



ADVANCING RECIPROCAL COMMUNITY ENGAGEMENT

Keystone Fellows



TABLE OF CONTENTS

01

FORWARD

02

INTRODUCTION

03

MEET KEYSTONE FELLOWS

04

**AMPLIFYING COMMUNITY
VOICE**

05

**MOVING ACROSS THE
SPECTRUM**

06

CONCLUSION

07

REFERENCES

08

ACKNOWLEDGEMENTS

FOREWORD

In 2024, Beyond100K began to explore a simple question - “How might we support our network in developing their community engagement capacity?” Concretizing belonging cannot happen without first interrogating how spaces are created for those most marginalized to come together to engage, shape and form a democratic society. Charting a Path to STEM Belonging and Success for Every Student hypothesized that transforming the Beyond100K Map into an even more actionable tool required understanding “how these challenges are experienced by Black, Latinx, and Native American STEM teachers and how the intersectionality of individuals’ identities impact their experiences (Beyond100K, 2023, p. 10).” Love and belonging are needs we all need fulfilled in order to achieve self-actualization as represented in Abraham Maslow’s hierarchy of needs. Maslow’s short time living with the Blackfoot Nation influenced his motivational theory (Blood & Heavy Head, 2007). At first glance most assume that moving up the pyramid is an individual task to accomplish. The First Nations’ Perspective, however, encompasses the role of the individual and the community as both are invaluable to the achievement of self-actualization. In fact, the community is there to guide the individual on their path towards self-actualization so that the

individual in turn serves their community. This reciprocal relationship between the individual and the community creates a sense of belonging, where individuals feel valued, supported, and connected to a larger whole.



Community is integral to belonging which means listening, engaging and sharing power with the community is a foundational cornerstone of classrooms of belonging.



The most pressing national and global challenges of today and tomorrow can only be tackled if we believe each person, and therefore the community in which they are situated, has a piece of the solution. This approach recognizes that communities possess valuable insights and solutions to address current and future challenges. To achieve this, institutions are called to expand their understanding of knowledge and expertise to include community wisdom. And in this moment they are called to become attuned to the communities in which they are situated. By embracing a more community-centered approach, institutions can foster a sense of connection and purpose in STEM for Black, Latinx, and Native American communities.

INTRODUCTION

Reciprocal community engagement is more than just collaboration—it is about co-creating solutions, building trust, and fostering relationships that lead to meaningful and lasting change with the people closest to an issue. This toolkit connects readers with network partners who are pioneering promising and actionable strategies rooted in community engagement. By sharing these approaches, we invite partners to explore how they might build equitable relationships within their own work—ensuring cultural responsiveness, relational accountability, and space for innovation.

At its core, this toolkit seeks to amplify the voices and experiences of network partners while offering concrete strategies for fostering authentic partnerships. Our approach integrates decolonizing methodologies by prioritizing and nurturing our relationships with each other and with the network partners highlighted in this resource (Jordan & Hall, 2023). We requested and received ongoing consent throughout the interview process with our network partners, and we documented our findings with the understanding that the Beyond100K network community would ultimately benefit from the knowledge we gained. The stories featured here highlight diverse experiences and also the process of deep engagement—offering reflection points that will allow partners to see themselves and their challenges reflected in these narratives.

Through our conversations with network partners, some key themes emerged that are worth highlighting as we think about strengthening community engagement. First and foremost, relationships matter—a lot. Trust, reciprocity, and mutual respect are at the heart of meaningful engagement. The most successful initiatives don't just invite community voices in; they actively co-create programs with them. We also heard that engagement works best when institutions align with existing community-led efforts rather than trying to reinvent the wheel. Many partners emphasized the importance of culturally responsive and decolonial approaches, which honor local knowledge, storytelling, and the lived experiences of those directly impacted.

At the same time, we heard loud and clear that systemic barriers—like limited funding, time constraints, and exclusion from decision-making—often get in the way. True engagement isn't just about showing up; it's about redistributing power and making sure communities have real influence, including ownership over their own data and narratives. Partners also emphasized the need for continuous reflection—questioning assumptions, checking biases, and making sure engagement efforts are truly collaborative and equitable. These themes remind us that community engagement isn't a one-size-fits-all process; it's an ongoing

relationship, built on trust and shared purpose. This toolkit is designed to help put these insights into action, making engagement more intentional, inclusive, and impactful.

We encourage network partners to ask: How does this resonate with my work? What can I learn from these approaches? How might I adapt these strategies to better serve my community? This toolkit is not meant to be static; rather, it is a living document that will evolve through shared learning, ongoing contributions, and continued dialogue. By engaging with this resource, partners become active participants in shaping a future where reciprocal community engagement is not just a practice—but a commitment to equity, collaboration, and shared power.

In today's shifting political and social climate, the urgency of reciprocal community engagement in STEM education has never been greater. Systemic barriers, policy changes, and growing disparities continue to impact Black, Latinx, and Native American (BLNA) communities, making it essential for network partners to approach this work with intentionality, cultural responsiveness, and a commitment to shared power. This toolkit acknowledges the uncertainty and challenges that organizations may face in advancing equity-driven initiatives. However, it also underscores the opportunity and responsibility we have to push forward. By fostering authentic partnerships and co-creating solutions with communities, we ensure that progress in STEM education is not just sustained but strengthened in the face of adversity. Now more than ever, this work is essential—not just for diversifying the STEM pipeline, but for ensuring that all students and educators feel seen, valued, and empowered.

This toolkit is for Beyond100K network partners working alongside Black, Latinx, and Native American communities to address the STEM teacher shortage through equitable, community-centered strategies. Each story highlights a network partner co-creating solutions with their community, showcasing actionable models for engagement, representation, and belonging in STEM education. By exploring these narratives, partners will find inspiration and practical insights to deepen their own work, ensuring that efforts to expand STEM education are rooted in cultural responsiveness and shared power.



EMILY MORTIMER

TULSA REGIONAL STEM ALLIANCE
TULSA, OK

"I enjoyed applying my qualitative analysis skills in a new and meaningful way while exploring connections between ecosystems and our work at TRSA. Interviewing diverse ecosystems also revealed exciting opportunities to strengthen and expand our partnerships."

