa Ernst, Jonathan Lee
Title: Examining How Students Analyze and Interpret Data to Develop Evidence-Based Arguments
Abstract: Several science processes are important in helping students engage with science as a model of inquiry and can include gathering and examining evidence, analyzing and interpreting data and graphs, and communicating evidence-based arguments. Our study was designed to examine how students perform in extracting information and evidence from data tables and graphs and subsequently how they use that specific information and evidence to formulate arguments. The results from the three distinct classroom settings have informed our future instructional practices and assessment of these science process skills, and the need to implement these at the beginning of the school year with consistent reinforcement throughout the academic year.

H-CCLS Group 3 (Upper Elementary/Middle School): Jodie Sheffels, Brenda Valine, Kendall Bell
Title: Planning and Carrying Out Investigations with a Multilingual Learner Lens
Abstract: Planning and carrying out investigations in the upper elementary classroom is a vital experience to get students engaged in Science. It is also a great way to enhance the

participation of multilingual learners. We are three 5th and 6th grade teachers who analyzed the use of scientific inquiry in our own classes, using research and classroom observations to inform and guide our conversations.

H-CCLS Group 4 (Elementary): Ann Hughes, Meghan Perfect. Shannon Arbildo
Title: Wild About Evidence: Evidence and Argumentation about Plant and Animal Structures in 4th Grade
Abstract: Argumentation from evidence is a vital skill for scientists of all ages. In the classroom, it is imperative that all learners are developing the ability to engage in productive and receptive language functions and develop metalinguistic awareness. Three 4th grade classes engaged in arguments about plant and animal structures during a Life Science unit. Current research and lesson observations revealed new understandings and next steps regarding best practices for argument and evidence instruction, specifically with support for multilingual learners.

H-CCLS Group 5 (Elementary): Erica Paisley, Jordan Garvey, Jeannie Son
Title: Supporting Multilingual Learners at the Elementary Level through Student Inquiry
Abstract: Our H-CCLS group explored strategies to help support our multilingual learners in an elementary school setting. Throughout our work we practiced the use of implementing sentence frames, visuals, student collaboration, modeling and kinesthetics to enhance our science curriculum.

Photos and Artifacts from the CA Wipro End of Year Conference

CA

Welcome to the Wipro Science Education Fellowship End of Year Conference at the Center to Support Excellence in Teaching, Stanford University Graduate School of Education!

The Wipro End of Year Conference is designed to showcase and engage you in the work that Wipro fellows have been doing in service of their professional learning. This year, the conference focuses on CA Cohort 4 Wipro Fellows and their work in Horizontal Collaborative Coaching and Learning in Science (H-CCLS) teams. Each collaborative group identified a particular NGSS Science and Engineering Practice as well as an action-research topic that the entire team explored via research articles, observations, and examining student work.

We hope that through your participation in this conference you will learn more about research-based science teaching practices, as well as develop a stronger sense of professional community with other local Wipro fellows. Furthermore, we hope that the opportunities presented in this conference will contribute to the development of Wipro teacher leaders by providing a platform for teachers to share what they have learned in the Wipro SEF Program and how their learning has impacted their classroom practice.

We are extremely grateful to our five partner school districts, our District Coordinators, and other district and school leaders for their continued support and investment in the Wipro Program.

This conference is made possible by the generous funding from the Wipro Foundation through the University of Massachusetts, Boston. Their investment and vision for education has given us the opportunity to build a strong community of science teacher leaders who continue to lead the way in their schools and districts.

We hope you enjoy the presentations today!

Sincerely,

The California Wipro SEF Team

Wipro End of Year Conference Program (LINK)

Plan for the Next Two Quarters

Date	People	Activity
June 20-23, 2023	Tammy	Wipro School Leaders Program- Summer Institute
August 2023	Tammy & Preetha	Discussions with District coordinators on Year 2 plans
July-August 2023	Preetha, Tammy, Brandi, and Janet	Write paper for science education journal IJSE
July-August 2023	Preetha, Tammy, Brandi, and Janet	Conducting a case study of three Cohorts from one site with a large percentage of multilingual learners

Featured Fellows

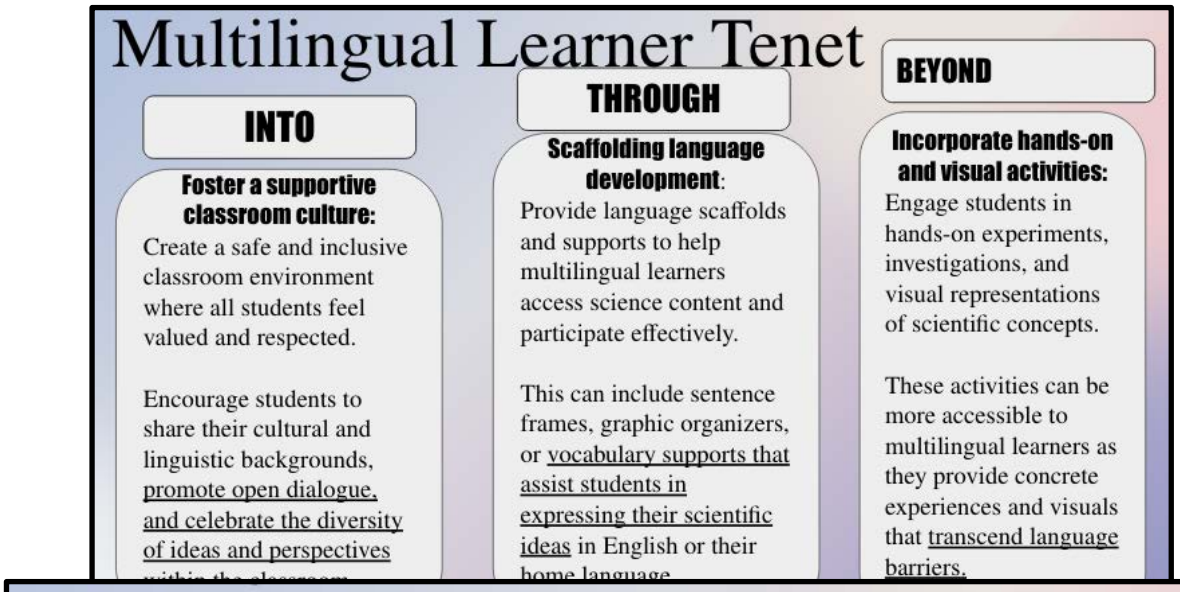
For this report, the CA Team has chosen to highlight two different H-CCLS Groups and their work.

Vignette #1: Upper Elementary and Middle school H-CCLS presentation
Planning and Carrying Out Investigations with a Multilingual Learner Lens
Presenters: Jodie Sheffels, Brenda Valine, Kendall Bell
Abstract: Planning and carrying out investigations in the upper elementary classroom is a vital experience to get students engaged in Science. It is also a great way to enhance the participation of multilingual learners. We are three 5th and 6th grade teachers who analyzed the use of scientific inquiry in our own classes, using research and classroom observations to inform and guide our conversations.

Presentation Slide Deck

Group: 3 Upper Elementary/Middle School	**Date:** 6/10/23
NGSS Practice: Planning and Carrying Out Investigations Article #11: Metz, K. (2004). Children's Understanding of Scientific Inquiry: Their Conceptualization of Uncertainty in Investigations of Their Own Design. Cognition and Instruction, 22(2), 219-290.	
Course of Study (Multilingual learner tenet): How do you enhance the participation of your students by bridging their cultural and linguistic resources with the science activities? (2nd Tenet) Article #2: Lee, O., Llosa, L., Grapin, S., Haas, A., & Goggins, M. (2019). Science and language integration with English learners: A conceptual framework guiding instructional materials development. Science Education, 103(2), 317-337.	
What do you hope your audience learns from the presentation? We hope the audience recognizes our commitment to our students as we design lessons with them in mind. We also hope colleagues see how the work we are doing together is designed to help an exponential number of students in the bay area if we duplicate our reflective teaching strategies back at our home districts.	
What would you like your audience to focus on during the presentation? Due to time constraints, we are unable to talk at length about our specific classroom strategies and how we set our students up to interact with these lessons. We ask the audience to engage in a segment of lesson building and reflect on an experience where they have taught something similar. Themes in our conversations and pieces of student work we picked out show a greater trend in learners today.	

The following slides show how this team applied the tenets for multilingual learner learning in their project.



The following excerpt shows how they reflected on the course of study they adopted for their H-CCLS project.

- **Brenda**- I thought I was engaging my students in scientific inquiries, but I was really only engaging them in one phase of an inquiry! I've also struggled with the question of how to engage my students in inquiries when teaching straightforward standards, but this project and the research articles, have shown me that I can expand those units to include more student voice and choice in the form of inquiries.
- **Jodie**- I've realized that some of the lack of depth I've seen in students' scientific engagement with labs is because I haven't been explicit about what it means to do science. Having direct conversations about the legitimacy of error, uncertainty and nuance in data analysis, and how all of that is "real science", has deepened my students' content knowledge and the precision of their scientific language.
- **Kendall**- This course of study allowed me to breakthrough a plateau I had been having with the NGSS practice of planning and carrying out investigations. The feedback from my formative assessments included a lot of confusion and frustration because I didn't have proper language structures for students to express their ideas and thoughts. I really figured this out through the conversations with my group.

Vignette #2: Middle School H-CCLS presentation
Examining How Students Analyze and Interpret Data to Develop Evidence-Based Arguments
Presenters: Charmaine Benham, Lisa Ernst, Jonathan Lee

Abstract: Several science processes are important in helping students engage with science as a model of inquiry and can include gathering and examining evidence, analyzing and interpreting data and graphs, and communicating evidence-based arguments. Our study was designed to examine how students perform in extracting information and evidence from data tables and graphs and subsequently how they use that specific information and evidence to formulate arguments. The results from the three distinct classroom settings have informed our future instructional practices and assessment of these science process skills, and the need to implement these at the beginning of the school year with consistent reinforcement throughout the academic year.

[Presentation Slide Deck]

