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

WIPRO SEF

MARCH 2020
QUARTERLY REPORT

Arthur Eisenkraft
Director, Center of Science and Math in Context (COSMIC)
Arthur.Eisenkraft@umb.edu

100 Morrissey Blvd
Boston, MA 02125

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INTRODUCTION

Wipro SEF Program Overview

The Wipro Science Education Fellowship (SEF) is a two-year program 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 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.

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 and culminates with a report and presentation of a poster session at the end of year conference.

A District Corps of Teacher Leaders

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

HOW TO READ THIS REPORT

This report captures the work of the Wipro SEF program from December 15, 2018 through March 15, 2019. The chart below summarizes the activities of this quarter and the activities that will take place in this school year. If you are unfamiliar with the Wipro Science Education Fellowship, please begin by reading the Introduction and Program overview. 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 Wipro Fellows read the sections entitled "Featured Fellows." To learn about how the Vertical Collaboration Coaching and Learning in Science (V-CCLS) has impacted fellows look for the section titled, "Fellows Reflections on the V-CCLS teams."

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

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				Activities proposed by individual sites.

Key to yearly activities

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

Leadership Meeting of Site Leaders and District Science Coordinators

A leadership retreat was held on February 7-9, 2020 in Dallas, Texas. One of the topics that was emphasized at the meeting was the role that District Science Coordinators (DSC) play in the Wipro SEF program. Each site team included site leaders from Institutes of Higher Education (IHE) and DSC's.

Site	Role	Name
CA	DSC	Diane Aronson
CA	DSC	Eric Lewis
CA	IHE	Sharon Parker
DHA	Eval	Anne Gurnee
FL	IHE	Allan Feldman
FL	DSC	Larry Plank
FL	DSC	Fawnia Schultz
MA	IHE	Bob Chen
MA	IHE	Marilyn Decker
MA	DSC/IHE	Pam Pelletier
MA	IHE	Arthur Eisenkraft
MO	IHE	Meera Chandrasekhar
NJ	DSC	Susan Bartol
NJ	IHE	Mika Munakata
NY	IHE	Amanda Gunning
NY	DSC	Carmen King
TX	IHE	Kendra Brown
TX	DSC	Jeremy Hesse
TX	DSC	Faith Milika
TX	DSC	Danielle Moore
TX	IHE	Ratna Narayan

Each site team played a role in leading the meeting. Sites were given assignments and they prepared the presentation and supporting materials. All the materials that were shared at

the meeting and the artifacts from the meeting were posted on the IHE meeting Trello Board.

IHE Meeting Agenda		
Friday, February 7, 2020		
Afternoon	Arrive and Check in to SpringHill Suites by Marriott Dallas NW Highway at Stemmons/I-35E	
7:00-9:00	Welcome Dinner at Pappasito's Cantina, 10433 Lombardy Lane, Dallas, TX 75220	
Saturday, February 8, 2020		
7:00-8:00	Breakfast at Hotel	
8:00-8:30	Travel to UNT Dallas, 7300 University Hills Blvd, Dallas, TX 75241	
Time	Topic	Facilitator
8:30-9:00	**Welcome** • Introductions • Review agenda	Arthur Eisenkraft
9:00-10:00	**Session 1 (Part1)-Teacher Leadership** • What is Teacher Leadership? Developing a o Shared vision o Shared definition • How does Wipro SEF contribute to the development of Teacher Leadership? • How have DSC's used their fellows in the past? • How do DSCs plan to use their new cadre of teacher leaders? • What are the obstacles that block these new teacher leaders' success and forward momentum? From A Systemic Approach to Elevating Teacher Leadership by Learning Forward: *"Leadership roles for teachers have traditionally been narrowly defined or lacked flexibility, and many require teachers who choose leadership must decide to leave teaching for administration. Advancing their careers while remaining in the role of teacher is what many teacher leaders want, and their students and the profession deserve."*	Florida Allan Feldman Pam Pelletier Larry Plank Fawnia Schultz
10:00-10:10	Break	
10:10-11:00	**Session 2 (Part 1)-The Role of the District Science Coordinator** o What the evaluation report tells us o CA initiative o Network of DSCs across sites o What has worked well for the DSC role? o How have sites worked with DSC's this year? o What has been challenging?	California Sharon Parker Eric Lewis Diane Aronson

	o What have been some of the positive outcomes of relationships built between DSCs and IHEs? o Where do DSCs need more support/guidance/instruction to make this role work well for Wipro SEF? o What is the DSCs' level of interest in Wipro SEF providing PD for the DSCs? And if there is interest, what's needed/wanted by DSCs?	
11:00-11:30	**Session 3- Year 1 Meeting Agendas** • Highlights of this year • What is going well? • Have meetings improved? In what ways? Why? • Cross-site visits- what was learned?	Massachusetts Marilyn Decker
11:30-12:00	**Session 4 (Part 1)- Book** • Audience? • Proof of concept as a program (urban, suburban, rural) • How to get involved as a district • How to get involved as a university • Review of what we compiled in August meeting • Table of contents creation (Perhaps have each team develop a table of contents and then share to create final product) • Who is on board?	Anne Gurnee
12:00-1:00	Lunch followed by short walk outside and Piggy Splat	
1:00-2:00	**Session 4 (Part 2)-Book Conversation Continued**	Anne Gurnee
2:00-3:00	**Session 5 (Part 1)-Year 2 Fellows** • How do we prepare them for leading workshops? • What is the role of IHE, DSC? • How have we informed principals, superintendents and Board about their work?	Texas Ratna Narayan Kendra Brown
3:00-3:10	Break	
3:10-4:00	**Session 6 (Part 1)-May/June conferences** • 8 Fellows + 1 DSC + 1 IHE • Expectations • Additional Attendees o Prior cohorts o NY, NJ, MA o Interested parties from outside Wipro SEF program • Costs • Hotel, etc. • Registration (free for Wipro SEF sites) • More collaboration opportunities • Costs and funding • $5000 per site from UMB to defray some costs from 10 visitors • UMB pays for cross site travel and hotel	Missouri Meera Chandrasekhar
4:00 to 5:00	**Session 7- Sustainability beyond Wipro funding** • Ideas? • What aspects of the program are most important to continue?	New York Amanda Gunning

	• Ways to fund?	
5:00- 5:30	Travel from UNT to hotel to Pappadeaux	
6:30-8:30	Group Dinner at Pappadeaux, 10428 Lombardy Lane, Dallas, TX 75220	
Sunday, February 9, 2020		
7:00-8:00	Breakfast at Hotel	
	Meeting Room, Springhill Suites	
8:00-9:00	**Session 1 (Part 2)-Teacher Leadership Discussion continued**	Florida Allan Feldman Pam Pelletier Larry Plank Fawnia Schultz
9:00-9:45	**Session 2 (Part 2)-The Role of the District Science Coordinator continued**	California Sharon Parker Eric Lewis Diane Aronson
9:45-10:00	Break & Checkout	
10:00-11:00	**Session 6 (Part 2)- May/June conferences continued**	Missouri Meera Chandrasekhar
11:00-12:00	**Session 5 (Part 2)-Year 2 Fellows continued** • How do we prepare them for leading workshops? • What is the role of IHE, DSC? • How have we informed principals, superintendents and Board about their work? • How do we engage fellows beyond Year 2?	New Jersey Mika Munakata Susan Bartol
12:00-1:00	Wrap-up and Evaluation	Arthur Eisenkraft

Overall, the meeting was a lively 3 days of discussion and conversation. Our meeting hosts Ratna Narayan, Kendra Brown and the entire UNT team out did themselves with wonderful food, snacks, flowers and a small gift for each participant. Ratna invented a game of Piggy Splat to test our athletic skills and to provide some time for comradery.

"The richness of the conversations was incredible. Having sites present + facilitate provided depth of experiences and breadth of perspective"

To capture the conversations and outcomes of our discussions, notes and photos of each session were posted on the Trello Board.

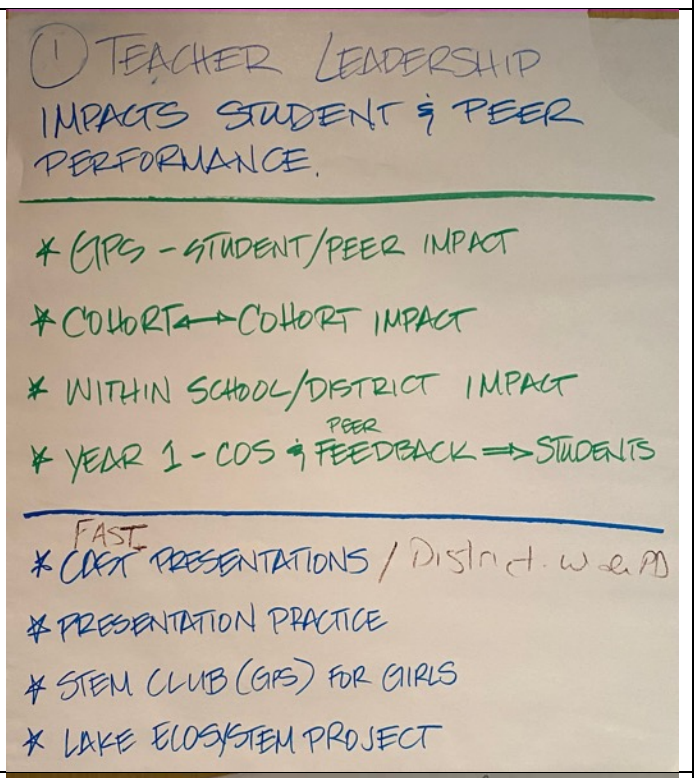
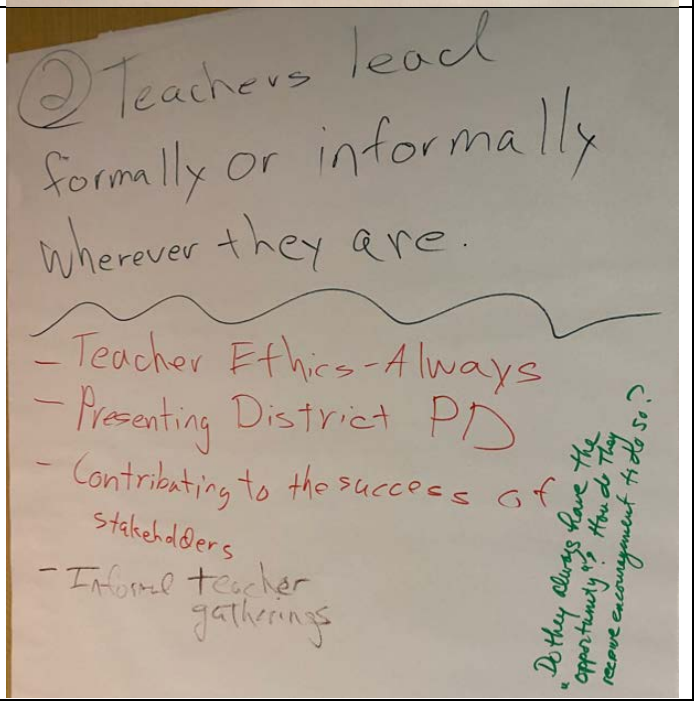
Lining up for a game of Piggy Splat

Here is a sample of one of these postings from the Teacher Leadership session.

Learning Forward: A Systemic Approach to Elevating Teacher Leadership

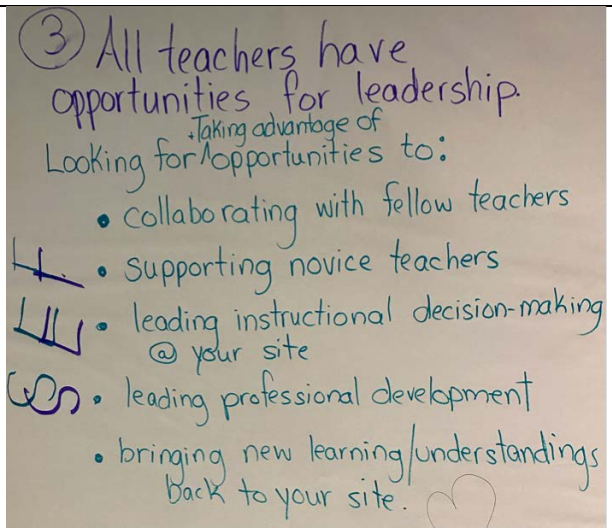
From the conversation on Teacher Leadership (Allan, Fawnia, Larry, and Pam)

Assumptions: [Link to Article]	**Poster**

Key ideas and Wipro SEF examples	
1) Teacher leadership impacts student and peer performance. • GPS - student/peer impact • Cohort <---> Cohort Impact • Within school/district impact • Year 1 - COS and Peer feedback --> students --- • FAST/CAST presentations/District-wide PD • Presentation practice • STEM Club for Girls • Lake Ecosystem Project	
2) Teachers lead, formally or informally, wherever they are. • Teacher Ethics – Always • Presenting District PD • Contributing to the success of stakeholders • Informal teacher gatherings Comments added: • Do they always have the opportunity? • How do they receive encouragement to do so?	

3) All teachers have opportunities for leadership.
Looking for/taking advantage of opportunities:

- Collaborating with fellow teachers
- Supporting novice teachers
- Leading instructional decision-making at your site
- Leading professional development
- Bringing new learning/understanding back to your site



This Assumption was questioned in the "Consensus" conversation to review/revise

A question was raised as to whether this is true in all districts/contexts…

4) Teacher leadership requires that teachers develop capacity for effective leadership.

Professional Skills

- Knowledge
- Application/Practice

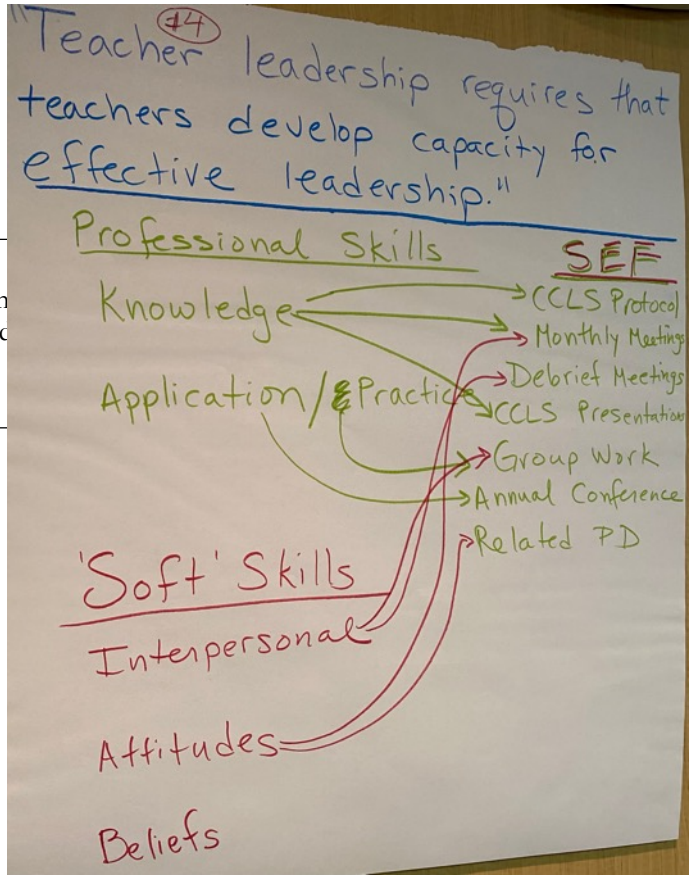
Soft Skills

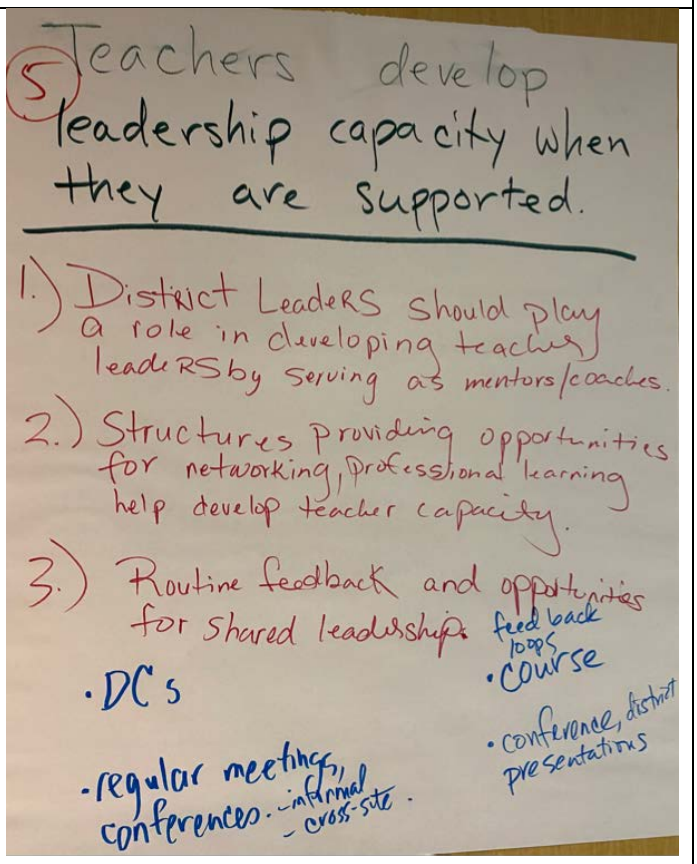
- Interpersonal
- Attitudes
- Beliefs

SEF

- CCLS Protocol
- Monthly Meetings
- Debrief Meetings
- CCLS Presentations
- Group Work
- Annual Conference
- Related PD

See image for connections th were illustrated



5) Teachers develop leadership capacity when they are supported. • District leaders should play a role in developing teacher leaders by serving as mentors/coaches. • Structures providing opportunities for networking, professional learning help develop teacher capacity. • Routine feedback and opportunities for shared leadership. Comments added: • DCs • Regular meetings, conferences o Informal o Cross-site • Feedback loops • Course • Conference, district presentations	

6) Teacher leadership requires changes in other leaders throughout the school system.

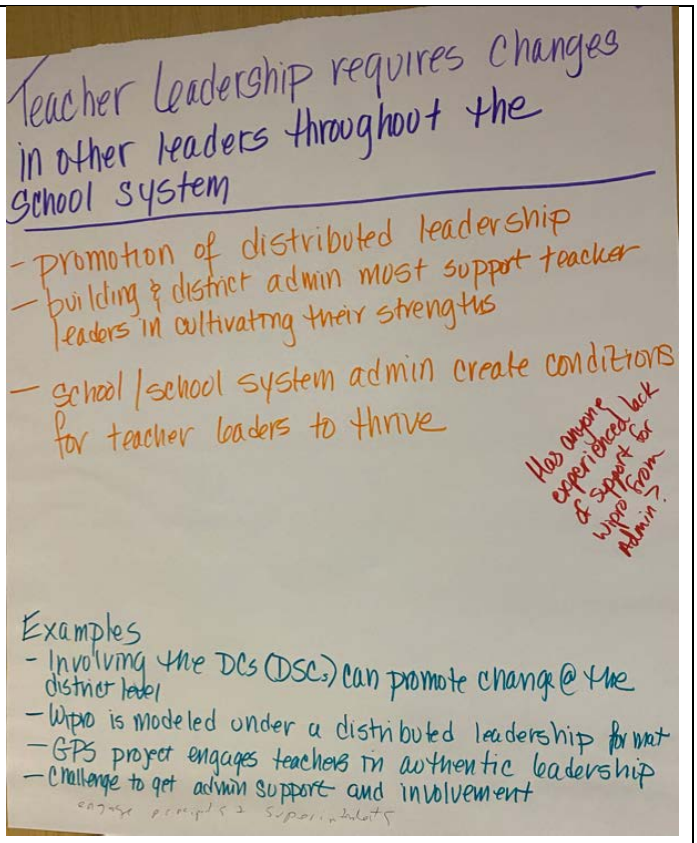
- Promotion of distributed leadership
- Building and district admin must support teacher leaders in cultivating their strengths
- School/school system admin create conditions for teacher leaders to thrive

Examples

- Involving the DSCs can promote change at the district level
- Wipro is modeled under a distributed leadership format
- GPS project engages teachers in authentic leadership
- Challenge to get admin support and involvement

Comments added:

- Has anyone experienced lack of support for Wipro from admin?
- Added example – engage principals and superintendents



This Assumption was also questioned

A question was raised as to whether this is true for this project (at all) as much has been accomplished without changes in others…

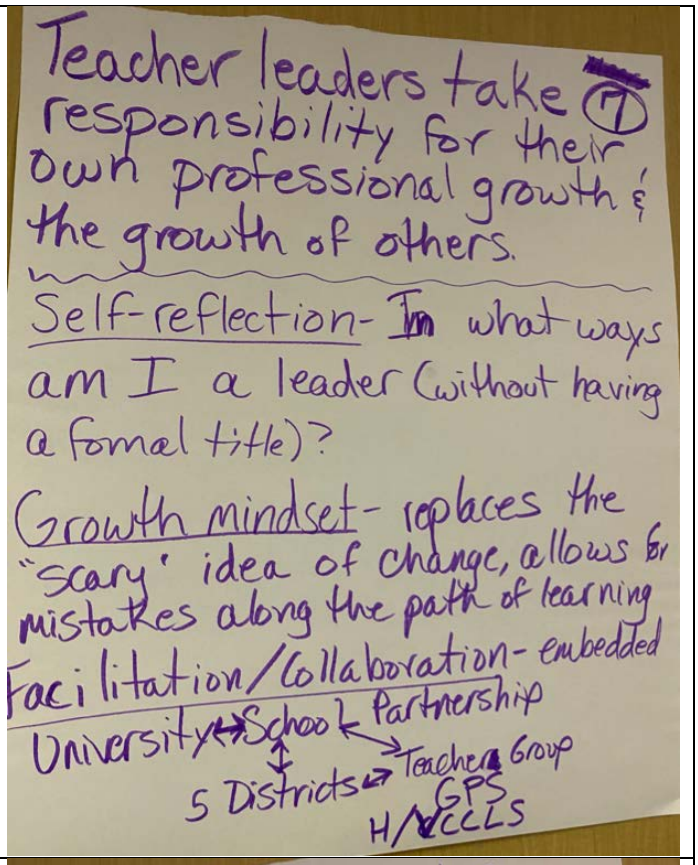
7) Teacher leaders take responsibility for their own profession- al growth and the growth of others.

- Self-Reflection: In what ways am I a leader (without having a formal title?)
- Growth Mindset: replaces the "scary" idea of change, allows for mistakes along the path of learning
- Facilitation/Collaboration: Embedded
-

University School partnership

5 Districts Teacher Groups

GPS
H-/V-CCLS



8) Teacher leadership requires courage, tolerance for ambiguity, and flexibility.

Requires:

- *Courage*
- *Tolerance for ambiguity*
- *Flexibility*

Courage

- To step out of comfort zone
- To be noticed

Wipro: Presentation

Others see you teaching

Tolerance for Ambiguity

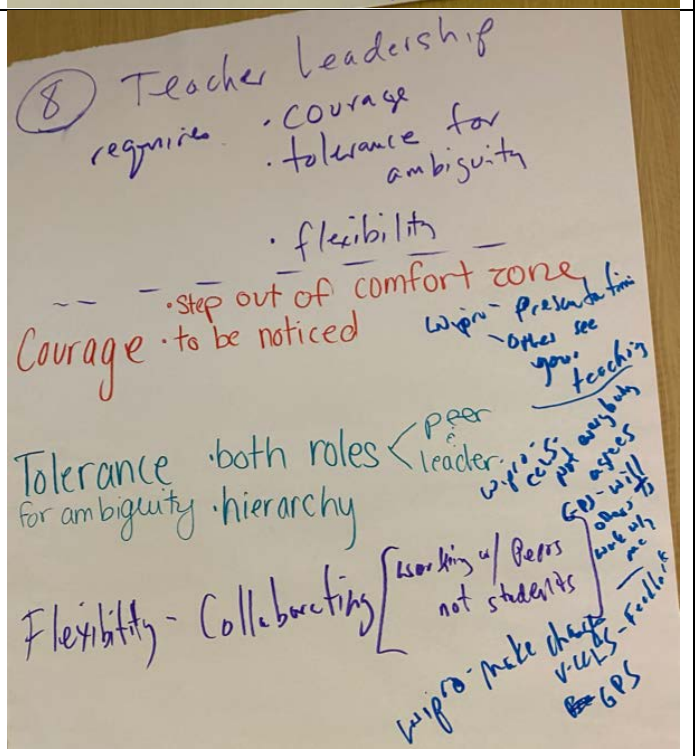
- Both roles – peer and leader
- Hierarchy

Wipro: CCLS: Not everybody agrees

Will other Ts work with me?

Flexibility

- Collaborating [Working with Peers not Students]

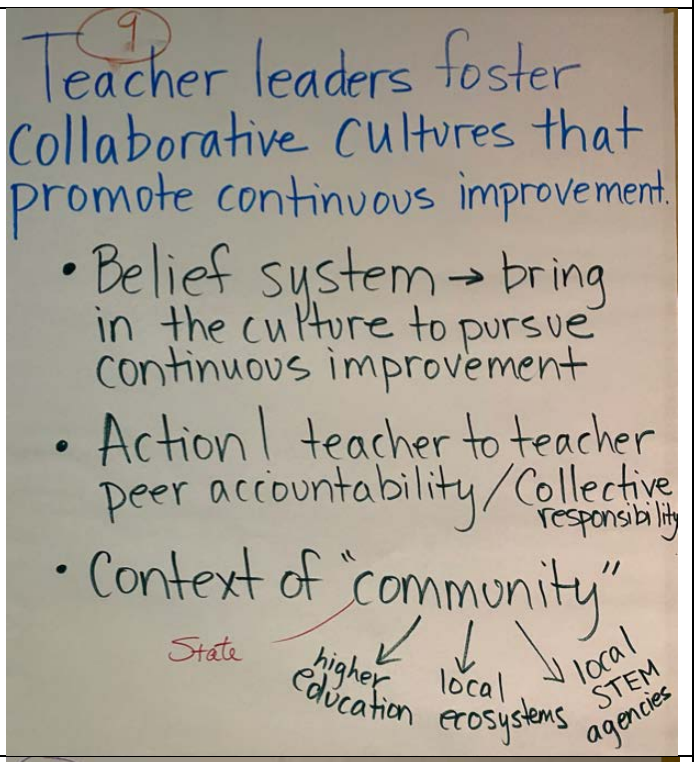


Wipro: Make changes
V-CCLS – Feedback
GPS

9) Teacher leaders foster collaborative cultures that promote continuous improvement.

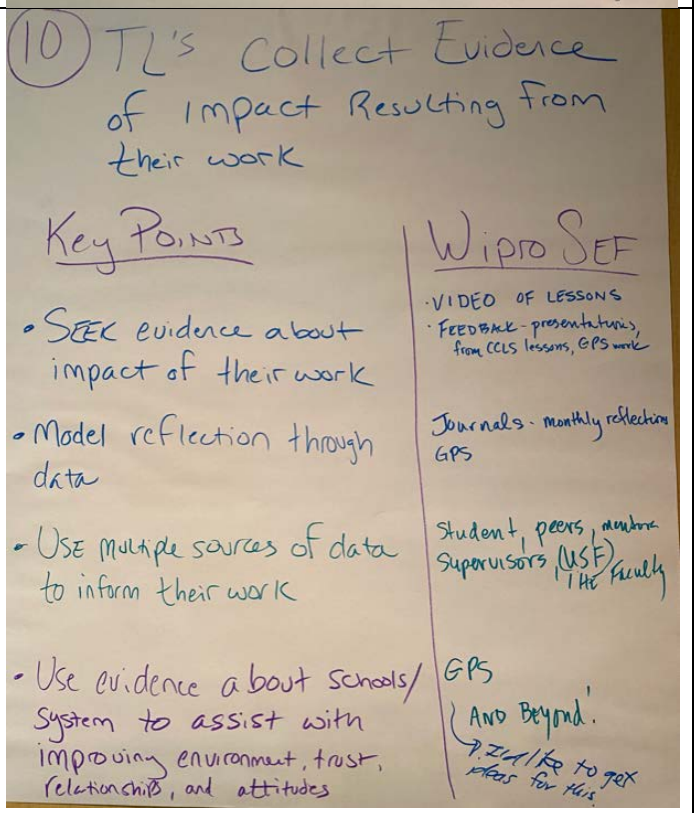
- Belief System ---> bring in the culture to pursue continuous improvement
- Action | teacher to teacher Peer Accountability/Collective responsibility
- Context of "Community"

State Higher Local
Local
Ecosystems
STEM Agencies



10) Teacher leaders collect evidence of impact resulting from their work.

Key Points from article Teacher leaders:	**Wipro SEF does this through:**
Seek evidence about the impact of their work	Video of lessons Feedback: from presentations, CCLS work and GPS work with mentor
Model reflection through the use of data	Journals, Monthly reflections, GPS
Use multiple sources of data to inform their work	Students, peers, mentor,

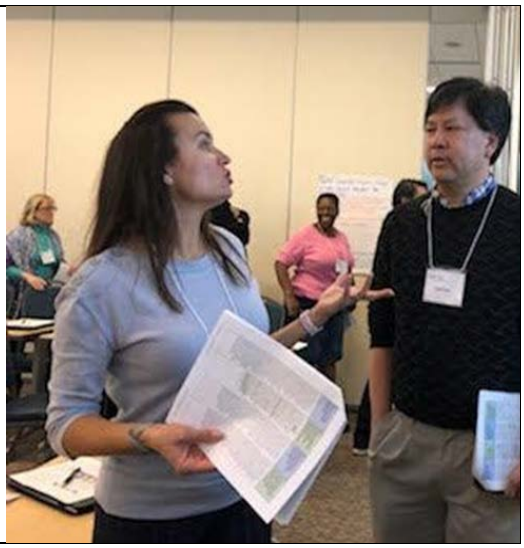


	DSCs, IHE faculty	
Use evidence about schools/system to assist with improving environment, trust, relationships, and attitudes	The GPS and beyond!	
Comments added: I'd like to get ideas for this.		

Scenes from the Wipro Leadership Conference on February 7th - 9th, 2020

The conference was very well attended with IHEs and DSCs from all the Wipro sites. The presentations were very interactive and very informative. The Leadership Conference went a long way in bridging the distance between sites and brought us all closer. The UNT Dallas leadership team was honored to be able to host such events.

February 7-9, 2020 Leadership Meeting



Meeting Evaluation and Next Steps

Feedback from the meeting was collected with an on-line tool that allowed all participants to see each other's comments. To indicate agreement with a comment a + could be added.

What went well?

It was great to discuss project level issues at the national level. +5	Lot's of good information about the other sites are doing. +4	Seeing all the different ways people present. +4
I think it was helpful to hear the ideas of other sites to adapt to our site or help spawn our own ideas Everyone did a great job facilitating- thank you so much +7	sharing conversations among the teams +3	Very thoughtful distributed responsibility for the meeting sessions. +3
Modeling of spirited, engaged, respectful, and important discussions. +3	Modeling of and strategies for good PD and workshops. +1	A plethora of ideas that pushed my thinking, deepened my understandings, and pumped me up to do more and do it better. Enjoyed the collaboration. Inspiring to work with such intelligent, committed educators +1
I think the record keeping is important. Please everyone post to Trello so we have a record of ideas and presentations. Many thanks to Texas!!! Great hosting and planning. +0	Collaboration with other Wipro sites. +2	Great opportunity to hear ideas from different sites, but also a great chance to hear feedback about our ideas +2

Two comments received many + marks,

"I think it was helpful to hear the ideas of other sites to adapt to our site or help spawn our own ideas Everyone did a great job facilitating- thank you so much."

"It was great to discuss project level issues at the national level."

Participants were also asked, "What topics should be included in our next IHE meeting?"