TRACEY STALEY

TECHBRIDGE GIRLS
TAMPA, FL

"Putting this together was really engaging and reinforced how important community-driven STEM equity work is. It was a great reminder that real change happens when communities shape the work, not just participate in it."



JEN MOSSGROVE

KNOWLES TEACHER INITIATIVE
MOORESTOWN, NJ

"Interviewing and looking at the data gave me a great chance to see how community-building is happening in different places. It reminded me of how important it is to work as a community around these efforts."



CECELIA GILLAM

BENJAMIN FRANKLIN HIGH CHARTER SCHOOL
ORLEANS PARISH SCHOOL BOARD
NEW ORLEANS, LA

"I enjoyed interviewing our partners and learning through their lens. It was interesting to learn how interconnected we all are in our work to solve for these inequalities in STEM."



JANELLE JOHNSON

COLORADO STEM ECOSYSTEM
METROPOLITAN STATE UNIVERSITY OF DENVER
DENVER, CO

"I was a newbie to using generative AI before this process started, and it really helped me dive in and feel comfortable exploring its possibilities. I enjoyed working through this process with B100K and the other Fellows."

TAUNYA NESIN

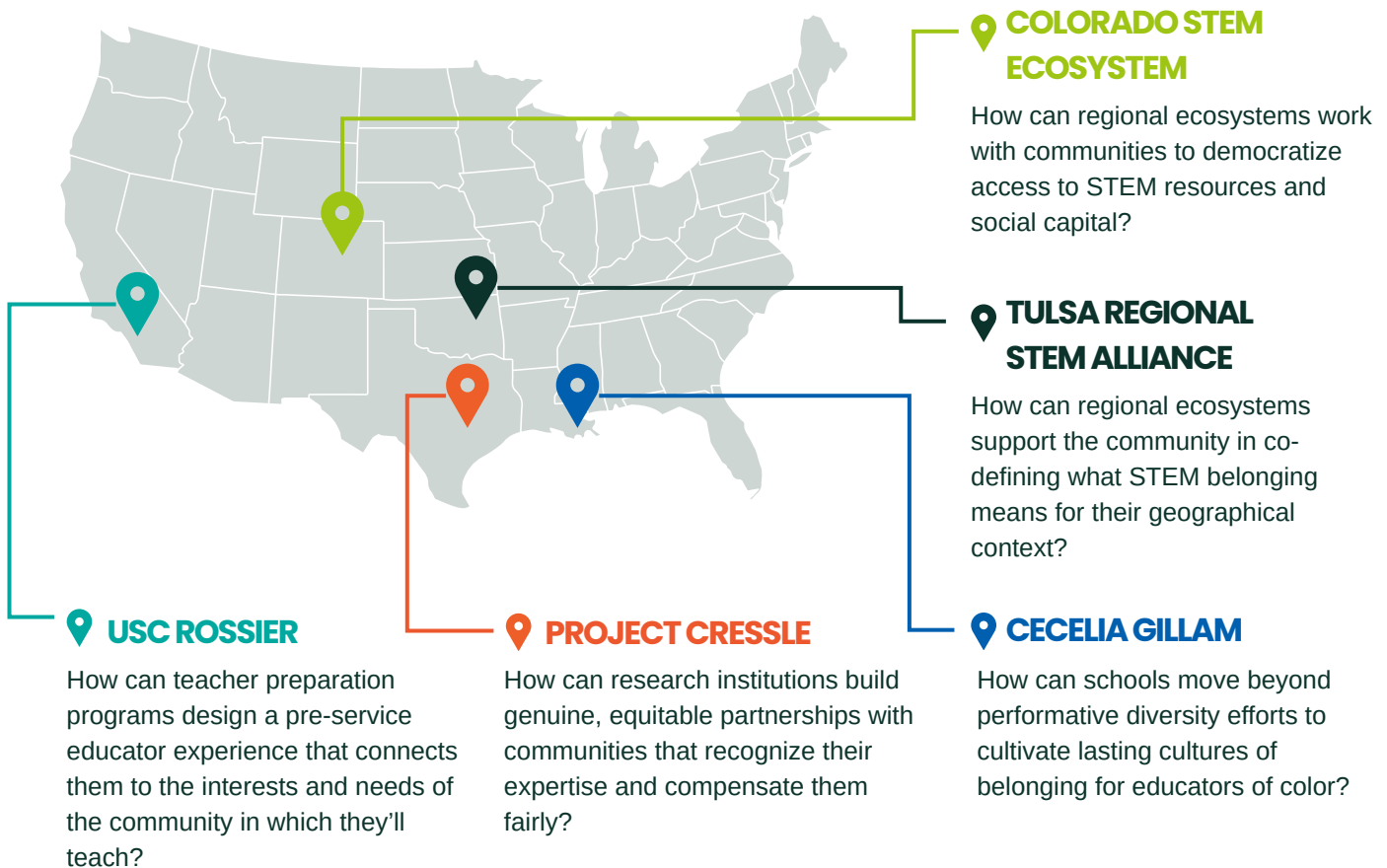
WEST ED
WASHINGTON, D.C.

"The interviews we conducted helped ground our work in the current needs of the stakeholders in the field. It reinforced for me the importance of designing practical, actionable solutions rather than just theoretical ones."



AMPLIFYING COMMUNITY VOICE

Reciprocal community engagement is about the people closest to an issue, place or opportunity being involved in creating bold visions for their future. These network partners are addressing the STEM teacher shortage in unique ways that model what it looks like for those closest to an issue to belong.



PROJECT CRESSLE



MEET JAY

Dr. Jay Banner is no stranger to the complexities of environmental science. Having spent over three decades researching water quality, climate resilience, and sustainability, his work has taken him from volcanoes to groundwater studies in urban settings. Yet, over time, his research focus has evolved—not just to understand environmental changes but to address the inequities embedded within them.



How can research institutions build genuine, equitable partnerships with communities that recognize their expertise and compensate them fairly?