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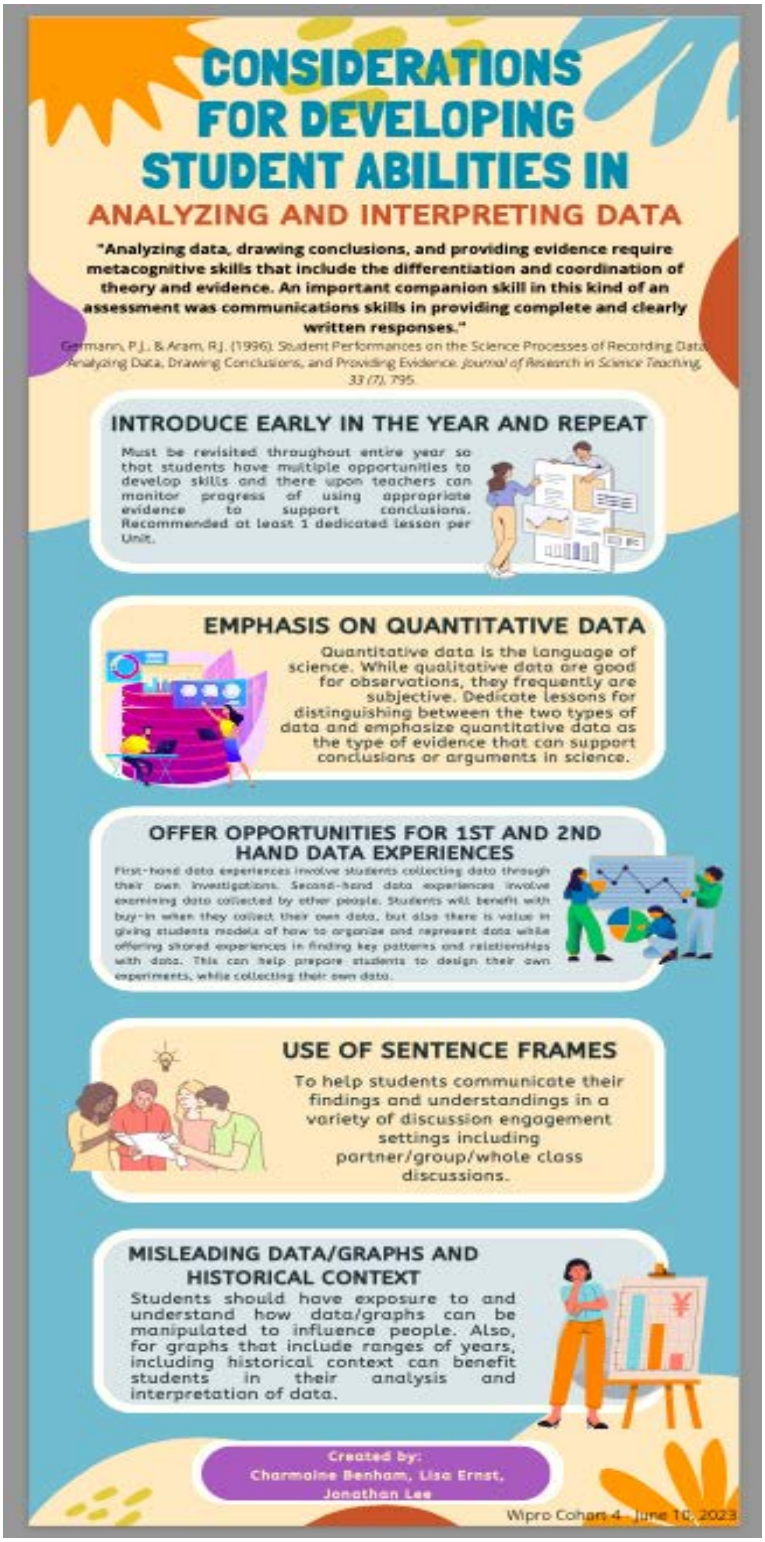
Group: 2 Middle School	**Date:** 5/18/23
NGSS Practice: Analyzing and Interpreting Data Scientific investigations produce data that must be analyzed in order to derive meaning. Because data patterns and trends are not always obvious, scientists use a range of tools—including tabulation, graphical interpretation, visualization, and statistical analysis—to identify the significant features and patterns in the data. Scientists identify sources of error in the investigations and calculate the degree of certainty in the results. Modern technology makes the collection of large data sets much easier, providing secondary sources for analysis. ***Article #1:*** *Germann, P.J., & Aram, R.J. (1996). Student performances on the science processes of recording data, analyzing data, drawing conclusions, and providing evidence. Journal of Research in Science Teaching, 33(7), 573–798.*	
Course of Study (Multilingual learner tenet): **Multimodal Teaching:** How do you provide multiple meaning making resources for your students and help your students communicate their understanding through both text and other modes? ***Article #2:*** *Barbara Hug & Katherine L. McNeill (2008) Use of First-hand and Second-hand Data in Science: Does data type influence classroom conversations?, International Journal of Science Education, 30:13, 1725-1751.*	
What do you hope your audience learns from the presentation? 1. Students at the middle school level are still developing their skills in how to analyze and discuss data and graphs and are not yet proficient in those practices 2. Teachers need to offer multiple opportunities throughout the year to gain experience in evidence gathering and evaluation and in application towards supporting students engaging in scientific argumentation 3. Students can move to a growth-mindset from being passive observers of data to active users that think and demonstrate like scientists	
What would you like your audience to focus on during the presentation? 1. Takeaways from our infographic that may be useful in your own classrooms 2. How our group came with three different lenses and classroom contexts and connected through the research	

infographic was created by this group and distributed to all participants during the Wipro End of Year Conference. It highlights the essential ways that the team took up their course

of study and made the study relevant for their students. The infographic outlines their key takeaways and recommendations.



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.

Summary of Current Project(s) and Goals

Nicole Holman - BSCS 5E Instructional Model at Jule Sumner High School
This professional learning experience 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 goal is to develop lessons that can be shared with the District and increase engagement in science learning through the 3-Dimensional learning experience. In the immersion of the 3-Dimensional learning experience, students explore the biology content standards by practicing science and engineering and applying the crossing-cutting concepts. The team will develop instructional sequences for each unit in the biology curriculum, implement them, and refine the lessons after teaching them. The team will share their results with the district to expand the practice of utilizing the BSCS 5E Instructional Model in other areas.

Michele Wiehagen and Melissa Triebwasser – They are working on two proposals together. A major change that they reported is that they have shifted their thinking to let the voices of the classroom teachers guide their work and change the immediate outcomes.

Proposal 1 Teaching Standards via Small Group Instruction
Melissa is taking the lead on this project. It supports a new district initiative of bundling standards for the purpose of small groups instruction in science. As this is a district wide initiative, the impact from this work will truly impact the entire district as the two focus on curriculum across Hillsborough School District.

Proposal 2 – Teaching Engineering Design
In this project Michele and Melissa are working with grades 2 and 3 teachers in 25 schools to help them implement engineering design in their classes. Michele is the lead. The goal is to identify barriers that prevent the teachers from implementing the curricular materials as designed, and to provide professional development activities to help the teachers overcome those barriers. Please provide a one-page summary (or less) of your current project(s) and their associated goals as we move into Phase II/III.

Progress and Highlights

Nicole Holman project:
The team has developed several storylines for Biology using the BSCS 5E model. They have one fully completed unit. The unit is complete with all the levels as NGSS. There are three other units that are complete storylines but still in development. The full lessons include all performance expectations for each instructional sequence along with all 5E lessons including Elaborate. Units 2-4 will include lessons for teachers but not tied to the performance expectations.

They have been having some difficulty aligning the Florida Next Generation Sunshine State Standards with the style of the NGSS. This is important in the planning process for the curriculum writing team but not necessary for teachers for implementation. They have also been having some issues with the performance expectations that align to the SEPs and using them in planning instruction. They imagine they will have similar issues in other units

Michele Wiehagen and Melissa Triebwasser Projects:
During this past quarter they established the teams they are working with, created pathways for the two projects, and presented their initial work at NSTA. The major challenge is the availability of teachers to work with them. with teachers. Many of them are covering extra because of the critical shortage of teachers in Hillsborogh County. As a result all their otherwise "free" periods are taken up with covering those classes. Overall, they have found that very few teachers in the county are attending professional development in any content area or level. They attribute this to the overall culture and climate of the schools right now.
They are addressing this by building their meeting calendar around the team they are working with. They clearly defined dates, tasks, roles, expectations, and are meeting at locations convenient for everyone and that can accommodate teachers' children. Another challenge that because of the staff shortages, their team members have had to shift their jobs.

Melissa and Michele meet monthly in both projects' teams face to face to create the deliverables and develop support structures for beginning of the year. For the beginning of the next school year they are hoping to have tangible things for teachers to utilize in Region four to test out, so they can collect data. In both projects they have collected data through coaching cycles, observations, planning, teacher surveys, and feedback.

They also report that it is great having Lesley Kirkley as a partner since she knows elementary - that is a critical component of our project. Elementary standards, science, and teachers are the foundation to the improvement of science education. She brings the knowledge of what is present in these classrooms, the content, and the fact that an elementary teacher must be proficient in all subjects is a different hurdle than middle and high school.

Small Groups in Science:

Date	Topic/ Task	Attachments/ Deliverables
10/17/2022	Contacted principals to be part of our work flow and identify leaders	Principal communication
12/21/2022	Identified the needs of the district for small group instruction with acceleration opportunities Surveyed our 60 science leaders during the monthly meeting	Sign in sheet from 12/21/2022
12/12/2023	Newsletter of our work	Wipro newsletter
1/21/2023	Wipro meeting (met with Lesley to help reformat our project)	Wipro notes 1.21.23
1/26/2023	From the feedback from Lesley and our work with our administrator- Shana Tirado We developed a foundational small group calendar and training. Created documents Created a structure Create a new calendar alignment with accelerated resources Presented to our 60 science leaders. Met with Region 4	5th grade year at a glance Small Group for Resource ppt Launching into Small Science
February-May WEEKLY MONDAY PLANNING	Hosted weekly Monday planning sessions with identified region (region 4) Identified needs from the teachers • More foundational support is needed	Sign in sheet from planning
January-May	Coaching and pulling small groups in classroom- DAILY	Student work/ calendar
March	Met leaders at NSTA that create story lines based on the student assessments Connected with COESEE	pictures
4.1.2023	Presented to WIPRO group updates	Wipro April Update ppt.
May	Collaborated with teacher leads to identify a small group training for the district. Worked with Brandie Palmer, Laura Dunn, Nicole Reneau, and Kristen Martinez	Pictures of brainstorming
May	Created a district training- developing a small group training (Using STEM to Accelerate Small Groups)	Updated Using STEM to Accelerate Learning
May	Met with region 4 leaders from Wipro to facilitate the training	

June	Trained over 100 teachers with the training. With our leads	Sign in sheets June 12-15

Engineering Design

Date	Topic/ Task	Attachments/ Deliverables
10/17/2022	Contacted principals to be part of our work flow and identify leaders	Principal communication
12/21/2022	Surveyed the district leaders for the why current EDC's were not being utilized	Microsoft Forms survey results
12/12/2023	Newsletter of our work	Wipro newsletter
1/21/2023	Wipro meeting (met with Lesley to help reformat our project)	Wipro notes 1.21.23
January-May	Worked with our teams to create standards aligned EDC's for Inquiry Monday K-5	Year at a Glance
February-May WEEKLY MONDAY PLANNING	Hosted weekly Monday planning sessions with identified region (region 4) Inquiry Mondays embed the new edc's	Sign in sheet from planning
January-May	Coaching and pulling small groups in classroom- DAILY	Student work/ calendar Design challenge document
March	Presented the work of EDC's at the National Science Teachers Association	EDC Animal Care Specialist
April	Presented to WIPRO group updates	Wipro April Update ppt.
June	Met with region four leaders to rewrite the first EDC	Continued

As far as the project as a whole, we are working on receiving cohort 2 applications. In the original proposal, we were not going to be accepting 2-year applications this year, however since we had relatively few projects in the first cohort, we opted to allow submissions for the 2-year projects this year as well. Our applications are due next week, then our review team will look them over and score them. We will look at the projects in three categories, those we will fund, those that need some tweaking, and those that are not fundable. If there are projects that require some tweaking, they will get specific feedback on what is needed for them to resubmit. Our goal is to help our fellows be successful with these projects, thus we want to support them as much as possible.

If you look at the calendar below, you will see the specific events we are doing in the next two quarters.

Plan for the Next Two Quarters

Date	People	Activity
6/19	Leadership & Fellows	Cohort 2 proposals are due for this Phase.
Mid-June/July	Leadership & Fellows	We are having individual meetings with each cohort team to discuss progress and meet with members.
July	Leadership	Meeting with Leadership to discuss upcoming celebration, applications, and the year ahead
8/26	Leadership & Fellows	Wipro Celebration
October	Leadership & Fellows	Wipro Meeting (Dates will be planned at July meeting)
November	Leadership & Fellows	Wipro Meeting (Dates will be planned at July meeting)

Featured Fellows

Melissa Triebwasser and Michele Wiehagen

Melissa Triebwasser and Michele Wiehagen have partnered on a Wipro project designed to use student data to enhance small group instruction in science. While this project may seem simplistic in nature, it is a multi-step approach in looking at student data as a story to guide teachers in uncovering gaps in learning. Teachers will then use small group instruction to close those gaps in an approach that is not a one-size fits all.

The work began by identifying third and fourth "fair game" science benchmarks into our current curriculum map so that teachers could naturally make connection to acceleration-based standards. For this work, team member Laura Dunn, a district science coach helped ensure benchmarks connected and flowed together while also identifying resources that teachers could use for the small group instruction. Through informal surveys and discussions, Melissa and Michele realized that teachers required support in creating a structure for small group instruction in science. In order to successfully begin implementing data driven small groups, Melissa and Michele had to break-down the basics of what these groups may look like in elementary science. Together they wrote a district training, Using STEM to Support Small Group Instruction in Science, to model a possible structure for implementing small groups. They brought in team member Brandie Palmer, a site-based science coach, to facilitate the training which will be offered in June 2023.