- Continuation of Teacher Leadership...roles, examples, etc.
- I think we need to keep talking about the book. Also, now that newer sites are further along, let's talk about what sites are doing/could be doing post Year 1 and Year 2
- Sustainability, Network map, The WIPRO SEF Story
- Ideas for specifically targeting the elementary level to grow science teacher leaders.
- Include district goals in projects.
- Maybe fewer topics — Some of the sessions seemed very rushed.
- More on developing relationships with Wipro Fellows-building trust.

Cross-site Visits

Site	Date of Site Visit	Site visit report
Florida	January 18, 2020	Pam Pelletier
Texas	January 18, 2020	Arthur Eisenkraft
California	January 25, 2020	Anne Gurnee
Florida	February 15, 2020	Pam Pelletier
Missouri	December 5, 2019	Arthur Eisenkraft

Following each site visit, host sites received warm and cool feedback on the visit.

CALIFORNIA- STANFORD UNIVERSITY

Vertical Collaborative Coaching and Learning in Science (V-CCLS) Presentations

The V-CCLS Presentations took place on January 25, 2020 at Stanford University. Fellows spent the first half of the day doing V-CCLS Presentations in two separate breakout rooms. The second half of the day was spent debriefing their V-CCLS Presentation experience as well as rolling out their H-CCLS Groups and Course of Study. The agenda for the day can be found HERE.

All fellows were in attendance as well as several District Coordinators, family members, and teacher colleagues from fellows' school sites. All attendees participated in the interactive V-CCLS presentations and feedback sessions.

This year, V-CCLS groups were asked to choose a course of study that was based on one of the CSET Equity Principles. What was not anticipated was that all groups chose the same equity principle for their course of study. What the team discovered, however, was that each group found their course of study extremely rich and were able to communicate their learnings in their V-CCLS Presentations in ways that were not repetitive, even though they were exploring the same general topic. See the table below for a description of the CA Cohort 2 V-CCLS Groups and their Presentation Titles.

V-CCLS Presentations

Group Number	Group Members	Content Focus	Course of Study	Presentation Title
Group 1	Sohum Bhatt Krista Berry Joanne Endo	Chemistry	Inclusion/Equity of Voice: Our group will focus on creating equitable opportunities for students to share with the whole class.	Increasing Equity of Voice with Whiteboards
Group 2	Jessica Overby Margaret Dominguez Melissa Duran Kelsey Magaña	Biology	Inclusion/Equity of Voice	Equity of Voice in Photosynthesis
Group 3	Roy Walton Jennifer Lim	Biology	Inclusion/Equity of Voice: Focus on using multiple	Equity of Voice: Talking Time

	Theresa Lester		modalities for students to share their thoughts (semi- or non-verbal) while promoting ELL's and helping them to self advocate in order to be heard.	
Group 4	Anu Sarkar Carol Lima Antony Torres	Biology	Equity of voice: Our group is focusing on the different talk protocols that exist to engage students in academic conversations.	Equity Talk with Ecosystems
Group 5	Vicente Patiño Andrea Martinez Satomi Fujikawa	Earth Science	Inclusion/Equity of Voice Our group will focus on engaging all voices in our classroom and finding multiple ways of talk and expression in both whole class and small group settings.	Equity of Voice in Different Group Settings
Group 6	Allison Houghton Kjartan "Eric" Armann Gina Maschio	Physics	Equity of Voice: We will be focusing on how to incorporate all voices in group discussions and nonverbal communication. Through the teacher lens, how do we model this effectively and see it active in the classroom.	Creating Design Challenges and Labs to Enhance Equity of Voice in Student Groups

Fellows Reflections on the V-CCLS Teams

The following comments are from CA Cohort 2 Fellows regarding their V-CCLS Experience.

"*We experimented with many different participation students to use in class. We discussed how things we could use or have used influenced how our students have conversations with each other. We also brought in a lot of outside research to prop up what we learned together. Finally, stretching our brains to think about how our content areas in Science connected had all of us thinking outside of the box*."
"I was able to reflect on the importance of student talk. I appreciated gathering new tools that can be used in my classroom right away. Often teachers don't have exposure to different strategies, and this has been a great experience being able to gain more knowledge."

"The most important take away from my VCCLS group is to be as intentional as possible. What I realized watching my 2nd grade cohort work was how deliberate she was with her own students. Another time, I watched the 8th grade teacher spend a full ten minutes demonstrating how ineffective a student's instructions were by acting them out. For me, I spent a lot of time at the beginning of the year establishing norms and standards and then got into the routine of work / life. Without constant direct reinforcement of those norms, they have slowly eroded and then I found myself frustrated by the quality of the work I'm receiving."
"I've learned new strategies to implement in my teaching and had great insights into best practices."
"I have learned that professional educators at all levels have more similarities than differences. I have also learned that best practices can be carried across large grade spans."
"*I have learned what students look like at different grade levels. It has been enlightening seeing what students are doing in grade 5 and junior year of high school. Understanding the progression of skills as well as content has helped me prioritize what I feel I should be emphasizing for 8th graders."*
"*I learned how to be vulnerable in opening up my practice to others, even when I am not entirely confident with the results."*
"What are some different structures and how they are implemented in different classes in different grades."
"*I shouldn't make assumptions about what the teachers before me did / did not do to prepare kids academically. If I frame to students correctly, I can activate prior knowledge of what kids did learn to be able to build on it in middle school."*
"Using and implementing launchpads as a collaborative document has been a huge boon to my students as they work in groups frequently. Seeing how other teachers utilize their time and how their curriculum sets up their teaching practices was nice to compare and contrast as well."
"I loved getting to share ideas and observations with my peers and receive their feedback. We were able to support each other's learning by focusing on our students' challenges and strengths. I appreciated the opportunities to reflect, revise, and apply all of the strategies I am learning along the way."
"I have learned that student are exposed to the same concept multiple times before they come to high school, so activating their prior knowledge before teaching something in high school is a good way to both get students excited as well as prepare lesson which build upon what students already know.
"We were able to look at a lot of the "differences" between middle and elementary, and found that the two settings are a lot more similar than we thought going in. We spent a lot of time talking about sentence starters and how we can look at varying those so that students don't become so dependent on them."
"I have learned how important it is to have different avenues for student voice to be heard. It's not just about verbally sharing whole group; depending on the background or culture of the student, they can feel engaged and heard in ways that are not viewed as traditional."
"*I found power in observing short video clips with a purpose. Being able to discuss it with other teachers has been very helpful*."
"I really enjoyed working with my V-CCLS. They brought such a breadth of knowledge and ideas! It was nice to see the progression in the content between our grade levels. Even nicer to see was the need for equity of voice across all levels. From the youngest to the oldest, they all could benefit from some of the same strategies that would help the students to be engaged more with their learning through talk. We saw how illustrating could be used to elicit thinking that

students could communicate with one another. We learned how different talk structures and grouping would help students be more confident in what they were sharing. Other commonalities include more wait time for students, more student talk, and less teacher talk."
"Through my experience in my VCCLS group, I learned that there are practices and strategies that can be used in all grades to support student engagement in science learning. After reading and using our research article in our conversations as a group, I realized that I want to build discussion skills and incorporate many ways for students to explain and share their thinking with others."
"I have learned that collaboration and conversation are the way that teachers get better. Unfortunately, this is not a standard practice at my school, so I'm thankful to have it be a part of Wipro."

V-CCLS team binders/portfolios

All V-CCLS Documents are being collected on a group form where fellows can attach links. Each group has been given access to their group's form. The CSET Team has found that these forms made the collection of documents much easier to manage than a repository or folder. Here is an example of the group form log:

V-CCLS Form Log - 2019

Sohum, Krista, Joanne	
October 2019	
Instructional Video (*Joanne*) Video Name: VCCLS_Endo_Joanne_2019_October_Classroom	**Reflection Video** (Facilitator: *Sohum*) Video Name: VCCLS_Endo_Joanne_2019_October_Reflection
• Form 1 from Sohum • Form 1 from Krista Lesson Docs: • Lesson Plan from Joanne • Student Work from Joanne	• Form 2 from Joanne • Form 3 from Sohum • Form 3 from Krista • Form 3 from Joanne
November 2019	
Instructional Video (*N/A*) Video Name:	**Reflection Video** (Facilitator: *N/A*) Video Name: N/A
•	•
December 2019	
Instructional Video (*Sohum*) Video Name: VCCLS_Bhatt_Sohum_2019_December_Classroom.mp4	**Reflection Video** (Facilitator: *Krista*) Video Name: VCCLS_Bhatt_Sohum_2019_December_Reflection
• Form 1 from Krista • Form 1 from Joanne Lesson Docs: • Lesson Plan from Sohum + Supporting Doc • All Student Work from Sohum	• Form 2 from Sohum • Form 3 from Sohum • Form 3 from Krista • Form 3 from Joanne
January 2020	
Instructional Video (*Krista*) Video Name: VCCLS_Berry_Krista_2020_January_Classroom	**Reflection Video** (Facilitator: *Joanne*) Video Name: VCCLS_Berry_Krista_2020_January_Reflection
• Form 1 from Joanne • Form 1 from Sohum	• Form 2 from Krista • Form 3 from Sohum

Creating Horizontal Coaching and Learning in Science (H-CCLS) Teams

Fellows were placed into H-CCLS Groups. We then asked each group to do several community building activities that included making slides of their group telling about themselves and what they had in common. Examples of the H-CCLS community building slides can be found HERE.

New H-CCLS groups were then asked to submit their top three choices for the NGSS Practice that they would like to focus on for their Course of Study. The CSET Wipro Team was then able to assign each group's course of study based on their first or second choice preference.

CA Cohort 2 H-CCLS Teams

Team	Science and Engineering Practice	Course of Study	Research Article
Group 1 Sohum Bhatt Jessica Overby Roy Walton Anu Sarkar	Developing and using models	Supporting students with showing a progression or a process with models	The modeling toolkit - Making student thinking visible with public representations (not peer reviewed but written by Mark Windschitl and Jessica J. Thompson) Acher, A., Arcà, M., & Sanmartí, N. (2007). Modeling as a teaching learning process for understanding materials: A case study in primary education. Science education, 91(3), 398-418.
Group 2 Krista Berry Maggie Dominguez Eric Armann	Developing and using models	Supporting students to create and refine models that support their metacognition and understanding of a topic	Gouvea, J., & Passmore, C. (2017). 'Models of' versus 'Models for.' Science & Education, 26(1), 49–63. (Developing and Using Models)

		throughout a learning topic.	
Group 3 Andrea Martinez Carol Lima Allison Houghton	Asking Questions and Defining Problems	Supporting students in question protocol that builds upon asking questions and requires students to apply the questions	Reiser, BRIAN J., et al. "Asking questions." *Helping students make sense of the world using next generation science and engineering practices* (2017): 87-108 To Build a Better Question
Group 4 Jennifer Lim Melissa Duran Vicente Patino	Obtaining, Evaluating and Communicating Information	Bringing students to deeper understandings of content by having students communicate opposing viewpoint or misconceptions in the context of small-group argumentation	Osborne, J. (2010). Arguing to Learn in Science: The Role of Collaborative, Critical Discourse. Science, 328(5977), 463 LP-466.
Group 5 Theresa Lester Joanne Endo Anthony Torres	Analyzing and Interpreting Data	Students will see relationships and patterns in data that relate to real world phenomena	Glancy, A.W., Moore, T. J., Guzey, S., and Smith, K. A. (2017). Students' Successes and Challenges Applying Data Analysis and Measurement Skills in a Fifth-Grade Integrated STEM Unit. *Journal of Pre-College Engineering Education Research,* 7(1), 5.
Group 6 Kelsey Magana Satomi Fujikawa Gina Maschio	Using mathematics and computational thinking	Support students with using mathematics and computational	Waterman, K. P., Goldsmith, L., & Pasquale, M. (2019). Integrating Computational Thinking into Elementary Science Curriculum: an Examination of Activities that Support Students' Computational

		thinking to gather, analyze, and represent data.	Thinking in the Service of Disciplinary Learning. *Journal of Science Education and Technology*, 1-12. https://drive.google.com/file/d/0B2BEJva7IcpEU0thdldpSU5XMk9oVnJyNkk4UXJQRWdsM0NJ/view?usp=sharing Weintrop, D., Beheshti, E., Horn, M., Orton, K., Jona, K., Trouille, L., & Wilensky, U. (2016). Defining computational thinking for mathematics and science classrooms. Journal of Science Education and Technology, 25(1), 127–147. https://drive.google.com/file/d/13t1-yoCDoqYBkJXE6B7JhVqeivsqfd0q/view?usp=sharing

Fellows meetings

Date	Focus of Meeting
February 27, 2020	Agenda: H-CCLS Group Introductions Research Article Work H-CCLS Work and Expectations End of Year Conference H-CCLS Work Time Mid-Year Survey Feedback Slide Deck
March 21, 2020	Canceled due to COVID-19
April 23, 2020	Possible Virtual Meeting due to COVID-19
May 14, 2020	Possible Virtual Meeting due to COVID-19

Featured Fellows

Natalie LaRosa, Elementary Teacher, Cohort 1
Stevenson PACT Elementary School, Mountain View Whisman School District

As a third grade teacher, I always felt like I didn't have enough time to dedicate to regularly teaching science lessons. Through Wipro, I have learned how "teaching science" has so many benefits and is not as scary as it appears to elementary teachers. Not only is it accessible by all students, it is also engaging and exciting. Science connects *all* learners to their everyday lives and promotes asking questions about why something is the way it is. Plus, in many ways, elementary teachers are already incorporating so many science practices and concepts into their practice, such as asking questions during read alouds that highlight cause and effect or teaching about patterns in math. I felt empowered when Wipro helped me see that I was already implementing "science" on a daily basis, without even noticing it. Taking that further, Wipro taught me that by being just a bit more intentional about connecting and including science content, I am able to deepen my instruction and give a real-world context to my students about our learning.

Through my GPS, I have stepped out of just my own classroom, and looked at the bigger picture of science education within my district. I want to make a difference in my district, and I thank Wipro for helping me believe that I can. My district recently adopted a STEAM (science, technology, engineering, art, and mathematics) model in our elementary schools, where STEAM teachers teach lessons to classes twice a week. My GPS is focused on promoting collaboration between STEAM teachers and classroom teachers to enhance learning for all students. I am exploring different collaboration models and creating visuals with examples for how the collaboration could work. For example, it could be the STEAM teacher who is supporting the classroom curriculum. In contrast, another model could be that the classroom teacher implements a curriculum that supports and extends the learning form the STEAM classroom. My hopes are that each school site in my district adopts the model that is best for them, to help their STEAM teachers and classroom teachers work together more closely. With this, I think all students would have a stronger learning experience in both their STEAM and regular classroom.

Dean Lorenzo, High School Teacher, Cohort 1
Prospect High School, Campbell Union High School District

If I were to sum up my experience with the WIPRO program, I would say that it helped build up my confidence as a teacher for my students and for my colleagues. The

connections and opportunities of the WIPRO program has gradually pushed me into the role of a teacher leader within my campus and district because of the projects, group evaluations, and professional development provided by the educational department from Stanford. In a short two years, I have been given opportunities to not only to learn from educators that are in the classroom, I was given the chance to share my experiences with educators from around the United States.

Coming into the program as the first cohort, it was exciting, and I honestly didn't know what to expect. The advertisement provided by our district was that the program was made for emerging leaders in science education, it is a two-year commitment, and there was a stipend (all three things I was highly interested in). In year one, we worked with science teachers from different grade levels, same grade levels, and with the educational staff from Stanford University, with a specific focus on one of the Cross-Cutting Concepts in the Next Generation Science Standards. Here we spent time researching the art of asking questions. My group found a research article about questions in the classroom and we applied the practices we learned into our classroom routines. From here, we collected evidence of our students' work and discussed our findings as a group. Through a very structured format, we went over our data and provided each other with feedback. I found that this was the best part of the whole program! Through the feedback given, I learned how to improve my practice, but while working together as a group of educators, we were able to point out the amazing practices we do. As a teacher, it is very hard to take pride in all the work we put into our classes so, to hear from other science teachers that what I am doing is making a difference with our kids makes me feel proud in my work.

Year two, is a combination of our personal projects and educational leadership. Here is where I got to pick a project that I am passionate about and apply my own research and data to the classroom. I am currently researching how to increase my students' science identity. It has been very busy, but with the constant check ins with the Stanford Staff is helping me get through this process. In addition to working on our project, we are given training on becoming an efficient teacher leader. The training on its own I think is priceless. I'm not completed with the program and I'm already speaking up in meetings at our district office to provide feedback on policies that will affect my colleagues.

Recruitment of Cohort 3 Wipro Fellows

Recruitment of Cohort 3 Fellows has been strategic. Our CSET Wipro Team first started with a chart outlining how many fellows, the number of fellows from each district, their grade levels, and their subject areas. We then made recommendations to each District

Coordinator indicating the number and "type" of fellow they should try to recruit for Cohort 3. See below for a table showing our assessment and recommendation for each district as well as a sample letter to the District Coordinators.

Breakdown of Anticipated Fellows for CA Wipro SEF Cohorts:

	Campbell Union High School (9-12) *small district*	Moreland (K-8) *small district*	Mtn View Whisman (K-8) *small district*	SFUSD (K-12) *large district*	SJUSD (K-12) *large district*	
Cohort 1	4 - HS	3 - 1 ES; 2 MS	4 - 3 ES; 1 MS	0	6 - 1 ES, 4 MS; 1 HS	17
Cohort 2	1 - HS	3 - 2 ES & 1 MS	4 - 2 ES; 2 MS	7 - 2 ES; 4 MS; 1 HS	4 - 2 MS; 2 HS	19
Cohort 3 Recommendations	4 - HS	4 - (2 ES; 2 MS)	3 (1 ES; 2 MS)	8 (3 ES; 2 MS; 3 HS)	5 (2 ES- Jessie's school; 1 MS; 2 HS)	24
Total Overall Fellows	9	10	11	15	15	60

Sample Letter to District Coordinator:

Dear Diane and Brad,

Here's what we recommend for SJUSD Cohort 3 Recruitment:

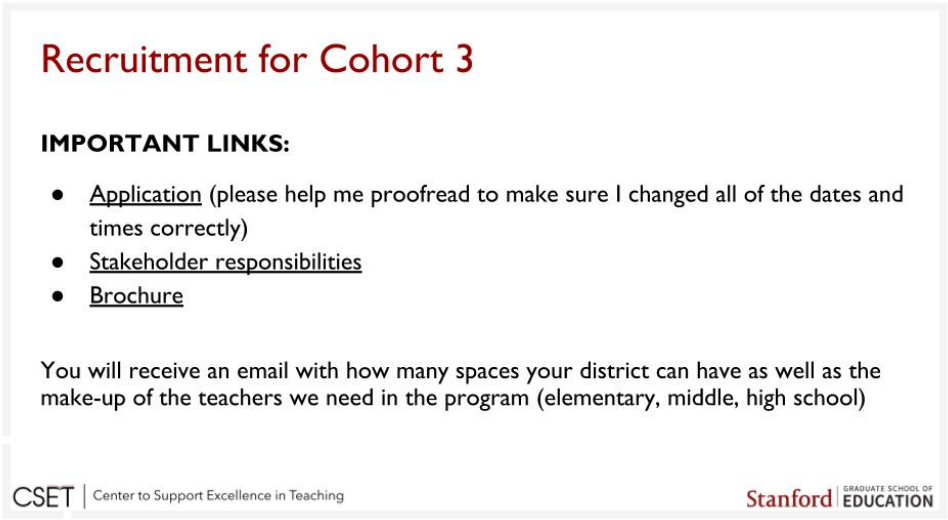
*For Cohort 3, we would like to have SJUSD take a total of **5 spots** with a make-up of **2 elementary, 1 middle school, and 2 high school.** This will give you a total of 15 fellows overall (3 elementary, 7 middle school, 5 high school).*

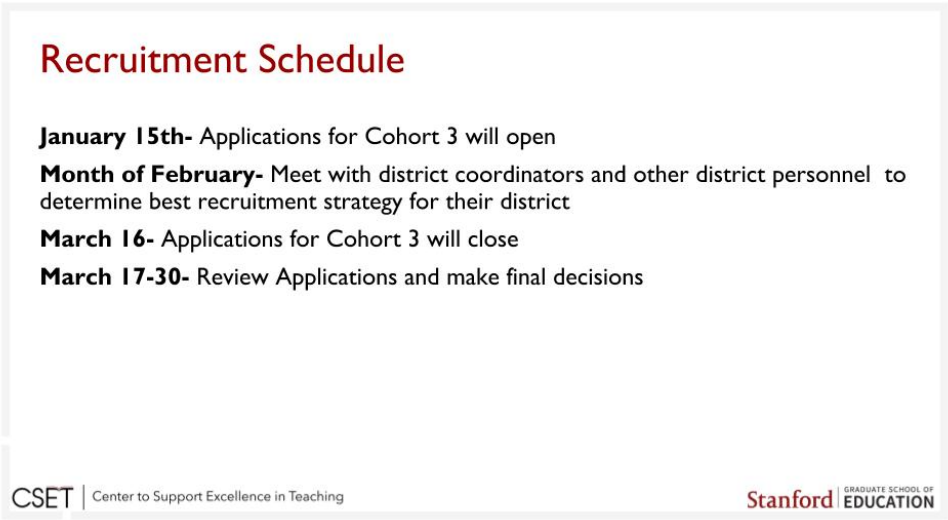
Of course, the quality of the applicant is more important than the grade level, so the make-up is a suggestion, not a requirement. (We may also be able to give you one more spot depending on who applies from other districts.)

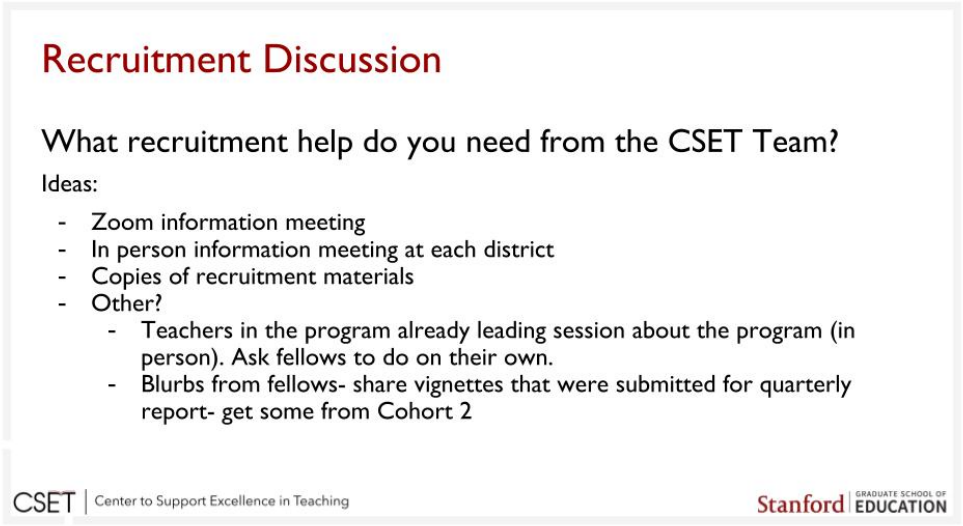
Thanks again and let us know if you have any questions!
Sincerely,
The Wipro SEF Team

Information Sessions for Fellows

The CA Wipro SEF Team met with the District Coordinators to discuss plans for recruitment. Here are slides showing what was discussed:







District Coordinators thought that the best recruitment strategy was for current fellows to discuss their experience in the program. Districts Coordinators assured the CSET Wipro Team that they would reach out to us if they thought we needed to hold information sessions for their districts. However, no sessions were requested, and all District Coordinators reported that recruitment was going well.

Update: Due to the COVID-19 situation, the application deadline has been extended.

Application and Selection Dates

Application and Selection Information	
Activity	**Date**
Posting of Application	January 15, 2020
Application Deadline	March 16, 2020- extended
Decision date	April 1,2020- extended
Induction Ceremony	May 12, 2020- extended

Wipro SEF Application and Selection Criteria

	Link
Wipro SEF application	Wipro Cohort 3 Application
Wipro SEF Selection Rubric	Wipro SEF Selection Rubric

Visiting Fellows Classrooms

The Wipro CSET Team coordinated with all five District Coordinators and conducted classroom visits to a sub-set of Wipro fellows within each district. Fellows understood that these classroom visits were meant to be supportive, informative, and allowed for discussions about district needs and how the Wipro fellowship could support these needs. District Coordinators also shared that this was a meaningful way to align their thinking about science classroom practice with research-based practices. The CA Wipro Team plans to continue with these observations at least once a year, but ideally twice a year. Here is a sample schedule for one of these observation days:

San Jose Unified School District- Wipro Classroom Observation Schedule (January 30, 2020)

8:30	Meet at the District Office		
9:06- 9:45	Lincoln High School	Kenneth Pringle	2 Honors Chemistry
10:17-10:37	Willow Glen Middle	Amy Howell	3 Science 8
10:45-11:05	Willow Glen Middle	Ron Hamby	3 Science 7
11:30-11:50	Castillero MS	Dean Guillen (Prep 4)	3 Science 7
12:00-12:20	Castillero MS	Delyna Cruz-Tanzi	3 Science 8

Planning for End of the year Induction Ceremony and H-CCLS Conference- TBD

GPS Progress

Site location (State)	Cohort #
CA	1

Meetings with GPS fellows – CA Cohort 1

See the following PD Calendar for Cohort 1 Fellows using this LINK.

Reflections on your meetings with GPS fellows.

The CA Wipro Team determined the following focus for Cohort 1:

Fellows will practice leadership by implementing a year-long project that is aligned with personal and district science goals and influences others in their understanding of high-

quality science teaching and learning. This will be accomplished by attention to the following three areas:

1. *GPS Project & Portfolio*
2. *Equity- equity principles, equity framework*
3. *Leadership- practicing leadership in your setting, influencing others, etc.*

Professional Learning Sessions for Cohort 1 will focus on the following:

Practicing Leadership in Science Teaching and Learning in Fellows' Context

- Deepen fellows understanding of what it means to practice leadership in their setting/context
- Deepen fellows understanding of how to help others' understanding of science teaching and learning
- Strengthen fellows' ability to provide equitable opportunities for all learners
- Build community with other science fellows within and beyond fellows' school districts
- Continue reflective practice in fellows' own classroom practice

Overall, professional Learning Sessions with Cohort 1 fellows have been going well. Fellows have enjoyed using the WiX Platform to create their portfolios and have all chosen projects that they are finding useful to themselves as classroom teachers as well as to others around them. District Coordinators are in tune with what fellows are doing for their GPS Projects in their districts and are offering support, in varying degrees, to their fellows. Mentors have been scheduling monthly check-ins with each fellow to discuss their progress on both their projects as well as their portfolios.

Celebration for GPS fellows

The CA CSET Team was planning a Pinning Ceremony and Celebration for Cohort 1 Fellows on June 12, 2020 at Wipro Technologies in Mountain View, CA. The celebration will still take place but has been postponed until the situation with COVID-19 has been resolved and normal life can resume. The CSET Wipro Team has been in communication with partners from Wipro Technologies to discuss new plans for this event, but details are currently on hold.

Vertical Collaborative Coaching and Learning in Science (V-CCLS) Presentations

The event was held at the St. Petersburg College EpiCenter. The EpiCenter is a facility shared between St. Petersburg College and Pinellas County in which professionals from business, government and academia can come together for workshops, programs, and college and university courses. Tampa Bay Wipro SEF held one of its Saturday meetings there in the previous academic year. It is also used by the USF Tampa College of Education for courses in its off-campus EdD program.

The event began at 8:45am and ended at 3:00pm. A light breakfast and lunch were provided. The morning was devoted to the V-CCLS presentations. After lunch the Cohort 2 Fellows got into their H-CCLS groups and developed their new courses of study. They also planned out their schedules for videoing and debriefing. Cohort 1 Fellows reviewed the requirements for their GPS portfolio and for their posters for end of year conference.
In addition, they met in their affinity groups to share with one another where they are in their GPS projects, and to discuss successes, barriers, and solutions. The affinity groups were developed early in the GPS year by asking the cohort 1 fellows to group themselves according to similarities in their projects. Three groups were formed: Capacity, Nature, and Equity. A major purpose of the groups is to provide the fellows with the opportunity to continue to engage with one another in a small community. The members of the groups are:
Capacity: Liz Nash, Diana Mills, Stacy Hoffman, Jessica Strauss, and Stephanie Gardner
Nature: Tonia Flippen, Melissa Taylor, Kenny Coogan, and Katie Slifkin.
Equity: Tabatha Whaley, Jacqueline Bromley, Christina Calve, Loretta LaMore, Cheryl Slaughter, Sarah Swoch, Melissa Triebwasser, and Lindsay Guntner.

V-CCLS Presentation Attendance

- Cohort 1 Fellows: Dianna Mills, Cheryl Slaughter, Jessica Strauss, Melissa Taylor, Tabatha Whaley, Kenny Coogan, Lindsay Guntner, Tonia Flippen, Stacy Hoffman, Jess, Jacqueline Bromley, Christina Calve, Elizabeth Nash, Katie Slifkin, Sarah Swoch, Melissa Triebwasser, and Loretta LaMore
- Cohort 2 Fellows: Sherri Alvarez, Teresa Buckman, Karen Bulino, Richard Card, Jennifer Cogan, Carrie Donatelli, Julie Fine, Brett Goodrich, Jennifer Griffone, Bhagyashree Kulkarni, Tara McClintick, Cayla Repass, Daniel Rice, Ann Salazar, Latasha Seay, David Seis, Sonila Toska, Anita Ventura, Michele Wiehagen.
- Wipro: Pam Pelletier
- District Science Coordinators: Larry Plank, Fawnia Schultz, Lesley Kirkley

- District representative: Melissa Stephens, Middleton HS, HCPS;
- University of South Florida: Allan Feldman, Nancy Islam, and Karl Jung

Overall, the leadership team was pleased with the day. The Fellows' presentations were professional, and they accurately portrayed what they had accomplished in their V-CCLS groups. They demonstrated teacher learning, engagement, collaboration and camaraderie. The warm and cool feedback was provided in an open and honest manner.

The presentations were improved over last year. We provided the Cohort 2 fellows with the suggestions we received from the Boston Wipro team and they did an excellent job of incorporating those into their presentation. This included making the presentations more interactive and sharing with the audience examples of actual student work to engage with. There was the expectation that there would have been more visitors from the school districts. Fellows were encouraged to invite their principals, and an invitation was provided to them to share. We need to be more proactive about this both for the V-CCLS presentations and the spring conference.

January 2020 Monthly Meeting at the EPI Center at St Pete/Clearwater

January 2020 Monthly Meeting at the EPI Center at St Pete/Clearwater

Agenda for January meeting:

January 18th, 2020	
8:45 - 9:00 am	**Welcome**
9:00 - 9:10 am	**Introduction and Overview of the Presentation Process:** *Group Presentation (20 minutes)* *Silent Writing (3 minutes)* *Warm Feedback (4 minutes)* *Cool Feedback (4 minutes)* *Personal Reflection (3 minutes)* *Presenters Response (2 minutes)*

V-CCLS Group Presentations	
9:10 - 10:00 am	**Biology: Concept Mapping: A tool for integration and collaboration** Ann Salazar, Pinellas County Schools, Ridgecrest Elementary School Jennifer Griffone, Pasco County Schools, Woodland Elementary School David Seis, Hillsborough County Schools, Dr. Carter G. Woodson PreK-8 School Sonila Toska, Pasco County Schools, Pasco High School Bhagyashree Kulkarni, Hillsborough County Schools, Middleton High School
10:00 - 10:50 am	**Chemistry: Inquiry-based Teaching and Questioning** Richard Card, Pasco County Schools, Mittye P. Locke Elementary School Anita Ventura, Hillsborough County Schools, Essrig Elementary School Sherri Alvarez, Hillsborough County Schools, Town and Country Elementary School Brett Goodrich, Hillsborough County Schools, Tampa Bay Technical High School
10:50 - 11:00 am	**Break**

V-CCLS Group Presentations (continued)	
11:10 - Noon	**Physics: Movement for Learning** Cayla Repass, Pasco County Schools, Pasco Elementary School Jennifer Cogan, Hillsborough County Schools, Turner Bartels K8 School Michele Wiehagen, Hillsborough County Schools, Miles Elementary School Karen Bulino, Pinellas County Schools, Seminole Middle School Daniel Rice, Hillsborough County Schools, Middleton High School
Noon - 12:50 pm	**Earth: Collaborative Learning in the K-12 Classroom** Carrie Donatelli, Hillsborough County Schools, Turner Bartels K8 Tara McClintick, Pinellas County Schools, Westgate Elementary Teresa Buckman, Hillsborough County Schools, Heritage Elementary School Latasha Seay, Pinellas County Schools, John Hopkins Middle School Julie Fine, Pasco County Schools, Wesley Chapel High School
12:50 - 1:30 pm	**Lunch**

Afternoon Breakout Groups	
1:30 - 3:00 pm	**Cohort 1** ⇒ Review GPS portfolio and poster requirements for end of year conference. ⇒ Affinity Group Discussion. o Each person shares where they are in the process. o Discuss successes, barriers, and solutions. **Cohort 2** ⇒ H-CCLS Groups. o Science Practice. o Pedagogy. o Equity (to be discussed further at February meeting).