DEEPENING COMMUNITY ENGAGEMENT TO BUILD RESILIENCE

In many underserved communities, the legacy of environmental injustice persists—poor water quality, disproportionate exposure to industrial pollution, and the residual effects of redlining continue to shape daily realities. Dr. Jay Banner, a geoscientist at the University of Texas at Austin, is grappling with this challenge head-on. Through his work with Project CRESSLE (Community Resilience through an Earth System Science Learning Ecosystem), Banner is rethinking how scientific research is conducted by centering the voices and priorities of the communities most affected by climate change. Austin, Texas, has a long history of segregation and

environmental injustice, particularly in its East and Southeast neighborhoods, where historically redlined communities continue to experience higher pollution levels and urban heat island effects. As Banner witnessed these inequities, he recognized the limitations of traditional academic research models. The "helicopter science" approach—where researchers extract data from communities without meaningful engagement—was insufficient. Instead, Banner turned to Community-Based Participatory Research (CBPR) as a more impactful approach.

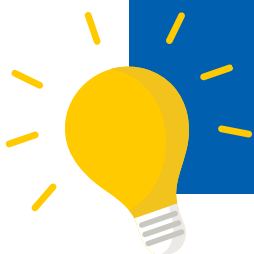
PROJECT CRESSLE

CO-CREATION DRIVES STEM SOLUTIONS

For Banner, partnerships are not just about working alongside community members; they are about co-creating solutions that address real, pressing concerns. “In CBPR, community members aren’t just consulted—they are equal collaborators at every stage, from ideation to implementation,” he explains. This model of CBPR prioritizes co-creation, where decisions are made collectively, and power is distributed across both academic researchers and community stakeholders. Unlike traditional engagement models that extract knowledge without meaningful reciprocity, this practice fosters long-term relationships, builds local capacity, and integrates community expertise as a core component of scientific inquiry. Through Project CRESSLE, Banner and his team have established a Community of Practice, bringing together researchers, community organizations, and local residents to co-develop and execute research projects that increase the resilience of underserved neighborhoods in Austin.” One of the most striking examples of this approach is in Austin’s Colony, a predominantly Black and Latinx neighborhood on the outskirts of Austin. Many residents there lack access to city-provided water and rely on independent water suppliers, often at higher costs and with lower quality. Banner’s team, in collaboration with local community fellows, has been measuring water quality, assessing regulatory compliance, and supporting residents in advocating for improvements. Rather than dictating research priorities, the initiative focuses on listening first, ensuring that the climate change concerns of the community drive the agenda.

INSTITUTIONALIZING COMMUNITY BASED SCIENCE

While Banner’s work is making strides, he acknowledges that systemic barriers remain. Universities often undervalue CBPR, prioritizing fast-paced publication cycles over the slow, relationship-driven work of reciprocal community engagement. His hope? That institutions will recognize the academic and societal value of CBPR and invest in its sustainability through funding, tenure recognition, and dedicated programs. “If we’re serious about transforming geosciences and STEM research as a whole, we need to make CBPR part of the university’s fabric, not just a side project,” he asserts. The challenge of integrating scientific research with authentic community engagement is vast, but Banner’s work offers a powerful framework. By centering equity, valuing co-creation, and rethinking traditional research structures, his approach provides a roadmap for how STEM professionals can contribute to true environmental justice.



A promising practice emerging from Project CRESSLE is its compensated [community fellowship model](#). The project ensures that those most affected by environmental issues are leading the charge for solutions by hiring local residents as research fellows.

USC ROSSIER SCHOOL OF EDUCATION



MEET FRED

Dr. Fred Freking's deep appreciation for science is rooted in summer months spent on his family farm in Minnesota. Fred has prepared hundreds of science teachers over the years and has derived valuable insights and profound perspectives about teaching and learning working with students in Los Angeles area schools. He believes that schools who connect their practices to a child's lived experience cultivate learners with a deep understanding of how science explains the world around them.



How can teacher preparation programs design a pre-service educator experience that connects them to the interests and needs of the community in which they'll teach?

BUILDING PURPOSEFUL SCIENCE EDUCATORS

USC Rossier is embedded within the city of Los Angeles and their approach emphasizes the importance of leveraging the wealth of knowledge and skills in a child's home. From the outset pre-service educators complete a variety of projects intended to build their understanding of the interests and needs of this diverse community. Pre-service educators immerse themselves as learners as they meet parents and administrators and understand their student's strengths. Fred asserts, "if you can't connect science content to the kids and what they bring to schools, they're not going to learn." Fred nudges his pre-service educators to continually reflect on who they

are teaching, what science knowledge they already bring, and how to build upon it. By fostering a deep connection with the community, USC Rossier pre-service educators are equipped to create meaningful and impactful science learning experiences that resonate with students' lives and backgrounds.

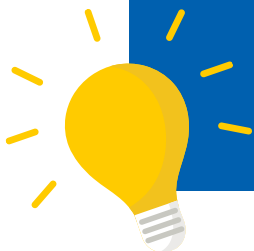
USC ROSSIER SCHOOL OF EDUCATION

BRIDGING STEM WITH REAL-WORLD COMMUNITY CHALLENGES

The [5E Lesson Plan](#) is one tool USC Rossier leverages in their preparation of future science educators. This tool positions BLNA students to understand real-world STEM challenges relevant to their community and has the potential to connect them to community members. Pre-service science educators engage students in an immersive way as students use a real world relevant phenomenon, for instance, exploring the connection between sickle cell disease and gene mutation. Students inevitably make connections to people they love and care about. Fred shares, “The lesson becomes relevant and meaningful to the student because they may have a grandmother with sickle cell or a cousin with diabetes.” This also presents pre-service educators with the opportunity to engage community members who can contextualize the data or support the interpretations of findings. This collaborative approach can enrich the learning experience, keep students engaged and foster a deeper connection between students and their communities. By incorporating culturally relevant pedagogy, and diverse perspectives, these pre-service educators are inspiring the next generation of STEM leaders.

TRANSFORMING SCIENCE EDUCATION THROUGH COMMUNITY CONNECTIONS

Fred embodies the USC Rossier School of Education’s mission and values as he continually reflects on his practice. Fred states, “The way we improve is we keep thinking about it, we keep reflecting on what’s working, what’s not working, and how we can do better.” Actively seeking out community partners and mobilizing these resources to ensure pre-service science educators foster a love of learning and science in their students is reflective of this mindset. He admits, “You can’t do everything as one educator, but you can connect to other organizations that have amazing stuff and bring it to your students.” Fred’s and USC Rossier’s asset-based lens demonstrates what is possible when preparation programs value and utilize the knowledge students, families and communities hold to unlock BLNA student potential.