Following the training, teacher leaders at targeted schools will meet to help identify assessment tools that can be used in building a student data story so learning gaps can be identified. Once gaps are identified, Melissa and Michele will meet with site-based science

leaders Brandie Palmer, Kesha Simmons, Stacy Summers and Kristin Martinez to identify resources and steps in implementing small groups. This work is not scheduled to take place until August 2023.

The goal of this project is to increase student curiosity and knowledge of science while also increasing teacher understanding of science instructional practices and content knowledge using small group instruction. By targeting some of our strongest science teachers, we hope that this practice will spread to other teachers and students throughout the targeted schools.

Sharfun Islam Nancy

After joining the PhD program in science education at USF, I have been fortunate to be working as a graduate assistant for the Tampa Bay Wipro Science Education Fellowship program. Working in this professional development program has increased my experience in working with schoolteachers, USF faculty members, as well as district science coordinators.

As an international student from Bangladesh, when I joined USF for my doctoral program in science education, I had little exposure to K-12 education in the United States but an immense passion to understand how science is taught in this country. I was able to observe and know about the classroom practices of teachers through Wipro Science Education Fellowship program. It has been an exciting opportunity to explore teachers and their classroom practices from Hillsborough, Pinellas and Pasco counties. I understand that this has been an extremely valuable experience for me. I helped the project to organize monthly meetings, keeping records of progress of fellows, writing reports, mentoring fellows with their GPS projects, facilitating sessions as well as conducting research. I have worked closely with two fellows from cohort two of the program, Laurie Vaughn-Grantges and Chelsey Swats, to help and mentor them with their GPS project. We meet bi-weekly to discuss on their GPS project, monitored their progress and provided any assistance they required in the process of completing GPS work. Recently, I have presented a research study I have been working on at the NARST 2023 conference at Chicago. The study is titled “Understanding science teacher perceptions of the influence of vertically and horizontally aligned collaborative teams”.

I am extremely grateful for this invaluable opportunity to meet professionals in science education and to observe closely their extraordinary skill, dedication, passion for learning and help them implementing new strategies in their science classrooms.

MASSACHUSETTS- UNIVERSITY OF MASSACHUSETTS BOSTON

The Boston area partner sites are at the early stages of engaging in the Innovation Phase program. The sites will be pursuing a mixture of district-wide initiatives and smaller projects. Information sessions for the next set of grants were held on 25 and 31 May 2023. We are in the process of receiving and reviewing applications for grants for the 2023-2024 school year. We are excited to help the sites begin this work as they begin to leverage the cadre of leaders they have developed in the earlier phases of the program.

Summary of Current Project(s) and Goals

In Boston, The science department seeks to develop a district-wide cadre of science teacher leaders known as **Science Stewards**. Science Stewards are science teachers whose voices and collective expertise support work connected to professional development and curriculum. The department seeks teachers to become lead teachers, curriculum advisors, and professional learning facilitators. The roles they fill will support STE Program Directors in their mission to ensure Boston Public Schools maintains high-quality science curricula and instructional resources.

The Cambridge Public Schools have been awarded a new grant to implement vertical teaming in the middle and high schools.

Progress and Highlights

Boston

Early Childhood: K0-2

What is the role?	The STE department has collaborated with WIPRO to increase district-wide science teacher leadership capacity by assembling a Board of Advisors, or Science Stewards, comprised of BPS teachers whose responsibilities include: 1. Supporting fellow teachers 2. Professional Learning facilitation 3. Increasing science teaching and learning at the school level 4. Advising central office on curriculum decisions
What need are they filling and what is expected of them?	BPS teachers have expressed that they prefer receiving PL from other BPS teachers.
How many teachers?	About 15

Who are the teachers?	K-5 science teachers
How often will, or have they, met?	3 full days in June 2 full days in August 1 full day in the fall 3 afternoon meetings during the school year Independent work in the summer
How have they been recruited?	-through email -in person -via central office communications -during PD
What is their product? (include link or anticipated completion date)	-updated scope and sequences -facilitation guides -facilitation slidedecks -anecdotal feedback -survey data

Upper Elementary: 3-5

What is the role?	Curriculum Advisor
What need are they filling and what is expected of them?	Teachers are piloting 1. A condensed scope and sequence merging the two Physical Science Units in the 4th grade. 2. A Life Science Unit in the 4th grade 3. A Life Science Unit in the 5th grade Each upper elementary grade has three units: life science, physical science, and earth and space science, with the exception of 4th grade. Currently, 4th graders experience two physical science units in the sequence and no life science unit. Teachers have criticized this, especially as many of the lessons are similar. They have further provided feedback about the negative impact of students missing a year of life science lessons. The life science units in the 4th and 5th grades are currently out of date and not meeting the needs of the 2016 STE Frameworks. Teachers are expected to teach the units with as much fidelity as possible and submit feedback according to this PPT on the units

	addressing a few key elements of the BPS-modified EQuIP Rubric. Feedback includes student work and a classroom video.
How many teachers?	4th Energy Scope and Sequence: 3 4th Grade life science pilot: 6 5th Grade life science pilot: 4
Who are the teachers?	6 Science Specialists, 1 Classroom teacher
How often will, or have they, met?	Training session in March Focus Group in June
How have they been recruited?	Recruitment email Google Classroom and Listserve Google Form
What is their product? (include link or anticipated completion date)	The teachers piloting the life science units must submit a completed PPT (see above) and participate in a focus group in June.

Middle Grades: 6-8

What is the role?	Curriculum Advisors
What needs are they filling and what is expected of them?	As we've fully adopted all the units for OpenSciEd (6 per grade), pacing is a challenge for teachers. The focus of this group is to develop a guidance resource that applies OSE Condensed recommendations for each unit, by naming the lessons/activities that are required (necessary to maintain the integrity of the storyline) versus those that are optional (won't disrupt sensemaking process if omitted). This guidance will then inform the revisions to the scope and sequence for SY23-24.
How many teachers?	Grade 6: 3 Grade 7: 3 Grade 8: 3
Who are the teachers?	K-6 Science Specialist: Middle Grades Science Teachers:
How often will, or have they, met	By the end of June 2023, this group will meet for 3, 1hr synchronous meetings and engage in 8 hours of asynchronous work time to complete the unit guidance spreadsheets for each grade 6-8.

How have they been recruited?	Through an interest Google form share via a Google classroom announcement and secondary science listserv e-mail.
What is their product? (include link or anticipated completion date)	Grade 6 OSE Unit Guidance Grade 7 OSE Unit Guidance Grade 8 OSE Unit Guidance
What is the role?	Professional Learning Facilitator
What needs are they filling and what is expected of them?	In order to support the successful implementation of the OpenSciEd curriculum, teachers need high-quality research-based professional learning (PL) that's grounded in the curriculum and allows room for both self-reflection and collaboration. Teacher voice is important to use and BPS teachers have expressed that they prefer receiving PL from other BPS teachers. There are three buckets of Professional Learning that these leaders will lead: 1. Beginning of Year August PD 2. Year-long Unit Trainings 3. Year-long Professional Learning Communities The focus for SY 2023 is developing the professional learning structure for SY23-24 and creating the Beginning of Year August PD materials.
How many teachers?	Grade 6: 2 Grade 7: 2 Grade 8: 2
Who are the teachers?	K-6 Science Specialist: Middle Grades Science Teachers:
How often will, or have they, met	By the end of June 2023, this group will meet for 3, 1hr synchronous meetings and engage in 2 hours of asynchronous work time to complete the facilitator agenda, slide deck, and identify investigations for the learning lab.
How have they been recruited?	Through an interest Google form share via a Google classroom announcement and secondary science listserv e-mail
What is their product?	Each grade level facilitation team will complete the following templates for their respective grade level: Facilitator Guide Template

(include a link or anticipated completion date)	Slide Deck Template Learning Lab Template

High School: 9-12

What is the role?	Curriculum Reviewers
What needs are they filling and what is expected of them?	BPS currently does not have curricula aligned to the current 2016 MA STE Standards for its introductory biology, chemistry, and physics courses. Teachers piloted curricula for each of these courses and gave feedback on their and their students' experiences using those materials. The teachers then completed a survey indicating the extent to which key criteria were embedded in the curriculum they piloted and how it helped students learn content. It was necessary for teachers to teach and provide feedback on potential curricula to help the science department determine which curriculum it should adopt. The teachers taught either one unit or the whole curriculum in its entirety.
How many teachers?	9
Who are the teachers?	These are the teachers who have piloted the following curricula: Savvas: Experience Chemistry • Denise Puopolo - East Boston HS - dpuoplo@bostonpublicschools.org • Ngoc Truong - East Boston HS - ntruong2@bostonpublicschools.org • Nadja Lamaue - Excel HS - nlamaute@bostonpublicschools.org Savvas: Experience Physics • George O'Meara - Community Academy of Science and Health - gomeara@bostonpublicschools.org Savvas: Miller and Levine Biology • Nadja Lamaute - Excel HS - nlamaute@bostonpublicschools.org Lab Aids - SEPUP, Science and Global Issues Biology • Hannah Johnson - Fenway HS - hjohnson3@bostonpublicschools.org • Joe Cheung - Fenway HS - jcheung@bostonpublicschools.org • Juliana Thompson - Fenway HS - jthompson3@bostonpublicschools.org

	• Mark Knapp - Quincy Upper - mknapp2@bostonpublicschools.org • Johanna Waldman - Another Course to College - jwaldman@bostonpublicschools.org
How often will, or have they, met	The teachers have met for 3 professional learning sessions.
How have they been recruited?	They were recruited via email and information sessions
What is their product? (include links or anticipated completion date)	The teachers will have completed a feedback form by May 31st.

What is the role?	MassCore Advisory
What need are they filling and what is expected of them?	BPS recently adopted the MassCore Framework as its requirement for high school graduation. As part of this framework, students are required to take 3 lab-based science courses. The framework, however, does not define or outline what a lab-based course is. It is therefore up to the district to determine this for itself. We will be bringing together a group of high school teachers to draft guidance on what constitutes a lab-based science course. The teachers will review documents that have the definition embedded and craft such language as a group.
How many teachers?	5
Who are the teachers?	High school science teachers
How often will, or have they, met	2-3 times
How have they been recruited?	The teachers will be recruited via email.

What is their product? (include links or anticipated completion date)	The product will be a draft guidance document that defines a lab-based course and provides examples. The expected completion date will be June 16, 2023.

Cambridge

A new project has been approved for the Cambridge Public Schools to implement vertical teaming. Here is the press release announcing the project:

FOR IMMEDIATE RELEASE

Boston, MA. June 13, 2023 — The Wipro Science Education Fellowship program, as administered by the Center of Science and Math in Context (COSMIC) at University of Massachusetts Boston is pleased to announce that Tal SebellShavit and the Combridge Public Schools have been awarded a grant in the amount of $19,800 to implement vertical teams within their educational framework. This competitive funding opportunity has been secured through a rigorous selection process, marking an exciting new chapter in Cambridge Public School's development.

Vertical teams, a concept that encourages interdisciplinary collaboration and seamless educational transitions across different grade levels, has the potential to bring significant positive change to the Cambridge Schools. The implementation of this model signifies a dedicated effort to innovate and advance educational methods for the benefit of students, staff, and the wider educational community.

"Mr. SebellShavit's commitment to excellence in education and innovative thinking stood out in the proposal," says Arthur Eisenkraft, Distinguished Professor of Science Education, Professor of Physics and Director of the Center of Science and Math in Context (COSMIC) at University of Massachusetts Boston. "We believe their project embodies the academic and professional development that the Wipro Science Education Fellowship (Wipro SEF) program strives to encourage and nurture."

