



# Building Bridges of Knowing: Using Culturally Relevant Pedagogy (CRP) Theory to build Culturally Relevant Community Outreach (CRCO) to Promote STEM Literacy

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## Abstract

Science literacy has implications for legislation, the general health of a society, and the funding climate for research. Increasing science literacy requires the deliberate bridging of STEM content to the lives and experiences of community members beyond the classroom. Presently, the airwaves and digital platforms are being flooded with information from both vetted and amateur sources, requiring the individual capacity to tease out and apply the useful and truthful information to combat COVID-19. Using the lessons already learned in Education, we propose the application of Culturally Relevant Pedagogy (CRP) as a model for community-level work. Our goal within VI-EPSCoR Outreach Education & Diversity (OED) is to boost the science literacy of the entire USVI through addressing Ladson-Billings' (1995) three foci: social relations, conceptions of self and others, and conceptions of knowledge. Our team has developed a community-level approach to CRP to inform the work of community outreach that embraces the diversity of communities as a well of strength.

## Aims and Procedures

The need for science literacy within the general public is more apparent now than in years past. Educational outreach must relinquish top-down approaches, with experts arriving and prescribing change without aligning agency goals to that of the communities of interest. This approach has contributed to the general mistrust of scientists and researchers in communities of color due to prior exploitation and grab-and-go patterns of research (Scharff, Mathews, Jackson, Hoffsummer, Martin & Edwards, 2010).

The VI-EPSCoR Educational Outreach and Diversity (EOD) component engages the community through activities to educate the public on STEM content indigenous to the islands and/or relevant to its preservation. The outreach team utilize hands-on learning activities (Christmas ornament up-cycling), conservation activities (beach clean ups), learning circles (adult and kiddie science cafes) and lectures (brown-bag lecture series) to engage various demographics on the island. For each activity, the team assesses the relevance of the STEM content, the most approachable mode for teaching the information, and attitudinal changes toward STEM.

Ladson-Billings' (1995) culturally relevant pedagogy model in education emphasizes three foundational considerations: 1) the conceptions of self and others held by teachers, 2) how social relations are structured, and 3) the conceptions of knowledge. This study investigates the Culturally Relevant Community Outreach (CRCO) approach, derived from CRP to build inclusive informal education within our Caribbean context. The CRCO is a direct parallel of the recommended activities for teachers to application within informal learning spaces and activities.

## Culturally Relevant Community Outreach

A review of the literature reveals the wide-reaching impact of Ladson-Billings' Culturally Relevant Pedagogy in formal education(1995). Gay (2000), extended CRP into five essential elements of teaching including: 1) Developing a knowledge base about cultural diversity, 2) Including ethnic and cultural diversity content in the curriculum, 3) Demonstrating caring and building learning communities, 4) Communicating with ethnically diverse students and 5) Responding to ethnic diversity in the delivery of instruction.

**Culturally Relevant Community Outreach (CRCO)** is a re-imagining of CRP for informal learning spaces, particularly in pursuit of greater science literacy. CRCO honors the three domains of social relations, conception of self, and conception of knowledge. The parallels developed are in Table 1.

Conceptions of Knowledge		Perceptions for Self as a Teacher/Educator		Social Relations	
CRP	CRCO	CRP	CRCO	CRP	CRCO
How teachers view the curriculum/content and the assessment	How the team chooses content and activities with local relevance and specific outcomes	All students are capable of academic success	Science knowledge and agency is a goal for all islanders (p-12, adult, elders)	Fluid teacher-student relationship in which the students have opportunity to act as teachers	Participants have opportunity to lead educational activities
Knowledge is not static, it is shared, recycled, and constructed	Target gatekeepers in the community to share, recycle, and implement lessons in alternative community spaces.	Always getting better at teaching-feedback loop	Layered assessment procedures to measure learning and our effectiveness-consistent communication with community stakeholders	All students are good at something and contribute to the learning experience	Strength-focused approach in activity development - community wells of knowledge
Knowledge must be viewed critically	Re-assessed what is relevant to the community and built clear connections with local lives	View selves (teachers) as members of the community	Reflective exercises to clarify our role in the community	Develop a community of learners	Goal to develop science literacy, agency and skills throughout the community
Teachers must be passionate about knowledge and learning	Team members began documenting activity descriptions, ratings, and impact to improve	Sees teaching as a way to give back to the community	Clarified goals within the team to 'do good' with science in the community		
Teachers must scaffold, or build bridges, to facilitate learning	Activities and outreach must include scaffolding that links community life				
Assessment must be multifaceted, incorporating multiple forms of excellence	Assessment procedures, data sources, and ethics training for the team				