A promising practice emerging from USC Rossier is pre-service science educator use of the [5E Lesson Plan](#). By using real world relevant phenomena that connect to a child’s lived experience science becomes meaningful and engaging.

TULSA REGIONAL STEM ALLIANCE



MEET EMILY

Dr. Emily Mortimer is a devoted advocate for STEM education passionate about cultivating spaces of belonging for staff and students. Her love of science led her to pursue a degree in biology and work in the informal education space. Today, she is building impactful partnerships and creating a community infrastructure that provides equitable pathways into high-quality STEM fields for students.



How can regional ecosystems support the community in co-defining what STEM belonging means for their geographical context?

HONORING HISTORY AND SHAPING FUTURES

The Tulsa Regional STEM Alliance (TRSA) serves as a backbone organization engaging a cross-sector of organizations committed to ensuring Tulsa students access high-quality STEM experiences. Emily emphasizes the importance of community members understanding their ability to influence and contribute to TRSA's work given the region's complicated legacy. Greenwood, home to a thriving business district - Black Wall Street - was burned and looted in what is known as the 1921 Tulsa Race Massacre.

Tahlequah, situated an hour east of Tulsa, was the final destination for the Cherokee people who walked the Trail of Tears. Emily recounts, "Over the last five years there's been a focus on reconciliation and we have a lot of connections to organizations that are promoting these efforts." For Emily, investing in community partnerships is about cultivating STEM belonging in a community that has not always been welcoming to Black and Native American communities.

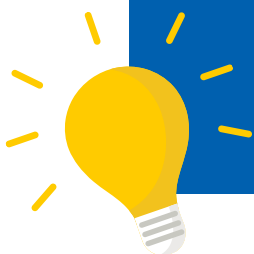
TULSA REGIONAL STEM ALLIANCE

COMMUNITY DRIVEN TRANSFORMATION

Emily is a champion of community voice in North Tulsa as educators, community organizations, families, and university leaders gather to define STEM within their context. The North Tulsa STEM Hub unites community stakeholders to evaluate the current state of STEM, collaboratively develop a shared vision for its future, and articulate the role the hub is positioned to play. The inclusion of those closest to the challenge coupled with ongoing conversations with teachers and school administrators positioned the STEM Hub to narrow its focus around transportation, staff turnover amongst STEM providers, family engagement, and funding. Emily remains reflective as she guides the STEM Hub in co-creating their future. “How do we create the funding structure and the funding priorities that are not TRSA’s priorities but rather the hub’s priorities?” This point of tension is one Emily is open to exploring as the STEM Hub is but one of many initiatives launched by TRSA. Standing up a STEM Hub in what is defined as a STEM desert has allowed TRSA to mobilize community members in designing a sustainable STEM ecosystem that reflects North Tulsa’s long-term aspirations.

SPURRING EQUITABLE GROWTH

The community of Tulsa was recently awarded a Tech Hubs Designation by the U.S. Economic Development Administration. These endorsements are given to regions that demonstrate great potential in becoming “globally competitive innovation centers” within the next decade. TRSA’s work takes on added urgency within this context. Incorporating diverse community perspectives remains a priority and TRSA is in the process of creating more formalized agreement structures with community-led organizations. Although community engagement has always been valued they realize there is room for improvement. Emily explains “we want people to really own and know that they can impact and have a voice in our work, and the different ways that they can engage in the way that makes the most sense to them either as an individual or as an organization.” The reality is stark - BLNA students cannot compete globally without organizations like TRSA walking in lockstep with community members to remove structural barriers that hinder innovation and growth.



A promising practice emerging from TRSA are [STEM Hubs](#). These hubs mobilize community members to define their vision for STEM and build ecosystems that reflect their highest aspirations.

COLORADO STEM ECOSYSTEM



MEET JANELLE

Dr. Janelle M Johnson is an educator, researcher, and advocate for STEM equity with extensive experience in teacher education and community-based engagement. She has worked with organizations such as the National Girls Collaborative Project and currently leads efforts within the Colorado STEM Ecosystem. With a background in multilingual STEM education and a commitment to social justice, she focuses on dismantling systemic inequities and creating sustainable pathways for underrepresented communities in STEM.



How can regional ecosystems work with communities to democratize access to STEM resources and social capital?

EMPOWERING LOCAL STEM LEADERS

STEM ecosystems have the power to shift who holds influence in education by rooting opportunity in community leadership. Dr. Janelle M. Johnson, director of the Colorado statewide STEM Ecosystem, is at the forefront of this movement—working to ensure that equity isn't just a value but embedded in structure and approach. She recognizes that static leadership roles in STEM fields often create systemic barriers to access and representation. Dr. Johnson describes the Ecosystem as designed to broaden access: "You don't have to be a power player to engage - you have a voice at the table to tell your story, do the networking

and access resources." By treating community members as co-owners—not participants—her work makes STEM feel both accessible and accountable. She highlights how traditional models often fail to serve local needs, leading to what she terms "talent drain," where students must leave their communities to pursue STEM opportunities. This intentional integration of STEM education with economic empowerment ensures that people can remain connected to and invested in their local communities.

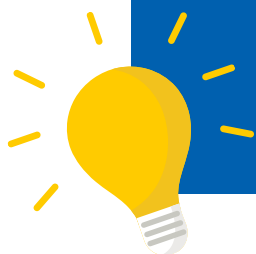
COLORADO STEM ECOSYSTEM

DIGITAL STEM TOOL CHAMPIONS STRUCTURAL CHANGE

Under Dr. Johnson's leadership, a digital STEM ecosystem visualization tool was built using the KUMU.IO platform. Dr. Johnson shares, "A lot of the technology that we come across might address STEM, but equity is an afterthought. The concept of building a tool to close the STEM opportunity gap was researched and cultivated from grassroots organizations. Long before the tool was built, community organizations were serving the needs of students and families and broadening access to high quality STEM learning experiences." Members of community organizations complete a [Google Form](#) upon joining the Colorado STEM Ecosystem, and the data submitted is then automatically integrated onto the digital platform. The information is mapped in such a way to blur the lines between rural and urban communities and organizational size, leveling the playing field for more even participation and ownership. Her team continuously refines the STEM Ecosystem platform based on user feedback, making it a living, evolving tool that reflects the needs and aspirations of its co-owners. The [Colorado STEM Ecosystem](#) is not just a tool for networking—it is a mechanism for structural change, enabling communities to define and lead their own STEM equity efforts. In today's charged political climate, this kind of hyperlocal, justice-centered collaboration isn't just bold—it's necessary.