This award highlights Tal SebellShavit’s and Cambridge Public School's commitment to pursuing and implementing innovative educational strategies, with the ultimate aim of enhancing student outcomes and professional development. Their efforts will set a precedence for other institutions, demonstrating the transformative potential of vertical teaming.

UMass Boston is proud to partner with Mr. SebellShavit and Cambridge Public Schools on this project, offering support as they embark on this exciting venture. Wipro SEF eagerly

anticipates the positive impact this project will bring, marking a significant step forward for educational advancement.

For more information about the vertical teams implementation at Cambridge Public Schools and 35 school districts nationwide or the work of the Wipro Science Education Fellowship program, please contact Arthur Eisenkraft (arthur.eisenkraft@umb.edu).

Press Contact:
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email: arthur.eisenkraft@umb.edu

Plan for the Next Two Quarters

June: Receive applications for grants
Summer: Review and approve grants
September: Kick-off for new projects

Featured Fellows

Theresa Lee – Boston Public Schools

Theresa Lee is currently a BEES (Building Excellent Educators of Science) content coach in the Boston Public Schools. Theresa holds a Bachelor of Science in Communications from Suffolk University and a Masters in Education with a concentration in Science Inquiry from Fitchburg State College. She spent 23 years as an elementary Science/STEAM specialist teacher prior to transitioning into her current coaching role. In 2001, Theresa was recruited as a Science Teacher Leader for the Boston Public Schools and has facilitated content training at a variety of grade levels. While completing the Science Education Fellowship (SEF-a predecessor to the WIPRO fellowship,) during the 2009/2010 school year, Theresa discovered a passion for working with teachers on incorporating science content into their classrooms. She facilitated a Science Leadership Team at Sumner Elementary (BPS) in order to encourage grade level teams to plan more time for science in their classes. She also developed a number of partnerships between Sumner Elementary and local cultural institutions. Theresa has presented with BPS colleagues at NSTA conferences in Atlanta, Boston and Chicago. She has also worked with pre-service teachers through the Boston Teacher Residency Program and Emmanuel College. I believe in the value of scientifically literate individuals. Learning to

observe, notice and wonder starts with our youngest learners. As a specialty teacher, I wanted my students to not only feel comfortable sharing their ideas, but to ask questions and eventually participate in public policy decision making about issues like urban heat islands, access to clean water, or even designs for green spaces. With the revised NGSS standards, we are seeing the value in starting with a phenomena that sparks curiosity. As a teacher, I am able to use that curiosity and questioning to encourage students in their learning journey. Place-based phenomena is even more relevant as we consider equity in the urban district in which I currently work. Science is real and it is right outside your door! Working with my SEF cohort, I looked at content not only in a grade band, but also vertically. Utilizing both views has impacted my practice as both a teacher and an instructional coach. I frequently find myself encouraging teachers to take a look at what they are teaching in terms of vertical alignment. This allows them to see not only what has previously been taught, but also how what they are teaching helps develop conceptual understanding. I've kept in touch with many of my SEF colleagues. It's a privilege to be part of such a great group of teacher leaders!

MISSOURI- UNIVERSITY OF MISSOURI

During this past quarter Cohort 4 Fellows completed their Year 1 work. They watched their team's HCCLS videos, met for debriefs, created and submitted their presentations and one lesson plan each. The HCCLS conference was held on May 16, 2023. This work moves them to their Year 2 assignments of creating 4 lesson plans and disseminating them to their buildings / districts. The focus of the lesson plans is to integrate math and science in their teaching, with the ultimate goal of disseminating their work among their district colleagues, moving their math and science teachers to integrate their instruction, and their students to think about math and science as related subjects rather than as stand-alones. The faculty members have been working on recruiting Cohort 5 grade 6-12 fellows for the two-year program and Cohort 4 K-5 fellows to work with current Cohort 4 6-12 fellows for a one-year program.
Plaques for Cohort 1, 2, and 3 Fellows were sent out. MU faculty attended the plaque presentation at the School Board meeting at Hallsville School District.

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 specific math units on science topics, the differences in graphing methods used in math and science classes, and so on. The collaboration between math and science teachers is essential to the implementation of a successful science curriculum. This project will focus on the Science and Engineering Practices of Using Math and Computational Thinking.

The project will recruit 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. Fellows will work with the project for 2 years. Three cohorts of fellows are to be recruited in 2022, 2023 and 2024, with 15 fellows per cohort. Fellows will work in V-CCLS and H-CCLS teams in Year 1 and will 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, 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 so that they can integrate science into their math classes and vice versa.

Progress and Highlights

HCCLS Conference:
Cohort 4 Fellows completed their H-CCLS work, and the teams made presentations at the H-CCLS mini conference on May 16, 2023. Each teacher and DC was asked to bring an administrator with them. Our audience included 8 visitors: a secondary science coordinator (DC), a secondary math coordinator (DC), a secondary assistant principal (DC), an incoming secondary math coordinator (who will be a DC next year, replacing a retirement), an assistant superintendent, an assistant high school principal, an elementary math coordinator and a Cohort 1 fellow. The MU Physics department chair and a faculty member also attended part of the program.

The conference began with dedicated to the late Prof. Dorina Kosztin, who was co-Pi and PI of the Missouri Wipro SEF project since its inception in 2018. The conference program brochure included a short description of her contribution to the professional development of Missouri teachers, in which she was deeply involved since 2006.

The next item in the program was a short discussion among district-alike groups of teachers and administrators, where they discussed two questions. The discussions were captured on a jamboard (https://tinyurl.com/MoMay2023Jamboard). The questions discussed and a summary of the responses are included below:

1. Q: How can the skills developed by Wipro fellows be utilized in the building or district? Responses:
    a. Fellows will mentor incoming young staff.
    b. Fellows can provide professional development and math/science co-curricular processes to all staff.
    c. Fellows would like to observe non-Wipro teachers in their classes, film and debrief.
2. Q: How can fellows be supported by the district as they launch new initiatives? Responses:
    a. District can provide meaningful vertical teaming time.
    b. District can provide PD opportunities to bring together math/science teams for collaborative work and unit development. Specifically, to start thinking about the order in which content is taught in math and in science, and how to align the skills taught in the two subjects.
    c. District could work on setting up math and science classes with a shared wall so the wall between classes could be opened up as teachers deem useful.
    d. District can provide time to share on PD days.
    e. Districts can provide opportunities to network/collaborate with other districts.

The final item on the program was the HCCLS presentations (https://tinyurl.com/MoWiproC4Presentations -this folder contains H-CCLS, V-CCLS and research article presentations in 2022-23). Four teams presented in the usual format. Several teams provided hands-on activities. Fellows and visitors provided thoughtful warm and cool feedback. The hands-on activities clearly indicated the integration of math and science in the classrooms. For example, Susan Elliott, a math teacher, had students conduct an experiment where they hung a plastic dixie cup on a strand of angel-hair spaghetti as a bridge; the cup was then loaded with pennies to determine how many pennies were needed to break the bridge. This allowed her to have students draw graphs and discuss experimental variations in real data. Other teachers used simulations to obtain data and create models. Each teacher also submitted the lesson plans they created this year. This lesson plan will be discussed during our August meeting, and further adjustments will be made as needed, so they can start working on the four lesson plans they will create in Year 2.

The presentation abstracts with related Science and Engineering Practices (SEP) and Standards for Mathematical Practices (SMP) are listed below.

MIDDLE SCHOOL - COLUMBIA TEAM

"Using Mathematics and Computational Thinking," by Nicole Campbell, Susan Elliott, and Matt Wightman, Smithton Middle School, Columbia Public Schools

SEP: Constructing Explanations & Designing Solutions
SMP: Construct viable arguments and critique the reasoning of others
Using lessons that are both integrated and cognitively demanding promote students' mathematical reasoning and scientific sense making. By constructing viable arguments and explanations we learned that students can take ownership of their learning when they must articulate what their data means.

HIGH SCHOOL - BOONVILLE TEAM

"Visual Representations and Annotation," by Brea James and Melissa Hundley, Boonville High School, Boonville R-1 School District

SEP: Using Mathematics & Computational Thinking
SMP: Reason Abstractly & Quantitatively
There are many factors that can influence the effectiveness of various teaching strategies. Some of these factors include learners' prior knowledge, motivation, self-efficacy, annotation, and the use of visual representations. The use of visual representations, whether that be concrete or abstract, can help learners focus their attention during the problem-solving process. Examples of each type of visual representation are shown to help students use mathematics to reason abstractly and quantitatively.

HIGH SCHOOL - HALLSVILLE TEAM

"Pigeon Genetics, Mouse Click Battle, and Computational Thinking in the Classroom," by Melissa Hough and Erin Snelling, Hallsville High School, Hallsville R-IV School District

SEP: Using Mathematics and Computational Thinking

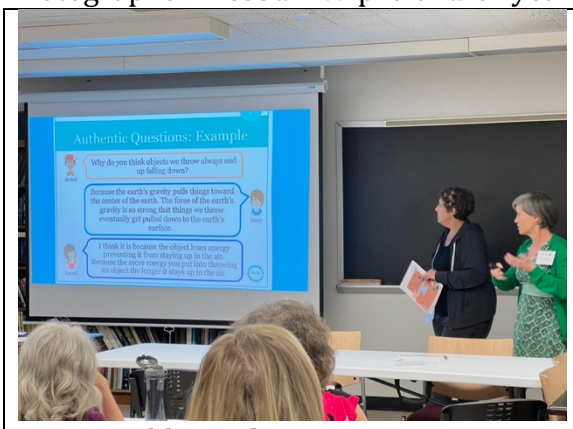
SMP: Make sense of problems and persevere in solving them.
Students develop computational thinking when they approach a new situation with an awareness of the many ways that computers can help them visualize systems and solve problems. This is similarly done in the math classroom when students develop mathematical thinking when they approach a new situation with a range of mathematical skills. It is important to understand that simply using computers in the classroom is not enough. It is important for students to deepen their understanding by using computational thinking opportunities such as simulations, data mining, gaming, robotics, programming, and automated data collection and analysis.

High School - Columbia Team

"Quality Talk for Sense Making in Math and Science," Karen King and Vera Reichlin, Rock Bridge High School, Columbia Public Schools

SEP: Engage in argument from evidence
SMP: Construct viable arguments and critique reasoning of others
Through writing and communication, students develop understanding of math and science concepts. Communication can look like arguments, summary sentences, questioning, explanations and reviewing each other's work. We tried new strategies to build argumentation and communication.

Photographs: Missouri Wipro end-of-year conference, May 16, 2023.



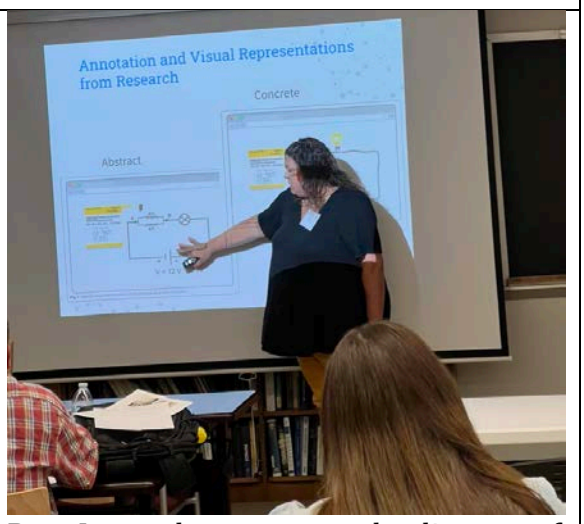
Vera Reichlin and Karen King present what Quality Talk might look like in a classroom.

Erin Snelling's slide shows her students working on a simulation of the genetics of pigeon chromosomes in her biology classroom.

Three math coordinators from Columbia Public Schools conduct a discussion during the HCCLS conference. L-R: Jenifer Smith, Lisa Nieder, Melissa Fike.

Susan Elliott and Nicole Campbell work on a "make a model of a water molecule with legos" hands-on activity.