V-CCLS Presentations

Site Location: Florida

	Course of Study	Content Focus	Team Members
Biology	Using concept maps as a way to organize and connect ideas to help with retention	Law of conservation of energy in living systems	Ann Salazar Jennifer Griffone David Seis Sonila Toska

			Bhagyashree Kulkarni
Chemistry	Inquiry-based teaching and Questioning	Mixtures and Solutions	Richard Card Anita Ventura Sherri Alvarez Jennifer Rivera Brett Goodrich
Physics	Movement in the science classroom	Energy transformation	Cayla Repass Jennifer Cogan Michele Wiehagen Karen Bulino Daniel Rice
Earth Science	Collaborative learning	Human impact	Carrie Donatelli Tara McClintick Teresa Buckman Latasha Seay Julie Fine

Fellows Reflections on the V-CCLS Teams

"*Having previously taught in California, I had some experience in working in a vertically aligned group and I was so happy to have had that opportunity for the first time in Florida! It's so important to have those discussions, but what I LOVE about the Wipro program is that we got an opportunity to actually SEE what happens in a vertical way. This is not something that I experienced in California. Absolutely brilliant!*" -- Teresa Buckman

"*My biggest take away from VCCLS group was learning how the same pedagogy can be used from K-12, how the complexity of the activity increased or changed from elementary to High school level. Debrief was the most effective part of this group, I learnt about new strategies implemented in the classrooms by different teaching styles. Warm feedback gave me a sense of achievement as not many of us get warm feedbacks. Cool feedback helped me understand how I can make changes to the lesson in future to make students learning effective. Also, we developed a long-term bonding with teachers in our group which can help us collaborate in future.*" -- Bhagyashree Kulkarni

"*The conversations that our vertical team engaged in were amazing! It was eye opening to see how the standards progressed from its foundational introduction in elementary to its complexity in high school. I have realized through this experience that if one step between elementary and high school is missed, the standard cannot be understood as it was intended. I also enjoyed getting feedback from my lesson with my vertical team that confirms my teaching abilities and finding areas that I can grow as a professional, including new strategies that I observed in each of the fellows on my team.*" -- Richard Card

"*Working with the teachers in the vertically aligned group on a common concept as well as a common strategy for teaching it was a fun and insightful experience. It was the first time in a*

while that I felt like I was truly part of a team of professionals thinking through a challenge of practice and sharing ideas, results and issues along the way." -- David Seis

Other reflections can be found in the profiles below from Karen Bulino and Latasha Seay.

V-CCLS team binders/portfolios

The V-CCLS work that the fellows have completed are being collected and maintained digitally in Binders/portfolios via Dropbox. All group forms, documents, fellow videos from each debrief meeting are stored in a folder for each V-CCLS group. There are folders for each of the fellows.

Creating Horizontal Coaching and Learning in Science (H-CCLS) Teams

We have 4 HCCLS teams: 2 elementary, 1 middle school, 1 high school. These teams were established by the TB Wipro leadership team and were organized to ensure that each district was represented in the group, and wherever possible, that there were not members who had worked together previously in the VCCLS groups. These teams were introduced to the fellows at the January meeting. Once fellows were in their groups, we worked collectively as a group to determine which science and engineering practice each group would focus on during the spring semester.

Middle school HCCLS group.

High school HCCLS group.

H-CCLS Teams

Cohort #	Course of Study		
Team name (include grade span)	**Science/ Engineering Practice**	**Title of Research Article**	**Research article citation**
Elementary 1	Engaging in arguments from evidence	Thoughtful Dialogues and Socratic Seminars Socratic seminars in science class: Providing a structured format to promote dialogue and understanding	Pihlgren, A. S. (2014). *Thoughtful dialogues and Socratic seminars*. Ignite Research Institute. Chowning, J.T. (2009). Socratic seminars in science class: Providing a structured format to promote dialogue and understanding. *Science teacher (Normal, Ill.)*, *76*(7), 36–41.
Elementary 2	Planning and carrying out investigations	Intersections of language, content, and multimodalities: Instructional conversations in Mrs. B's sheltered English biology classroom Instructional Conversations and their Classroom Applications	Meskill, C., Nilsen, J., and Olveira, A. (2019). Intersections of language, content, and multimodalities: Instructional conversations in Mrs. B's sheltered English biology classroom. *AERA Open*. *5*(2), 1–15. Goldenberg, C. N. (1991). *Instructional conversations and their classroom application* (Vol. 2). National Center for Research on Cultural Diversity and Second Language Learning.
Middle	Constructing explanations and designing solutions	The Effects of Problem-Based Active Learning in Science Education on Students' Academic Achievement, Attitude and Concept Learning	Akinoglu, O., & Tandogan, R. Ö. (2007). The Effects of Problem-Based Active Learning in Science Education on Students' Academic Achievement, Attitude and Concept Learning. *EURASIA Journal of Mathematics, Science & Technology Education*, *3*(1), 71–81.
High	Analyzing and interpreting data	The meanings of hands-on science Relationship among laboratory instruction, attitude toward science, and achievement in science knowledge	Flick, L. B. (1993). The meanings of hands-on science. *Journal of Science Teacher Education*, *4*(1), 1-8. Freedman, M. P. (1997). Relationship among laboratory instruction, attitude toward science, and achievement in science knowledge. *Journal of Research in Science Teaching*, *34*(4), 343-357.

Fellows meetings

Date	Focus of Meeting
February	Equity in science education
March	Continued learning around equity in science education, GPS check in, introduction to GPS projects
April	Wrap up equity focus and preparing to develop and write GPS proposals
May	End of year conference – HCCLS and GPS presentations

Featured Fellows

Karen Bulino, 8th grade science, Pinellas County

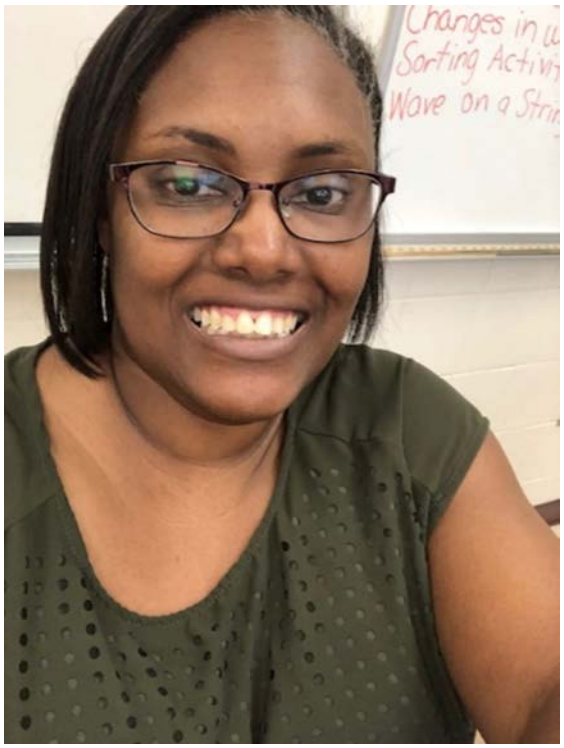
My name is Karen Bulino and I have been teaching middle school science for seven years. Currently, I teach 8th grade science at Seminole Middle School in Pinellas County. I realized early in my teaching career that if I were going to expect my kids to do better, than I was going to need to be better. This growth mindset led me to focus on improved science instruction, implementing equitable grading practices, differentiated instruction, personalized learning, and closing the achievement gap in my classroom. It also led me to take on leadership roles and I am currently the science department chair as well as the co-chair of the Leadership Academy, and an Equity Champion at our school. I attend professional development regularly and have had the privilege to present professional development for new Pinellas County Middle School science teachers, equitable grading practices, and the impact of implementing standards-based grading in my classroom. Never one to be content with being stagnant, I recently completed my Master of Science in Curriculum and Instruction.

It is this passion for professional growth that led me to pursue the Wipro Science Education Fellowship in Tampa Bay. As I strive to not only improve my own practice and maximize the impact of our science department, I welcomed the collaboration with educational professionals from three school districts as a unique learning opportunity. While I am only in the middle of year one, I have already gained valuable knowledge to

improve my practice and grow our science program. Through the V-CCLS group, I found myself immersed in content through a completely new perspective. Observing the vertical articulation of our standard in three elementary school classrooms, my middle school classroom, and finally in the high school classroom offered me insight into what our kids need to be successful. For the first time I saw these standards come to life in the classroom, rather than connected standards on a task card. And through the videotaping and feedback process with an amazing group of like-minded educators who were open to the process, I became a better teacher and teacher leader. Currently in the middle of my H-CCLS work, I look forward to continuing to grow my practice and support my team. I am grateful to Wipro and USF for providing this collaborative learning platform.

Latasha Seay

I have been teaching for 15 years in a variety of positions from middle school to higher education. I have also taught in the public and private sector. I did not take the traditional route of education, so I participated in the alternative certification program. Throughout my teaching career I have participated in a variety of leadership and professional development programs for science teachers such as Frontiers in Physiology Teachers Fellowship Program partnered with University of South Florida. During this program I participated in research and also developed a lesson plan I could implement in my classes for the upcoming school year using feedback from fellow science teachers from different parts of the U.S. As the years went by, I continue to search for a program that would offer me the same opportunity to connect with other science teachers to collaborate and learn from. I found that and more as a Wipro fellow over these past couple of months. I have learned so much through my V-CCLS from teachers who teach in the elementary and high school sector. I realize that even though it is grades below or above what I teach, it is still the same content just delivered in a different package. The greatest part about Wipro are the friendships and camaraderie that has developed. It has also become a safe place to receive constructive feedback that doesn't have an evaluation attached to it. Wipro has truly taught me how to become a leader to help those in my department.



Recruitment of Cohort 3 Wipro Fellows

District Science Coordinators have distributed information about the fellowship to schools in their districts. In addition, the USF faculty has also distributed information to the student teachers of USF in order to circulate the information. The biggest challenge has been actually getting the information to the teachers. The extremely large districts that are part of the TB Wipro SEF are highly bureaucratic. District coordinators need to distribute information at the highest level, and that information is then distributed down to area superintendents, principals, department chairs, and finally to teachers. The biggest success is that applications are being received from very well qualified teachers who have the characteristics that will enable them to take on leadership roles in their districts.

Information Sessions for Fellows

Wipro SEF Information Sessions for Fellows		
Information sessions	# of sessions held	Total number in attendance
Face to Face at University	0	
Face to Face in Districts	0	DSCs distributed information and answered questions at district teacher meetings
Virtual	0	
Other	0	

This year FL have not held any information sessions for fellows. The leadership team felt it was just more effective to recruit through the coordinators. However, with the interruption to the school year, they may hold one or two sessions when school resumes.

Application and Selection Dates

Application and Selection Information	
Activity	Date
Posting of Application	January 6, 2020
Application Deadline	March 23, 2020
Decision date	April 15, 2020
Induction Ceremony	May 15, 2020

Wipro SEF Application and Selection Criteria

	Link
Wipro SEF application	https://www.usf.edu/education/anchin/wipro/apply.aspx
Wipro SEF Selection Rubric	In application materials in the link above

The application materials are the same as they were for cohort 1 and cohort 2 except for the addition of one sub-question to Question 5 in the open response questions (underlined below). The addition of this question will provide information of how the applicants are already serving as leaders within their districts, allowing us to see how they can build on the work they are already doing through their participation in the Tampa Bay Wipro SEF.

Teacher Leadership: How do you define teacher leadership? What are the characteristics of a strong teacher leader? Describe any teacher leadership roles you have taken or that you aspire to take in your school/district.

End of the year Induction Ceremony and H-CCLS Conference

Induction Ceremony for Cohort 3 Wipro Science Education Fellows

The induction ceremony will take place on May 15th, in the TECO Room at the USF College of Education from 5:00pm-7:00pm. The first 30 minutes will be a social as fellows and guests arrive, followed by an hour program in which the new fellows will be welcomed and inducted into the program, with remarks from various people related to the program. The following people will be invited to the event:

- Cohort 3 fellows and family members
- Cohort 1 and 2 fellows
- Partner district administration (principals, superintendents, district science staff)
- USF faculty and administration (COEDU Dean and Associate Deans, USF President and Provost, various VPs)
- Local Wipro contacts
- Media
- Local politicians

*Details of this event are tentative due to the unknown nature of COVID-19, and the affect it will have on our ability to hold gatherings of this sort.

H-CCLS Presentations/Conference

The end of year conference will be held in the USF Tampa College of Education building, which will allow access to multiple rooms at a time. Breakfast pastries and beverages will be available for attendees while they check in. The morning will consist of presentations from TB Wipro SEF H-CCLS groups and Fellows from Missouri. After lunch, there will be a session that will include posters from cohort 1 fellows and informative booths where attendees can learn about science initiatives taking place in local school districts. There will also be roundtables where attendees will engage in discussions focused on problems of practice. Finally, the keynote speaker will present on a topic related to science teaching and/or learning.

Tentative agenda:

8:30-9:00	Check in/breakfast
9:00-9:15 Time	Welcome
9:20-10:50	H-CCLS/MO presentations
10:50-11:00	Break
11:00-12:30 H-	CCLS/MO presentations
12:30-1:15	Lunch
1:15-1:55	Cohort 1 posters and vendor session
2:00-2:40	Roundtables
2:45-3:45	Keynote
3:45-4:00	Wrap-up

*Details of this event are tentative due to the unknown nature of COVID-19, and the affect it will have on our ability to hold gatherings of this sort.

GPS Progress

Site location (State)	**Cohort #**
Florida	1 & 2

Meetings with GPS fellows

Reflections on your meetings with GPS fellows

Overall, the Tampa team believes their meetings are going very well, both with the leadership team and the fellows. The fellows are working very well together in their projects and lessons which they expect to continue moving forward. The activities are very meaningful and relevant to the fellows which is due to the strong leadership team involved of education faculty and district personnel. For example, leadership has begun discussions and activities relating to culturally responsiveness and the issues facing minorities and women in science. This is happening due to the expertise that individuals in the team bring together. This quarter site leaders also introduced Dr. Rosengrant to the leadership team as he brings a wealth of experience from multiple teacher leadership and professional development projects. A concern by site leaders, "One thing that did happen that we will investigate with our future cohort is that we had a graduate student filming part of one of the sessions. Though this was not used in any research methods, a concern was brought forward. That tape was deleted, and a message went out to the fellows saying as such. Moving forward, we are going to have discussions about if there is any interest in research and if so, how do we handle video recording them (if we do any at all)."

Celebration for GPS fellows

A pinning ceremony will take place at the end of the spring conference.

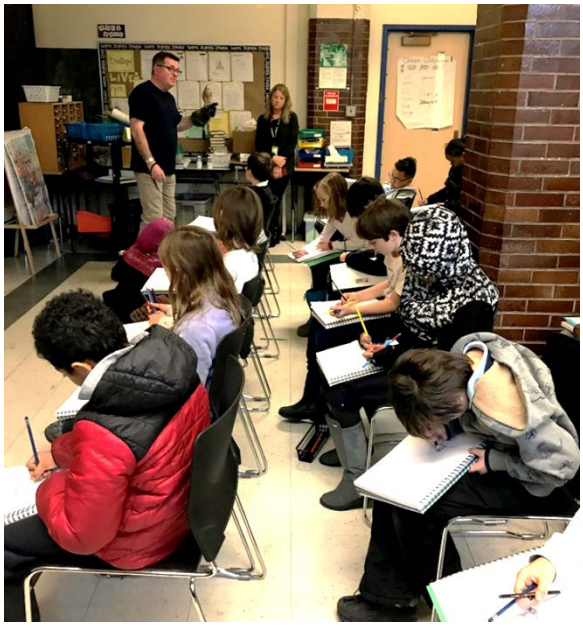
Phase II Activities

Elizabeth Hadly- Nature Journaling

This winter, Elizabeth kicked off the first four sessions of her before-school nature journaling club with 22 students in Grades 3-5. Joining Elizabeth was the art teacher and one other staff member. They decided to try out doing 4 sessions in the winter and 4 sessions in the spring to make it an easier time commitment for everyone involved, as well as to give the students a mix of seasons in which to observe phenomena and seasonal changes.

The first sessions centered on teaching students to get focused when outdoors and picking phenomena to journal about that they find intriguing. They also introduced students to creating "phenology wheels", which they will return to throughout the seasons to record seasonal observations in artistic form. They also introduced photography to students as a way to capture observations. Several students volunteered to bring in their instant polaroid cameras, and the teaching team provided film. Students shared the cameras to take photos of interesting phenomena that they could put into their journals.

Another new addition to their program this year was inviting a program called Wingmasters to come to the school for the final winter session before winter break. A handler brought several live birds of prey to our school and educated students about each bird while he held it out for students to draw, paint, and write about in their notebooks. There was also a conservation piece included in this, as the handler rehabilitates birds that have been injured to either return to the wild or be included in the program for educational purposes. Students were so engaged and had so many thoughtful questions! Even the art teacher and Ms. Hadly learned some amazing facts about adaptations of these birds.



The nature journaling club will start up again in the spring with the same students (plus any interested new additions) in May.

Laura Degelmann, Robots and Maker Space

Sometimes projects do not go as well as fellows had hoped. Laura not only received a Phase II Wipro grant but also a grant ($60,000) from Home Depot to create a Maker Space for her school. Unfortunately, a colleague who was supposed to work on the project with her dropped out, putting all the responsibility on Laura.

> *"I have to admit that this project is moving much more slowly than I had planned- simply because I have been so overwhelmed this year with the new Makerspace that I created and bumps in the road with that. "*

She did, however, have the chance to use the Botley robot with two of her 2nd grade students. The other students in their class were on a field trip and she took time during the day to show them how to use the Botley robot and let them play with it. She started off by teaching them how to use the line following function. The students created various paths for the robot to follow. They then progressed to the coding stage. They set up the path squares and began to code the robot using the direction controller. One student was finished with this after about 5 minutes. The second student lasted another 5-8 minutes.

Laura is continuing to think of ways that she can learn these robots and incorporate them into the Pathways classrooms. Unfortunately, her prep time first thing in the morning is not the best time of day for her to go into the classrooms to teach students how to use the robots. She does have some ideas floating around in her head and will be checking in with teachers to see if any of the ideas may work for them.

Judy McClure, Stories from Science Classrooms: Wipro SEF Educators and Their Work

After spending many hours observing Elizabeth, Richard, and Michelle, Judy is now writing about their work as teachers. Judy's *creative nonfiction bootcamp* course provides her with seven classmates and a writing teacher who read and comment on her work.

Here are Judy's reflections on her work and a sample of her writing.

"Richard, Michelle, and Elizabeth frequently live in my mind as I write about how they teach, their classrooms (or in Elizabeth's case, her cart,) and their students. Here's a paragraph from my work in progress:

In the fall of 2019, I observed three former Wipro Fellows in their classrooms, frequently marveling at their energy, drive, and determination as they faced a variety of challenges familiar to teachers who work in urban public schools. Richard Kelly, teaching junior kindergarten in a small school in Cambridge, guides his students like a skilled Sherpa, shepherding his charges calmly and confidently up the steep mountain of early childhood learning. Michelle Curreri, who teaches at the same school, is an energetic firecracker of a teacher who handles her 5th graders with firm resolve, a nurturing heart, and a healthy dose

of humor. Elizabeth Hadley, a renaissance woman who uses her expertise in science, art, pedagogy, learning outdoors, and team building, is a K-5th grade science specialist in Boston. These are their stories.

Judy's writing continues to move forward. Through the feedback she received in her class she realized that she needed more information on the students, including details about individual students, to create a more vivid description of the classroom. That meant she needed to return for further observations and to take some video so she could get specific details. She has only been back to Richard's class, but that one visit gave her so much information to add to the piece. Judy will go to Elizabeth's and Michelle's over the next few weeks. Her first draft is almost complete, but it is going to require a great deal of restructuring and editing.

Michelle Curreri, STEM Book Club and Continued STEM Projects

Michelle has been meeting with her second book club, which finished in February. She will follow it with another group. Michelle is creating a survey to give the kids to check in on how they like the book and what they are learning. In STEM, the kids are starting to plan their big end of the year project. This year Michelle's team paired small groups with a classroom in the school. They are currently consulting with a teacher about a problem or need in that classroom and will work with their team to engineer and execute a solution. The kids started by writing a questionnaire to their teacher to get and give ideas about this project. The picture below is the culmination of the first STEM project, the ice pop challenge. The two winning teams got to make the recipe for their buddy classrooms and fun was had by all.

Stem Club enjoying Ice Pops with their little buddies.

Tal SebellShavit, Collaborative Coaching and Learning in Science (CCLS)

Tal's group finished their first round of debriefs around the student skill of collaboration. The four samples explored were:

- 9th grade physics students trying to explain the connections between electricity and magnetism at a station's activity (working in groups of 3-4 and rotating through stations; then summarizing patterns on whiteboards for whole class debrief)
- 9th grade history students looking at a photo and making observations --> claims/assumptions using observations as evidence --> building argumentative paragraphs (students rotated the person in charge of taking notes as they were given prompts by the teacher)
- post-grad students (special ed students continuing to get services such as autistic students) using beans to figure out a budget with a roommate; and then whole group discussion about how to use money they received for participating in a pilot program at a nearby university
- 10th grade ELA students building a collaborative learning space during final presentations on "American dream/American nightmare"

The next skill is around feedback and how students are able to incorporate/internalize feedback. They will have their first debrief for that in March.

The participants have found it a good use of their time. One member has mentioned wanting to speak to the union president to see if there's a way that this PD can be used as an option instead of our current evaluation system. It is more reflective and productive - it more truly gets to the stated evaluation goal of reflective practice toward growth.

To quote Tal, "Going great!"

Braintree Public School – District Phase II

Activities

During this quarter, progress slowed a bit. Dr. Betsey Clifford has been working to get the final round of funding to come through to the district. We have received the cameras and tripods and purchased the SD cards as well. She was also able to get large student whiteboards for group work. The Braintree team met on January 8th and are planning to meet again soon to keep progressing with the high school PLC. Dr. Clifford has been working to expand the Modeling pedagogy and plan to use some of the funding to send

Amy Ferguson and Nadia Johnson to the Chemistry II course this summer for Modeling. One of the other chemistry teachers has expressed interest along with two teachers from the middle schools. Betsey is hopeful that they will continue to expand this pedagogy and utilizing the protocols and sharing recorded lessons is going to be a major part of this process.

Involvement of District Fellows

Jessica Passeggio and Sandra Dziedzic are involved in this work. Mary O'Donnell and Lea Lewis-Santos have been active in the East Middle School PLC.

Successes and Challenges

The challenges continue to be time. Ideally, they would meet more often and for longer periods of time, but the teachers just don't have it.

Featured Fellows

Katy Bizier, Director of LearningWorks Afterschool and Summer – South Portland, Maine

Katy joined the team at LearningWorks in fall of 2017 after moving back to Maine. LearningWorks is an educational non-profit serving over 3,000 people annually through free community-based education programs for children, adults, and families in the Southern Maine area. Katy oversees the 21st CCLC DOE grant in South Portland that supports students who are below grade level at two schools through free after school and summer programming. The curriculum blends STEAM and literacy resources and practices to build students' academic standing and confidence, while also supporting families through educational events and resources. The skills Katy gained through Wipro-SEF's 2-year fellowship help with curriculum decisions, mentoring staff, and overseeing the successful implementation of the grant. In addition, she has also taught several semesters at Portland Adult Education, working with Southern Maine's growing adult New Mainer population. This past year, Katy was chosen as a member of the Maine DOE's first cohort of its Leadership Development Program, run by the National Institute for School Leadership. She is thankful for the extensive knowledge and skills she learned while with Wipro-SEF.

Photo by Molly Haley Photography

Molly Peters, Assistant Director Science, P-2, Boston Public Schools

Molly was an elementary teacher in the Boston Public Schools when she was a Wipro fellow. For her individual GPS goal, she collaborated with her 1st grade students and the school music teacher to write, direct, design and perform a musical about local, urban ecology. For her district goal she worked with the Science and Early Childhood departments to align the science curriculum and the Focus on K2 curriculum with the new science standards and practices. "*By working in collaboration with the K2 teachers at my school, I will be able to relay any new information from the district as well as provide feedback from the teachers working with students. I will also be able to give the district feedback from the students with a small survey they will complete after each unit.* "

The work Molly did during this part of her GPS laid the foundation for her current position as Assistant Director of Science, P-2 in BPS. Molly has been teaching science in the district since 2012. Before that, she was a paraprofessional, and a preschool teacher while earning her degrees in Ecological Teaching and Learning (MS), Environmental Science (BS), and Early Childhood Education (BS). Molly has always had a passion for exploring the natural world, which was nurtured by her father (a geological engineer). As a child, she could often be found searching for critters in the backyard of her childhood home in Alabama. Although she didn't know it at the time, those early explorations would set off her career as a science educator. Her favorite part of teaching science is helping her students step out of their comfort zone and discover something amazing about the ecology of their own neighborhood.

Fun Fact: When Molly isn't working or on Mom duty, she is probably practicing yoga, working in her garden, or planning her next adventure… usually with a rock and roll soundtrack.

Vertical Collaborative Coaching and Learning in Science (V-CCLS) Presentations

The Missouri Fellows made their VCCLS presentations on Dec 5, 2019. Attending were all cohort 2 Fellows, Arthur Eisenkraft from Boston, all district coordinators (Cynthia Dwyer from Boonville, Bethany Morris from Hallsville, Erik Logan from Maries R-2, Ty Crain from Fulton, Mike Szydlowski from Columbia, Betsy O'Day representing Community R-6), one principal from Hallsville and district curriculum coordinator Alice Walker from Maries R-2, and the Missouri team staff (Meera Chandrasekhar, Dorina Kosztin, Marcelle Siegel, Program coordinator Kate Kelley and graduate student Joinee Taylor).
Invitations to the event were sent out in October and repeated during the intervening months. Fellows and DCs were sent electronic copies of the invitation and asked to send them on to their principals and administrators. The invitation included a link to a google form RSVP. A pizza dinner was served.

The Fellows worked very hard at preparing the presentations. All teams included hands-on activities in their presentations, keeping the attendees engaged. For example, one Fellow's VCCLS lesson was on the chemistry of cooking; he provided sealable jars of heavy cream that the audience had to shake during the presentation and make into butter over a 15-minute period. Yes, they later served crackers so the attendees could eat the butter they made! Following each team's presentation, all attendees were asked to participate in warm and cool feedback. Pictures are included below, with more pictures in this slideshow video: https://www.youtube.com/watch?v=c8-TNPyjAhw

We were pleased with the attendance of all district coordinators and other school administrators. They stayed engaged through the evening and were impressed with the presentations made by the Fellows. DCs from two new districts, Maries R-2 and Fulton, scheduled presentations for their respective school boards by their Fellows.
We did not face any particular challenges this year – having done it once before, the logistics went smoothly.

Event Program: VCCLS Presentations Cohort 2: Dec 5, 2019
Goals:

- Continue to build relationships and connections within the Wipro Cohort
- VCCLS presentations

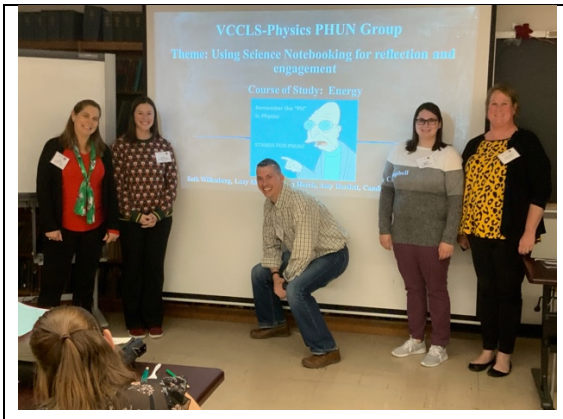
By the end of this meeting Fellows should:

- Make your VCCLS presentations
- Summarize what you learned from others' presentations

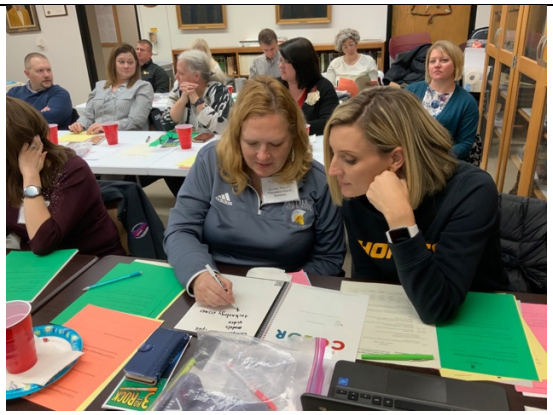
5:00 - 5:10 Pick up dinner
5:10 – 5:20 Welcome and opening remarks - Arthur Eisenkraft and Meera Chandrasekhar
5:20 – 6:00 Biology Group: "Place-Based Education, "Stacey Bishop, Melissa Milius, Beth Newton, Susan Saracini-Cram, and Rachel Tinsley
Presider: Dorina Kosztin
6:00 –6:40 Chemistry Group: "Phenomenon Based Learning, "Becky Eckerle, Stephanie Harman, Maggie Hunter, Gable Nichols, and Rachael Nichols
Presider: Marcelle Siegel
6:40 – 6:45 Break
6:45 – 7:25 Earth and Environmental Science Group: "Third Rock from the Sun: Earth's Changing Surfaces," Jennipher Adams, Teresa Edwards, Jessica Johnson, Liz Schwab, and Kelsey Strubel
Presider: Kate Kelley
7:25 – 8:05 Physics Group: "Using Science Notebooking for Reflection and Engagement," Amy Bartlett, Kristin Harris, Lucy Shrout, Candace Smith, and Seth Willenberg
Presider: Joinee Taylor

Presentation Protocol:

Minutes	**4**	**20**	**3**	**4**	**4**	**3**	**2**
Task	Presentation prep	Presentation	Silent writing	Warm feedback	Cool feedback	Personal reflection	Presenters respond
Presenters	Handout form 1	Present	Wait/talk quietly	Listen - fill form 4	Listen - fill form 4	Fill form 6	Share what you learned
Observers	Read form 1	Take notes on form 2	Fill form 3	Give warm feedback	Give cool feedback	Fill form 5	Listen

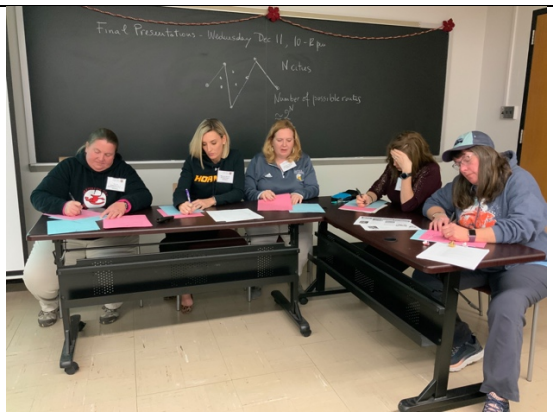


The Physics VCCLS team



Rachel Tinsley and Melissa Milus responding to an activity prompt

The audience



The Biology VCCLS team

V-CCLS Presentations

	Course of Study	Content Focus	Team Members
Biology	Place-based education in science	Energy Transfer in Ecology	Stacey Bishop Melissa Milius Beth Newton Rachel Tinsley Susan Saracini-Cram
Chemistry	Phenomenon Based Learning	The Chemistry of Cooking	Rachael Nichols Becky Eckerle Maggie Hunter Gable Nichols Stephanie Harman
Physics	Science Notebooking	Energy	Candace Smith Amy Bartlett Lucy Shrout Seth Willenberg Kristin Harris
Earth Science	Improving student achievement using notebooks	Earth's changing surface	Kelsey Strubel Jessica Johnson Jennipher Adams Teresa Edwards Liz Schwab

Fellows Reflections on the V-CCLS Teams

During the January meeting Fellows were asked to register their feedback on their VCCLS experience via a google form.