CO-CREATION DRIVES SUSTAINABILITY

Co-creation is at the heart of effective and sustainable community engagement. Dr. Johnson emphasizes the importance of listening to community voices and ensuring they play a central role in decision-making processes rather than imposing top-down solutions. With an open source ethos, Colorado has been sharing their digital infrastructure with ecosystems in other states and countries, and are currently working toward a fully open source product that others can customize for their efforts. Looking forward, Dr. Johnson envisions expanding impact by increasing engagement across different sectors and documenting and amplifying success stories to drive policy and funding decisions. By prioritizing community voice, transparency, and collaboration, Dr. Johnson's approach offers a replicable framework for other communities striving to deepen their engagement in STEM education and workforce development.



A promising practice emerging from the Colorado STEM Ecosystem is a [network mapping platform](#). It removes barriers to entry and participation and allows funders to discover and support grassroots initiatives.

CECELIA GILLAM



MEET CECELIA

Dr. Cecelia Gillam is an experienced science educator committed to fostering equity and inclusion within school systems. She brings a deep understanding of the systemic challenges that impact the retention of educators of color. Her experiences have shaped her passion for ensuring that educators—especially Black, Latinx, and Native American educators—find supportive spaces where their voices are heard and their presence valued.



How can schools move beyond performative diversity efforts to cultivate lasting cultures of belonging for educators of color?

FROM INDIFFERENCE TO ENGAGEMENT

Cecelia has firsthand experience with the ways in which educator voices are suppressed or ignored. “I only have so much that’s within my sphere of influence and everything from the top trickles its way down.” This candid reflection comes from an investment of time and energy into campus initiatives that didn’t yield tangible change for herself or other educators. It forced her to reflect on where the change truly happens and what it takes for educators to be heard. She acknowledged that those moments left

her feeling indifferent. Treating educators as genuine partners in a child’s learning means shared accountability for Cecelia. It’s not enough to invite educators, parents and community members into a conversation; real engagement happens when institutions take measurable actions that reflect the needs and aspirations of those they serve. Co-creation, in her view, is a process of listening, acknowledging, and acting in ways that build trust over time.

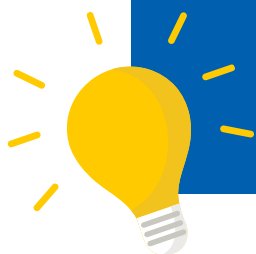
CECELIA GILLAM

RETAINING EDUCATORS THROUGH CONSTRUCTIVIST LISTENING

Cecelia's work as a Black science educator is grounded in the reality that while many districts successfully recruit educators of color, they struggle to retain them. She experienced a disconnect between the messaging communicated to her at professional development workshops and her everyday experiences once back in the classroom. Reflecting on the experience she shared, "I was still subjected to microaggressions and macroaggressions. How might we stop that?" Determined to change her experience, Cecelia formed a Teachers of Color Committee with support from the [Smithsonian Science Education Center](#) and Shell. The goal was simple - develop core strategies that help educators of color know they belong and retain them professionally. Cecelia convened educators from across the district and provided a space for educators to share their experiences and identify systemic barriers. Initially, they were hesitant—they feared speaking out due to potential backlash. However, thanks to training provided by the Black Teacher Project, Cecelia introduced Constructivist Listening, a practice that fostered trust and encouraged open dialogue. Once trust was established, educators analyzed data to uncover the district's retention issues and collaboratively strategized solutions. Cecelia's work illuminates the spectrum of community engagement—moving beyond token representation toward meaningful participation. By challenging leadership to examine retention data and listen to educator concerns, she pushed for deeper accountability.

EMBEDDING BELONGING INTO SYSTEMS OF ACCOUNTABILITY

Cecelia is currently working to institutionalize accountability measures that prioritize belonging as a Project Team leader within the Beyond100K network. While her previous district projected a commitment to diversity, she recognized that their approach was largely transactional. She is exploring ways to integrate educator feedback into administrative evaluations, ensuring that belonging is not just a talking point but a fundamental metric of success. Cecelia shares, "My idea is aimed at cultivating a sense of belonging for Black and Brown educators by creating a framework for belonging within a school and holding administrators accountable for delivering." Despite the setbacks encountered, she's determined to end the STEM teacher shortage because she is deeply familiar with the data. Cecelia's insights underscore the critical need to move beyond surface-level diversity initiatives and cultivate environments where educators of color feel genuinely valued and heard.



A promising practice emerging from Cecelia's work is [Constructivist Listening](#). Cecelia leveraged training from the Black Teacher Project to guide teachers in necessary discussions that were emotionally charged.