Melissa Hough, Julie Esquivel and Erin Snelling work on testing the strength of a spaghetti bridge.



Brea James demonstrates the diagram of an electrical circuit with annotation.

Recruitment

We are currently recruiting cohort 5 grade 6-12 teachers for the two-year fellowship as well as recruiting cohort 4 grade K-5 teachers for the one-year fellowship. Recruitment has been slow, but the application process is still open. We are continuing to be in contact with district coordinators, former fellows, and new districts. We also plan to have a booth at the Missouri Interface conference in October, but that will be to jump-start recruitment for cohort 6 (2024-26).

Visit to Hallsville School Board Meeting

Meera Chandrasekhar and Linda Godwin attended a school board meeting at Hallsville, Missouri on May 17, 2023, to support the awarding of Cohorts 1-3 plaques to the fellows, coordinators, and district. Wipro fellow Erin Snelling, coordinator and Hallsville Middle School Principal Ty Sides, and coordinator and Hallsville Intermediate Principal Bethany Morris attended the presentation.

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>  </td><td>Top left: Meera Chandrasekhar explains the Wipro project and accomplishments of the Wipro fellows.

Top right: L-R: Ty Sides (DC 2018-20), Meera Chandrasekhar, Erin Snelling (Cohort 2 fellow), Bethany Morris (DC 2018-22), and Linda Godwin.
Bottom left: Bethany Morris, Hallsville Intermediate School Principal with Coordinator Plaque.</td></tr>
</table>

Plan for Next Two Quarters

Date	Participants	Activity
Aug 2 or 9	Cohort 5 & DC's	Introduction to program, VCCLS process, search for research articles, leadership discussion
Aug 3 or 10	Cohort 4, grades 6-12 and K-5	Finalize lesson plans, and plans for working with elementary teachers
Sep 21	Cohort 5	Presentation on upcoming eclipses, presentation on PowerPoint, finalize research articles.
Oct 11	Cohort 4, grades 6-12 and K-5	TBD. DC's cycle in.
Oct. 19	Cohort 5	Research Article presentations, Math in Physics First presentation

Nov 16	Cohort 5	Outside speaker, prep for VCCLS presentations
Dec 7	Cohort 5 (Cohort 1-4 DCs, visitors invited)	VCCLS presentations

Featured Fellows

Erin Snelling, Hallsville R-IV School District

My name is Erin Snelling. I am a high school life science teacher at a rural school in the mid-Missouri town of Hallsville. I currently teach Biology to students in 10th grade, dual credit Biology to 11th and 12th grade students, as well as dual credit Anatomy to 11th and 12th grade students. I just finished my 18th year of teaching and my 3rd year of being involved with the Wipro Science Educator Fellowship. I was involved with the Missouri Cohort 3 for two years and am now finishing up year 1 of the 4th cohort.

Erin Snelling's Hallsville class works on their simulation project.

This year, our focus is on incorporating math in the science classroom and science in the math classroom. The recent focus for my H-CCLS group was incorporating computational thinking into my classes. I chose to use a genetics simulation called Pigeonetics (Pigeon Breeding: Genetics At Work (utah.edu). Students had to simulate mating pigeons to create offspring with specific traits. The simulation was very challenging; the students were engaged and had fun. Students were given a worksheet the following day that included completing crosses with pigeons and their traits on paper. They then completed a survey asking for feedback about the simulation versus the worksheet. Most of the students felt that they learned more by completing the simulation as they felt challenged, engaged, and were able to make a connection to the real world. I learned that it is important to pick a meaningful form of computational thinking to use with my students so they can learn and have fun at the same time.

Melissa Hundley, Boonville R-1 School District

My name is Melissa Hundley, and I have been a high school Mathematics teacher for 24 years. I currently teach Algebra 1, Geometry, Technical Mathematics, Contemporary Mathematics, and Algebra 2 at Boonville High School, a rural community in Central Missouri. I have worked closely with Brea James, a science teacher at Boonville High School, as we share many students in Algebra 1/Physical Science or Algebra 2/Chemistry. We realized there were topics we were teaching that overlapped between our classes, so we started developing lessons together. Brea was the person that got me involved with the Wipro project.

My involvement in this project has helped me develop lessons that include more cooperative learning techniques, requiring students to use visual models to represent situations and develop their problem-solving skills. As one example, this past year I used a technique called World Cafe, borrowed from another Wipro participant. Students worked in groups to solve linear programming problems, then rotating around the classroom sharing their equations, graphs and solutions with other students. While working on their problem, they had to use the "more is less" strategy, another borrowed practice from a Wipro participant. "LESS" was an acronym developed by a Physics teacher that stands for List (define variables), Equations (write equations or inequalities), Substitute and Solve. I added the "more" component, which required them to model their situation with a visual representation, which in this case was graphing and shading the inequalities from the problem. Being involved in the Wipro program has allowed me to make connections with other mathematics and science teachers while gaining ideas on teaching strategies to use in my classroom.

Melissa Hundley assists a student with her project at Boonville High School

Since the last reporting, the NJ site moved towards its goal of district transformation by hosting a culminating event for Year 1 (of Phase III) for its Fellows and guests. The event took place from 4:30—6:30pm on Tuesday, May 2nd. The site leaders were pleased with the record turnout. In all, 13 Alumni Fellows, 14 New Fellows, 9 administrators, and 1 Fellow guest attended the event.

After an ice breaker activity meant to focus the attendees on district initiatives and the ways in which administrators and Fellows can work together, each Alumni Fellow, with their New Fellow recruits, presented their Year 1 work. The presentations were given simultaneously in three rooms, with four presentations per room, and 15 minutes per presentation including questions and answers. The presentations ranged from powerpoint to hands-on demonstrations to a skit put on by the Fellows. Photos of the event are attached at the end of the report.

During the summer, the leadership team will meet to determine additional supports for the Fellows including having them recruit more new Fellows, restructuring the academic year meetings, and supporting their communication with district administrators.

Summary of Current Project(s) and Goals

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

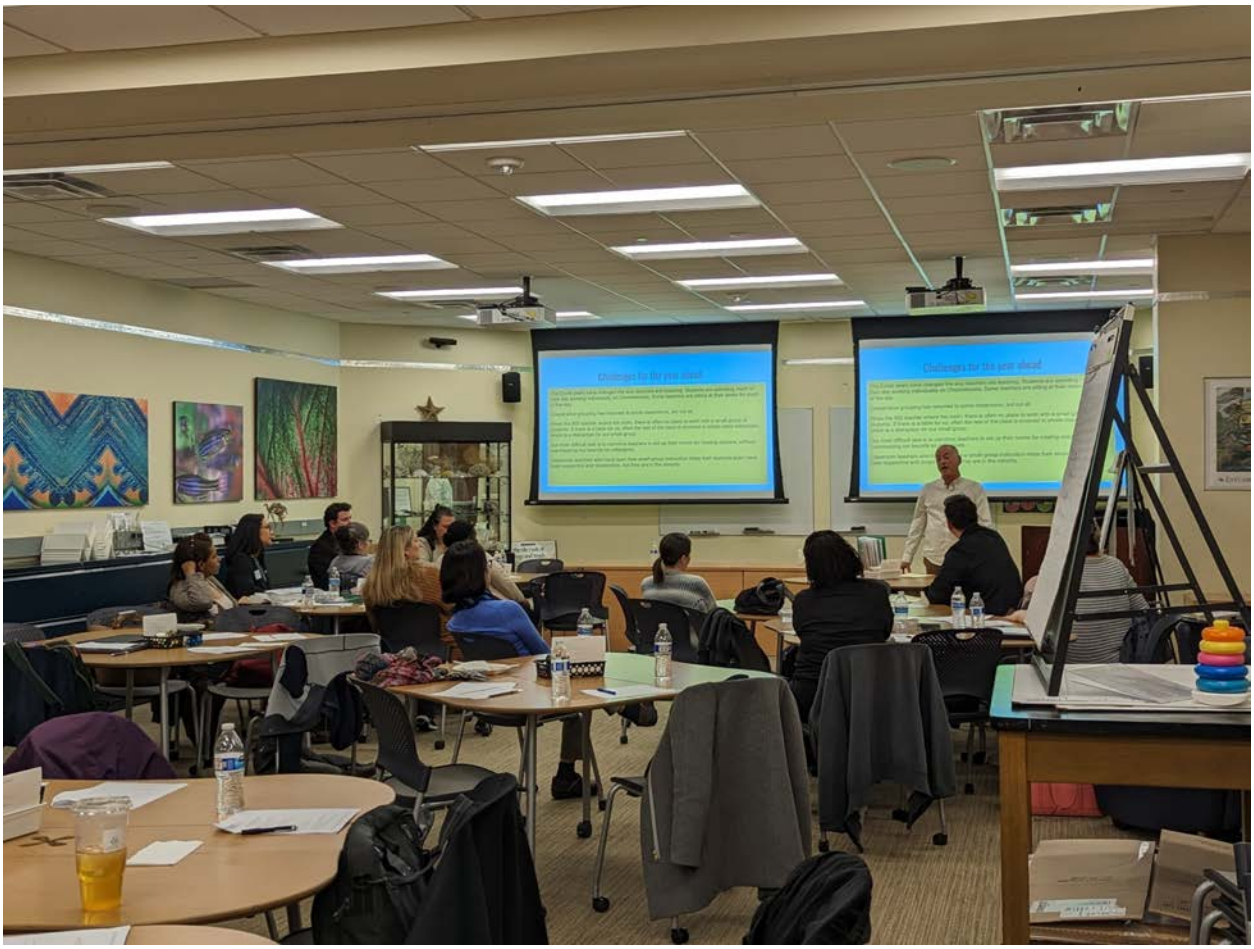
Aside from the culminating event on May 2 described above, the NJ Wipro SEF site engaged in research and outreach activities. On April 26th, Ursula Derios, Shanna Anderson, John O'Meara and Tim Aberle—all PhD research students involved in Wipro—presented research on the development and use of a social network theory-based tool for having Fellows consider their leadership projects from a different perspective.

On April 27th, Wipro SEF Fellows Kristen Trabona and Alison Mahfouz led a cross-site webinar on tapping into research on teacher leadership as a resource, using Kristen Trabona's dissertation work and the leadership team's past research article as frameworks.

The leadership team and doctoral research students are planning proposals for AERA and NARST for next year. These will be submitted by the end of July and mid- August, respectively.

Pictures from the culminating event on May 2:

Susan Bermeo, of Montclair School District, presenting her project at the May 2 event.



David Kleiner, of Clifton School District, presenting his project at the May 2 event.

The Hawthorne Fellows putting on a skit as part of their presentation at the May 2 event.

Fellows and guests generating ideas for continuing work on district initiatives.

Plan for the Next Two Quarters

We have yet to determine the meeting schedule for AY 2023-2024. The leadership team will meet in the next month and communicate tentative scheduling with district coordinators.

Featured Fellows

Michele King

School #13 – Clifton

22 years teaching
Taught 1st grade – 14 years
Taught 2nd grade – 7 years
Math Interventionist – 1 year

As a classroom teacher I had been incorporating small group math instruction and stations for the past 10 years. This year I have taken on a different role as a BSI Math interventionist for grades K-2.

It has been told to the elementary staff by our math supervisor that math stations must be incorporated daily in all K-5 classrooms. I have prepared math topic stations for the students that I service in K-2. These stations work really well in the classrooms where teachers are implementing stations. In some cases, I have helped those teachers set up rotation schedules and the stations as well. The students have really benefitted from working in these small groups and it is nice to be a part of their success and to see their excitement when they understand a difficult concept.

I hope to get more teachers to incorporate stations into their daily routine by the end of the year.