- What worked well: they particularly enjoyed the people in their group, working with other professionals, learning about resources, seeing others' teaching styles during the debrief videos, and sharing ideas.
- What they learned: Several of them mentioned the value of vertical alignment, learning about students in other grades ("That middle and high schoolers are just

like elementary kids just in bigger bodies and we shared the same struggles"), and techniques for fostering the love of science.

- Improvements: forms were repetitive; they wanted an online form that could be filled easily, need for more collaborative time during the monthly meetings.
- Monthly meetings: they liked the flow, conversations, instructors, work time, and dinner. They wanted more time to discuss their work with their groups.

In December all VCCLS teams wanted to stay together and not be regrouped into HCCLS teams. After they worked together in their HCCLS teams for one session in January, the staff could see how well those teams were functioning over the course of one meeting; later two different teams voiced that they were now happy with their HCCLS teams too.

V-CCLS team binders/portfolios

All team submissions are on the Torsh platform. When Fellows upload their videos, they upload all forms associated with the classroom and debrief videos, as well as comments on the videos on Torsh. The materials are much easier to access and organize this year!

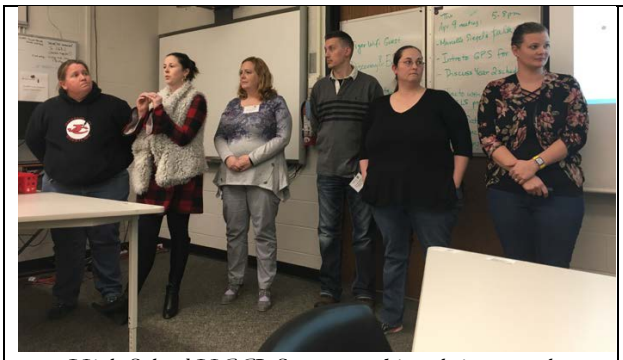
Creating Horizontal Coaching and Learning in Science (H-CCLS) Teams

HCCLS teams were defined by grade level. During the January meeting, time was set aside for them to choose an NGSS Science and Engineering Practice, and to find a research article. Marcelle Siegel and Joinee Taylor pointed to a few sample articles and helped them find others to read and choose from.

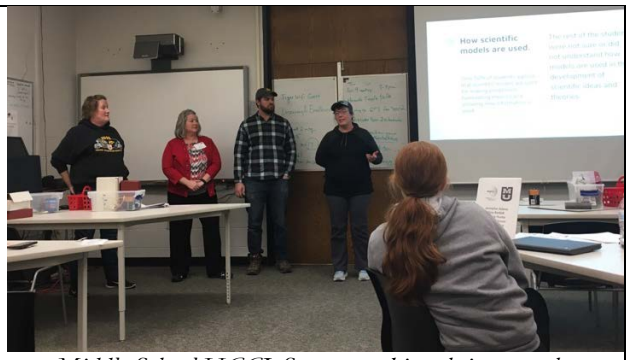
HCCLS teams finalized their research papers between the January and February meetings. In February each team gave a 10-minute presentation about their research articles. Fellows remarked about the crossover between the different groups, and how they can collaborate over the semester.

January Meeting of Cohort 2: Fellows discuss Research articles.

The K-2 team discussing their Research Article choices at the January meeting



High School HCCLS team making their research presentation at the February meeting



Middle School HCCLS team making their research presentation at the February meeting

H-CCLS Teams

Cohort # 2	**Course of Study**		
Team name (include grade span)	**Science/ Engineering Practice**	**Title of Research Article**	**Research article citation**
K-2 Team Stacey Bishop, Candance Campbell, Becky Eckerle, Rachael Nichols, Kelsey Strubel	Developing and Using Models	How Can I Build a Model if I Don't Know the Answer to the Question?": Developing Student and Teacher Sky Scientist Ontologies Through Making.	Becker, S., & Jacobsen, M. (2019). International Journal of Science and Mathematics Education, 17(S1), 31–48. doi: 10.1007/s10763-019-09953-8
3-5 Team Jennipher Adams, Amy Bartlett, Maggie Hunter, Jessica Johnson, Melissa Milius	Analyzing and interpreting Data	Students' Successes and Challenges Applying Data Analysis and Measurement Skills in a Fifth-Grade Integrated STEM Unit	Glancy, Aran W.; Moore, Tamara J.; Guzey, Selcen; and Smith, Karl A. (2017) Journal of Pre-College Engineering Education Research (J-PEER): **7**, Issue 1, Article 5. https://doi.org/10.7771/2157-9288.1159
6-8 Team Teresa Edwards, Beth Newton, Gabe Nichols, and Lucy Shrout	Developing and Using Models	Students' Understanding of the Role of Scientific Models in Learning Science	Treagust, David F., Chittleborough, Gail, and Mamiala, Thapelo L., (2002) Int. J. Sci. Educ., 24, 357–368.
9-12 Team Susan Saracini-Cram, Kristen Thurman, Stephanie Harman, Liz Schwab, Rachel Tinsley, & Seth Willenberg	Engaging in Argument from Evidence	Facilitating Argumentation in the Laboratory: The challenges of Claim Change and Justification by Theory	Walker, Jio P., Van Duzor, Andrea G., and Lower, Meghan A. (2019) J. Chem Educ., 96, 435-444. DOI: 10.1021/acs.jcemed.8b00745

Fellows meetings

Date	Focus of Meeting
January 16, 2020	"Leading the Rebellious with Empathy," presentation by Johannes Strobel, Prof. of Information Science and Learning Technologies; Work in HCCLS teams to choose SEP and research article.
February 20, 2020	"Elements of a Modeling Curriculum," presentation by Meera Chandrasekhar; HCCLS Research Presentations by Fellows
March	No meeting
April 9, 2020	Presentation by Marcelle Siegel; work on HCCLS presentations.
May 2, 2020	Teacher Leadership Conference

Featured Fellows

Jennipher Adams, fifth grade teacher at Bland Middle School, Maries R-2 School District.

In fifth grade, our classes are self-contained, therefore each teacher is responsible for lessons in all content areas. Science and math are two of my favorite subjects. I devote many hours to research on teaching concepts in new or different ways, and WIPRO has been invaluable in this particular area. I have the privilege of participating as a Cohort 2 Science Education Fellow, and the first semester of monthly meetings as well as meetings with my Grade Band Focus Area Project Group have given me useful takeaways for my personal and professional development.

For our course of study, my group chose improving student achievement using student notebooks. Viewing team members lessons, resources, and incorporating the warm and cool feedback given by my team, I now have my students record their science labs in the form of digital and hard copy notebooks. Using this method, I have seen my students' scores improve approximately 75%. Additionally, during a team video lesson I became excited about the new digital formats, Rocketbooks and Pictograph and plan to incorporate them into my lessons in the future. Taking part in the WIPRO Program makes me a better educator.

Becky Eckerle, Kindergarten teacher at Hannah Cole Primary in Boonville, Missouri.

This is my first year being a part of the WIPRO program through the University of Missouri. During the first semester, I feel like I have been able to enhance my teaching in the area of science. In September, we were able to learn about physical and chemical changes while learning about the apples. We have incorporated some Phenomenon Based learning into our lessons. We looked at a jar of store-bought apple sauce and as a class we brainstormed and predicted what we would need to do to our apples to turn them into applesauce. It was so rewarding to see the level of engagement and excitement among my students. Another activity, we completed after studying the life of the early settlers, was making our own butter. This was a wonderful, hands on activity that allowed the student to see the changes taking place with the cream as they shook it. This was a lesson that one of my peers had taught and taken a video of for our VCCLS project. It was exciting to bring new ideas to my teaching. Being part of the WIPRO program has been a wonderful experience.

Recruitment of Cohort 3 Wipro Fellows

The leadership team has already accepted four teachers who had applied in 2019 and could not be accepted into cohort 2. Current Fellows and district coordinators have been helping recruit teachers for cohort 3. So far 14 teachers have sent in intent-to-apply forms, and 5 have sent in full applications. The team expects more as the deadline rolls around in March. They also contacted a couple of new districts but have not heard anything from them. Leadership has been in email contact with all administrators, and in verbal and email contact with current Fellows, and in email contact with those who have expressed an intent to apply. The leadership team has offered zoom and face-to-face meetings with districts, but so far no one has taken up that offer.

Application and Selection Dates

Application and Selection Information	
Activity	Date
Posting of Application	Late Nov 2019
Application Deadline	March 15, 2020
Decision date	April 14, 2020
Induction Ceremony	May 13, 2020

Wipro SEF Application and Selection Criteria

No changes were made to the application form over the past three years – it appears to have served the team well.

	Link
Wipro SEF application	https://physics.missouri.edu/wiprosef/how-apply (Intent to Apply and Application Form accessible from this page)
Wipro SEF Selection Rubric	https://physics.missouri.edu/sites/default/files/wiprosef/wipro_sef_cer_forpostingv2.pdf

Planning for End of the year Induction Ceremony and H-CCLS Conference

Induction Ceremony for Cohort 3 Wipro Science Education Fellows

The Induction Ceremony will be held on May 13, 2020 at the McQuinn Atrium, Life Sciences Center, University of Missouri, tentatively from 4:30-8 pm. We plan to invite the Chancellor of the University of Missouri-Columbia campus to deliver welcoming remarks. New Fellows, their significant others, principals, district science coordinators, and superintendents will be invited. Local Wipro representatives, university deans and chairs, and state-level education administrators will also be invited.

H-CCLS Presentations/Conference

The HCCLS conference will be held in the Monsanto Auditorium and Lobby of the Life Sciences Center at the University of Missouri on May 2, 2020, tentatively from 8:30-5 pm. A University administrator will be invited to open the event. Cohort 2 will present their HCCLS work, and Cohort 1 their posters. Cohort 3 will also be invited. One or two guests of each Fellow, DSC's, principals and superintendents will be invited to the event, along with University deans, chairs, faculty, two Missouri-DESE representatives and a few graduate students who are interested in education. Local Wipro representatives will also be sent invitations. The Florida Wipro SEF site will send a team to the Missouri conference. Anne Gurnee, the evaluator will also be present, and will conduct two focus groups sessions. **Nobel Laureate** George P. Smith from the University of Missouri, who won the Nobel Prize in Chemistry in 2018, will be the keynote speaker. He has indicated that he is interested in attending several hours of the conference and interacting with the teachers. Scheduling and logistics of will be finalized in March/April 2020. The whole group presentations will be made in the Monsanto auditorium, which is a well-appointed auditorium that holds up to 300 people. Other rooms will be used for the HCCLS presentations and the focus group meetings. The poster session will be set up in the Monsanto Auditorium lobby.

A social hour/dinner will be organized for Friday evening at a local restaurant. Wipro fellows will be invited – we expect some of the fellows and DCs who live a short drive away will attend. Invitations will be sent out in the next month, and RSVPs will be collected. The pinning ceremony for cohort 1 will be held at the end of the day.

GPS Progress

Site location (Missouri)	Cohort #1

Reflections on meetings with GPS fellows.

GPS fellows are making good progress on both goals overall. Some Fellows are regularly scheduling meetings with advisors, while others are not. The same holds for submissions of reflections and reports, which is done directly on Wix, which becomes their portfolio. We took a somewhat hard line and announced that we would release stipends only after all fellows submitted all reports. This caused some consternation, but we explained that it was just not possible for us to keep track of each person and release stipends one by one. About 75% of the Fellows submitted reports on-time, for whom we have now released the stipend payments. The lagging 25% were sent emails that they will be paid when the last person submits the reports.

Some Cohort 1 Fellows have had troubles with Wix. A peer tutorial session during out February meeting seems to have helped. Some Fellows were impressed with what others were putting up on their sites – and that seems to have motivated them about doing more with their sites.

Next year we plan to have four meetings during the academic year. We have planned themes for each meeting and have discussed them with cohort 2 Fellows. The Fellows weighed in on convenient dates, thus we have part of the calendar finalized as well.

Celebration for GPS fellows

GPS fellows will attend the May conference and present their posters. They will also have a chance to talk about their GPS experiences with Cohort 2. A pinning ceremony for them will be held at the end of the day. During the next academic year the leadership team will visit school board meetings and present Fellows with plaques.

Phase II Activities

Leadership Meeting and Teacher Leadership Endorsement

The leadership team met on Tuesday, January 21, 2020 to plan the upcoming workshop and to think of ways in which it can sustain Wipro SEF activities beyond the funding period. One avenue is through the newly approved endorsement in Teacher Leadership, described below:

Endorsement in Teacher Leadership— The Teacher Leadership Endorsement program has been approved by the New Jersey State Department as well as Montclair State. This 12-credit program will provide teachers with four or more years of experience an added Teacher Leadership Endorsement to their Teacher Certification.

Specifically, this program is completed in only two semesters (Spring/Summer or Fall/Spring), and is offered on-site in districts, using a hybrid modality. Courses are offered back-to-back, with two courses per semester. Courses can be tailored to district-specific initiatives such as universal design, STEAM, teaching for social justice, and other pressing initiatives. Drs. Monica Taylor and Emily Klein who have designed and will be coordinating and teaching in the program, have over a decade of experience in teacher leadership in New Jersey.

Because this is a new pathway for teachers in New Jersey, the NJ DOE has created a fluid definition for the ways in which Teacher Leaders can function in schools. They write: Teacher Leadership creates opportunities for distributed, school and district-wide leadership; it allows teachers a myriad of opportunities to develop their own practice and the practices of their colleagues. Moreover, teacher leadership has been shown to positively impact job satisfaction, a major influence on retention, while also building a pipeline within the profession. These impacts not only benefit teacher leaders, but also build a sense of professionalism that can attract others to the field. Most importantly, the positive influences of teacher leadership, such as increasing educator skillsets and retention, have been shown to lead to better outcomes for students.

Program Objectives:

At MSU, the objectives of our proposed Teacher Leadership Endorsement program directly align with the Teacher Leader Model Standards, that were developed by The Teacher Leadership Exploratory Consortium.

See https://gtlcenter.org/sites/default/files/docs/TeacherLeaderModelStandards.pdf

MSU's TL Endorsement Core Commitments	**Teacher Leader Model Domains**
Teacher Leadership is grounded in knowledge of learners and subject matter.	Domain Two: Accessing and Using Research to Improve Practice and Student Learning; Domain Four: Facilitating Improvements in Instruction and Student Learning.
Teacher Leadership is a moral commitment.	Domain Two: Accessing and Using Research to Improve Practice and Student Learning; Domain Four: Facilitating Improvements in Instruction and Student Learning; Domain Five: Promoting the Use of Assessments and Data for School and District Improvement.
Teacher Leadership is collaborative and inclusive.	Domain One: Fostering a Collaborative Culture to Support Educator Development and Student Learning; Domain Three: Promoting Professional Learning for Continuous Improvement; Domain Seven: Advocating for Student Learning and the Profession.
Teacher Leadership is transformative.	Domain Three: Promoting Professional Learning for Continuous Improvement; Domain Six: Improving Outreach and Collaboration with Families and Community; Domain Seven: Advocating for Student Learning and the Profession.

Completion of this program includes 12 credits of coursework:
EDFD/TLRN 686: Examining Teaching and Learning as Teacher Leaders (3 credits)
EDFD/TLRN 684: Conducting Self-study and Action Research as Teacher Leaders (3 credits)
EDFD/TLRN 689: Teacher Leadership in Professional Development (3 credits)
EDFD/TLRN 692: Teacher Leadership for Impact: People, Policy, and Practice (3 credits)

Phase II Fellows meeting

The second Phase II Wipro Fellows meeting of the year took place on Tuesday, January 28, 2020 from 4:30-6:30. Twenty of the 22 participating Fellows attended the meeting. During the meeting, there was discussion about the new endorsement in teacher leadership described above. The leadership team is in the process of determining how it can support the Fellows for this program.

Fellows were also asked to complete a goal-setting worksheet meant to help them think about progress on their projects. For the remainder of the time, the Fellows were asked to work in district teams to design a product that showcases their collective projects. These are included with this report and are meant to replace the vignettes.

Fellows at the Smithsonian Tropical Research Institute

Jackie Willis hosted in February four Wipro Fellows from Clifton while in Panama at the Smithsonian Tropical Research Institute. They participated in Dr. Willis' research project, interviewed 5 other scientists online with more than 400 participating students in New Jersey in 16 interactive videoconferences. In the course of their activities in the tropical forest, the teachers learned about how field research is done and what sorts of questions tropical biologists investigate. Fellows Janine Hogel, Stephanie Langner, Donna DeBellis, and David Kleiner reached out by Internet to teach third- through eighth graders about a variety of topics in conservation, ecosystems dynamics, research methodology, and how diversity in scientists is important. In lessons that they will carry forward in the remainder of the school year, they will reach other teachers as well as students.

Documentation of Fellow's work

Each fellow is preparing a poster for the Poster Session to take place in June.

Jamillah Rawls' classroom

Jamillah Rawls' students in Orange District engage in the Art QR Code project.

Districts Thank Wipro

Fellows from each district created a thank you to Wipro for their SEF experience.

Dear Wipro,

Hundreds of children have directly benefited from your generosity. Our students experienced nature first-hand, exploring the salt marsh and identifying organisms they discovered. They interviewed scientists via computer from the Panamanian rainforest. I was able to share my knowledge of the NGSS at the national NSTA conference, and bring my newly acquired knowledge to my school.

Dave Kleiner
Grade 3
School 13

Thank You Wipro! I have learned so much and am excited to share with other teachers. The Rainforest Connection created such excitement among students and staff. Hopefully creating future scientists.

Donna DeBellis
Grade 3
School 11

Dear Wipro,

Thank you for this fantastic opportunity! When I first started I was excited to attend a national science conference, and by the time I finished I was presenting at conferences about the work that I accomplished with the grant funds! I felt empowered and respected as a teaching professional.

Regina Borriello
Clifton High School
Biology

Wipro, I cannot thank you enough for helping me achieve my goal of becoming a Teacher Leader. My students love the enthusiasm I bring to the classroom. I have also enjoyed mentoring other teachers in the district.

Lorin Pontelandolfo
Woodrow Wilson Middle School
6th grade Science Teacher

Without WIPRO and PRISM, I would never had stepped out of my comfort zone.

I was not comfortable speaking in front of my peers and never would have considered leading any PD.

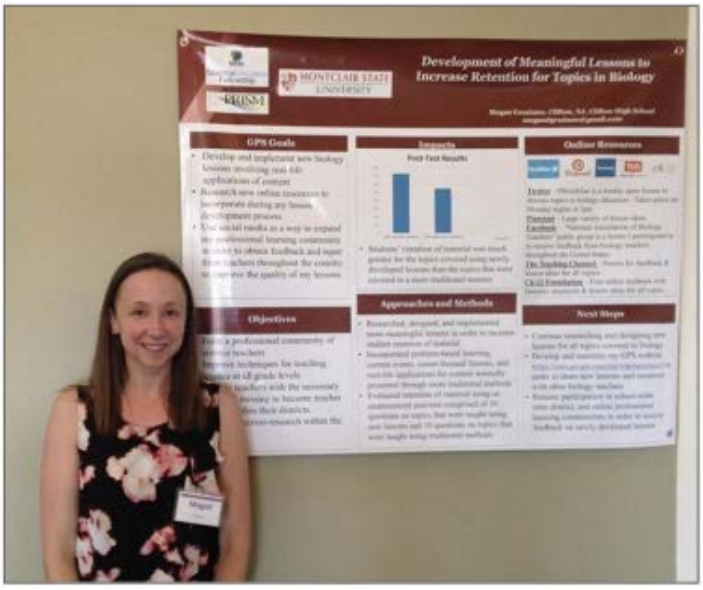
I could not have pictured myself spending the week in the middle of the rainforest. I am looking forward to returning, and even better, my students and colleagues are excited about seeing more of our lessons from Panama.

Thank you for allowing me to grow as a teacher-leader and as a person!

Janine Hogel, 4th grade
School One

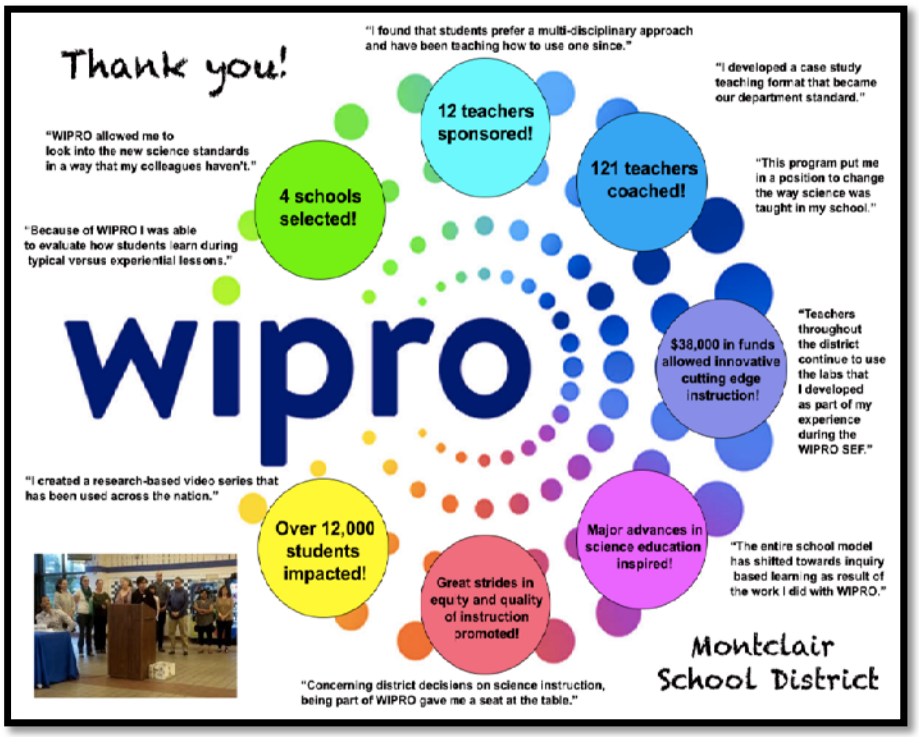
Thank you Wipro for helping my students and me expand our understanding of science. With your support we have connected with researchers on the field station, Barro Colorado Island, and applied ourselves to new hands-on experiences in the classroom!

Stephanie Langner
8th Grade Science
Christopher Columbus Middle School



Participation in the WIPRO fellowship program has provided me with so many opportunities to act as a teacher-leader. I am very proud of the action research projects I completed, the multi-district professional learning communities I was able to participate in, and the HCCLS groups I established at my own school. Thank you, WIPRO, for helping me to grow and develop as a science educator and teacher-leader!

Megan Graziano
Clifton High School
9th Grade Biology



Spring Conference

The Fellows' next meeting will be on Monday, June 1st from 4:30-6:30 for the poster session.

Phase II Activities

Fellow activities at the Greater New York site are ongoing. Phase II funding supports a variety of professional growth opportunities. Mercy College Center for STEM Education (MCCSE) offered a professional development course and has been recruiting Fellows for a prestigious summer science research program. The program, Education And Research: Testing Hypotheses (EARTH), led by the Monterey Bay Aquarium Research Institute, trains teachers with authentic data from deep ocean studies to bring ocean literacy into the classroom. The summer science program will be co-hosted at Mercy College in August 2020. Two Wipro Fellows have been accepted. Additionally, Fellows may serve as instructors during MCCSE's Saturday STEM Academy or they may choose to attend science education conferences.

Mercy College Center for STEM Education has partnered with the Science Teacher Association of New York State (STANYS) to offer professional development courses for in-service teachers. On January 21, 2020, a workshop, titled Science and Engineering Practices for New York State Science Learning Standards (NYSSLS) and Next Generation Science Standards (NGSS) provided teachers with time to explore this dimension of the new science standards and integrate science and engineering practices into their instruction. Elizabeth Barrett-Zahn, cohort I, participated in the event.

Chuck Sincerbeaux, Cohort I, attended the MakeyMakey Train the Trainer workshop last fall. This spring, he will lead a class involving Makey Makey during the Saturday STEM Academy. Chuck will bring his knowledge of computer science and his experiences during the Makey Makey Train the Trainer workshop to engage students in invention literacy. The fourth and fifth graders will learn basic Scratch coding and electronic technology to create circuits and music using the Makey Makey microcomputer and their creativity.

Chuck Sincerbeaux demonstrating Makey Makey device

Patricia McCue, Cohort II, is leading a programming class of sixth and seventh graders during Saturday STEM Academy. The students are developing coding skills using Scratch and Python. Patricia supports students as they develop their own electronics projects using a Raspberry Pi microcomputer.

Introductions with Patricia McCue early Saturday morning

Carmen King, Cohort I, attended the Wipro Leadership Meeting hosted by the University of North Texas. She currently serves as the district science coordinator (DSC) for the White Plains school district. At the meeting, Carmen and Dr. Amanda M. Gunning proposed an idea for supporting DSCs in their roles at the district level. They suggested implementing a GPS project for their professional growth. A few weeks after the conference, Dr. Gunning met with a DSC from another district to seed the idea. The idea for a DSC GPS project was well received and more details will follow as Carmen's idea is transformed into planning for implementation stage.

Wipro Fellows from the New Rochelle school district have been meeting monthly. The Fellows have been creating a plan that will provide more transparency and coherence in elementary science instruction across their district. Wipro funding has been supporting their work. More details will follow as the work is unveiled.

Documentation of Fellow's work

Each Fellow that received a mini-grant will submit posters for the Annual K-12 STEM teacher conference in October.

Featured Fellows
Alexandra Danz
Alexandra Danz's mini-grant leadership project 'Ask the Expert' is in full swing this year. The project is designed to facilitate connections between science in the classroom and science in the community. Alex implemented the project to ensure that every student has an opportunity to interact with science professionals in the fields of astronomy, meteorology, and geology. One of experts, a local meteorologist, visited students in the classroom. Students posed questions, interacted with the meteorologist, and learned about his career path. Wipro funding allowed students to receive T-shirts and books to commemorate the project.

Meteorologist Geoff Bansen with two enthusiastic learners

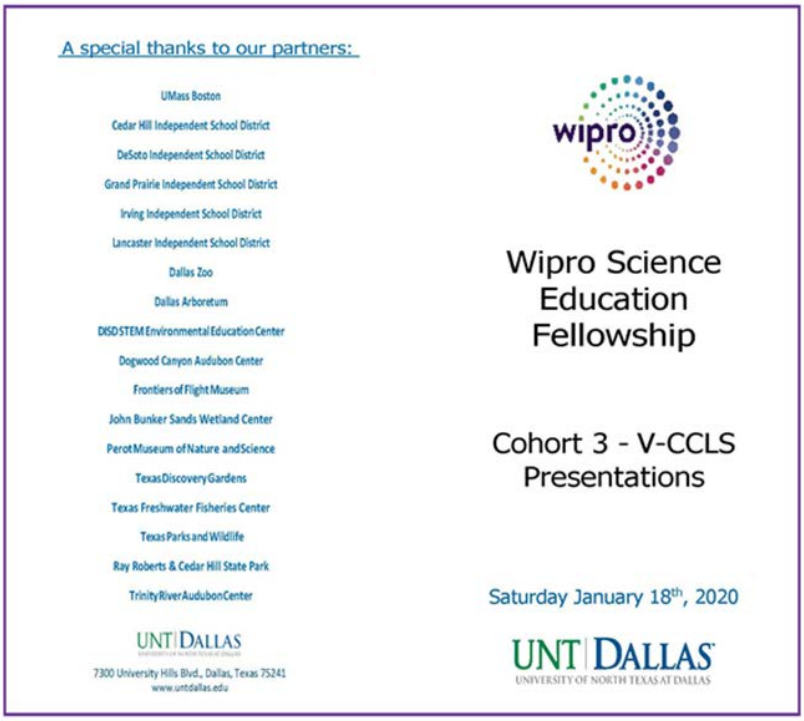
Fall Conference

The Annual K-12 STEM Teacher Conference will occur on the heels of the Northeast ASTE conference. Both conferences will be held at Mercy College in the Fall this year. The conference date for the K-12 STEM Teacher portion is Saturday, October 3, 2020.

Vertical Collaborative Coaching and Learning in Science (V-CCLS) Presentations

The event was well attended, Dr. Narayan was surprised to see several principals and district folk in attendance, some who have never come to any Wipro events. She was also very happy Dr. Eisenkraft could make it for the presentations. The entire audience had the opportunity to give feedback if they chose rather than just the fellows or the feedback table. Dr. Narayan reflected on the day, "*The more events we have, the better we get at managing them. I have a good team that assists me.*"

Dr Narayan felt that the presentations could have been more in depth and detailed. They will work on that for the next set of presentations. The feedback the leadership team received also mentioned that after the presentations and feedback, that the presenters be given the opportunity to express their thoughts in a few words. They will implement this in the next round of presentations.



V-CCLS Agenda Booklet Cover

V-CCLS Agenda

Cohort 3 Wipro SEF Fellows

Tiffanie Johnson, Cedar Hill ISD

Olaide Ajakaye, Cedar Hill ISD

Tamesha Brown, DeSoto ISD

Tatayanda Younger, DeSoto ISD

Marquita Rawlins, DeSoto ISD

Veronica Martin, Grand Prairie ISD

Marsha Bolden, Irving ISD

Amanda Cortez, Irving ISD

Terra Murphy, Irving ISD

Linda O'Bryan, Irving ISD

Sherry Thompson, Irving ISD

Yesenia Vasquez, Irving ISD

Julien Yacho, Irving ISD

Shelby Allen, Lancaster ISD

Markus Burkhalter, Lancaster ISD

Larissa Keys, Lancaster ISD

Cohort 3: V-CCLS Presentations Agenda

8:30 – 9:00 AM — **REGISTRATION AND BREAKFAST**

9:00 – 9:15 AM - WELCOME ADDRESS — **President Bob Mong**, UNT Dallas

9:15 – 9:30 AM - ADDRESS AND REMARKS — **Dr. Arthur Eisenkraft**, University of Massachusetts Boston

9:30 – 10:10 AM - PRESENTATION 1: **Making Earth Science Fun Again**
Group Members: Larissa Keys, Marquita Muhammad, Terra Murphy and Julien Yacho

10:20 – 11:00 AM - PRESENTATION 2: **Project Based Learning**
Group Members: Shelby Allen, Olaide Ajakaye, Marsha Bolden, Veronica Martin, Tatayanda Younger

11:00 – 11:15 AM — **COFFEE BREAK – INTERMISSION**

11:15 – 11:55 AM - PRESENTATION 3: **Metacognition – Exploring the Metacognition Cycle**
Group Members: Linda O'Bryan, Amanda "G" Cortez, Yesenia Vasquez

12:05 – 12:45 PM - PRESENTATION 4: **Mirroring Words With Gestures**
Group Members: Markus Burkhalter, Tiffanie Johnson, Sherry Thompson, Tamesha Brown

12:45 – 12:55 PM – CLOSING REMARKS — **Dr. Ratna Narayan**, Associate Professor & Wipro SEF PI, UNT Dallas

12:55 – 1:30 PM — **LUNCH**

THANK YOU FOR JOINING US TODAY!