MOVING ACROSS THE SPECTRUM

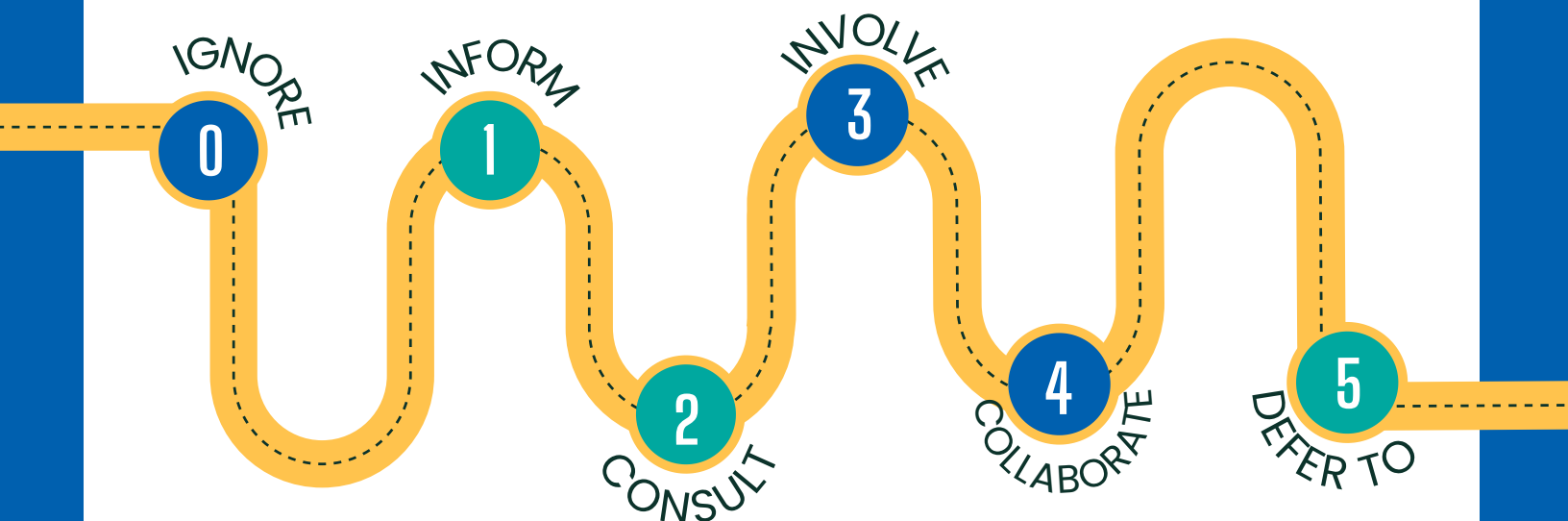
Our hope is that these partner-shared practices and resources encourage collective learning and growth within the Beyond100K network. You may be reading this resource because you are curious to understand what it looks like to move towards reciprocal community engagement. Just as colors seamlessly blend in the light spectrum, so too do engagement practices intermingle and overlap. Depending on the context there may be instances where both marginalization and collaboration occur. Everyone starts at a different place, so reflect and remain curious rather than to judge. This is also not a linear process with boxes to be checked. Gaining a deep understanding of the community context and its history is an ongoing journey. Engaging Black, Latinx, and Indigenous communities requires acknowledging and

addressing the lasting harm caused by institutions, a complex and significant undertaking. Building trust amongst those closest to an issue requires time and consistent effort. The uptake of these practices has ripple effects that may be difficult to discern immediately and these are partners that have taken those first steps.

As you read through [The Spectrum of Community Engagement to Ownership](#) (González, 2020) consider the following:

- Where are we?
- Where do we want to be and why?
- What wisdom does the community hold that can inform our efforts?
- What are we willing to shift and let go?

THE SPECTRUM OF COMMUNITY ENGAGEMENT TO OWNERSHIP



THE SPECTRUM IN PRACTICE

“To be an effective educator, it is critical to get connected to the community you serve by understanding their needs and integrating community projects into the curriculum.”

— **FRED FREKING**

THINKS

Fred believes BLNA students won't learn science if the teacher cannot connect science content to the student and their lived experience.

DOES

Fred supports pre-service teachers as they take the role of a researcher and talk to various community members in order to broaden their understanding of community interests and needs.

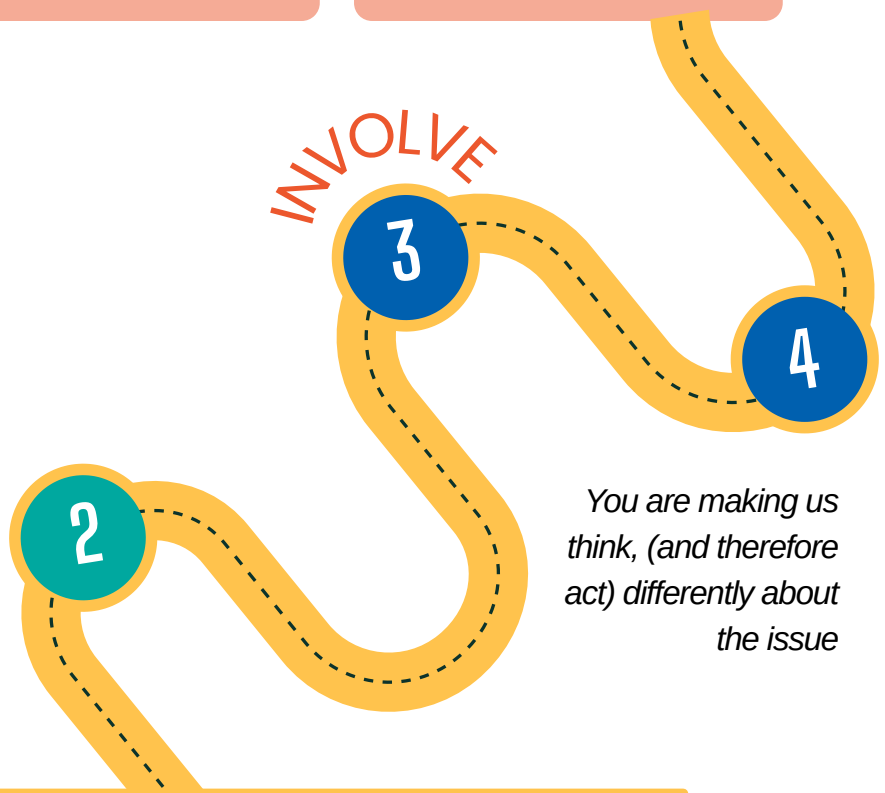
FEELS

Fred leans into his curiosity and regularly reflects on what's working, what's not working and how USC Rossier can do better for BLNA students.

Voice

Ensure community needs and assets are integrated into the process & inform planning.

- Interactive workshops
- Polling
- Community forums



THE SPECTRUM IN PRACTICE

“We believe in accessibility and transparency, and that everyone, regardless of their position, should have a say in shaping the STEM landscape.”

— JANELLE JOHNSON

THINKS

Janelle believes their digital networking visualization tool centers the perspective of BLNA communities and has the potential to close the STEM opportunity gap.

DOES

Janelle takes a page from the grassroots organizing playbook and leverages Kumu to build an inclusive STEM ecosystem which exemplifies one doesn't have to be a power player to have a voice at the table.