Hawthorne Team

Kristen Trabona

21 years in Education (Teacher, Supervisor, Principal, Director)
Biology, Chemistry and Science Electives

When I circled back to the WIPRO program this year I found myself back at the heart of what I love; teaching and learning. I have been working with new fellows on critiquing their work around phenomena-based instruction. This has forced me to be reflective in my own practice and step back into the role of today's teacher. A different lens was needed after 12 years in administration. I felt the need to immerse in today's classroom. Through informal visits and observations, I reacquainted myself with today's students. It took time I(months) for me to fell on the same page and ready to help lead the teachers I was working with. The trust has been mutually re-established so there is not a barrier or divide of administrator and teacher. The work now is progressing beautifully.

James Hurley

Hawthorne High School, Hawthorne NJ
8 years teaching
Chemistry, Physics, & Anatomy & Physiology

This year I have been trying to focus more on adding phenomenon to drive my lessons forward. I can think of a very simple lesson that I did that perfectly covered and achieved this goal. I was trying to convey that temperature is actually a measure of movement instead of heat. I had students place food coloring in a hot water bath, room temperature water bath, and in an ice-cold water bath. Through this work, the students were able to discover the answer all by themselves.

Julia Abahazy
Hawthorne High School, Hawthorne, NJ
2 years Physics

To become a better leader as a teacher I am collaborating with other teachers within my department as well as teachers at the middle school. I am experimenting with phenomena-based instruction that encourages student to lead their own learning. We are planning on presenting new strategies/techniques and reflections of this process at department meetings to cultivate “buy in” from other teachers. By collaborating with other teachers, I am influencing and being influenced at the same time – changing the culture within the district I work. I am learning how other teachers in my community have the same goals as me and new strategies to achieve these goals.

NEW YORK -MERCY COLLEGE

This quarter, Fellows completed their Wipro Reimagined projects. Through these projects, 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. These projects demonstrated how Wipro Fellows met their district initiatives while engaging STEM teaching/learning at higher rates in their elementary schools. These projects were successfully carried out in each district, with the support of administrators, often providing additional funding. Districts shared the Fellows' work through newsletters, the website, and social media.

Summary of Current Project(s) and Goals

The Mercy College 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 College 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, MCCSE 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, MCCSE 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 MCCSE 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.

Progress and Highlights

During this quarter, all groups completed their work for their Wipro Reimagined projects. The goal for this year was to engage Fellows in planning for sustaining their work beyond the scope of the program. This goal required two approaches: 1) finding, asking for, and securing funding beyond Wipro and; 2) developing and strengthening relationships with administrators. This took great effort on both the part of the Fellows and IHE. In the January group meeting, there were few administrators in attendance from White Plains or Port Chester. IHE sent follow up emails that were unanswered. In March, Arthur Eisenkraft, Anne Gurnee, Eric Weiss, and Kristen Napolitano conducted site visits to each district, visiting administrators along the way. After the visits, Kristen Napolitano sent all district administrators, including superintendents, district-specific portfolios that outlined the successes of each Wipro Fellow in their district from 2014-2022. Throughout March, April, and May, Kristen Napolitano visited Wipro schools to attend numerous events and to continue to meet and chat with administrators. Wipro Fellows also continued to develop relationships with their administrators by inviting them to their events, sending them project updates, and asking them for their guidance regarding funding. This continuous nurturing of the teacher-administration-IHE relationship helped almost every group receive new funding, gain more time for their projects, and helped spread the word of their incredible work. At the end-of-year May group meeting, five administrators, representing all three districts, showed up to support their Fellows. This was seen as a huge success by all involved.

Plan for Next Two Quarters

Date	People	Activity
March 2023 – June 2023	Marcia Manzueta, Lovely Grant, Diana Santiago, Kelly Budde	Benefit Gala – raised awareness for their "kindness garden" – brought in $6,000 in donations. Teachers across grades designed school wide activities to ensure kids are involved at every stage of the garden–from planning, seed selection, planting and caring of plants. Met with district administrators to discuss garden logistics. We hosted a planting party over two days for all students including STE(a)M exploration and learning stations. Getting coverage for teachers was a challenge.

March 2023 – June 2023	Carrie Poulos, Colleen Cahill, Georgina Diaz	Completed three STEM investigations with their students. Finishing up two final investigations at the end of May and beginning of June.
March 2023 – June 2023	Aimee Artis, Ashley Ramirez, Alicia Ricks, Vittoria Condello Vessecchia, Marsha Belton, Gillian Roshinko, Michelle Memoli	PD offered to staff/faculty on computer science. Robotics Assembly for grades K-5. CASEL SEL exposure to grades K-5 during morning mindfulness on Zoom. Computer Science Open House for grades 3-5 Tinkering nights for grades K-2 & 3-5. Read-a-thon in Jefferson: Theme - Computer Science & SEL
March 2023 – June 2023	Ann Marie Manganiello, Johanna Vasquez, Jill Ritacco, Melody Castiglia, Maria Torres, and Ali Abramo	Completed three STEM units – civil engineering and environmental engineering centered. Family STEAM night in April (this was highlighted in their district newsletter).
March 2023 – June 2023	Marisa Barzelatto, Pamela Del Balzo, Susannah Genty-Waksberg, Carmen King, Grizel Marquez, Elcilia Taveras	Presented Wipro project at the Ten County Math Educators Association Conference on March 25, 2023. Published work in the Diarrablu Journal. Working towards the release of their STEM teacher resource hub.
March 2023 – June 2023	Anny Vanegas and Maia Starcevic	FLORES family science workshop series throughout April and May for K-3 families
May 23, 2023	All Fellows, administration, and IHE	Final whole group meeting to discuss sustainability and presenting work in the fall.

September 30, 2023	STEM Educator Conference	Wipro Brainstorming session Wipro Reimagined Cohort 1 presentations

Featured Fellows

Each Wipro Reimagined group did incredible work this year. It is difficult to highlight just two. Attached to this IHE report, are each groups' quarterly reports that they send to MCCSE. Below are two vignettes providing further detail on the White Plains group and the New Rochelle, Columbus Elementary School group.

White Plains

The White Plains group worked towards creating a STEM Hub for all the teachers in their district to use to implement integrated STEM lessons that align with culturally responsive pedagogy. Their Hub is still in the works, but the lessons that they have created have been accessible, relevant, and fun for all students. For instance, in Susannah Genty-Waksberg's 2nd grade math class, students created their own textile patterns using geometrical shapes that they coded to repeat to make a pattern. This lesson was so successful that it was featured on a Senegalese fashion blog that highlighted students' work (https://diarrablu.com/blogs/journal/how-we-are-transforming-math-education). Another teacher in the group was so inspired by the lesson she was designing for the STEM Hub that she used it to drive the structure and implementation of the Math Nights she ran for her district. These teachers have been given time to continue this work and will continue to build up the STEM Hub to be released late summer/early fall.

A collage of photos and screenshots from the White Plains group. Pictured are photos from the STEM Hub and photos from the implementation phase of the STEM Hub lessons.

Columbus Elementary School

The Columbus Elementary group took on a big challenge for their Wipro Reimagined project by expanding an existing program to reach more families in their district. Anny Vanegas and Maia Starcevic (a foundation Fellow), along with the help of Elizabeth Barrett Zahn (a foundation Fellow who has since retired) extended FLORES, a K-1 family STEM workshop, to reach 2nd and 3rd grade children and their families. This was no small undertaking as Anny and Maia needed to create a whole new curriculum for the workshops to align with 2nd and 3rd grade standards and interests. The grades 2-3 FLORES included three new units, one on vermiculture (in response to parent feedback from previous iterations of FLORES in which parents asked for more unit related to gardening, a major part of their everyday lives), one on engineering a Maglev train using magnets (similar to this one: https://www.sciencebuddies.org/science-fair-projects/project-ideas/Phys_p093/physics/maglev-train-weight), and one on robotics. Anny and Maia were able to partner with New Rochelle High School's robotics team to bring volunteers to Columbus and to work with families as they explored various robots including Ozobots, Beebots, and Vex robots. This partnership allowed caregivers and children to explore

robots while gaining insight into possible STEM opportunities at the middle and high school levels. Below are photos from FLORES.

A child and their caregiver working on Hour of Code during FLORES.

Robotics team high schoolers and advisor help students navigate a competition robot during the last session of FLORES. Parents watched and were encouraged to participate.

Anny Vanegas translated for families. FLORES is a bilingual, Spanish/English program.

We are completing Phase 3, Year 1 at UNT Dallas. We have a mixture of proposals, school proposals, individual as well as collaborative proposals. I feel that each of them in their own way is directed at District Transformation through Teacher Leadership. The whole notion of District Transformation is nebulous and highly interpretive and somewhat directed by the Leadership structure at the ISDs. However, each of my fellows in some way or the other feels they can bring about district transformation by being a teacher leader who can bring about change. We will continue towards this goal in Year 2 as well.

Summary of Current Project(s) and Goals

The Wipro @ UNT Dallas Phase 3 Proposals are of three types: a) School Projects, b) Collaborative Projects and c) Individual Projects.

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	GFAA ST*Arts* Club! students	3-5	3	1DSC

	ISD				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		1 alum

			biology		

Progress and Highlights

All 14 projects are completed / nearing completion.

- A requirement of the grant @ UNT Dallas is that all funded participants are required to submit a proposal to present at the annual Conference for the Advancement of Science Teachers (CAST 2023) to be held in Houston TX Nov 9-11, 2023. While the 14 proposals will have to go through the review process and I cannot guarantee any of them will be selected for presentation at the conference, I am pleased that we will submit our work for presentation. The date for submission is June 15th, 2023.
- Each project has a google site that has been created for it, All CAST proposals and proof of submission will be submitted on the website. In addition, participants are required to upload other information about themselves and their projects on the site. All project websites will be due June 30th. I will share all the completed sites in our sept 2023 quarterly report.

Problems I faced:
On April 9th, 2023, I fell, broke 3 bones in my leg, had surgery, and spent 2 weeks in rehabilitation hospital before I came home. I was on Continuous FMLA till June 1st which meant I was not able to do any official work. I had planned the annual Wipro dinner and Poster session on May 22nd, and I had to cancel this event because of my injury. Frustrating, I feel I have lost 2 months. I am working frantically to make up for lost time! I feel like I have let my Fellows, my DSCs and Dr Eisenkraft down.

Anticipated Problems: There is a LOT of movement among the Wipro Fellows. I know that 6 of the current Phase 3, Year 2 participants are moving to other schools and districts and yet others are looking for positions in non-Wipro districts. I am not sure how many I can support for Year 2 projects.

Things I would like to change for Phase 3 Year 2:

- I am not sure Google slides are as presentable as Wix was. I will take a decision about which of them to use after I see the final product in June.
- Results and Data analysis of the projects: Many of the fellows are not Masters students and have not taken a research course, I feel many of them need some more guidance with the depth of analysis of their data and presentation of their results. There is a depth that is missing that needs to be addressed. Perhaps a workshop on the topic will do the trick.
- District Transformation: there needs to be more open conversation among the fellows and admins about what exactly District Transformation means at various levels. The conversation during session 5 of the Leadership Conference was

fascinating and a much needed first step. For the rescheduled Sept event, I would like to forgo the poster session for a more open, detailed discussion about district transformation, teacher leadership and the pillars and principles Wipro is based on.

Plan for Next Two Quarters

Date	People	Activity
Auh 31st	Dr E, 5 DSCs, Dr. RN, maybe President, Provost, Dean @ UNT Dallas	Dinner event hosted by Wipro Dallas
Sept 2023 At UNT Dallas	Dr. E, DSCs, admins, Principals, P3Y1 participants, P3Y2 participants	Induction of new fellows, P3Y1 participants receive plaques Dinner and discussion, District Transformation
Oct 2023 UNT Dallas	DSCS, P3Y2 participants	First in person meeting of Phase 3-year 2
Nov 9-11,2023 Houston		Conference for the Advancement of Science Teaching
Dec 2023 UNT Dallas	DSCS, P3Y2 participants	Second in person meeting of Phase 3-year 2
Jan 2024 UNT Dallas	DSCS, P3Y2 participants	Third in person meeting of Phase 3-year 2
Mar 2024 UNT Dallas	DSCS, P3Y2 participants	Fourth in person meeting of Phase 3-year 2
May 2024	CAST 2024 proposals due	
June 2024 UNT Dallas		Annual Wipro dinner
June 2024	P3Y2 project websites due	

Featured Fellows

Markus Burkhalter

My name is Markus Burkhalter, I was a C3 Wipro EF Fellow, I was also involved in a Wipro Phase 2 project. For Wipro Phase 3, Year 1 I am apart of two groups. My first group is working on collaborating to provide equitable outcomes for all students that will allow them to develop a deeper understanding of science through hand-on activities. Through this grant our students are afforded the opportunity to experience science in a way they've never experienced. My second group consists of myself and 3 other colleagues. Our grant focuses on teacher PLC's that are intended to create the conditions (improve their own content knowledge and pedagogical content knowledge) that help educators become more skillful in facilitating student learning of science to a greater degree.