## Methods

The current study employs a qualitative methodology that integrates interviews and archival analysis of documentation generated throughout the team process for integrating the CRP theory into community educational efforts.

A phenomenological methodology was employed to give voice to the shared experience of the team in adjusting and employing this more embracive model for community outreach. The phenomenological research methodology seeks to describe the lived experiences of people who are part of a particular phenomenon or event (Creswell, 2018). Phenomenology provides a means to understand the reasons for a shift to this model, a glimpse into the planning and application within community outreach, and its impact on the team's beliefs about the purpose of STEM community outreach. This constructivist approach melds with phenomenological methodology and organizational process research by focusing on the team's understanding, integration, experiences to derive a collective meaning of effective outreach and informal learning within the Caribbean context (Creswell, 2013).

**Participants.** The current qualitative study will include three interviews from team members of the Outreach Education and Diversity team including the Director, the community outreach specialist, and the data analyst.

## Results/Discussion

### Emergent Themes

Analysis of Interview data yielded 3 overarching domains in the application of CRP theory into community outreach; a Team domain, a Community domain, and Linkages between. There were 8 emergent themes that fit into these domains; 1) shift in professional purpose, 2) understanding purpose, 3) proof of ineffectiveness, 4) rethinking success, 5) one-sided outreach, 6) culturally relevant approach, 7) community engagement and empowerment, and 8) implementation of CRP. Analysis of the coded interview activity forms, and meeting notes revealed a pattern of interaction in these domains that creates a system of feedback and revision to stay true to a culturally relevant or responsive approach. See image 1.

### Team Domain

Among the interviewees, there were distinct aspects of this experience that were housed within the team's communication, defined purpose, and reflective exercises that created a fertile space for embracing a new model of community engagement. These team level themes included 1) analysis of ineffective strategies, 2) a shift in team members' professional purpose for the community work, and 3) a revised understanding of the team's goal of increasing stem literacy for the local community.

### Community Domain

At the community level, the team began reassessing their work in the community to understand how community and informal education work needed to change to boost effectiveness. The community domain includes modifications in the actions taken in community outreach including 1) the team rethinking what constituted a successful outreach endeavor and 2) centering community interest to avoid one-sided outreach efforts that did little in increasing stem literacy for the local community.

## Results/Discussion

### Linkages

Between the community and team domains, the CRCO has cyclic connections in which the team engages the community through outreach activities and communities are empowered to provide feedback on their effectiveness. The bridge of communication includes three concepts; 1) prioritizing cultural relevance as a centralizing them in science education, 2) actively developing culturally relevant activities, materials, approaches that embrace and celebrate a community's culture, and 3) a commitment to community Engagement and Empowerment that encourages active feedback and contribution.