C3 Fellow Julien Yacho from Presentation 1: Making Earth Science Fun Again

C3 Fellows Olaide Ajakaye and Veronica Martin taking notes during feedback session in Presentation 2: Project Based Learning

C3 Fellow Linda O'Bryan guiding audience through hands on activity during Presentation 3: Metacognition-Exploring the Metacognition Cycle

C3 Fellow Tiffanie Johnson demonstrates gestures for audience participation in Session 4: Mirroring Words with Gestures

V-CCLS Presentations

	Course of Study	Content Focus	Team Members
Biology	Metacognitive Learning Cycle	Plants	Amanda Cortez Linda O'Bryan Yesenia Vasquez
Chemistry	Mirroring words with gestures	States of Matter	Tiffanie Johnson Sherry Thompson Markus Burkhalter Tamesha Brown
Physics	Project Based learning	Light energy	Marsha Bolden Olaide Ajakaye Shelby Allen Tatayanda Younger Veronica Martin
Earth Science	Mnemonics	The earth and its interaction	Larissa Keys Marquita Muhammed Julien Yacho Terra Murphy

Fellows Reflections on the V-CCLS Teams

Linda O'Bryan

"Prior to becoming a part of this team and participating in the VCCLS project I believed my direct involvement in determining every aspect of a project and the direction that would be taken to achieve success was my direct responsibility. Working with this incredible team, I learned a great deal about myself as a teacher and as a leader. I now truly understand I do not always have to be in complete control to reach a goal and that allowing other team members to contribute and set the pace and direction of the team's efforts can be a much more rewarding way to lead and to accomplish collective goals. "

Amanda Cortez

"*I think that sometimes upper elementary sees the lower grades as just bells and whistles, but I think that Linda and I made Yesenia realize just how much teaching goes into the building blocks of their learning that they are in possession of by the time they make it to their high school years. On the opposite side of the coin, Linda and I were fascinated to learn that Yesenia had to deal with newcomers just like we do in early elementary, but she has to work so hard to catch them up and advise them on such a higher level! It was a great experience to have the opportunity to watch the video of what teaching science looks like in a high school classroom. I do find myself wishing that we would be allowed the opportunity to actually sit in on one of the classroom sessions during this project. "*

Yesenia Vasquez

"Taking part in debriefs gave me an inside look into the elementary world and how vertical alignment is important when trying to intervene if students have gaps in their learning. I think many times as educators we overlook what students have been exposed to, which creates more work when we assume students don't know much about the topic. If anything, we're not raising the bar if we choose to ignore or figure out what students already know to then understand what they are interested in learning. I really enjoyed that we were given the biology topic because, as mentioned before, it has opened my eyes to how much students have already been exposed to. I usually would only go as far back as 7th grade science and this gave me the opportunity to be a fly on the wall into younger subjects."

Markus Burkhalter

"From working on our VCCLS presentation I learned that procrastination is horrible and not the way to get things done. I found myself scrambling to get the necessary work done to keep my end of the project up to date. I learned how to better manage my time, as well as being a team player. This VCCLS project has shown me that it's not just about my personal growth and what I can get out of it, but what my team can do and how we can grow as a group."

Tamesha Brown

"It was interesting to see how the content of states of matter grew throughout the vertical alignment. The idea of one topic growing as students move throughout the vertical alignment of grade levels. If vocabulary is introduced and solidified in the lower grade, schools would begin to see an increase across the board. The pedagogical topic of mirror words with gestures actually turned out to be fun. Those students who love to talk had an absolute blast and even those who are not talkers, they enjoyed it too. The retention from the use of words with gestures was such an impact. If school campuses focused on one strategy like mirroring words with gestures from the youngest student to the oldest, we would have more buy-in from the students because they would be used to it and they would also begin to make connections with their academic growth the accountability of the strategy "

Sherry Thompson

"*Vertical alignment is so important when planning lessons. Something discussed among my group was how vocabulary plays a vital role in student success. We discussed how students can be introduced to vocabulary they will learn the following year and make connections with what they are currently learning. I appreciate knowing that the students learn about solid, liquid, and gas in first grade for the first time. The way they are introduced to the concept is very important since it is the foundation. Third grade and fifth grade have more similarities in discussing the particles. Fifth grade takes it a step farther by discussing the phases they go through. Ultimately, knowing what possible gaps need to be filled prior to addressing what is needed for your grade level is important for students to fully grasp any concept. "*

Tiffanie Johnson

"A group is only as strong as its members. As a member of this group, I learned how important it is to communicate what is going on with you as a person not just as a member. All the

members in our group had some pressing outside responsibility but as a team someone was always there to pick up the slack. There were disagreements, because we did not always agree on everything, but we were able to communicate our feelings and compromise. This group really proved to me that there is no I in team because we all took on the lead at any given time."

Marsha Bolden

"*Vertical alignment helped me understand what students learn at the elementary level and the depth students are required to learn information. It shed a light on how prepared students are when they reach the next level of study. It also helped me to see how elementary teachers prepare students for the next level of study. What I learned from vertical alignment is that the progression from elementary was aligned correctly for students to advance to middle school science."*

Shelby Allen

"I have learned how incredibly important vertical alignment is through this project. I am guilty of only knowing fifth grade Texas Essential Knowledge and Skills (TEKS) and a handful of fourth grade. However, it was shown how important knowing both lower and higher-grade level TEKS can be within the content that is being taught in the classroom. It was important to see the lower level progress in rigor and vocabulary. "

Olaide Ajakaye

" *I must admit that working with my group has fueled new ideas in me that I have used in my classroom. Collaborating with my group was eye opening for me because I have only taught 5th grade science through my teaching career but seeing how science is vertically aligned made me realize the importance of making sure scholars master science concepts at every grade level."*

Tatayanda Younger

"Collaborating as a team is essential for maximized success. Each member has their own unique strengths which made this Project Based Learning component exciting. I value the commonalities that each of us share and the differences as well. As educators, our goal is to extend memorable connections through meaningful learning opportunities for our students."

Veronica Martin

"The vertical alignment was interesting to say the least. It was interesting to see how important it was for students to grasp the concepts in the lower grades in order to be successful in the upper grades. We all basically teach the same concepts, but as the grades progress they go more into detail. With light energy, when we discussed the 9th grade level concept it was interesting to hear how many students still struggled with just the basic reflection/refraction concepts taught in the lower grades."

Larissa Keys

"*Finally, I found it very important to have a vertical team of educators at various grade levels who work together to help students acquire the academic skills necessary for success. Often, us teachers at the lower elementary levels don't know what our colleagues in upper elementary and middle schools are teaching and vice versa. I learned that communication between the two is valuable. Educators are able to clarify misconceptions and close gaps in student learning. I learned Vertical teaming increases communication across grade levels so teachers, collaboratively, can identify expectations at each grade level and support one another in meeting them. Vertical teaming decreases the fear of teachers feeling alone in the learning process and creates a system that allows more student success."*

Julien Yacho

"I am honestly going to miss my group. We came along way together and I am honored to have shared this part of my life path with such dedicated and strong teachers. I cannot wait to see what gems of knowledge I gain from the next group!"

Terra Murphy

"This VCCLS project has been a growing experience for me in many ways. I don't usually enjoy working in groups under this type of situation or when I am being graded and I am required to depend on others to do their part. I found myself doing some serious reflecting about the complaints my students voice when they are working in a group and the suggestions, I give them. I also realized my students are much more flexible than I am and much more willing to show patience and forgive each other. Our VVCLS has helped me to be mindful of the groups I create in class and the dynamics within the groups. I have also been reminded of how much I can learn from other professionals regardless of the grade they teach or the background they come from. It is so nice not to have to come up with all the ideas by yourself and to get constructive feedback from someone who has the same goals as you."

Marquita Muhammed

Lastly, while completing the VCCLS I learned that by doing our vertical alignment regarding our pedagogical strategy there is commonality in the grade levels. This commonality can be intentionally linked to stimulate interest and retention by incorporating the mnemonic device. It also emphasizes the thoroughness of the topic being taught. This assignment has assisted me in easily identifying vertical alignments in planning lessons. Such planning is necessary to close the gap of struggling learners, new language learners, and students with behavioral issues. The feedback from other colleagues and experts in the field was very appreciated and relevant. This information gathered was well noted and will definitely be applied to future in-class lessons and presentations."

V-CCLS team binders/portfolios

The Wix online portfolios are downloaded and stored on a safe storage device

https://rainobhatti.wixsite.com/website-8 Biology VCCLS C3 site
https://rainobhatti.wixsite.com/website-5 Chemistry VCCLS C3 site
https://rainobhatti.wixsite.com/website-15 Physics VCCLS C3 site
https://rainobhatti.wixsite.com/website-17 Earth Science VCCLS C3 site

Creating Horizontal Coaching and Learning in Science (H-CCLS) Teams

Because of the composition of cohort 3, it was easier to establish HCCLS teams grade wise. There is a 9th grade team, a 4th grade team, a 5th grade team and a mixed lower elementary team consisting of a 1st, 2nd and 3rd grade teacher

H-CCLS Teams

Cohort #	**Course of Study**		
Team name (include grade span)	**Science/ Engineering Practice**	**Title of Research Article**	**Research article citation**
4th grade team Amanda Cortez Linda O'Bryan Marquita Muhammed	Engaging in argument from evidence	Science as argument: Implications for teaching and learning scientific thinking.	Kuhn, D. (1993). Science as argument: Implications for teaching and learning scientific thinking. *Science Education. 77.* 319 - 337. 10.1002/sce.3730770306.
9th grade team Yesenia Vasquez Marsha Bolden	Asking questions and defining problems	To find yourself, think for yourself	Chorzempa, B. F., & Lapidus, L. (2009). "To Find Yourself, Think for Yourself." *TEACHING Exceptional Children*, *41*(3), 54–59. https://doi.org/10.1177/004005990904100306
5th grade team Julien Yacho Olaide Ajakaye Shelby Allen Sherry Thompson Tiffanie Johnson	Constructing explanations and designing solutions	Constructing Scientific Explanations: a System of Analysis for Students' Explanations	de Andrade, V., Freire, S. & Baptista, M. (2019) Constructing Scientific Explanations: a System of Analysis for Students' Explanations. *Res Sci Educ 49*, 787–807) https://doi.org/10.1007/s11165-017-9648-9
Lower elementary team Markus Burkhalter (1st grade) Tatayanda Younger (2nd grade) Tamesha Brown (3rd grade)	Planning and carrying out investigations	Planning and carrying out investigations: an entry to learning and to teacher professional development around NGSS science and engineering practices	Duschl, R.A., Bybee, R.W. (2014) Planning and carrying out investigations: an entry to learning and to teacher professional development around NGSS science and engineering practices. *IJ STEM Ed* 1, 12 https://doi.org/10.1186/s40594-014-0012-6

Fellows meetings

Date	Focus of Meeting
January 13th 2020	V-CCLS Presentations practice
February 11th 2020	Uploading Panopto videos to group Wix portfolios. V-CCLS debrief
March 3rd 2020	H-CCLS Presentations, Present Plan of action for the HCCLS project, CAST Proposals, Informal Component (Original date changed due to Irving ISD spring break)
April 14th 2020	C3 meets with the informal science educators. C3 buddies with C2 to visit sites and provide feedback
May 5th 2020	Touching base on everything H-CCLS
May 26th 2020	H-CCLS Presentation Practice

Featured Fellows

Tamesha Brown, Advanced Academics Specialist, DeSoto Independent School District

My name is Tamesha Brown and I currently serve as the Advanced Academics Specialist at

Katherine Johnson Technology Magnet Academy in DeSoto ISD. I have been in education for sixteen years, with this year being my first year out of the classroom. It is an honor for me to be able to support the scholars and teachers at my school. Currently, I am on a redesign team that travels with my Administrative Team and District Leaders. We have collaborated with other schools from around the country; together we are reimagining the way we create learning experiences for all scholars. I have taught Kindergarten, First Grade, and Third Grade. I have had the privilege of being a Mentor Teacher, serving on several Campus Leadership Teams, being a member of the Superintendent Teacher Advisory Council, and Teacher of The Year for 2018-2019. My Master's degree is in curriculum and instruction; I spent the summer writing curriculum for our district. Though I have accomplished many things, my greatest accomplishment is my husband and two daughters.

As a Wipro fellow, I can honestly say that the experience has been rewarding. The work that we do is not easy; but it is achievable. I am always reflecting, monitoring, and adjusting in order to create balance in my life. There are times that the work on top of everything that I have going on can seem overwhelming; but I refuse to cave in or give up. This experience is helping to stretch and strengthen me. I feel as though my craft is being

perfected through this process. I have gained a deeper appreciation for group work as well. As I look back and I reflect on how each VCCLS group began in comparison to how each group finished it makes me proud that I am a part of this growth experience. What I love more than anything is that the knowledge that we are gaining is transferable throughout everything that we do. I am grateful for this leadership experience.

Candace Edmerson,

Currently, I hold a Master of Education Degree in Secondary Teaching from the University of North Texas, Denton, Texas and have a State of Texas, Life Science 8-12 certification from the University of North Texas in Denton, Texas. I have 11 years of successful teaching experience. I have experience with using and implementing AVID strategies within the classroom since 2008. In addition, I have served as a mentor to other teachers and provided additional support and resources when needed to promote the overall goal of student achievement. In those twelve years, I have obtained greater than 200 hours or more of professional development in pedagogy and content, as well as attending and presenting professional development both within and outside of the district. In the past I have also written and reviewed curriculum, and have served on various committees to review technology, as well as reviewed manuscripts for publication. Currently, I participate in the Wipro Science Education Fellowship, which is hosted by UNT Dallas, School of Education.

I believe that student success is a priority. With that in mind, I am convinced that both teachers and students need to have support to increase their knowledge of content and strategies. Being a participant of Cohort 2, in the Wipro Science Education Fellowship, has provided me with a wealth of support. The collaboration with both the VCCLS and HCCLS groups has given me the opportunity to be more self-aware of my teaching, as it relates to the content, lesson plan, delivery and assessment. I have become more self-confident in my abilities to take the lessons and strategies obtained and learned throughout the first year and implement it within my classroom to support all of my students, no matter at what level. The results of being a part of this program are clearly

evident when I am analyzing district data of my students on both campuses. Because I am receiving the support as a teacher, it has enabled me to provide the same and/or more support for my students, which in turn has increased their overall academic achievement. The researched based pedagogical strategies and skills learned that have been applied and are currently being implemented within the classroom allow my students to become better equipped with the necessary 21st century skills. As a teacher, I hope to motivate students in ascertaining their inner strengths and abilities and discovering what truly inspires them. I aim to provide a stimulating learning environment that encourages students to trust their own opinions while fostering confidence in order for them to realize their full potential. The Wipro Science Education Fellowship has allowed me to grow both personally and professionally. I am excited to see my overall continual growth within the remainder of the program and years to come.

Planning for End of the year Poster session and H-CCLS Conference

Our end of the year poster session and the H-CCLS conference occur on the same date June 13th, 2020. Cohort 1 Fellows have been invited to Wipro events.

Pre-Conference social

The leadership team has two choices of location for the social which will be on June 12th 5-8 pm. Both C2 and C3 Fellows will attend. One option is to hold it at the zoo, while the other option is to hold it at UNT Dallas. Dr. Narayan feels the zoo might be too distracting avenue and also much more expensive than UNT Dallas. She has not yet made a decision about the location.

H-CCLS/Poster Session Presentations/Conference

The H-CCLS conference will pretty follow the same format as the conference last year. The previous night there will be a social for the visiting University of Missouri fellows from 5-8 pm Location TBA. The conference will start with breakfast and registration and a welcome address. The President will hopefully give the welcome address and the Provost will give the keynote address.

Two breakout sessions will be given prior to lunch, each with a UNT Dallas HCCLS presentation and a University of Missouri HCCLS presentation. The poster session which Dr. Narayan is hoping to be interactive will also be in the morning before lunch. Lunch will include the ice cream truck as well

The Keynote address will be after lunch followed by a hands -on interactive informal session led by 2 Fellows and the informal science educators. The day will end with two more breakout sessions each with a UNT Dallas HCCLS presentation and a University of Missouri HCCLS presentation.

GPS Progress

Site location (State)	Cohort #
Texas	2

Meetings with GPS fellows

For cohort 2, instead of meeting 4 times a year, Dr. Narayan decided to have C2 Fellows meet in class once every month. She also decided that given time constraints and the dreaded Starr test in March -May she would meet one on one for an hour each with the C2 Fellows once in January 2020 and a second time in February 2020.

Below is the schedule for the January/February one on one meetings.

Day and date	Time	Name of Fellow
Wed Jan 22nd	5-6 pm	R Anderson
	6-7 pm	R. Allen
	7-8 pm	M. Morrison
Fri Jan 24th	4-5 pm	Candace Edmerson
	5-6 pm	Tracey Craft
	6-7 pm	Tabitha Moreno
	7-8 pm	Mary Davis
Sat Jan 25th	11-12 pm	Julia Glowacki
	12-1 pm	Ana Belmonte
	1-2 pm	Billy Johnson
	2-3 pm	Brittney Preston
	3-4 pm	Rocio Avila
Mon Jan 27th	5-6 pm	L. Williams

	6-7 pm	M.Gaines
	7-8 pm	J. Morel

Day and date	Time	Name of Fellow
Mon Feb 17th	5-6 pm	Mary Davis
	6-7 pm	M. Gaines
	7-8 pm	Rocio Avila
Wed Feb 19th	5-6 pm	L. Williams
	6-7 pm	R. Allen
	7-8 pm	Candace Edmerson
Fri Feb 21st	5-6 pm	Tracey Craft
	6-7 pm	Brittney Preston
	7-8 pm	J. Morel
Sat Feb 22nd	11-12 pm	Julia Glowacki
	12-1 pm	Ana Belmonte
	1-2 pm	Tabitha Moreno
Mon Feb 24th	5-6 pm	R Anderson
	6-7 pm	M. Morrison
	7-8 pm	Billy Johnson

Reflections on your meetings with GPS fellows.

The one on one meetings are really going well. The fellows appreciate the opportunity to share their progress on their projects and feel supported. The meetings also ensure they are on a timeline to finish their projects by the date specified. Dr. Narayan would do this again with cohort 3 as well. It is time consuming, but well worth it.

Celebration for GPS fellows

The Medal ceremony for Cohort 2 fellows is planned for September 12th, 2020. This date might change after discussing it with the fellows as to what is the most convenient time for them, their families, principals and administrators to attend. By this time all the C2 will

have completed their GPS portfolios and received a grade for the graduate course they are in. The Medal ceremony will be similar to the 2019 Medal ceremony.

Presentations at the Informal Science Education Association (ISEA) conference at Waco TX

Six of the C2 Fellows and Dr. Narayan presented in the poster session of the 2020 Informal Science Education Association annual conference at Waco, Texas on Feb 27th, 2020. Each fellow presented material they created for their informal project of their GPS.

- Matthew Gaines: Matching the Hatch: Using observations in nature to select fishing baits
- Candace Edmerson: Inquiry and Excitement at the Dallas Zoo Reflection
- Brittney Preston: Frontiers Flight Museum: Teacher Led Program Guide
- Tracey Craft: Science classroom in the Park – Ray Roberts State Park
- Mary Davis: Technology Integration in the Outdoors
- Ana Belmonte: Solving a rock mystery
- Ratna Narayan: Integrating Formal Science Concepts into Informal Spaces

Dr. Narayan will be sending an email and pictures about this to the Principals and district administrators.

Reflections on ISEA:

Ana Belmonte:
"I really enjoyed attending the ISEA conference and meeting informal science educators. Although the sessions didn't provide many useful things for me as a classroom teacher, the discussions with the people there were effective. As I presented my poster on my collaboration with The Dallas Arboretum, my discussions with other educators were insightful. Many loved what we are doing in the Wipro fellowship and gave me ideas and suggestions on my current collaboration. I look forward to teachers and informal science educators continuing to collaborate and impacting learners everywhere. "

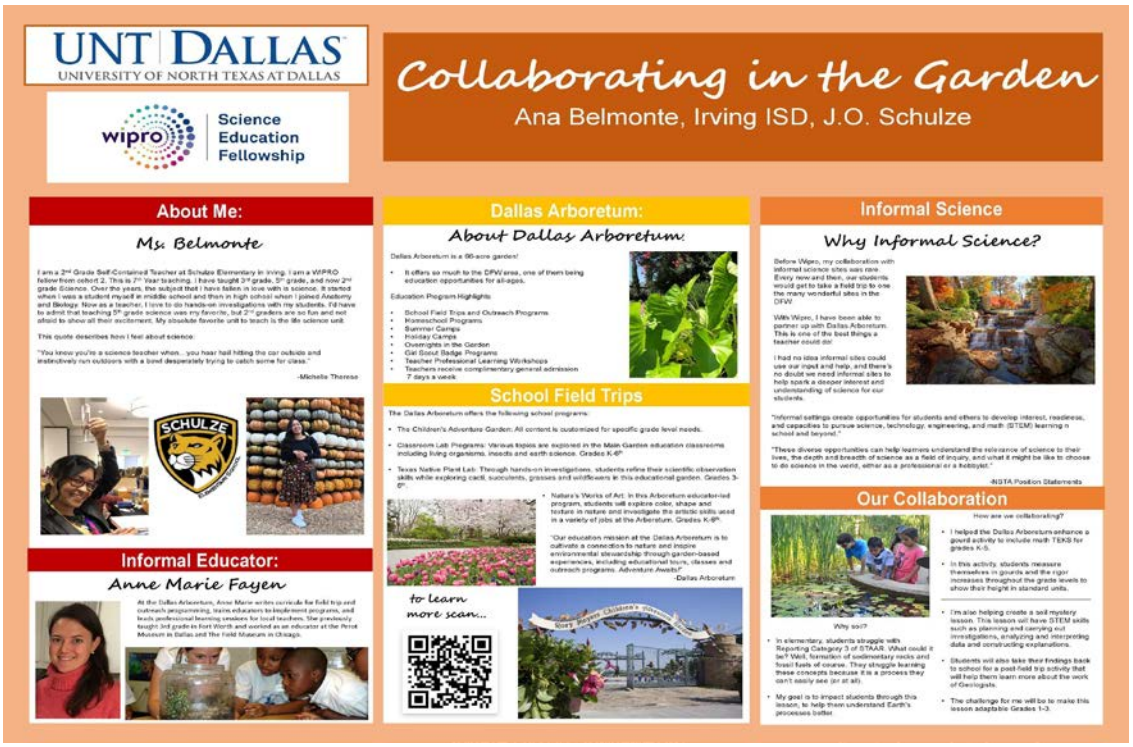
Tracey Craft:
"As a 2nd year Wipro Fellow, I was privileged to participate in the poster session at the 2020 ISEA Texas conference on February 27th, 2020. I met many people who are informal science educators and we discussed the possibilities of combining the best of both worlds by bringing formal education together with various informal sites. It was exciting to brainstorm ideas with like-minded educators who want to encourage a love of science in our students."

Mary Davis:
"My experience at the ISEA conference was eye opening. I was able to network and meet many different informal science educators. When I was presenting my poster, many different educators asked me how they could integrate my idea of the self-guided nature walk at their site. I realized how impactful my work at the DISD STEM Education Center could be. The potential for my work to reach hundreds, if not thousands of students across the state made me feel extremely proud. **"**

Candace Edmerson:
"When asked to submit a poster presentation proposal as a representative of UNT Dallas, WIPRO Science Education Fellowship in reference to my work with the Dallas Zoo, I didn't quite know what to expect. After attending the conference, I now have a new perspective on the work that ISEA has done, not only on the local level but also state, national and global as well. The conference allowed me the opportunity to learn and obtain a wealth of information from informal educators that was very encouraging. I walked away with a sense of accomplishment and confidence the partnerships and collaborative relationships formed have a far greater reach than I had imagined. This opportunity allowed me to gain access to other informal science educators, to network, obtain additional ideas about the current work, and receive support, gain encouragement and converse about the future goals of how we can spread word about our educational goals. I walked away from the conference with a sense of accomplishment, as a representative for all teachers to form collaborative partnerships with informal science educators. I am also inspired to do more and encouraged by the future and how it will continue to grow. "

Matthew Gaines:
"The experience at the ISEA Conference was very insightful. The conversations that occurred while presenting posters helped confirm the importance and value of the work completed during the Wipro Fellowship program. New partnerships were made through the presentations and possible new doors have been opened because of this experience. "