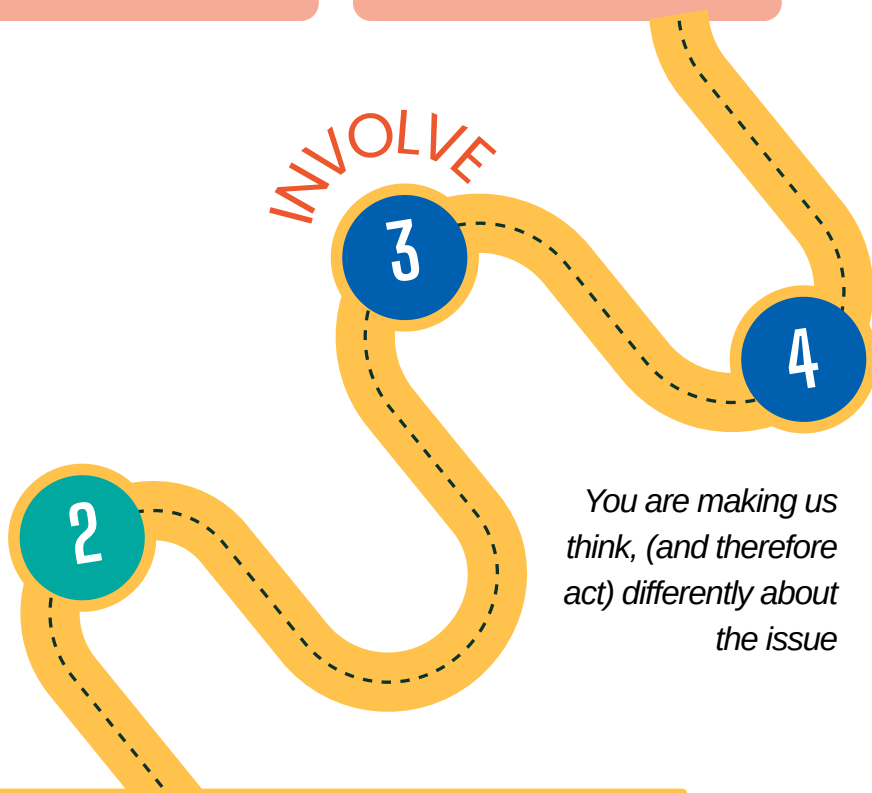
FEELS

Janelle contemplates how to amplify the perspectives of those with firsthand experience and wisdom, actively working to decenter her own position.

Voice

Ensure community needs and assets are integrated into the process & inform planning.

- Interactive workshops
- Polling
- Community forums



THE SPECTRUM IN PRACTICE

“We have a number of different ways we collect input and perspectives and voices.”

— **EMILY MORTIMER**

THINKS

Emily believes engaging with schools and BLNA community members to understand their needs are critical to removing barriers that impede access into STEM fields.

DOES

Emily creates a STEM hub in specific zip codes intended to serve a STEM desert and balances the needs of the hub with those of TRSA as she develops a funding structure.

FEELS

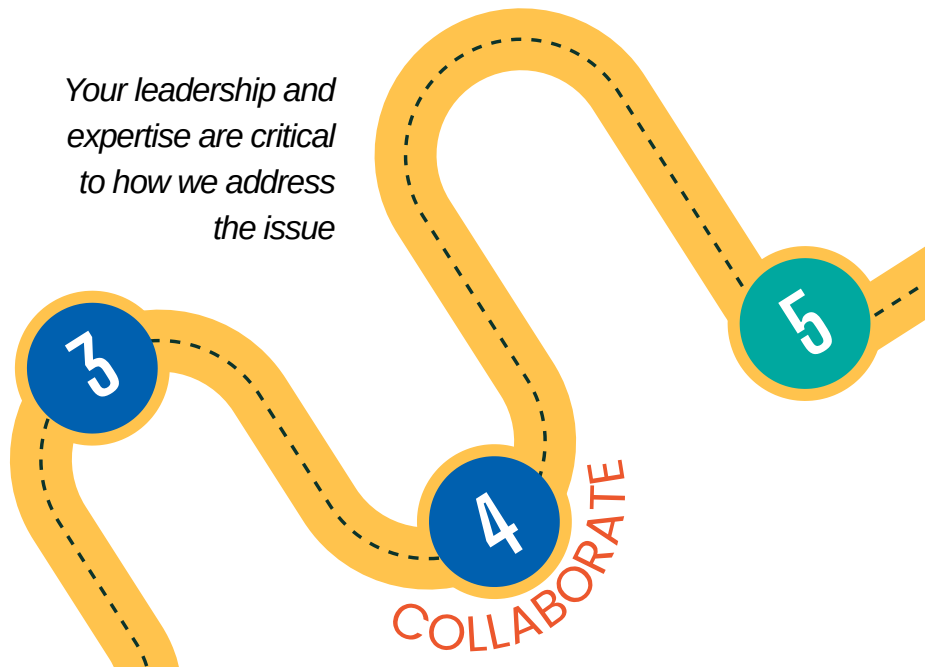
Emily feels energized about the collaborations fueled by a STEM hub and how they may address needs within a STEM desert.

Delegated Power

Ensure community capacity to play a leadership role in decision-making and the implementation of decisions.

- Citizen advisory committees
- Collaborative Data Analysis
- Co-Design and Co-Implementation of Solutions
- Collaborative Decision-Making

Your leadership and expertise are critical to how we address the issue



THE SPECTRUM IN PRACTICE

“Our goal was to retain teachers of color and ensure they felt a sense of belonging.”

— **CECELIA GILLAM**

THINKS

Cecelia believes harnessing disaggregated teacher retention data is pivotal to informing change and transforming work environments for teachers of color.

DOES

Cecelia, with guidance from Shell and Smithsonian, launches a Teacher of Color committee that meets regularly to address retention issues through data-driven discussions and community building.