Through my years in the WIPRO fellowship, I've grown up. I've been able to fine tune my teaching skills while also fine tuning my ability to talk in front of large groups. I've also become a leader for our science department at my school. This experience has also motivated me to pursue my Master's in educational leadership. That journey started 2 years ago and has ended with me successfully finishing my degree while also walking into a new leadership role starting next school year. WIPRO has not only been great from a career aspect I've also met so many great people.

APPENDIX A: MARCH SUMMARY FROM ANNE GURNEY CONSULTING, LLC

ANNE GURNEE
CONSULTING, LLC

Wipro Science Education Fellowship
Evaluation Update
March 2023

Activities this Month

- Conducted site visit to New York with Arthur and Eric on March 6 & 7, 2023. Visited four schools on March 6 and one on March 7. Also met with Mercy College Wipro SEF team.
- Wrote and submitted site visit report on March 27.
- Continued work with Brooke Whitworth on the Clemson University research work. Worked with research assistant, Brian Garrison, to populate a Google Drive folder with all past Wipro SEF data for her team.
- Finalized & submitted the mid-year report summarizing the data from the mid-year survey on March 30.
- Continued work on the spring evaluation instruments.
- Participated in team leadership meeting on March 21, 2023.

What's Next?

During the month of April, AGC will be working on the following:

- Preparing evaluation instruments for DSC Leadership meeting(s) in April/May 2023.
- Continuing to work with Brooke/team for research project.
- Finalizing all spring evaluation instruments (year-end surveys, interviews).
- Administering the year-end survey at the end of April.
- Beginning year-end interviews and/or focus groups with (selected Fellows, DSCs, district administrators).
- Participating in any scheduled/needed meetings for the project and/or research.

APPENDIX B: APRIL SUMMARY FROM ANNE GURNEY CONSULTING, LLC

ANNE GURNEE
CONSULTING, LLC

Wipro Science Education Fellowship
Evaluation Update
April 2023

Activities this Month

- Created DSC Leadership Conference surveys for each of five sessions.
- Touched base with all IHE leads to finalize/update their cohort contact lists in advance of the year-end survey administration.
- Completed and began administration of Fellows year-end survey (April 25-May 9, 2023).
- Completed the upload of all previous survey data and surveys to shared Google Drive folder for the Clemson University team.
- Made plans with Tammy Moriarty to attend/observe at the June Leadership Institute at Stanford University (June 20-22). Will also produce a post-institute survey for this program.
- Participated in team leadership meeting on April 18, 2023.
- Attended DSC Leadership Conference – Building Relationships (Session 1) on April 24, 2023.
- Attended DSC Leadership Conference – What Resources Are Available (Session 2) on April 27, 2023.

What's Next?

During the month of May, AGC will be working on the following:

- Continuing to work with Brooke/Clemson team as needed for research project.
- Setting up focus groups in late May/early June with select DSCs (3 states).
- Setting up interviews with select administrators from participating districts (1-2/state) for early June.
- Setting up interviews with IHE leads in mid-June.
- Attending Leadership Institute at Stanford, June 20-22.
- Beginning analysis of year-end data for year-end report.
- Participating in any scheduled/needed meetings for the project and/or research.

**Will be traveling in Uruguay and Argentina, May 11-27, 2023. Email and texting will be limited.

APPENDIX C: MAY SUMMARY FROM ANNE GURNEY CONSULTING, LLC

ANNE GURNEE
CONSULTING, LLC

Wipro Science Education Fellowship
Evaluation Update
May 2023

Activities this Month

- Began working with Tammy on survey for Leadership Institute in June 2023. Made all travel arrangements to observe at the Leadership Institute.
- Attended DSC Leadership Conference – Latest Trends (Session 3) on May 1, 2023
- Completed all surveys for DSC Leadership Conference sessions and began analysis.
- Closed the year-end survey for Fellows and began analysis.
- Continued to work with Brooke and the Clemson team to provide needed data.
- Continued to work on final IRB for Wipro SEF work.

What's Next?

During the month of June, AGC will be working on the following:

- Continuing to work with Brooke/Clemson team as needed for research project.
- Setting up interviews in with DSCs (1/state).
- Setting up interviews with select administrators from participating districts (1-2/state) for early June.
- Setting up interviews with IHE leads in mid- to late-June.
- Attending Leadership Institute at Stanford, June 20-22.
- Continuing analysis of year-end data for year-end report.
- Participating in any scheduled/needed meetings for the project and/or research.

APPENDIX D: MID-YEAR EVALUATION SUMMARY FROM ANNE GURNEY CONSULTING, LLC

Mid-Year Fellows 2023
Survey Response Summary
3.30.23

Introduction

This report summarizes the responses from the recent mid-year survey sent by Anne Gurnee Consulting, LLC (AGC) to all active Fellows in the Wipro Science Education Fellowship. The 105 Fellows responding of 123 invited worked through the survey during the last two weeks of January 2023. Those invited to participate were all those identified as active Fellows in the program in 2022-2023.

While the overall or cumulative data is still informative, the program is now changing significantly from the previous iterations of Wipro SEF making the interpretation of the overall data more nuanced. During this Innovation phase, each site is modifying the original program design in order to meet the needs of the universities and their partner districts. Because of this, the sites are no longer as comparable as they were during the original phases of work when all were following a very similar program format. Therefore, it may now be more useful to look at each state individually to consider how the program is continuing to impact those participants. The comments can also provide guidance on how the site-specific and programmatic elements can be strengthened. The different sites can also learn from each other through the Fellows' comments and insights.

Another important consideration is the length of time that Fellows responding have been involved in the program. Some responding are new to the program this year and others have been involved for five or more years. Each site should take this into consideration as they look at their state's data presented here. These survey responses are also functioning as a new baseline for new Fellows in the program and also as continued analysis of the Fellows who have been involved since prior to the Innovation phase of the program.

There are two distinct through-lines that the evaluation will be investigating going forward: 1) the continued impact of the program on the development of teacher leadership; and 2) evidence of district transformation as a result of the program's long-lasting relationships with the partner districts. Since the data included here is very early in the program's new iterations, concluding thoughts and recommendations will be included at the end of the academic year in the final evaluation report.

Notable Findings

While very preliminary, there are a few early findings that are noteworthy from this mid-year survey.

- Most Fellows responding to the mid-year survey this year (79%) are new teachers to the Wipro SEF program.
- The majority of those responding (83%) work at least in part with elementary (K-5) students. Less than half (44%) work at the middle or high school levels.
- Nearly half of those responding (45%) hope to benefit by improving science teaching, and more than a third (38%) hope to experience a collaborative network of professionals.
- Nearly a third of Fellows responding see themselves as leaders at the district level (32%) and school level (31%).
- Leadership behaviors that all responding Fellows engage in most frequently include:
    - Taking action to increase the success of all students at their school
    - Providing guidance to other teachers who ask for/need support
    - Engaging in discussions with other teachers in their school/district about how to teach a particular concept.
- Leadership behaviors that responding Fellows engage in least frequently include:
    - Assuming leadership roles in their district.
    - Leading professional development for other teachers in their school or district.
- The leadership interests that responding Fellows expressed the most interest in learning more about include:
    - Finding new leadership roles
    - Writing professional articles
    - Advocating for teacher leadership in their school/district
    - Presenting at conferences
    - Using/interpreting research
- Most responding Fellows agree that positive school change is possible and an important goal for every teacher. They are just slightly less optimistic about positive change in their districts.
- Many responding Fellows mentioned that they were hoping for improved science instruction in their schools (26%) and districts (19%). Many also mentioned hoping for improved district culture (23%) and school culture (16%).

APPENDIX E: DISTRICT SUMMARY REPORT FROM NEW ROCHELLE (NY) SCHOOL DISTRICT


SUMMARY
The Greater New York Wipro Science Education Fellowship (GNY Wipro SEF) started as a two year program for experienced teachers that used a model of teacher support and development to improve instruction and increase teacher leadership in public schools in the greater New York metropolitan area. Since 2014, City School District of New Rochelle has partnered with the Mercy College Center for STEM Education as a Wipro SEF site. Over the years, twelve teachers from six schools within New Rochelle have participated in collaborative professional learning communities, enacted projects to address district goals, and conducted professional development for their colleagues. Now, they are stepping up again to join Wipro Reimagined. Their stories and successes are captured in this report.
wipro
Science Education Fellowship
MERCY COLLEGE
CENTER FOR STEM EDUCATION
WIPRO SEF REVIEW | 2

NEW ROCHELLE'S WIPRO SCIENCE EDUCATION FELLOWS

COHORT I

Elizabeth Barrett- Zahn *(retired)*

Claudia Gianserra

COHORT II

Maia Starcevic

Daniel Pepe

Patricia McCue

George Gierer

Aimee Artis

COHORT III

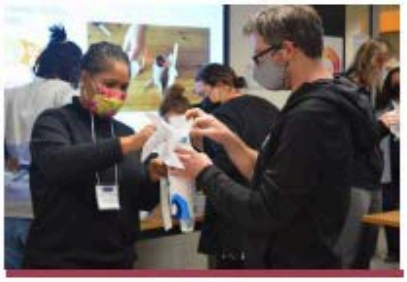
Hillary Zinman

Ron Schoenherr

Scott Misner

Ann Marie Manganiello

Diane Delgado *(retired)*



Aimee Artis,
Westchester Smart Start, 2021

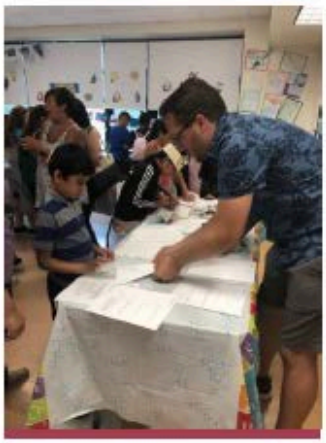
HIGHLIGHTS: OVER THE YEARS

GROWTH PROFESSIONAL SYSTEM (GPS) PROJECTS

- **Elizabeth Barrett Zahn,** *Development of Critical and Creative Thinking Through K-5 Elementary Inquiry Science Using the Next Generation Science Standards*
- **Claudia Gianserra,** *More Math Integration in the Units of: Analysis, Inquiry and Design of Scientific Investigations, Chemistry, STEM, and Motion and Forces*
- **Maia Starcevic,** *Family Science Workshop*
- **Daniel Pepe,** *Using Computers for Formative Assessment and Student Self-Assessment*
- **George Gierer,** *Podcasting & Science Education*
- **Aimee Artis,** *Making Science Meaningful for All*
- **Hillary Zinman,** *Using Photovoice in the High School Science Classroom*
- **Ron Schoenherr,** *Comparing the Traditional to Flipped High School Classroom*
- **Scott Misner,** *Increasing Science Knowledge Through Community Events*
- **Diane Delgado and Ann Marie Manganiello,** *Connecting to Science Literacy*