Brittney Preston:
"My experience at the informal conference was very interesting. I enjoyed the conference overall and learned that there is a disconnect between the school system and informal science sites. If teachers and informal science sites were able to combine their expertise more efficiently, the educational system would grow tremendously. I enjoyed presenting my poster about the product I'm creating for The Frontiers of Flight Museum. I was able to connect with other informal science sites and some even gave me suggestions on ways to improve my product. It was a great way to network and learn for others who are traditional schoolteachers. "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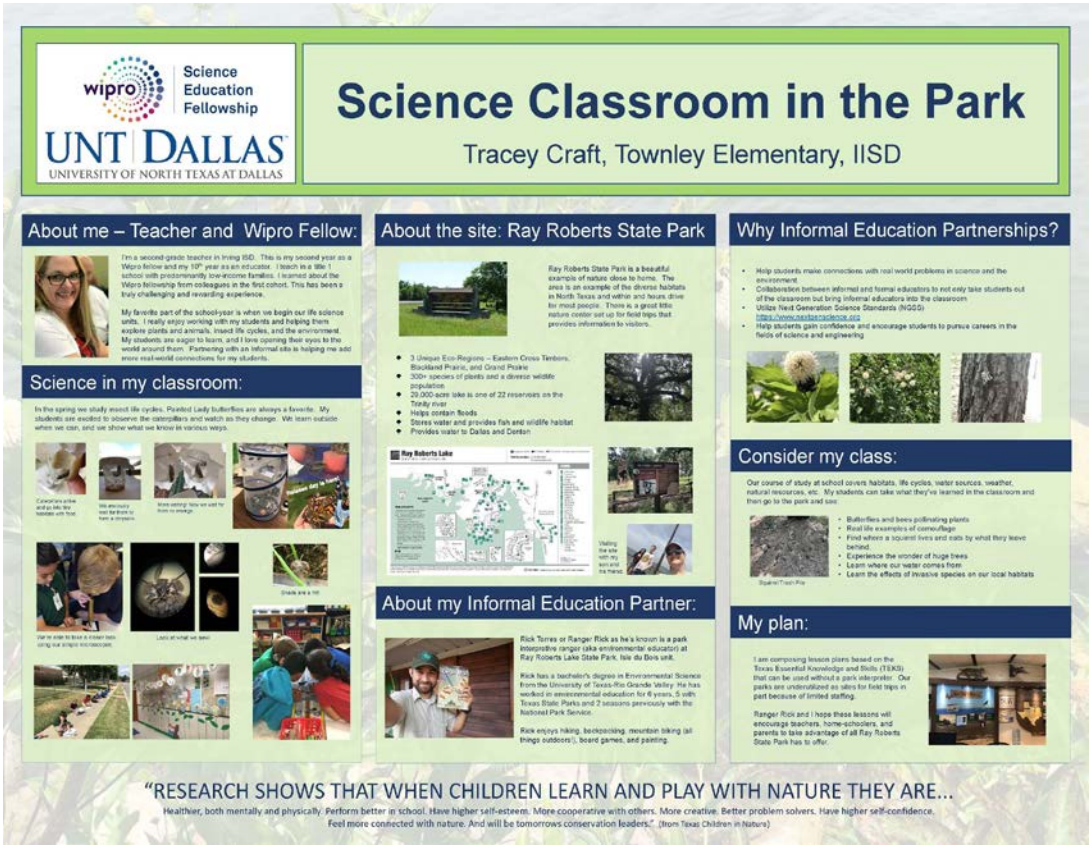
Collaborating in the Garden
Ana Belmonte, Irving ISD, J.O. Schulze
About Me:
Ms. Belmonte
Informal Educator:
Anne Marie Fayen
Dallas Arboretum:
About Dallas Arboretum:
School Field Trips
to learn more scan...
Informal Science
Why Informal Science?
Our Collaboration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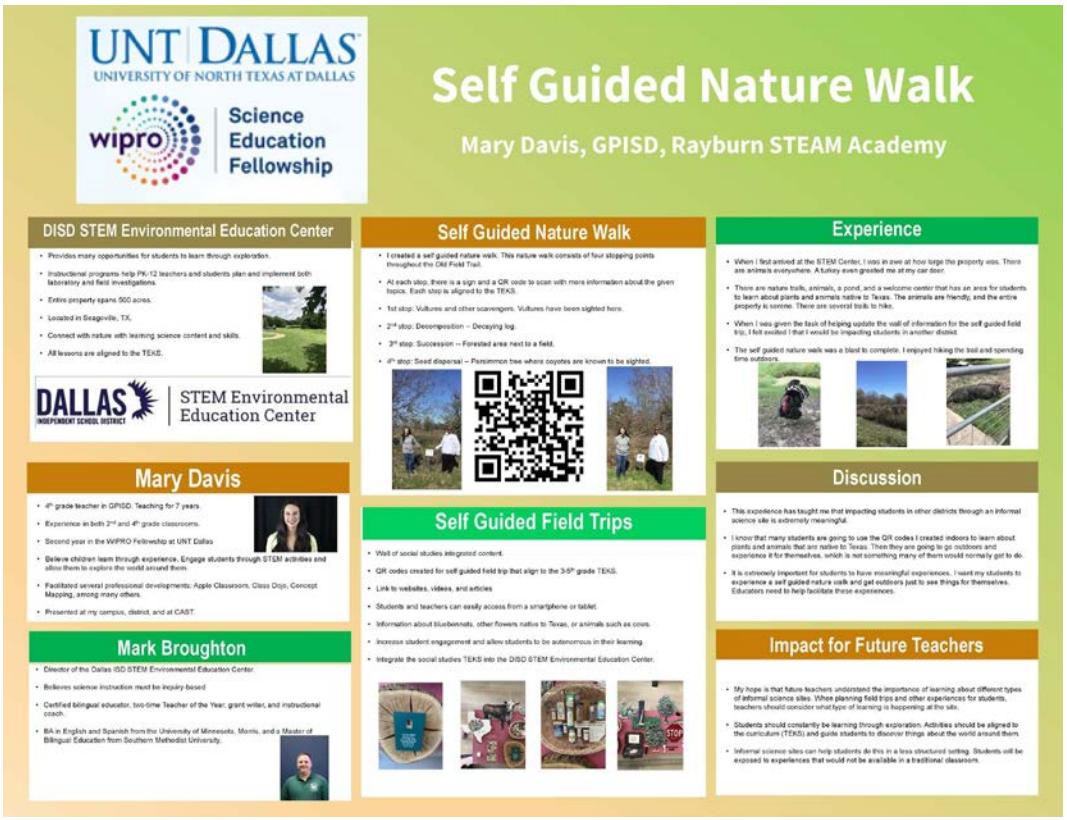
Science Classroom in the Park
Tracey Craft, Townley Elementary, IISD
About me – Teacher and Wipro Fellow:
Science in my classroom:
About the site: Ray Roberts State Park
About my Informal Education Partner:
Why Informal Education Partnerships?
Consider my class:
My plan:
"RESEARCH SHOWS THAT WHEN CHILDREN LEARN AND PLAY WITH NATURE THEY ARE...
Healthier, both mentally and physically. Perform better in school. Have higher self-esteem. More cooperative with others. More creative. Better problem solvers. Have higher self-confidence.
Feel more connected with nature. And will be tomorrows conservation leaders." (from Texas Children in Nature)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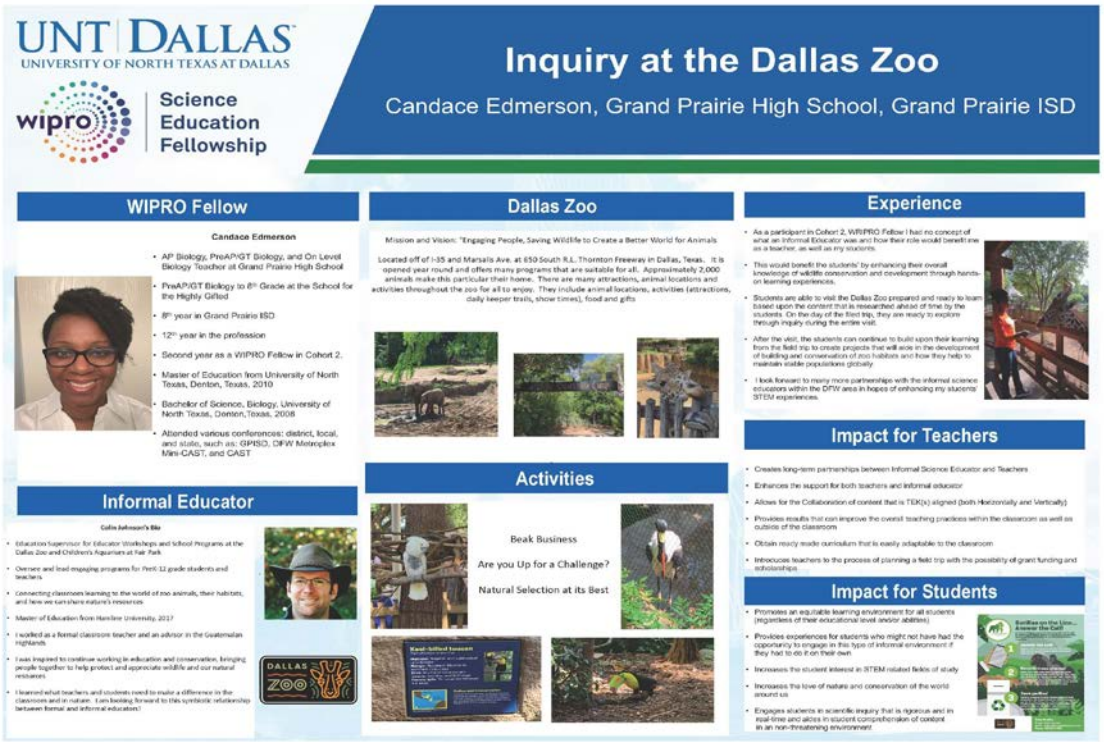
Science Education Fellowship
Self Guided Nature Walk
Mary Davis, GPISD, Rayburn STEAM Academy
DISD STEM Environmental Education Center
Provides many opportunities for students to learn through exploration.
Instructional programs help PK-12 teachers and students plan and implement both laboratory and field investigations.
Entire property spans 500 acres.
Located in Seagoville, TX.
Connect with nature with learning science content and skills.
All lessons are aligned to the TEKS.
DALLAS INDEPENDENT SCHOOL DISTRICT
STEM Environmental Education Center
Mary Davis
4th grade teacher in GPISD. Teaching for 7 years.
Experience in both 2nd and 4th grade classrooms.
Second year in the WIPRO Fellowship at UNT Dallas
Believe children learn through experience. Engage students through STEM activities and allow them to explore the world around them.
Facilitated several professional developments: Apple Classroom, Class Dojo, Concept Mapping, among many others.
Presented at my campus, district, and at CAST.
Mark Broughton
Director of the Dallas ISD STEM Environmental Education Center.
Believes science instruction must be inquiry-based.
Certified bilingual educator, two-time Teacher of the Year, grant writer, and instructional coach.
BA in English and Spanish from the University of Minnesota, Morris, and a Master of Bilingual Education from Southern Methodist University.
Self Guided Nature Walk
I created a self guided nature walk. This nature walk consists of four stopping points throughout the Old Field Trail.
At each stop, there is a sign and a QR code to scan with more information about the given topics. Each stop is aligned to the TEKS.
1st stop: Vultures and other scavengers. Vultures have been sighted here.
2nd stop: Decomposition – Decaying log.
3rd stop: Succession – Forested area next to a field.
4th stop: Seed dispersal – Persimmon tree where coyotes are known to be sighted.
Self Guided Field Trips
Wall of social studies integrated content.
QR codes created for self guided field trip that align to the 3-5th grade TEKS.
Link to websites, videos, and articles
Students and teachers can easily access from a smartphone or tablet.
Information about bluebonnets, other flowers native to Texas, or animals such as cows.
Increase student engagement and allow students to be autonomous in their learning.
Integrate the social studies TEKS into the DISD STEM Environmental Education Center.
Experience
When I first arrived at the STEM Center, I was in awe at how large the property was. There are animals everywhere. A turkey even greeted me at my car door.
There are nature trails, animals, a pond, and a welcome center that has an area for students to learn about plants and animals native to Texas. The animals are friendly, and the entire property is serene. There are several trails to hike.
When I was given the task of helping update the wall of information for the self guided field trip, I felt excited I that I would be impacting students in another district.
The self guided nature walk was a blast to complete. I enjoyed hiking the trail and spending time outdoors.
Discussion
This experience has taught me that impacting students in other districts through an informal science site is extremely meaningful.
I know that many students are going to use the QR codes I created indoors to learn about plants and animals that are native to Texas. Then they are going to go outdoors and experience it for themselves, which is not something many of them would normally get to do.
It is extremely important for students to have meaningful experiences. I want my students to experience a self guided nature walk and get outdoors just to see things for themselves. Educators need to help facilitate these experiences.
Impact for Future Teachers
My hope is that future teachers understand the importance of learning about different types of informal science sites. When planning field trips and other experiences for students, teachers should consider what type of learning is happening at the site.
Students should constantly be learning through exploration. Activities should be aligned to the curriculum (TEKS) and guide students to discover things about the world around them.
Informal science sites can help students do this in a less structured setting. Students will be exposed to experiences that would not be available in a traditional classroom.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Science Education Fellowship
Inquiry at the Dallas Zoo
Candace Edmerson, Grand Prairie High School, Grand Prairie ISD
WIPRO Fellow
Candace Edmerson
AP Biology, PreAP/GT Biology, and On Level Biology Teacher at Grand Prairie High School
PreAP/GT Biology to 8th Grade at the School for the Highly Gifted
8th year in Grand Prairie ISD
12th year in the profession
Second year as a WIPRO Fellow in Cohort 2.
Master of Education from University of North Texas, Denton, Texas, 2010
Bachelor of Science, Biology, University of North Texas, Denton, Texas, 2008
Attended various conferences: district, local, and state, such as: GPISD, DFW Metroplex Mini-CAST, and CAST
Informal Educator
Collin Johnson's Bio
Education Supervisor for Educator Workshops and School Programs at the Dallas Zoo and Children's Aquarium at Fair Park
Oversee and lead engaging programs for PreK-12 grade students and teachers.
Connecting classroom learning to the world of zoo animals, their habitats, and how we can share nature's resources
Master of Education from Hamline University, 2017
I worked as a formal classroom teacher and an advisor in the Guatemalan highlands
I was inspired to continue working in education and conservation, bringing people together to help protect and appreciate wildlife and our natural resources.
I learned what teachers and students need to make a difference in the classroom and in nature. I am looking forward to this symbiotic relationship between formal and informal educators!
DALLAS ZOO
Dallas Zoo
Mission and Vision: "Engaging People, Saving Wildlife to Create a Better World for Animals
Located off of I-35 and Marsalis Ave. at 650 South R.L. Thornton Freeway in Dallas, Texas. It is opened year round and offers many programs that are suitable for all. Approximately 2,000 animals make this particular their home. There are many attractions, animal locations and activities throughout the zoo for all to enjoy. They include animal locations, activities (attractions, daily keeper trails, show times), food and gifts
Activities
Beak Business
Are you Up for a Challenge?
Natural Selection at its Best
Experience
As a participant in Cohort 2, WIPRO Fellow I had no concept of what an Informal Educator was and how their role would benefit me as a teacher, as well as my students.
This would benefit the students' by enhancing their overall knowledge of wildlife conservation and development through hands-on learning experiences.
Students are able to visit the Dallas Zoo prepared and ready to learn based upon the content that is researched ahead of time by the students. On the day of the field trip, they are ready to explore through inquiry during the entire visit.
After the visit, the students can continue to build upon their learning from the field trip to create projects that will aide in the development of building and conservation of zoo habitats and how they help to maintain viable populations globally.
I look forward to many more partnerships with the informal science educators within the DFW area in hopes of enhancing my students' STEM experiences.
Impact for Teachers
Creates long-term partnerships between Informal Science Educator and Teachers
Enhances the support for both teachers and informal educator
Allows for the Collaboration of content that is TEK(s) aligned (both Horizontally and Vertically)
Provides results that can improve the overall teaching practices within the classroom as well as outside of the classroom
Obtain ready made curriculum that is easily adaptable to the classroom
Introduces teachers to the process of planning a field trip with the possibility of grant funding and scholarships
Impact for Students
Promotes an equitable learning environment for all students (regardless of their educational level and/or abilities)
Provides experiences for students who might not have had the opportunity to engage in this type of informal environment if they had to do it on their own
Increases the student interest in STEM related fields of study
Increases the love of nature and conservation of the world around us
Engages students in scientific inquiry that is rigorous and in real-time and aides in student comprehension of content in an non-threatening environment

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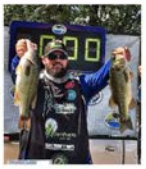
wipro Science Education Fellowship

Power of Partnership

Matthew Gaines, Cedar Hill ISD, Lake Ridge Elementary

Meet the WIPRO Fellow

Greetings! My name is Matthew Gaines and I have been a 5th grade science teacher in Cedar Hill, Texas for 5 years. I was voted Teacher of the Year for Lake Ridge Elementary in only my second year. I was very honored and humbled to receive such a title and to be view so highly by my educational peers. I continue to passionately drive my students to reach their highest potential and to inspire confidence.



My science coordinator worked very hard to get me to agree to return to school. I didn't want to go back to the classroom. However, I am beyond ecstatic that I signed up. Since being in the WIPRO program I have seen my competence and confidence grow tremendously. I still have lessons that flop, but I know how to respond to them now and measure the growth of my scholars as well as myself. Since being in the WIPRO program I have also been sought out to help write district curriculum, lead professional development sessions, and lead vertical and horizontal team meetings.

Outside of the classroom I enjoy fishing for fun and competition. I am married my beautiful wife Carol who also happens to be my fishing partner. Fishing is our second passion. Last year we won over 10,000 dollars just doing what we love.

I often integrate my passion for fishing into my lessons throughout the year. My enthusiasm while discussing how I use science in fishing makes the learning authentic. I also take all of my students to a local lake and I teach them how to fish after the big state tests. At the end of the day they get to take home a fishing rod and reel of their own.

Informal Educator Spotlight

Zoe Ann Stinchcomb works at the Texas Freshwater Fisheries Center in Athens, Texas in education and outreach. Prior to joining Texas Parks and Wildlife Department she was the senior naturalist at the River Legacy Living Science Center in Arlington, Texas. She also carried out public programming for the Dallas Zoo, Texas State Aquarium and the Oklahoma City Zoo.

All of her life she has been especially drawn in by watery places and their inhabitants, so much so that she could (should?) be considered a river rat.

When not working (or playing) in Texas, Stinchcomb enjoys spending time at her home on the remote Aleutian island of Adak, Alaska, with her husband, Larry D. Hodge.

TEXAS PARKS & WILDLIFE — TEXAS FRESHWATER FISHERIES CENTER

Informal Educational Facility

I was partnered with the Texas Parks and Wildlife Department to assist with the Fish Hatcheries facility in Athens, Texas. The Freshwater Fish Hatchery is an amazing place to learn about science.

They are home to the ShareLunker Program that breeds various fish species to promote a healthier collection of fish for Texas waterways. Fishermen who catch large fish can call the program and they will drive out to pick up the fish to return it to the facility for spawning purposes. This ensures genetically superior fish will thrive in Texas.

The facility is also home to several fishing ponds where visitors can rent fishing equipment for free and learn how to fish.

During our first few meetings, it became clear they needed assistance with linking some of the already great things they do to the Texas learning standards. This would make the facility more attractive to teachers to bring their students.

Our Accomplishments

While on one of my earlier visits to the facility, I took note of several things I wanted to improve.

First Project

- Updated and replenish fishing equipment
- Achieved through a grant
- IKE Foundation sent 60 new rods and reels
- 3,200 dollar value
- Will ensure frustration free learning experience

Second Project

- Pop-Up Station for Field Trips
- TEKS based and aligned hands-on activity
- Modern take on an old fishing philosophy
- Integrated with already established activities
- Match the Hatch Game
  - Observe nature for clues
  - Match the bait to the abundant forage
  - Teacher-led student discovery

Importance of Informal Education

Why is the Partnership Important?

The informal sites provide:

- Educators who are experts in specific fields
- Focused experiences on science concepts
- Real world connection to the classroom
- An adventure outside of school for kids
- Authentic learning activities

The classroom educators provide:

- Expertise on Texas Learning Standards
- An understanding of learning deficits
- "Customers" to bring via field trips
- Creative methods to engage students

Personal Classroom Benefits

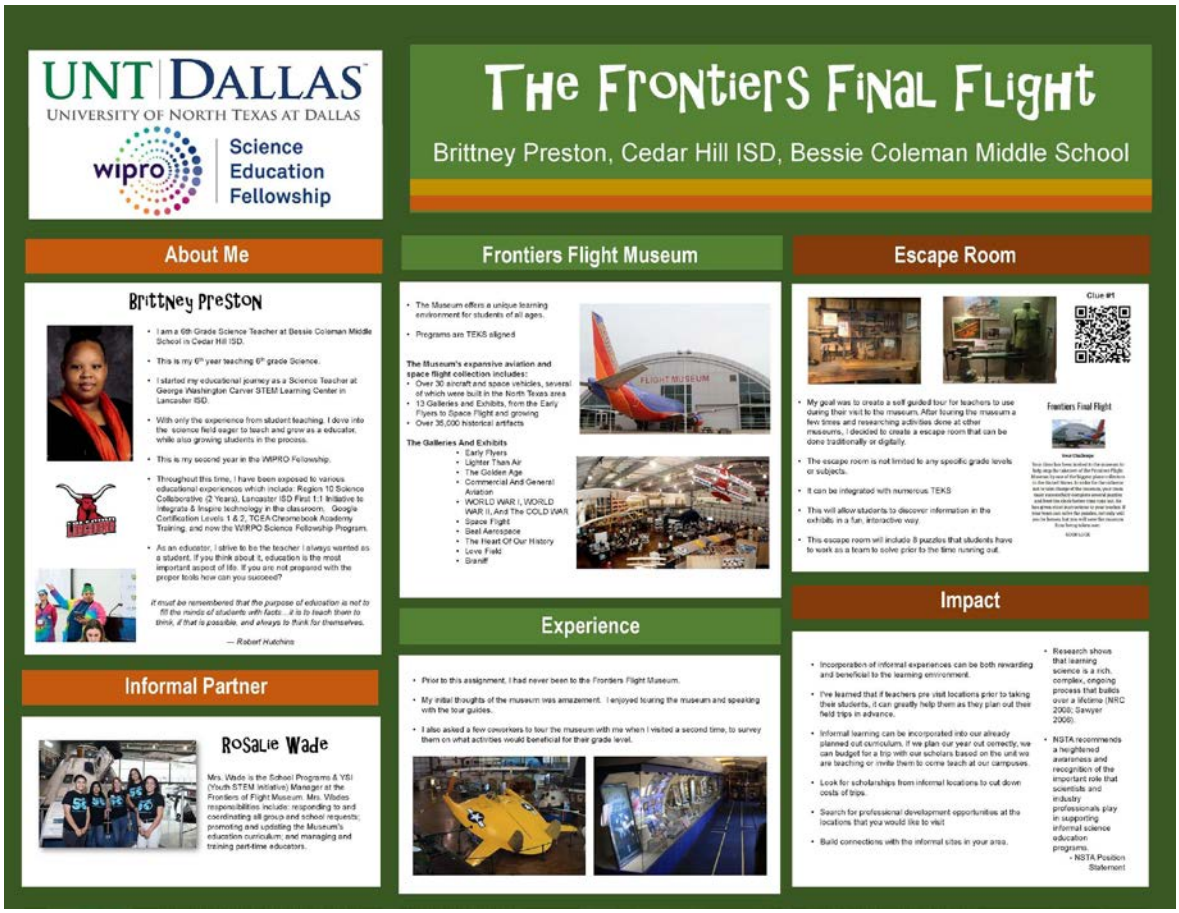
How has this helped my personal classroom?

- Easy integration into LRE Fishing club
- Allows material to be presented in authentic ways
- Applies to nearly all science concepts taught
- Added student buy-in for authentic learning
- Realistic classroom connections from site
- Bridges gap from classroom to real-world

Future Implications for Teachers

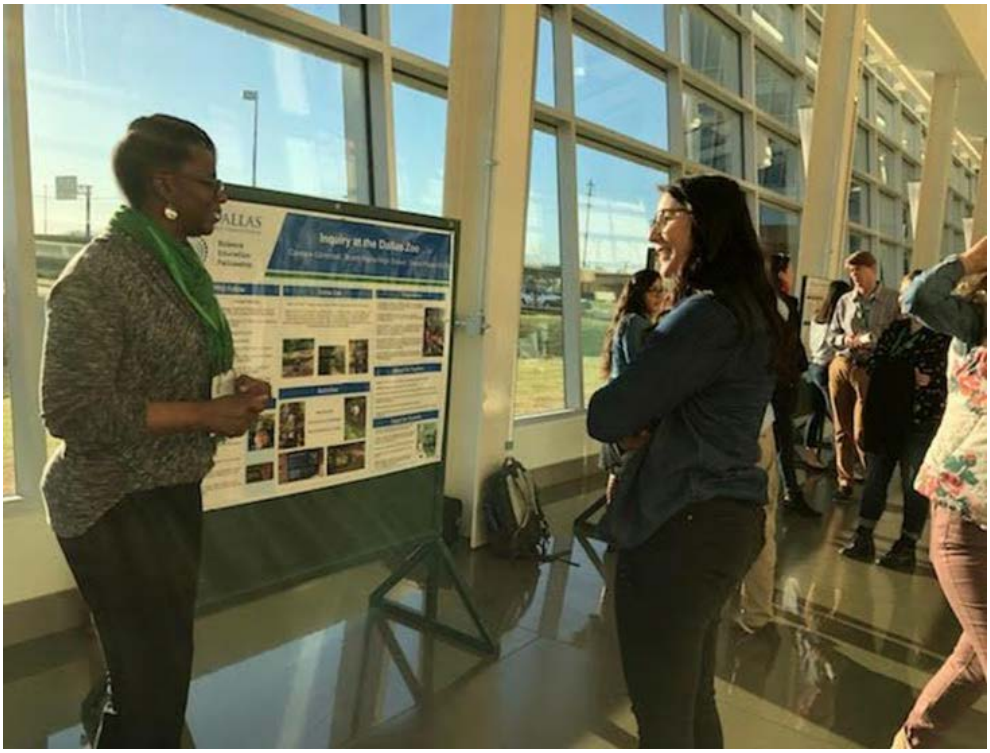
How will this help other educators?

- Lessons and ideas can be brought back to campus
- Real-world application to science
- TEKS aligned lessons at informal sites
- Hands-on experiences for students
- Professional relationships for the future
- Allows teachers to utilize unfamiliar resources
- Opportunities for outside of classroom learning
- Affordable local learning experiences


UNT DALLAS
UNIVERSITY OF NORTH TEXAS AT DALLAS
wipro
Science Education Fellowship
The Frontiers Final Flight
Brittney Preston, Cedar Hill ISD, Bessie Coleman Middle School
About Me
Brittney Preston
I am a 6th Grade Science Teacher at Bessie Coleman Middle School in Cedar Hill ISD.
This is my 6th year teaching 6th grade Science.
I started my educational journey as a Science Teacher at George Washington Carver STEM Learning Center in Lancaster ISD.
With only the experience from student teaching, I dove into the science field eager to teach and grow as a educator, while also growing students in the process.
This is my second year in the WIPRO Fellowship.
Throughout this time, I have been exposed to various educational experiences which include: Region 10 Science Collaborative (2 Years), Lancaster ISD First 1:1 Initiative to Integrate & Inspire technology in the classroom. Google Certification Levels 1 & 2, TCEA Chromebook Academy Training, and now the WIPRO Science Fellowship Program.
As an educator, I strive to be the teacher I always wanted as a student. If you think about it, education is the most important aspect of life. If you are not prepared with the proper tools how can you succeed?
It must be remembered that the purpose of education is not to fill the minds of students with facts... it is to teach them to think, if that is possible, and always to think for themselves.
— Robert Hutchins
Frontiers Flight Museum
The Museum offers a unique learning environment for students of all ages.
Programs are TEKS aligned
The Museum's expansive aviation and space flight collection includes:
Over 30 aircraft and space vehicles, several of which were built in the North Texas area
13 Galleries and Exhibits, from the Early Flyers to Space Flight and growing
Over 35,000 historical artifacts
The Galleries And Exhibits
Early Flyers
Lighter Than Air
The Golden Age
Commercial And General Aviation
WORLD WAR I, WORLD WAR II, And The COLD WAR
Space Flight
Bell Aerospace
The Heart Of Our History
Love Field
Braniff
Escape Room
Clue #1
My goal was to create a self guided tour for teachers to use during their visit to the museum. After touring the museum a few times and researching activities done at other museums, I decided to create a escape room that can be done traditionally or digitally.
The escape room is not limited to any specific grade levels or subjects.
It can be integrated with numerous TEKS
This will allow students to discover information in the exhibits in a fun, interactive way.
This escape room will include 8 puzzles that students have to work as a team to solve prior to the time running out.
Frontiers Final Flight
Impact
Incorporation of informal experiences can be both rewarding and beneficial to the learning environment.
I've learned that if teachers pre visit locations prior to taking their students, it can greatly help them as they plan out their field trips in advance.
Informal learning can be incorporated into our already planned out curriculum. If we plan our year out correctly, we can budget for a trip with our scholars based on the unit we are teaching or invite them to come teach at our campuses.
Look for scholarships from informal locations to cut down costs of trips.
Search for professional development opportunities at the locations that you would like to visit
Build connections with the informal sites in your area.
Research shows that learning science is a rich, complex, ongoing process that builds over a lifetime (NRC 2009; Sawyer 2006).
NSTA recommends a heightened awareness and recognition of the important role that scientists and industry professionals play in supporting informal science education programs.
- NSTA Position Statement
Experience
Prior to this assignment, I had never been to the Frontiers Flight Museum.
My initial thoughts of the museum was amazement. I enjoyed touring the museum and speaking with the tour guides.
I also asked a few coworkers to tour the museum with me when I visited a second time, to survey them on what activities would beneficial for their grade level.
Informal Partner
Rosalie Wade
Mrs. Wade is the School Programs & YSI (Youth STEM Initiative) Manager at the Frontiers of Flight Museum. Mrs. Wades responsibilities include: responding to and coordinating all group and school requests; promoting and updating the Museum's education curriculum; and managing and training part-time educators.


Power of Partnership


UNT DALLAS
Flight
Middle School


Inquiry at the Dallas Zoo

Presentation at the UNT Dallas Research Symposium, April 27th

Dr. Narayan is having all the C2 fellows present the poster they are creating for their district or personal project for their GPS at the Student Research Poster Symposium at UNTD on April 27th, 2020. All the fellows expressed an interest in presenting at the symposium. Dr. Narayan sent individual personal invites to their District administrators, Principals and Vice Principals inviting them to the event to support the fellows.

Creating a District Science Coordinator GPS

The idea for a DSC GPS came about as a result of the three DSCs from Lancaster, Cedar Hill and DeSoto ISD attending the Wipro Leadership Conference. For their GPS the three DSCs from the above districts, Faith Milika, Jeremy Hesse and Danielle Moore decided to team up and create a summer Professional development program for their teachers. All three districts are relatively small and close to each other hence it makes sense for them to combine their resources and jointly host a two-day, free Science Professional Development program. Science Teachers from the three host districts will attend, teachers from two other Wipro Districts, Irving and Grand Prairie will also be invited to attend. Teachers from a non-Wipro School district, Duncanville ISD, close in proximity to UNT Dallas and the three hosting school districts will also be invited. Presenters at the summer PD will also include Wipro C1 and C2 Fellows. While Dr. Narayan cannot pay to the Wipro Fellows to offer these professional development sessions, she can purchase materials for their classroom. She also plans on giving the DSCs a small stipend for their efforts towards the GPS. The above plans are still nebulous, so their next meeting on March 25th will clarify and solidify many of these details.

All three DSCS requested that Dr. Narayan invite the informal science educators to one of the sessions and that they display the materials C2 Fellows created for their informal projects at those sites. To quote Dr. Narayan, *"I believe all this goes a very long way in displaying the multiplier effect Wipro SEF and our Fellows have."*

PROGRAM EVALUATION AND RESEARCH GROUP (DHA)

A summary of the evaluation report follows.

Wipro Science Education Fellowship

Mid-Year Survey Preliminary Findings–Blind 2019-2020

Prepared by: DAVID HEIL & ASSOCIATES, INC.
Innovations in Science Learning

Method

- Formative survey administered online mid-year in January & February 2020 to:
  - Texas Cohorts 2 & 3, District Coordinators & Informal Science Education Partners
  - California, Florida & Missouri Cohorts 1 & 2 and District Coordinators
- The survey was anonymous and included
  - Open-ended items
  - Likert-scale, close-ended items

Sample*

	Year 1 Fellows	Year 2 Fellows	Dist. Coord.
Site 1	100%	100%	70%
Site 2	95%	95%	100%
Site 3	95%	95%	90%
Site 4	100%	95%	50%
Total Responses/Rate	**97%**	**96%**	**77%**

*Fellows & DC percentages have been rounded to help preserve anonymity.

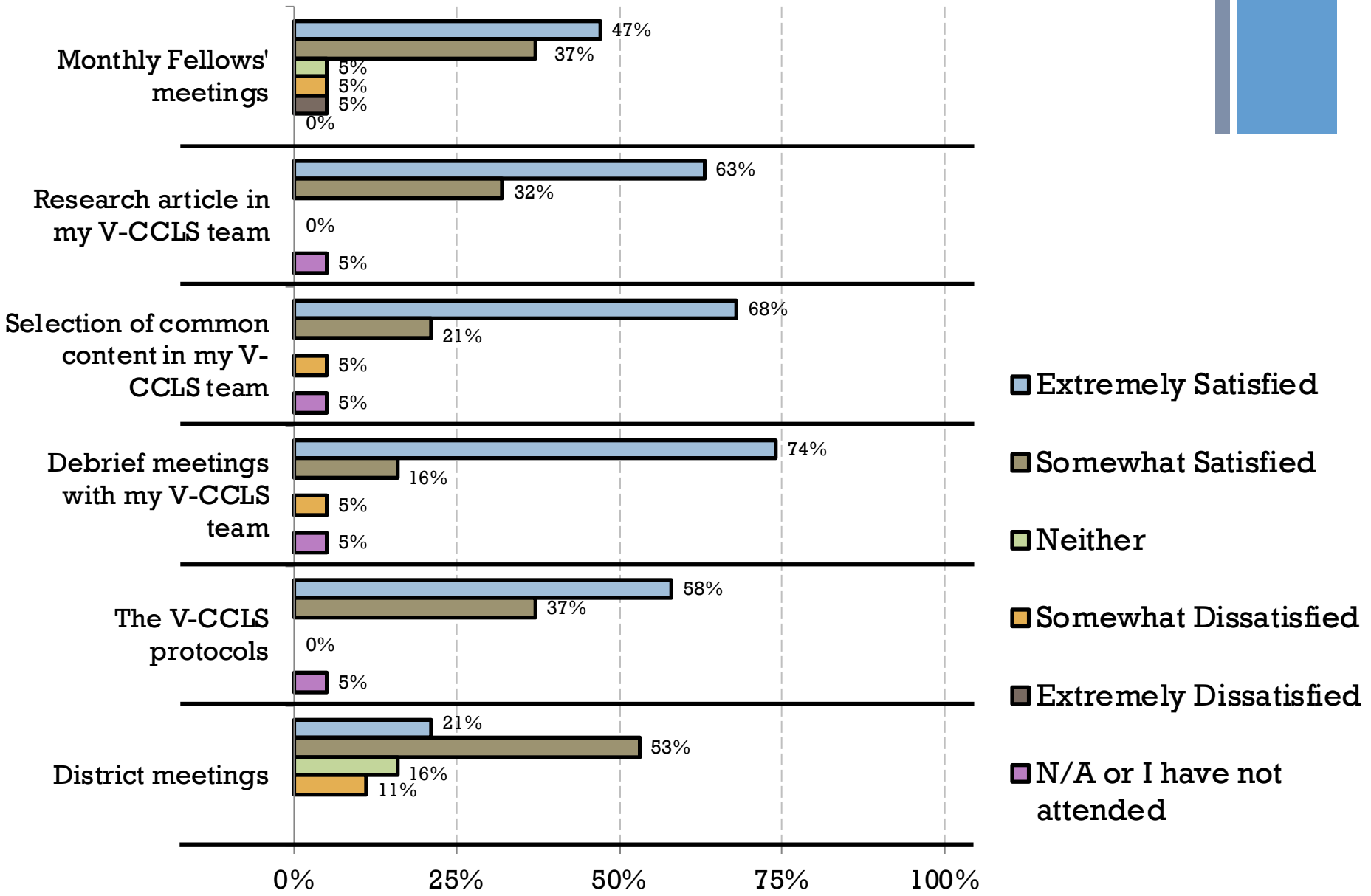
Findings: Overall Satisfaction

- Overall satisfaction findings varied from state to state. All together, 84% of respondents were “Extremely Satisfied” or “Somewhat Satisfied” with Wipro SEF this year

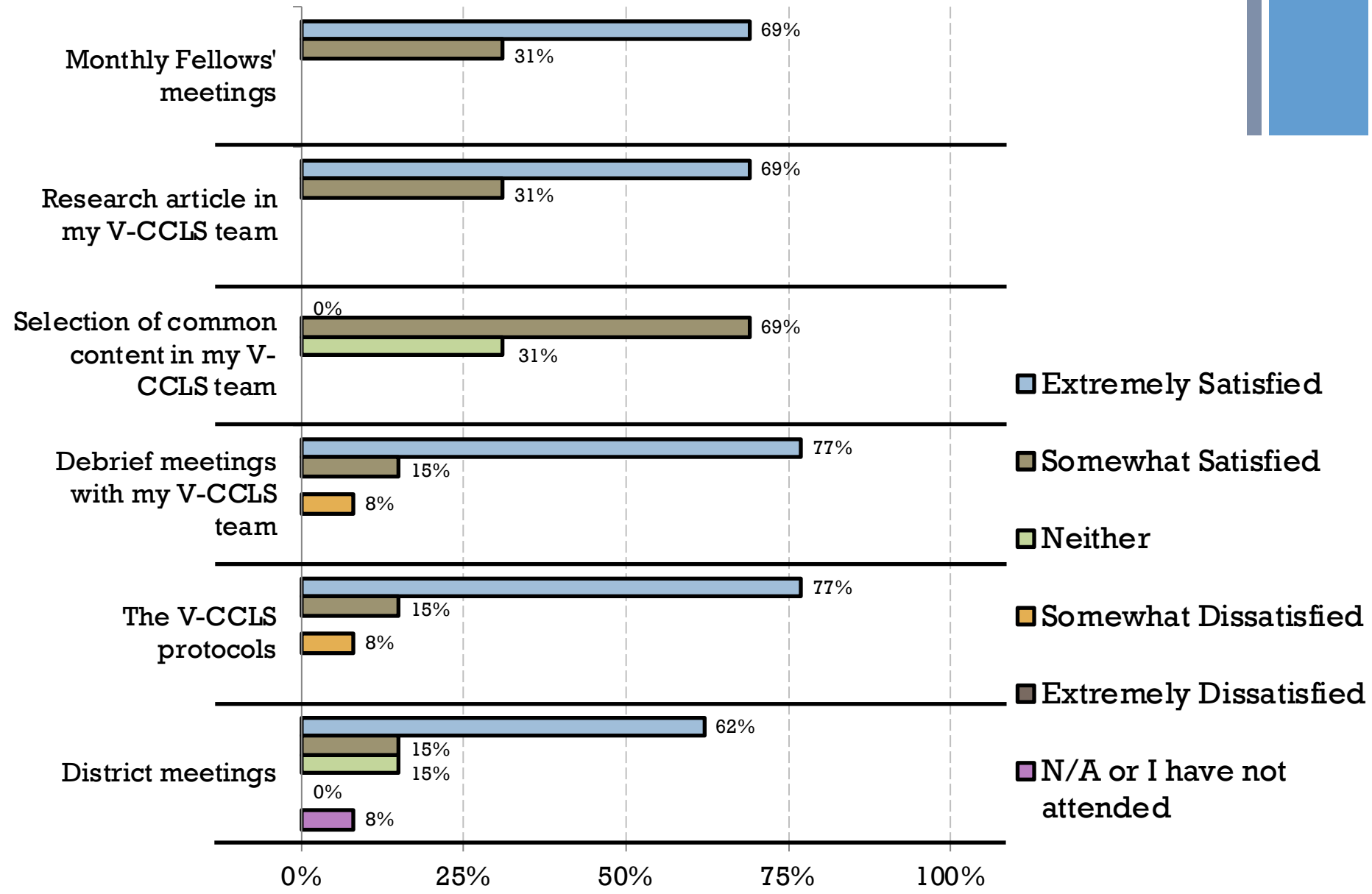
	Extremely Satisfied	Somewhat Satisfied	Total
Site 1	26%	58%	84%
Site 2	52%	43%	95%
Site 3	36%	39%	65%
Site 4	63%	32%	95%