FEELS

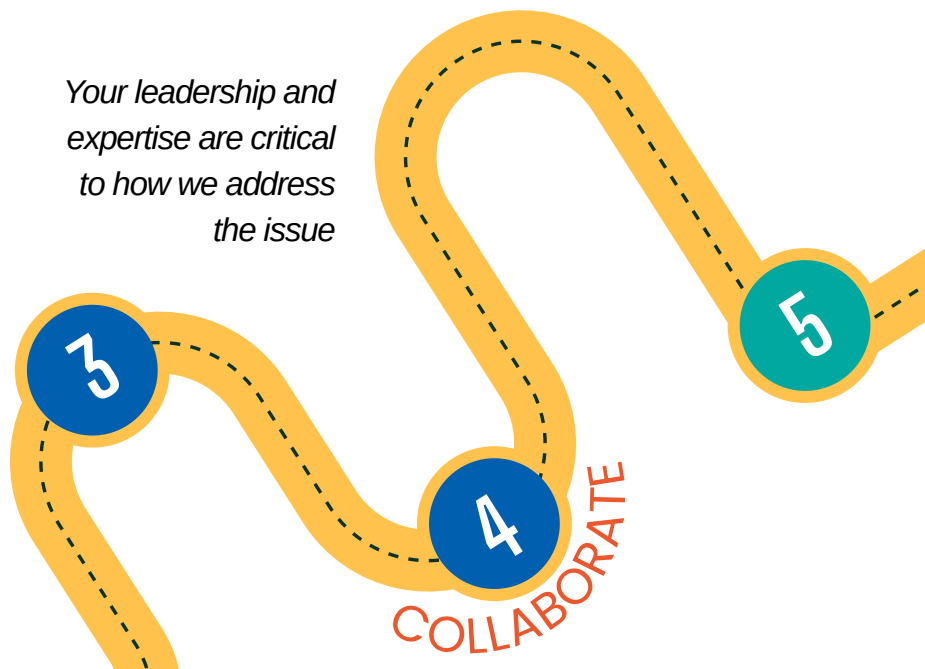
Cecelia feels affirmed as teachers of color express their thoughts, share their feelings, and express gratitude for the space.

Delegated Power

Ensure community capacity to play a leadership role in decision-making and the implementation of decisions.

- Citizen advisory committees
- Collaborative Data Analysis
- Co-Design and Co-Implementation of Solutions
- Collaborative Decision-Making

Your leadership and expertise are critical to how we address the issue



THE SPECTRUM IN PRACTICE

“Community-based participatory research is essential for empowering underserved neighborhoods and transforming the geoscience community.”

– JAY BANNER

THINKS

Jay believes scientists cannot in good faith helicopter into BLNA communities, collect data, and use the data to publish research the community never sees.

DOES

Jay applies for an NSF grant, includes a trusted community leader as a co-principal investigator, and with funding from the NSF hires community fellows to design and implement research projects alongside university researchers.

FEELS

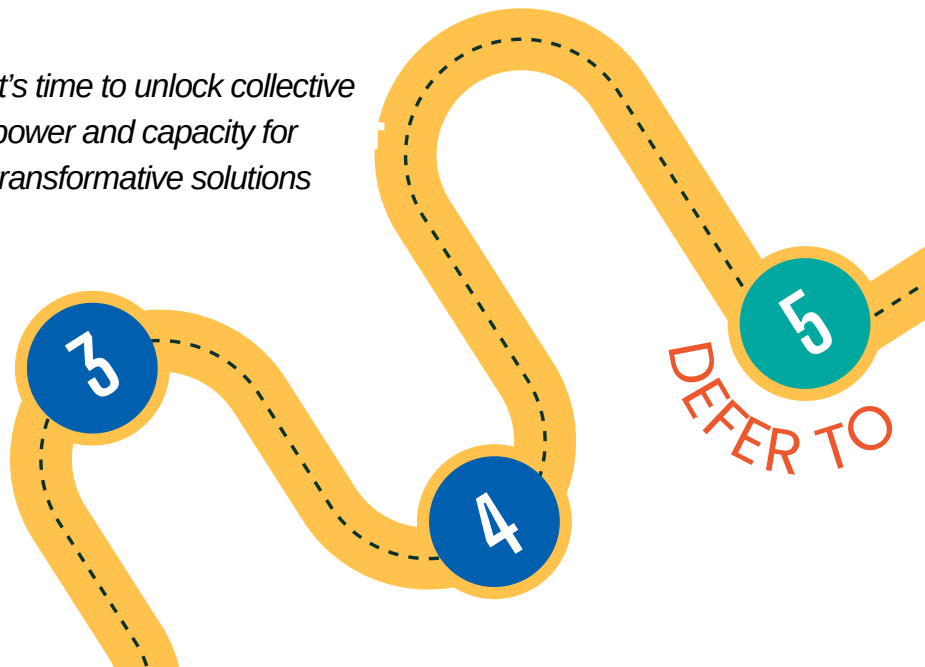
Jay remains determined to ensure Project CRESSLE serves as an example of what is possible when the geoscience community involves BLNA community members in research.

Community Ownership

Foster democratic participation and equity through community-driven decision making; bridge divide between community and governance.

- Community driven planning
- Consensus building
- Participatory action research
- Participatory budgeting
- Cooperatives

It's time to unlock collective power and capacity for transformative solutions



CONCLUSION

Reciprocal community engagement challenges us to set aside our institutional agendas, understand the historical context in which we operate, and co-create a shared future with Black, Latinx, and Native American (BLNA) communities. The stories illustrated here convey how partners are rising to the challenge and creatively integrating the expertise of BLNA community members as they seek to end the STEM teacher shortage. Their decisions and actions exemplify a deep intellectual curiosity, self-awareness, and humility. Yet, individual efforts, while valuable, are not sufficient to achieve significant systemic change. Systems must seek out community expertise, specifically engaging those that are closest to the issue, and treat it as not only an essential catalyst for innovation but also fundamental to a healthy, democratic society.

Solving the STEM teacher shortage will take more than new programs—it will require a fundamental shift in how systems value and engage community wisdom. This work demands courageous leadership - leaders willing to embrace practices that may feel risky in the context they are operating in. We stand at a pivotal moment with the opportunity to shape a more equitable future. Let us move forward—not with all the answers, but with the willingness to listen, learn, and lead in community as we activate our own collective commitment to bringing belonging more deeply into our practice.

“

What if the solutions to end the STEM teacher shortage exist and in order to enact them we must engage differently with ourselves and the world?

”

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The group's collective wisdom shaped this resource in profound ways, and we are honored to share their stories, strategies, and leadership with the broader network.