Ann Marie Manganiello,
Saturday STEM Academy, 2021

Patricia McCue and student work
from the Mars Rover Unit, 2020



Ron Schoenherr at STEAM Academy, 2019

PROFESSIONAL DEVELOPMENT AND NEW WORK

- Mini Grant Projects
  - **Diane Delgado – 2018, *Full STEAM Ahead*, $750**
    Students used anchor books and materials to engineer bat houses. Students practiced observation and inquiry skills.
  - **Elizabeth Barrett-Zahn – 2017, 2018, *STEM Night*, $1,500**
    Multiple mini grants were awarded to help Elizabeth lead a family STEM Night for their community school.
  - **Aimee Artis – 2017, 2018, *STEAM Kit Exploration and Field Trips in the Classroom*, $1,500**
    Multiple mini grants were awarded to Aimee. Her STEAM kit project provided other elementary school with the tools to implement STEM. The *Field Trips* project supported more science in her elementary classroom.
- Professional Development
  - **Scott Misner, Daniel Pepe, and Patricia McCue**, 2018, *Hour of Code Demystified*, instructors
  - **Aimee Artis and Elizabeth Barrett-Zahn**, 2018, *STEM Teacher Social,* participants
  - **Aimee Artis**, 2019, *STEM training for staff at Queens public library*, instructor
  - **Elizabeth Barrett-Zahn**, 2018, Editor of NSTA's *Science and Children*, a practitioner journal
  - **Claudia Gianserra**, 2018, *STEAM-a-thon,* participant
- Saturday STEM Academy at Mercy College, Instructor
  - **Aimee Artis**, 2019; 2021, *Elementary Engineering Challenge*, 1st and 2nd grade; *Exploring Play...Like a Scientist*, 3rd and 4th grade
  - **Patricia McCue**, 2018, 2019, 2020, *Programming with Basic Electronics*, 5th - 7th grade
  - **Ann Marie Manganiello**, 2021, *Our Amazing Lungs,* 1st and 2nd grade

Diane Delgado and Ann Marie Manganiello leading a New Rochelle brainstorming session, 2022

Claudia Gianserra with her students at Mercy College, 2018

- Enrichment activities
  - **Diane Delgado and Anne Marie Manganiello**, 2019, *STEAM Academy,* directors
  - **Scott Misner and Ron Schoenherr**, 2019, *STEAM Academy,* instructors
  - **Patricia McCue and Scott Misner**, 2020, *Mars Rover Unit,* instructors
  - **Maia Starcevic**, 2022, *Family Learning and Outreach for Research and Education in STEM (FLORES)*, instructor
- Wipro Reimagined
  - **Aimee Artis, Maia Starcevic, Elizabeth Barret Zahn, and Ann Marie Manganiello**, Cohort 1
- Leadership – District Science Coordinator
  - **Elizabeth Barrett-Zahn**, 2016
  - **Aimee Artis**, 2020

Fellows in "Hour of Code Demystified" workshop, 2018

PROFESSIONAL PRESENTATIONS

- Westchester STEM Ambassadors
  - **Scott Misner and Aimee Artis**, 2021, Cohort I
- Mercy College's Center for STEM Education, Annual K-12 STEM Teacher Conference
  - **Scott Misner**, 2018; 2022, *Using Rocketry to Teach Newton's Law of Motion, Marine Biology Program* (posters)
  - **Elizabeth Barrett-Zahn**, 2018, 2021, *Prepare a Manuscript for Submission to NSTA Journals* (workshop)
  - **Ann Marie Manganiello and Diane Delgado**, *STEAM Summer Academy* (poster)
  - **Aimee Artis**, 2020, *Using Technology to Teach Science* (workshop)
  - **Maia Starcevic**, 2022, *Why FLORES is engaging for Bilingual Elementary Families?* (presentation)
- National Science Teacher Association (NSTA)
  - **Elizabeth Barrett-Zahn**, 2015
  - **Aimee Artis and Patricia McCue** 2016, STEM Expo, Denver, CO

Maia Starcevic with students at FLORES, 2022

Aimee Artis leading the Wipro Reimagined group at Jefferson Elementary

WHAT'S NEXT

In our continuous pursuit of empowering teacher leadership, The Mercy College Center for STEM Education is proud of our new phase in Wipro called "Wipro Reimagined" which started in 2022. This funding opportunity, inspired by the work done by your teachers in the foundational SEF is designed to support your teachers in implementing projects for district change. To ensure the continued success of this program, we need YOUR support!

Wipro Reimagined is comprised of four, yearlong cohorts with recruitment for Cohort 2 happening now. In Fall 2022, 44 teachers along with their 11 administrators submitted their proposals for funding. Cohort 1 consisted of 31 teachers who made up six teams, three of which represented New Rochelle!

Together, each team planned projects for district change including developing STEM resource hubs for teachers, integrating engineering into elementary curriculum, and expanding a family science program for grades K-3. Awarded projects each received $750 for materials and supplies and teachers on the teams each received a $2,000 stipend. As a foundational partner of Wipro SEF, we want to invite New Rochelle teachers to apply for Cohort 2 funding.

Foundation Fellows, Patricia McCue, Daniel Pepe, Ann Marie Manganiello, and Aimee Artis welcome newly participating New Rochelle Wipro Reimagined teachers, 2023

MCCSE will kick off Cohort 2 with a brainstorming session at our annual MCCSE K-12 STEM Teacher Conference on October 14, 2023. During this workshop, invited foundation Fellows, administrators, and newly participating teachers will come together to find common goals and ideas for district change. Anticipated topics for district change may include: STEM/science support for ENL learners and/or students with disabilities, STEM integration, local socioscientific issues; computer science integration; or professional development, for example. In addition, Cohort 1 will present their findings and provide mentoring to potential Cohort 2 candidates.

In the 2022-23 AY, we awarded over $65,000 among three districts. We appreciate New Rochelle's commitment to addressing district needs and supporting their teachers as they address the challenges that their students face. The next round of Wipro Reimagined funding will be announced at our annual K-12 STEM Teacher Conference in October 2023 and we hope that New Rochelle will be there to join us!

Sincerely,
Amanda Gunning, Meghan Marrero, Kristen Napolitano, and Mary Ushay
The Mercy College Center for STEM Education Team

IMPACT

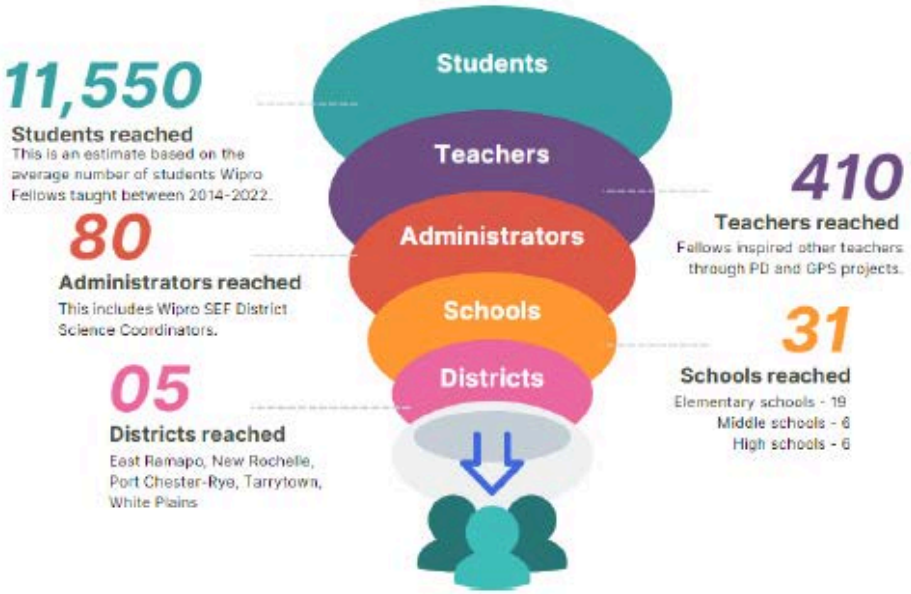


Figure 1. Estimated impact of the Wipro SEF program in New York between 2014-2022.

Wipro SEF Fellows worked tirelessly over the course of the last eight years to become leaders in STEM education. Fellows worked with their classes to make strides towards better STEM integration. Their work in their classrooms and conducting professional development has reached thousands of students and hundreds of teachers since 2014. Below are the topics covered during Fellows' leadership projects known as Growth Professional System (GPS) projects.

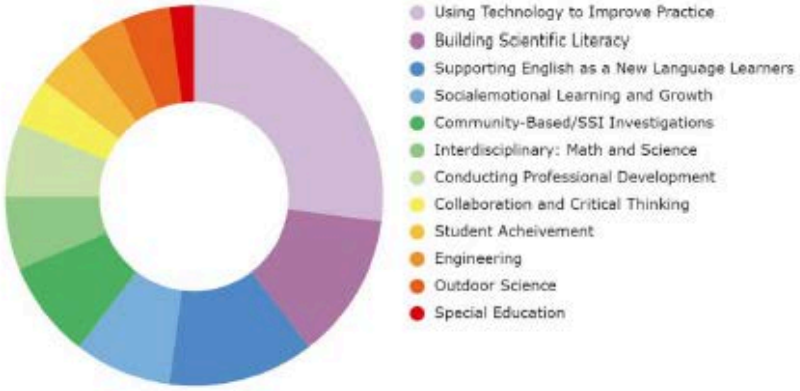


Figure 2. Wipro SEF Fellow GPS Project Themes

Since 2014, Fellows have shared areas of growth that they have experienced as part of Wipro. Analysis of these showed that teachers experienced by personal and professional growth as a result of their participation in Wipro. Personally, teachers felt reenergized about their teaching and learning. They described a sense of empowerment, pride, and accomplishment in the program. Professionally, teachers felt increased confidence in their STEM content knowledge, science and engineering practices, and meeting their students' diverse needs. Below illustrates these:

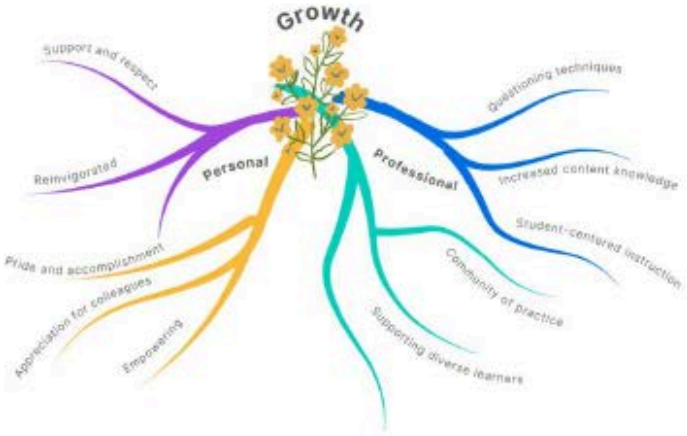


Figure 3. Areas of personal and professional growth described by Fellows.

Looking ahead to Wipro Reimagined we anticipate that teachers will a similar impact on students as a result of their participation in this program. Teacher teams have already demonstrated a passion for important topics including green spaces, outdoor learning, nutrition and food availability, and integrating the Next Generation Science Standards. We are eager to see how Cohort 2 shapes the trajectory of *Wipro Reimagined* in New Rochelle!

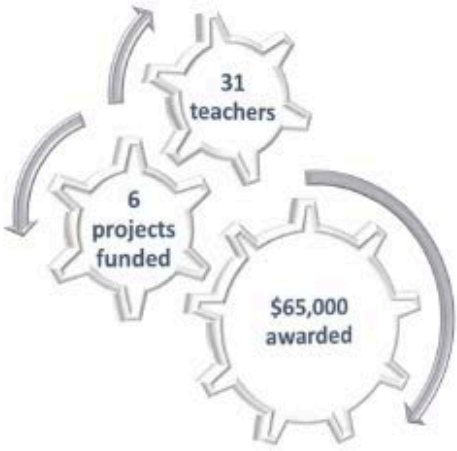


Figure 4. Wipro Reimagined funding in 2022-23 AY for Cohort 1 in New Rochelle, Port Chester, and White Plains.