## Implications and Recommendations

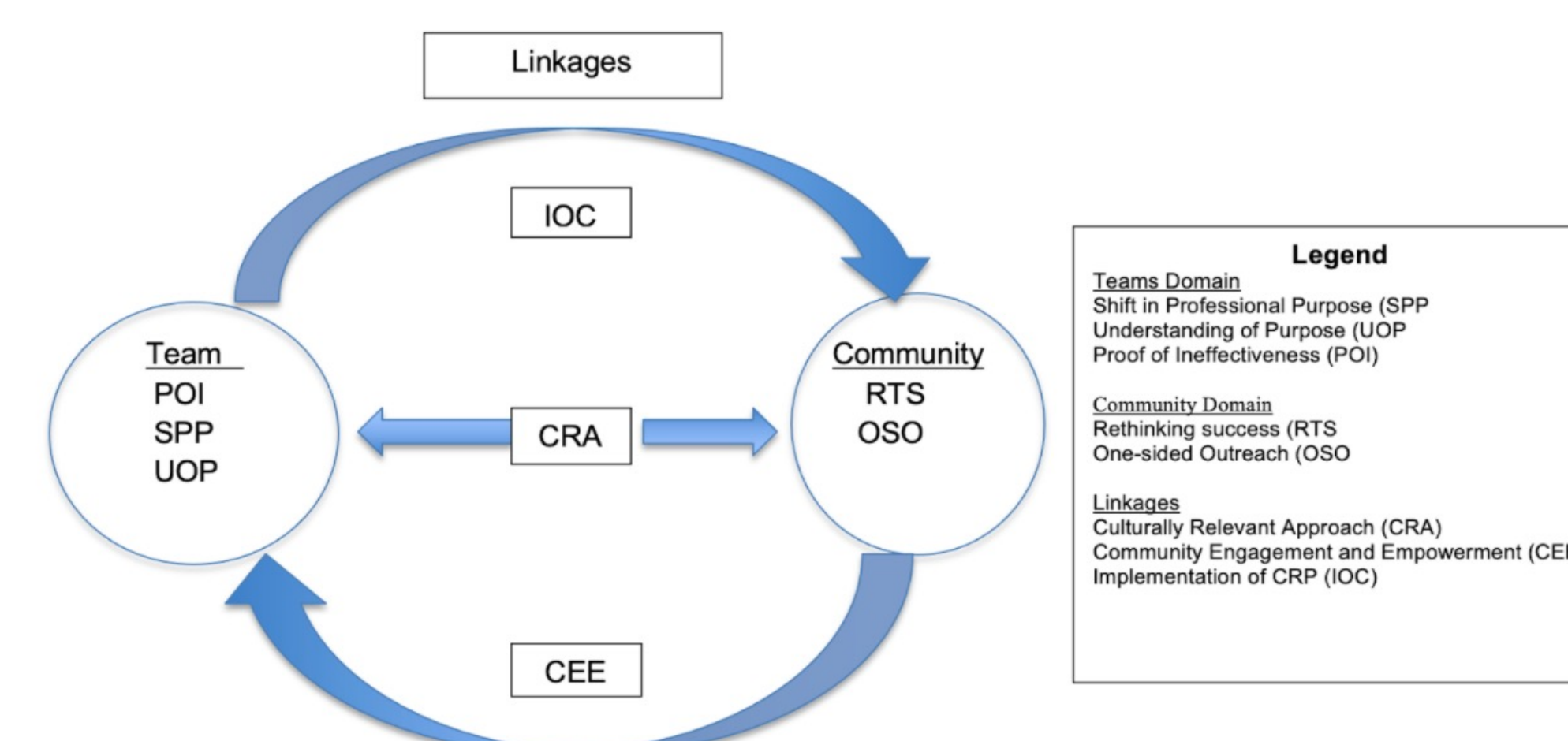
Using a community CRP model, CRCO, helps align outreach efforts to the needs and interest of the USVI community, increasing engagement and affinity to STEM content. Three major recommendations emerged.

**A Strengths-focused Approach** reframed community participants as partners in STEM outreach and shifted the focus to empowering citizens with STEM knowledge to manage their own context.

**Education Theory in Community Settings** acknowledged the value of theory to learning spaces beyond the classroom to reach a broad spectrum of community members.

**Reflective Practice and Flexibility** required the teams to create channels for feedback on the relevance and effectiveness of activities so could pivot if needed to improve STEM content engagement.

Image 1. Pattern of interactions for Community Outreach using CRP.