Rating scale: 1-Extremely dissatisfied; 2-Somewhat dissatisfied; 3-Neither satisfied nor dissatisfied; 4-Somewhat satisfied; 5-Extremely satisfied

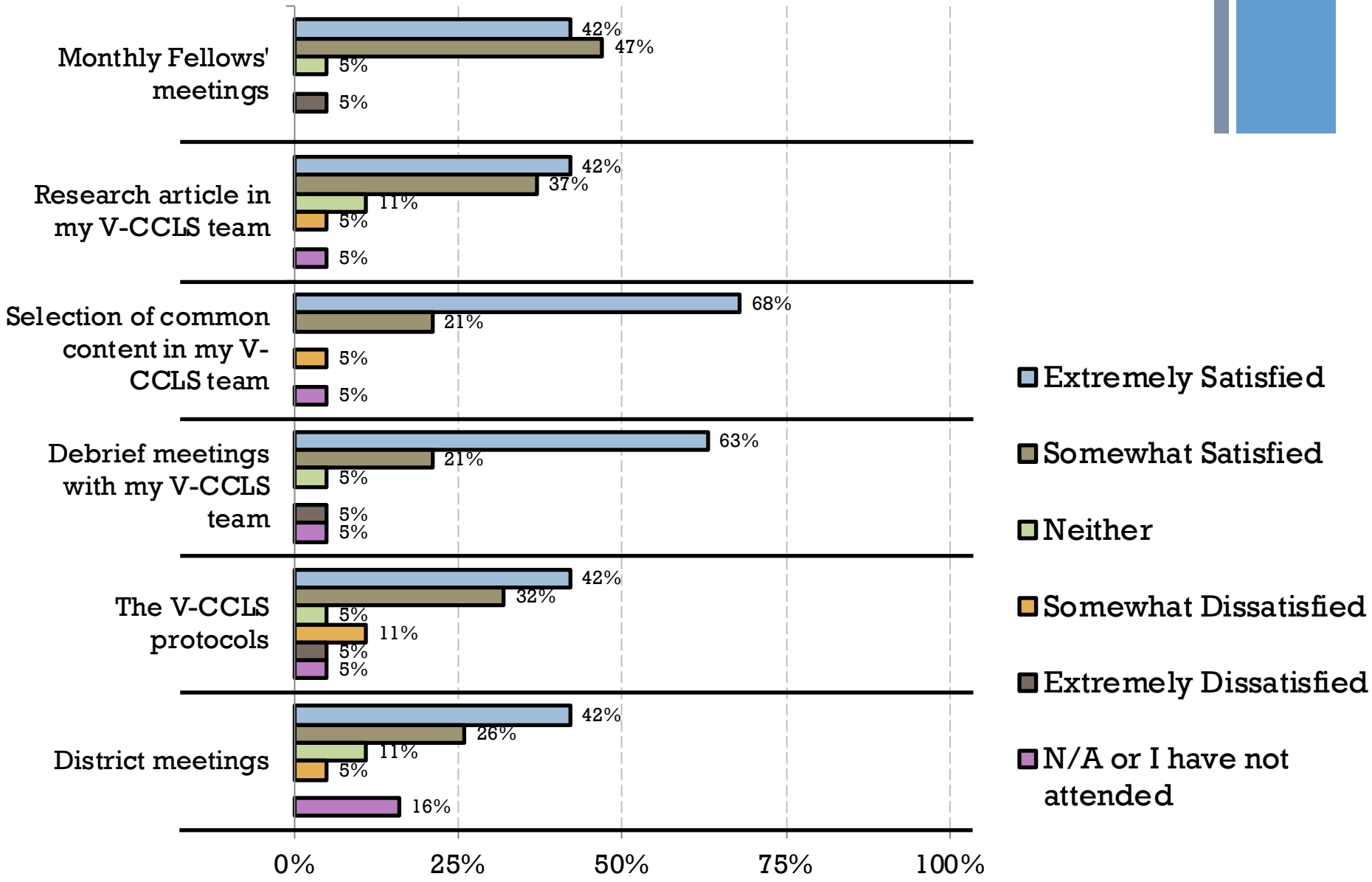
Program Features' Ratings: Site 1 Year 1 Fellows



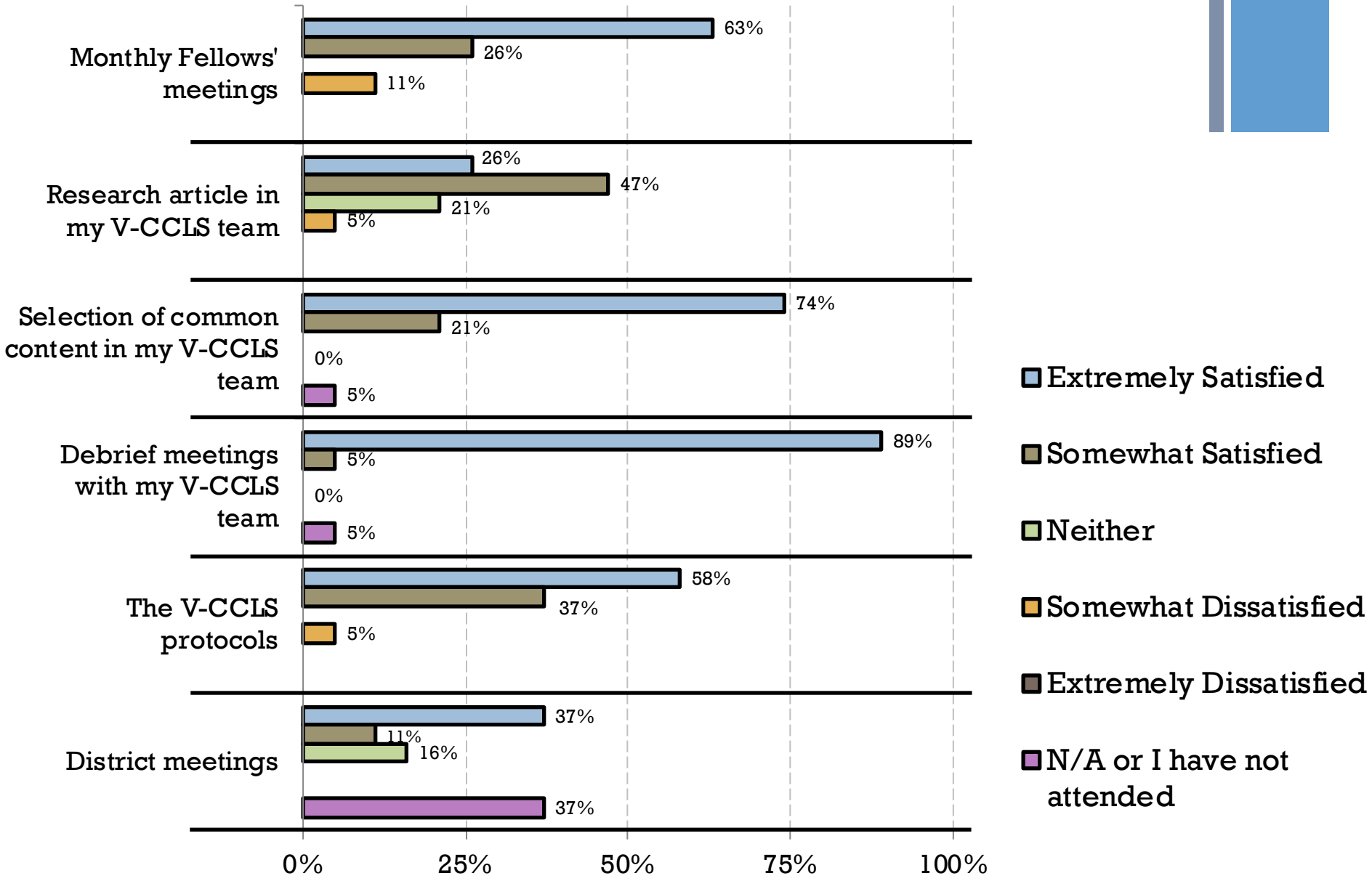
Program Features' Ratings: Site 2 Year 1 Fellows



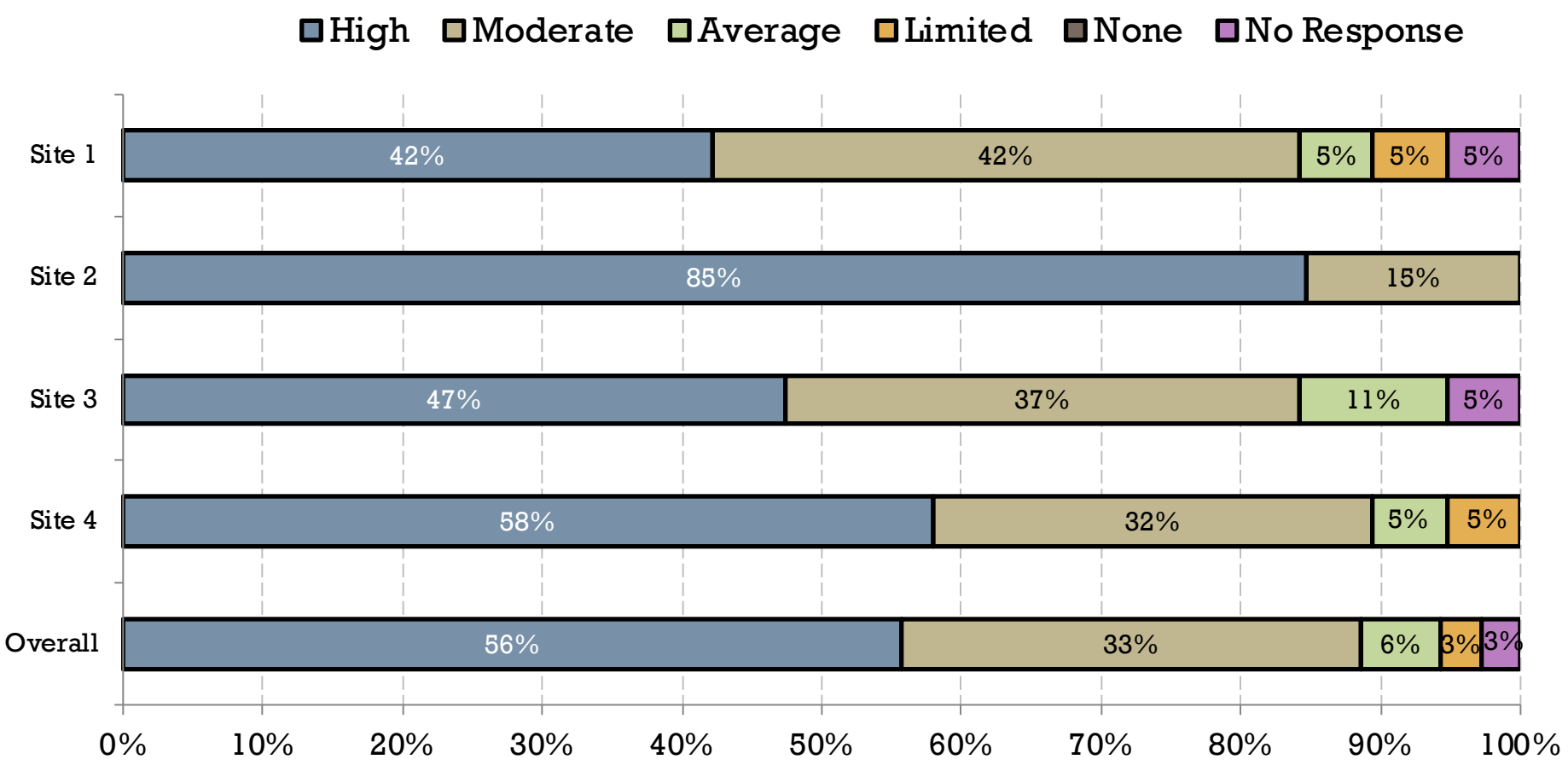
Program Features' Ratings: Site 3 Year 1 Fellows



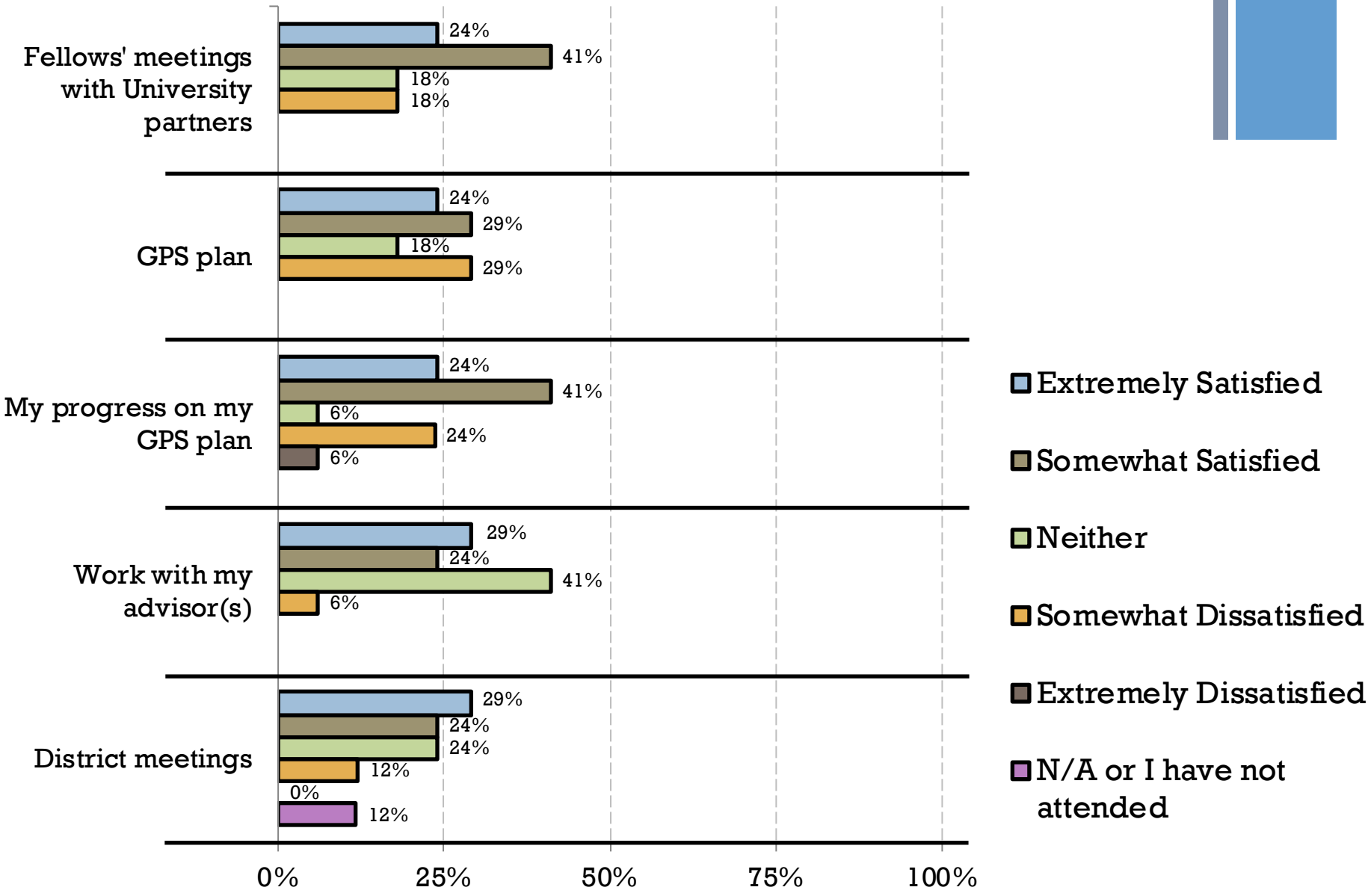
Program Features' Ratings: Site 4 Year 1 Fellows



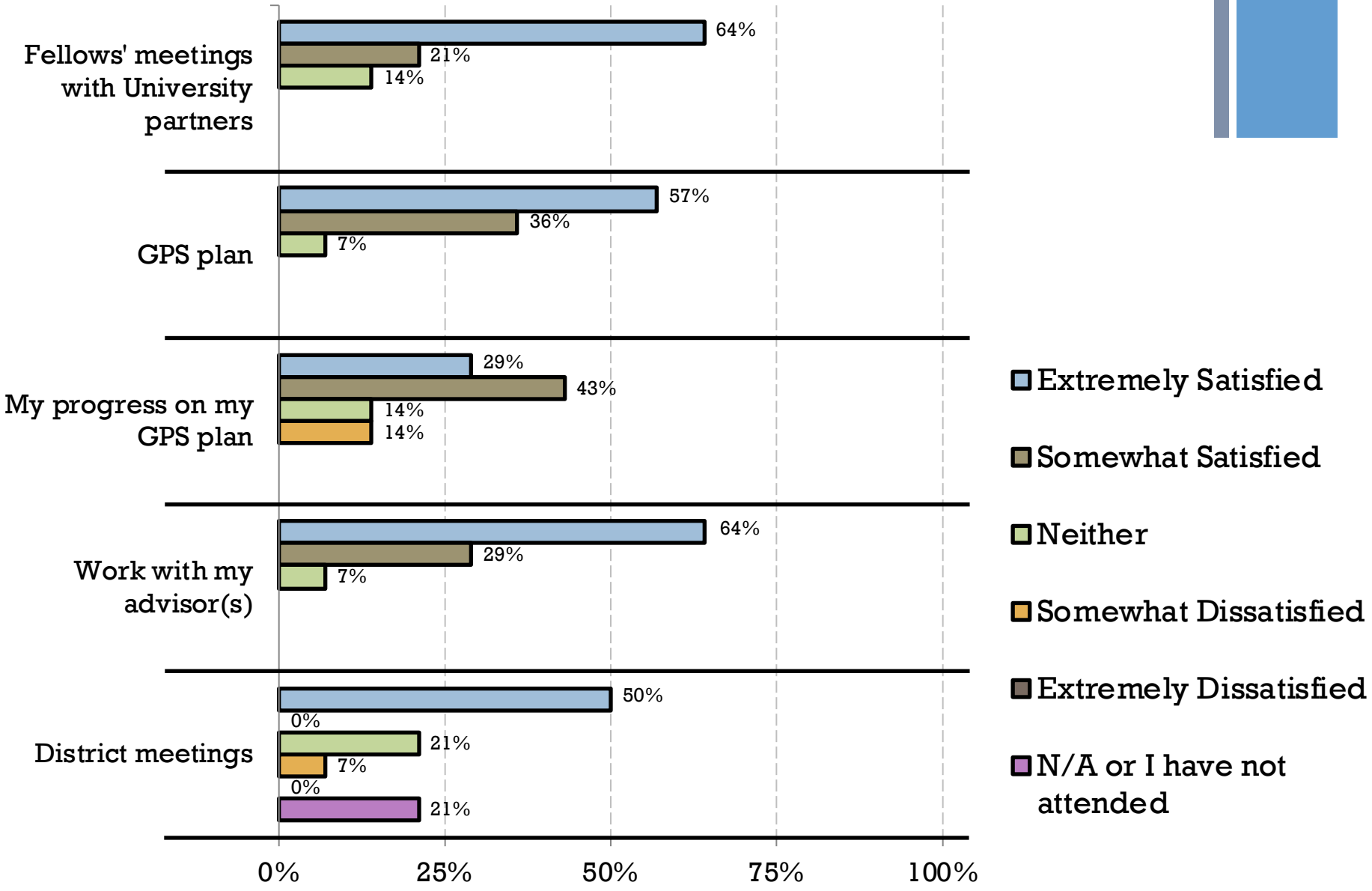
Value of V-CCLS Presentation Experience (Year 1 Fellows)



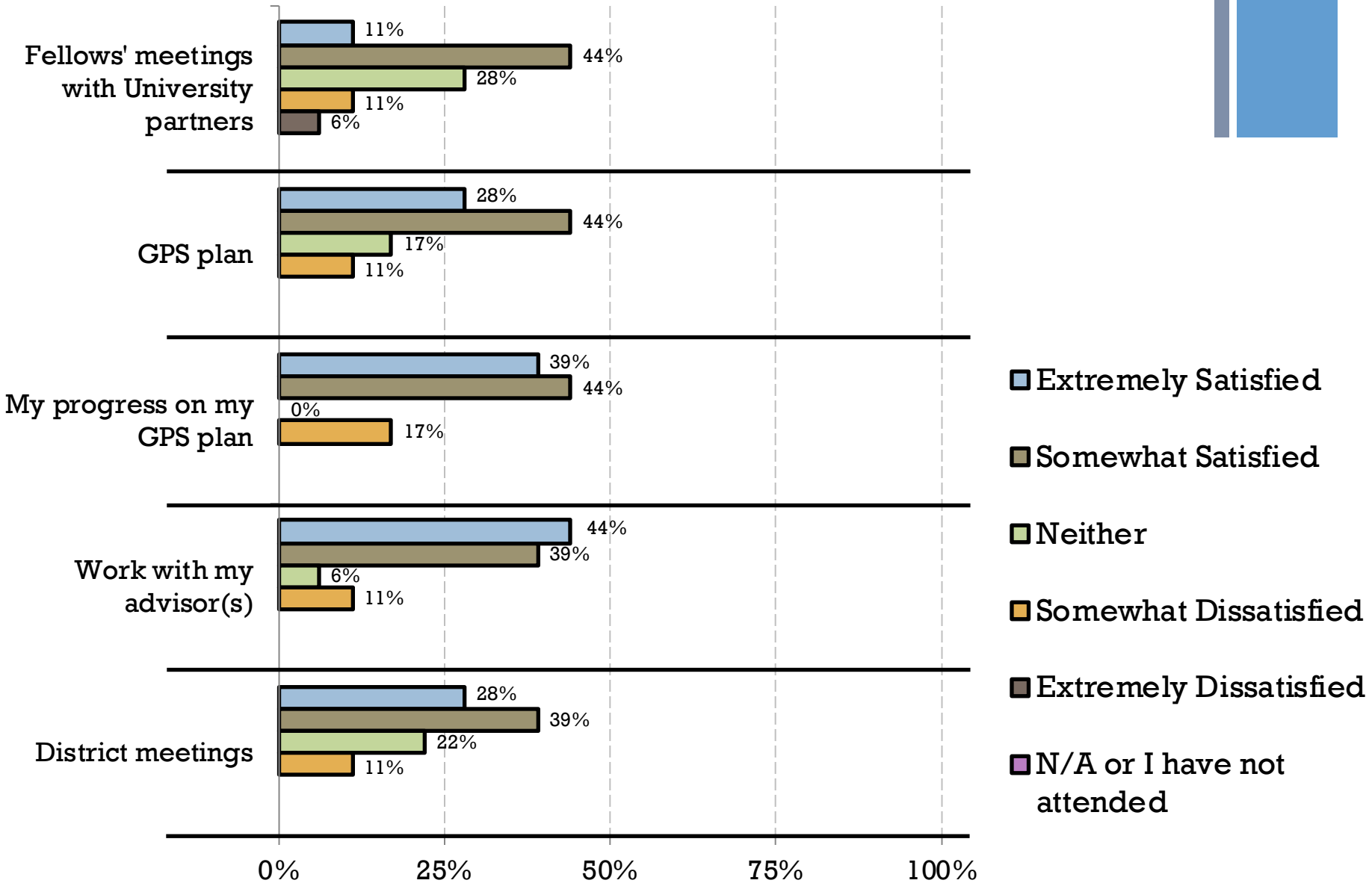
Program Features' Ratings: Site 1 Year 2 Fellows



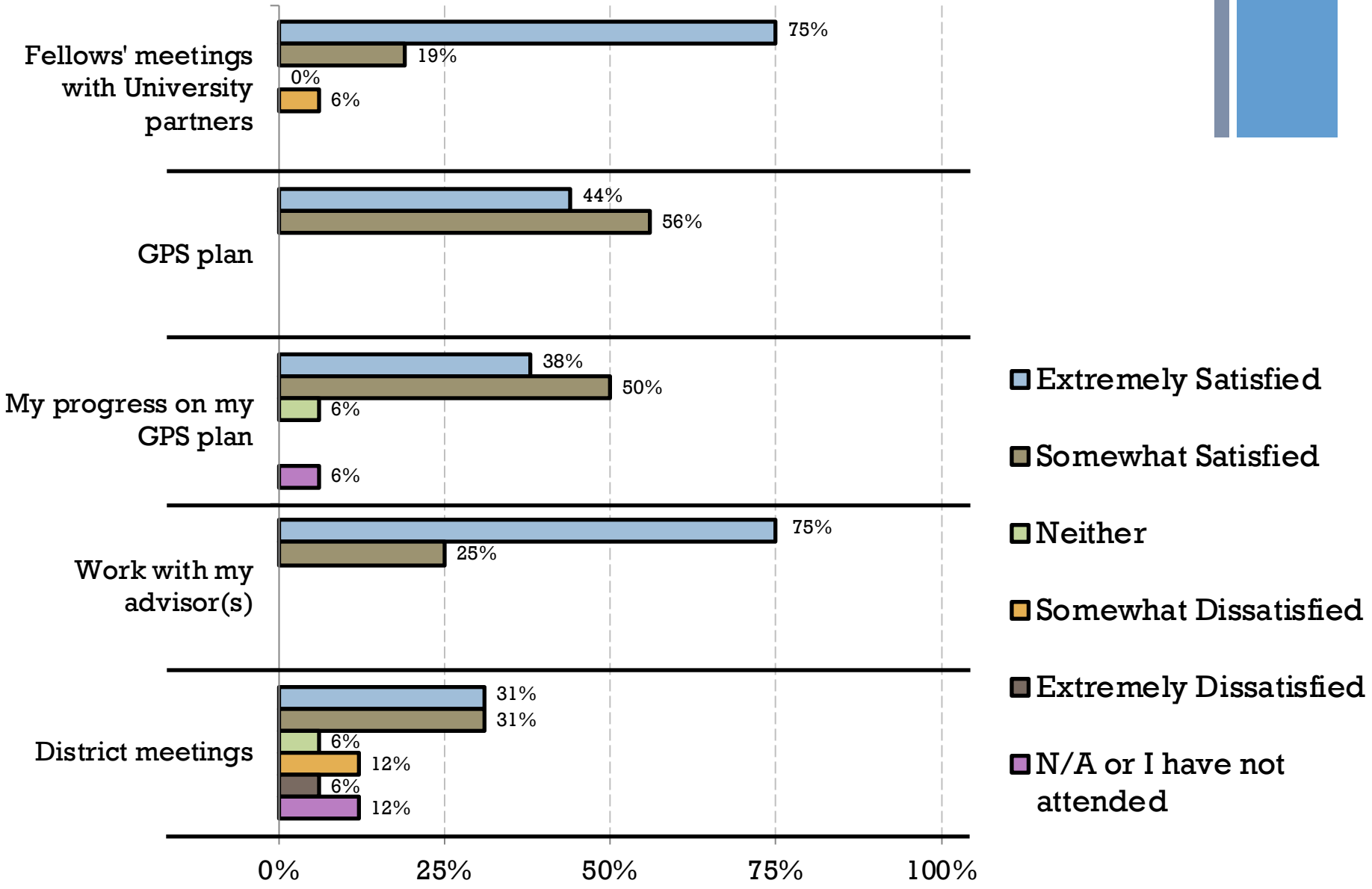
Program Features' Ratings: Site 2 Year 2 Fellows



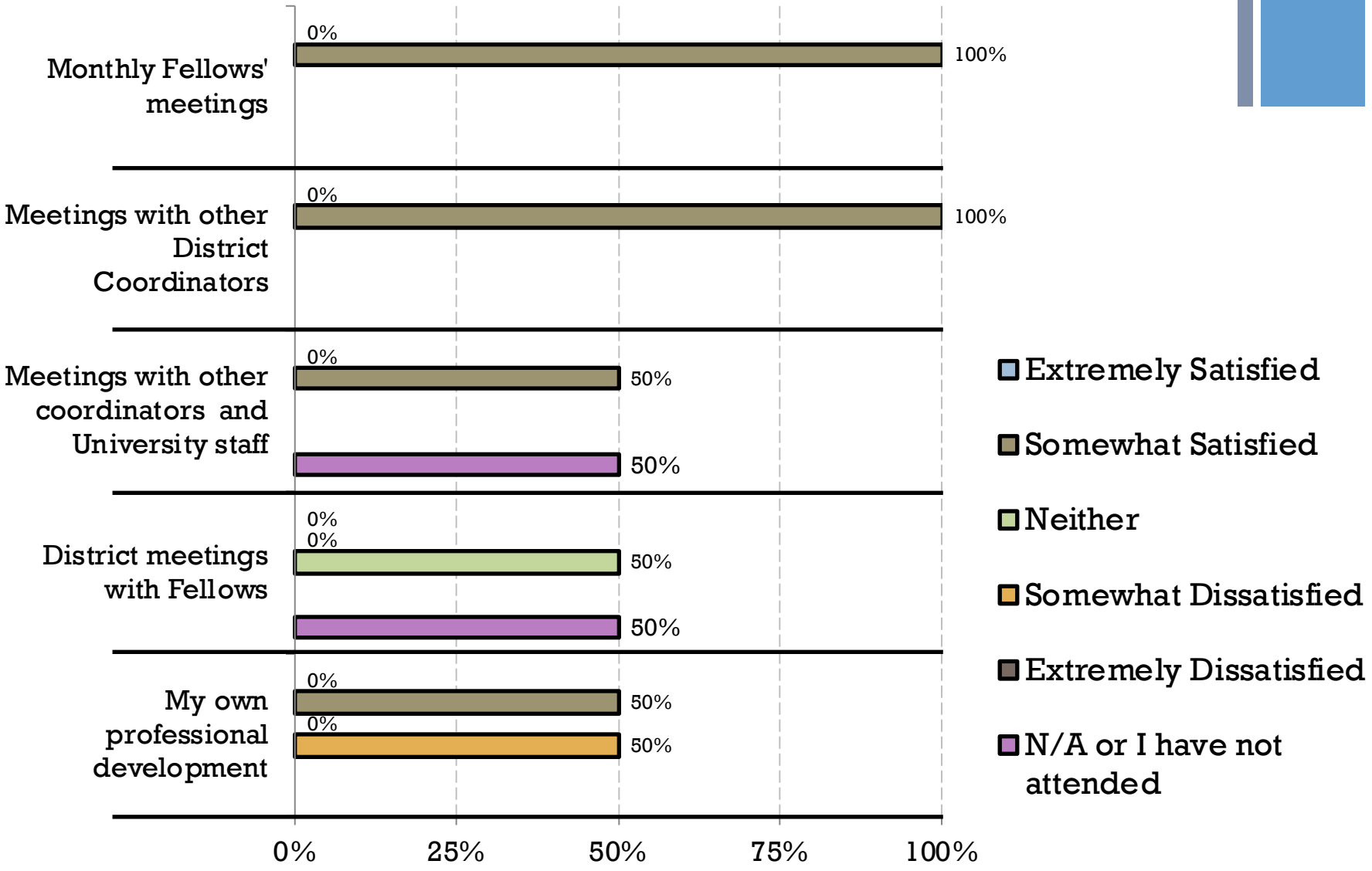
Program Features' Ratings: Site 3 Year 2 Fellows



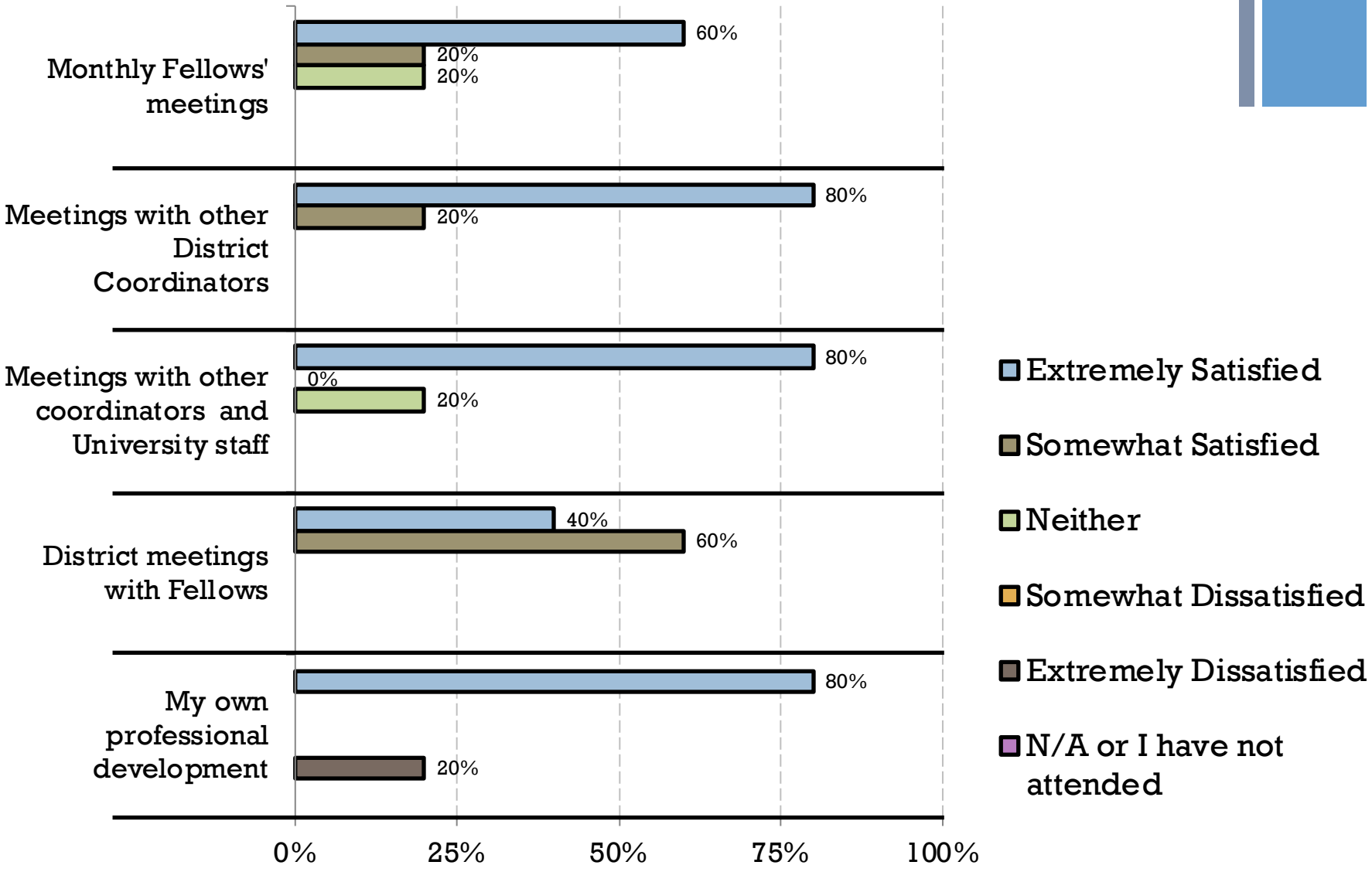
Program Features' Ratings: Site 4 Year 2 Fellows



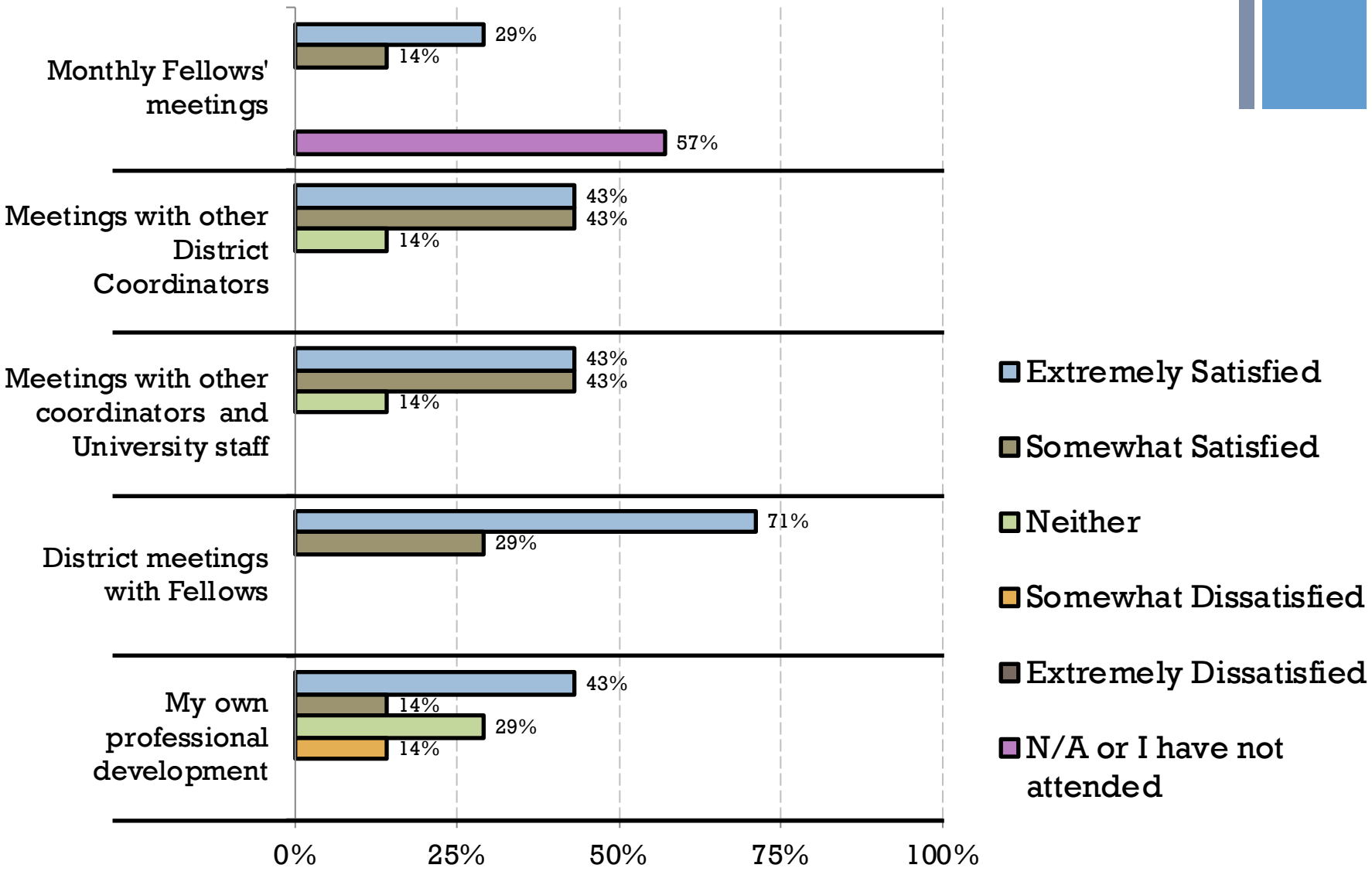
Program Features' Ratings: Site 1 DCs



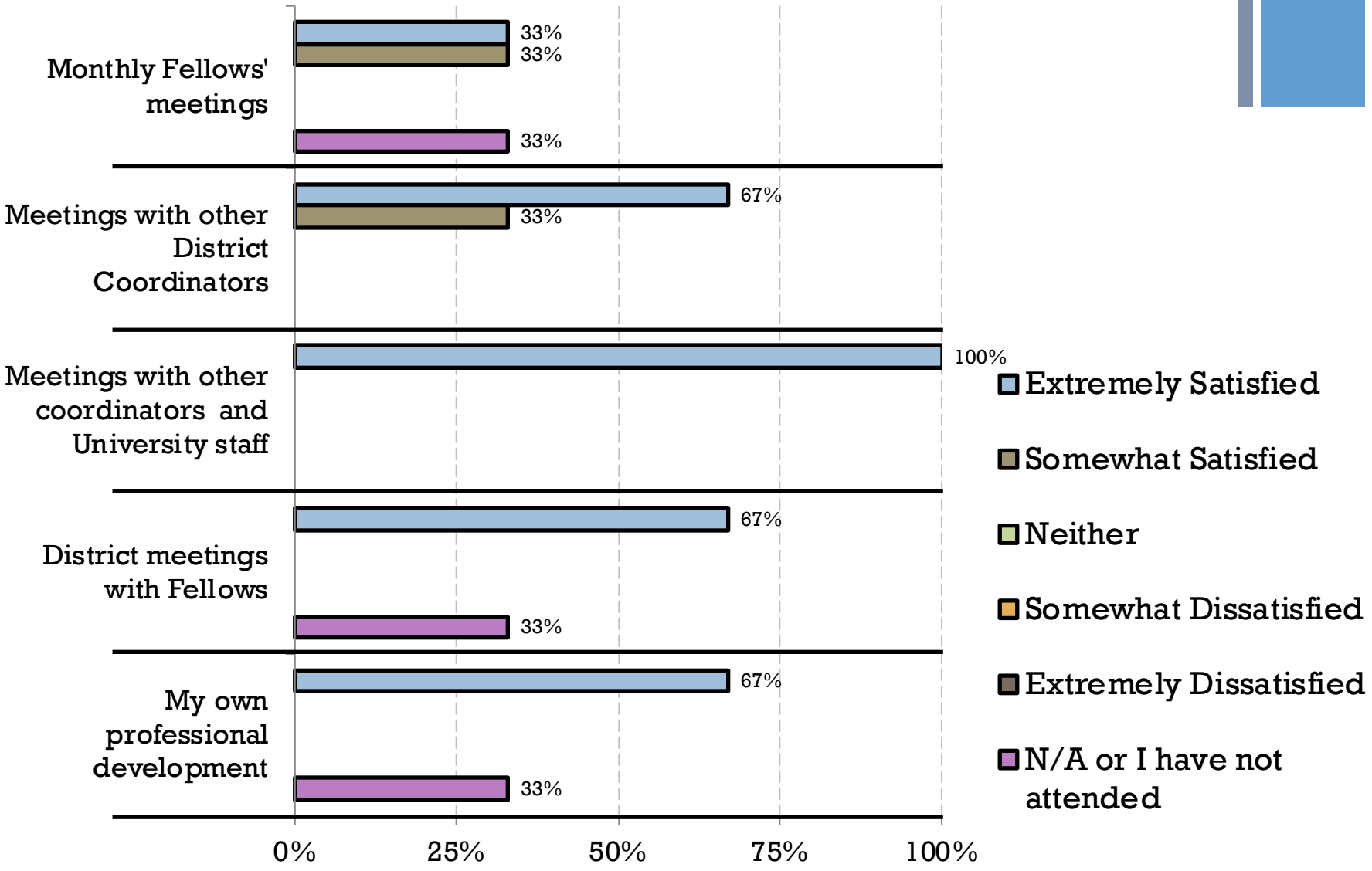
Program Features' Ratings: Site 2 DCs



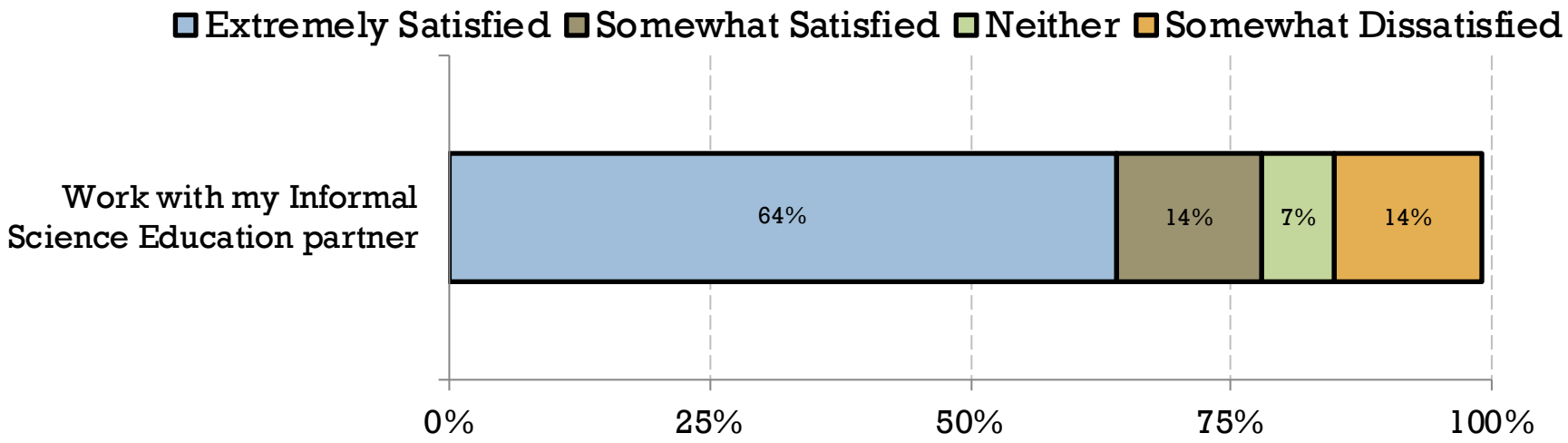
Program Features' Ratings: Site 3 DCs



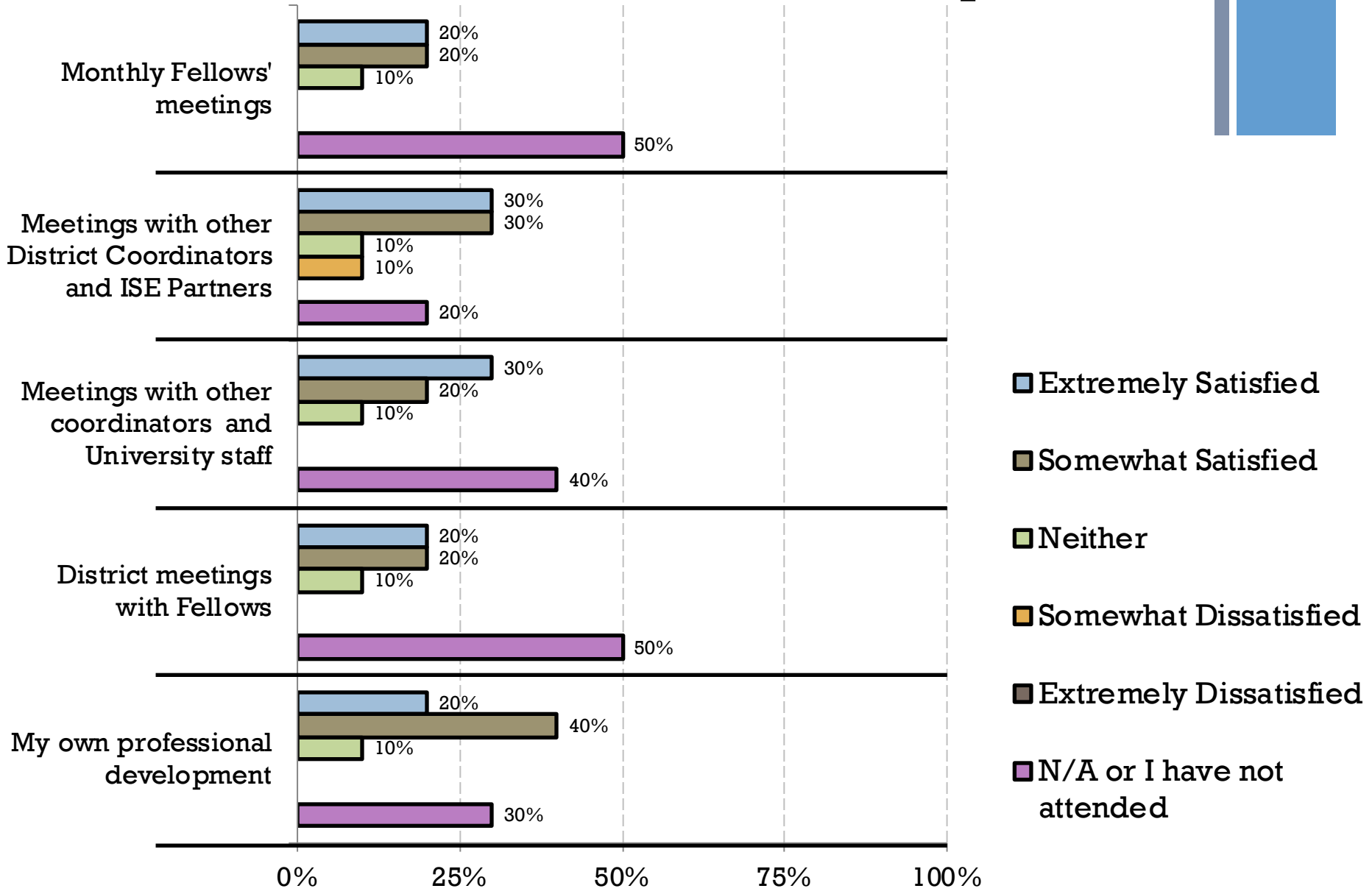
Program Features' Ratings: Site 4 DCs



TX: ISE Collaboration–Fellows' Response



TX: ISE Collaboration–ISE's Response



Site 1 Year 1 Fellows' Warm Feedback

- **Site 1 Year 1 Fellows reported favorably on:**
  - **Networking and collaboration (74%)**
  - **Increased vertical (K-12) awareness (21%)**
  - **Improved knowledge of science standards (16%)**

- *"The most successful part of the fellowship has been the opportunity to collaborate & work with colleagues from other elementary, middle & high school classrooms."*
- *"I really enjoyed seeing the vertical alignment of the same standard & how it changed throughout the different grades. It really pointed out how one grade builds on the grades below & if something is missed in lower grades, it can really impact that student's learning."*
- *"I appreciate how we see the standards & testing benchmarks for all the grade levels. This puts such a value on science education at every grade."*

Site 1 Year 1 Fellows' Cool Feedback

- **Site 1 Year 1 Fellows felt challenged by:**
  - **Meeting communication (33%)**
  - **Amount of work/time required (32%)**
  - **Technology (26%)**
  - **Compensation delays (22%)**

- *"Need more notice of where meetings are located."*
- *"[What is challenging is] balancing life, teaching, family, Wipro."*
- *"The thing that has been difficult is finding equipment & personnel to videotape lessons."*
- *"Recording video & sound has been challenging."*
- *"Still have not received my stipend (as of 2/2/20)."*

Site 1 Year 2 Fellows' Warm Feedback

- **Site 1 Year 2 Fellows reported favorably on:**
  - **Networking and collaboration (50%)**
  - **Leadership growth (25%)**

- *"Collaborating with other educators at different work sites has been absolutely amazing!!"*
- *"I think the most successful part of being in Wipro SEF has been my ability to grow as an educator & a leader at the same time. I never looked at myself as a leader, & now I do see myself as a leader in science education. It has brought out more of my passion in science & I want to spread that passion for science to everyone in the education field."*
- *"Working with other like-minded educators truly helps me become better & reinvigorates me as a teacher and leader."*

Site 1 Year 2 Fellows' Cool Feedback

- **Site 1 Year 2 Fellows felt challenged by:**
  - **GPS (53%)**
  - **Amount of work/time required (29%)**
  - **Unclear expectations (29%)**

- *"There was plenty of idea sharing at the end of our first year, but I would have liked more leadership/feedback during the writing process & actual planning of our projects & the planning for & matching with mentors. I also would have liked meeting with my cohort more often."*
- *"Getting the GPS paperwork & getting ideas 'approved' early in the year would have been helpful."*
- *"I think the biggest challenge is finding the time. I enjoy the time, but other responsibilities, both personal and job-related, can make it stressful to spend a weekend day on work."*
- *"I would like better guidance on expectations for the GPS."*

Site 1 DCs' Feedback

Warm Feedback

- *"I have appreciated being more involved in the planning & facilitating professional development during meetings."*
- *"The introduction of the science & engineering practices throughout the first half of the year has been successful."*

Cool Feedback

- *"The payment process through the university has been challenging."*
- *"The GPS projects need an improved introduction, expectations & supporting/mentoring of the teachers."*

Site 2 Year 1 Fellows' Warm Feedback

- **Site 2 Year 1 Fellows reported favorably on:**
  - **Networking and collaboration (46%)**
  - **Improved teaching (42%)**
  - **Improved leadership (27%)**

- *"Learning different things, like how to edit a website & the many techniques & strategies learned from other Fellows has been invaluable."*
- *"During my V-CCLS, we did project-based learning. It was one of the best lessons I ever taught. My students were engaged, & it taught me to trust & expect more from my students."*
- *"When we finished our presentation, I felt very successful. When I had my first meeting with my H-CCLS group, it felt like I had reached another level. My confidence had grown, & I was not afraid to create a bigger project."*

Site 2 Year 1 Fellows' Cool Feedback

- **Site 2 Year 1 Fellows felt challenged by:**
  - **Amount of work/time required (58%)**
  - **Unclear expectations (36%)**
  - **Group dynamics (25%)**

- *"Balancing the workload is challenging."*
- *"We need clear rubrics written with the mindset of brevity."*
- *"Ignoring pessimism [from other Fellows] was difficult for me."*

Site 2 Year 2 Fellows' Warm Feedback

- **Site 2 Year 2 Fellows reported favorably on:**
  - **Networking and collaboration (50%)**
  - **Improved teaching (40%)**
  - **Improved leadership (40%)**

- *"Meeting other teachers to find out that we share a lot in common with regard to professional goals has been a success."*
- *"When I share my work with my peers, they often ask questions or want me to share activities that I complete in my classroom with them."*
- *"My district goal has helped me to become a teacher leader."*
- *"I am implementing strategies & approaches with my low performing students which I might not have had time to implement had I not been in the Wipro SEF program."*

Site 2 Year 2 Fellows' Cool Feedback

- **Site 2 Year 2 Fellows felt challenged by:**
  - **GPS process (40%)**
  - **Time/amount of work (40%)**

- *"Adhere to a more detailed calendar of tasks & expectations. The Year 2 schedule seems to be too vague or flexible so that it is easy to lose track of goals, deadlines."*
- *"The district & personal goal having to be different is challenging."*
- *"The challenge that I have encountered is the overwhelming amount of time & work that has to be completed on top of a full-time job."*

Site 2 DCs' Feedback

Warm Feedback

- *"The teachers in my district are showing growth in their instructional practice as they exhibit a greater sense of confidence concerning teaching science content."*
- *"Networking has been a great benefit of the program."*
- *"The opportunity for teachers to work together in vertical teams to find connections among content standards has allowed teachers to understand the importance of foundational concepts."*

Cool Feedback

- *"Time & dealing with Fellows who are struggling to fulfill the program's expectations are both challenging."*
- *"I think there should be some adjustment to the meetings. Too many times, I have had to listen to the same information over & over. Things take too long & need to be streamlined."*
- *"Less Saturday meetings & conferences."*

Site 3 Year 1 Fellows' Warm Feedback

- **Site 3 Year 1 Fellows reported favorably on:**
  - **Networking and collaboration (73%)**
  - **Improved teaching (37%)**
  - **Improved vertical (K-12) awareness (21%)**
  - **Giving/receiving feedback (21%)**

- *"As a 20-year teacher, I have benefited & been refreshed in teaching by interacting with professionals in different areas."*
- *"Being able to see how science is taught above & below my grade level has helped me modify my [teaching]."*
- *"I have learned & implemented some new strategies to improve student learning."*
- *"My group provided very clear feedback on my lessons & gave great suggestions & supports for my techniques and content integration."*

Site 3 Year 1 Fellows' Cool Feedback

- **Site 3 Year 1 Fellows felt challenged by:**
  - **Amount of work/time required (50%)**
  - **Travel (19%)**

- *"Lack of personal time & technology [challenges] made it difficult to keep up with requirements."*
- *"The biggest challenge has been trying to schedule meetings. The distance between some [in our group] creates a barrier."*
- *"Communication & knowing when to be where & what would be happening was not always clear prior to the meeting. Maybe more frequent emails/communications would help with this."*

Site 3 Year 2 Fellows' Warm Feedback

- **Site 3 Year 2 Fellows reported favorably on:**
  - **GPS (44%)**
  - **Networking and collaboration (28%)**
  - **Improved teaching (39%)**

- *"I have liked the alignment of my personal & district goals. Both support each other."*
- *"Wipro SEF & my GPS have helped me take a look at my science teaching practices & improve upon them."*
- *"Choosing my own program (my GPS) has made the most impact. I was able to choose something that relates to where I am in my career as well as helping my students learn."*

Site 3 Year 2 Fellows' Cool Feedback

- **Site 3 Year 2 Fellows felt challenged by:**
  - **Unclear communication (47%)**
  - **Lack of organization (38%)**
  - **Technology (29%)**
  - **Lack of consistency (18%)**
  - **GPS (18%)**

- *"Communication needs to be clear."*
- *"I still feel communication & organization is lacking."*
- *"Communicating expectations could be improved. I learn best & know what is expected when I see lots of good examples."*
- *"The Wix site is really quite frustrating. Need training in the technology used."*
- *"I have been extremely dissatisfied with Wix program. Cumbersome and time-consuming."*
- *"I feel we needed to either have more meetings as a group or with our advisors. I feel like there was too much freedom to choose a project & not enough evaluation of projects that were chosen."*

Site 3 DCs' Feedback

Warm Feedback

Five of seven Site 3 District Coordinators commented that the networking and collaboration has been the most successful aspect of the Wipro SEF program so far.

- *"Several Fellows mentioned that they saw great value in filming themselves teaching and receiving feedback."*
- *"My Fellows have enjoyed the vertical teaming with teachers in the area."*
- *"The opportunity for teachers to collaborate & receive constructive feedback in a safe environment has been positive."*

Cool Feedback

- *"Need better communication on the technology aspect."*
- *"Organization of the material & its presentation to the Fellows could be improved. Having more information ahead of meetings allows for better discussions."*
- *"Fellows are mentioning communication issues."*
- *"Need more organization & purpose."*

Site 4 Year 1 Fellows' Warm Feedback

- **Site 4 Year 1 Fellows reported favorably on:**
  - **Networking and collaboration (84%)**
  - **Improved teaching (37%)**
  - **Increased vertical (K-12) awareness (26%)**
  - **Equity/equity of voice awareness (26%)**
  - **More reflective practice (26%)**

- *"I have reflected more deeply on my practice & have thought about vertical alignment much more than before."*
- *"[Wipro SEF] allowed me to think about progressions & scaffolds that my students need coming from [lower grades]."*
- *"I have grown because there is so much to learn from others & collaboration is a key catalyst to growth."*
- *"Working with this team has also allowed me to try out new things & have thought partners to talk with. I've tried lots of new strategies & gotten great ideas from my colleagues."*
- *"I have improved my science instruction with strategies that have increased student engagement & equity of voice."*

Site 4 Year 1 Fellows' Cool Feedback

- **Site 4 Year 1 Fellows felt challenged by:**
  - **Meeting logistics (39%)**
  - **Time/amount of work (37%)**
  - **Travel (16%)**

- *"I feel like there haven't been many professional development learnings that I can take right into my practice [from the meetings]."*
- *"It would have been beneficial to know the schedule for the whole semester & perhaps year so we could plan our meetings and finish work in a timely manner."*
- *"Working 50 hours a week just in the classroom (not counting planning & grading) makes it absurdly difficult to also work on secondary projects."*
- *"The commute on a weekday can be hard. I wonder why weekend sessions aren't the norm?"*

Site 4 Year 2 Fellows' Warm Feedback

- **Site 4 Year 1 Fellows reported favorably on:**
  - **Networking and collaboration (53%)**
  - **GPS (42%)**
  - **University leadership & mentors (27%)**
  - **Improved teaching (25%)**
  - **Improved confidence & leadership skills (22%)**

- *"The most successful aspect of Wipro SEF is the time spent together with other teachers."*
- *"I am able to have good conversations with people who are trying to do better & want to talk about education from the point of view of science & science goals."*
- *"The most successful aspect of Wipro SEF has been access to the experts at [our university partner]."*
- *"I am more cognizant of how I teach & what it is to teach science in an engaging manner."*
- *"I feel more confident to use my voice in meetings & to have my input on issues where I would normally keep quiet."*

Site 4 Year 2 Fellows' Cool Feedback

- **Site 4 Year 2 Fellows felt challenged by:**
  - **Amount of work/time required (57%)**
  - **GPS (29%)**

- *"Time…it's a huge time commitment."*
- *"It has been difficult to split my focus between my GPS project & my classroom video taping. Both demand a lot of focus & I am struggling to do them both on top of my daily work."*
- *"Finding time to work on my GPS project."*

Site 4 DCs' Feedback

Warm Feedback

- *"Wipro SEF has provided my teachers with amazing professional learning opportunities & leadership opportunities in science education."*
- *"I have seen all of our teachers grow & shine in their science teaching. I'm so impressed with how everyone has risen to the level that they have in their work. All of our teachers are so busy, it's inspiring to see how much they are working to improve their science teaching with their colleagues."*
- *"I really love the program, believe that the Fellows are growing & working hard."*

Cool Feedback

- *"I struggle with feeling a bit disconnected from the Fellows & hope to figure out ways to be more connected to their work."*
- *"Need more time for DCs and Fellows to meet to get more connected & see where the district can help the Fellows."*
- *"The biggest challenge has been in the timing of our meetings & getting there on time for our Fellows."*

Topics of Interest to DCs for Their Own Professional Development

- Site 1
  - Equitable grading practices
  - Lesson development around NGSS
  - Best practices for academic/scientific vocab acquisition
  - Grant writing
- Site 2
  - Funding to support/enhance science
  - Managing work load
  - Elementary science
  - Learning about research
- Site 3
  - District implementation of Wipro SEF
  - Supporting Fellows
  - Elementary science & NGSS
- Site 4
  - Teaching leadership
  - Leveraging teacher leaders
  - Assessment
  - Tools & protocols used by Fellows

Overall Findings/Insights

- Overall satisfaction remained high for Sites 2 and 4 (95%).
  - For Site 1, the lower overall satisfaction rate was due to fewer participants choosing “extremely satisfied.”
  - For Site 3, the lower overall satisfaction rate was largely due to lower satisfaction of Year 2 Fellows (Cohort 1).
- This year saw a significant improvement in the Year 1 Fellows’ overall ratings of the V-CCLS presentation experience. 56% saw the V-CCLS experience as a high value compared with 43% last year.
- In TX, the ISE partnerships continue to be a highly rated component of the program by both the Fellows and the ISE partners.