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Presented at the Mindsets for STEM Conference, Santa Fe College/The University of the Virgin Islands



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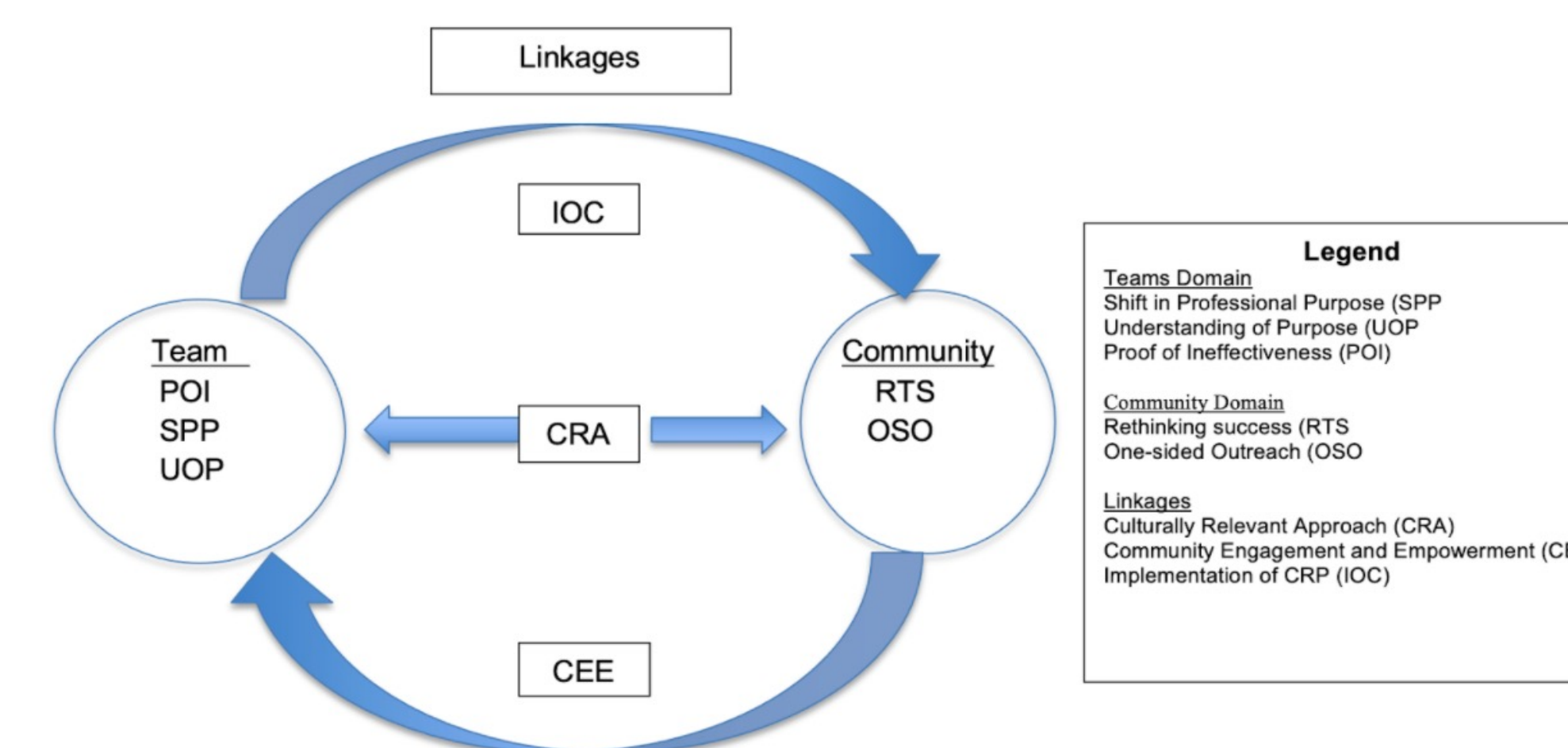
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