

GENIAL

Executive Summary and Call to Action

By Verónica García-Luis, Isabel Hawkins, Liliana Blanco, and Amy Oates
Exploratorium

INTRODUCTION

With generous support from the National Science Foundation, the Exploratorium held the [Generating Engagement and New Initiatives for All Latinos \(GENIAL\) Summit](#) on June 5–6, 2017, in San Francisco, California. The goals of the GENIAL Summit were to:

- Identify needs and opportunities for Latinos in Informal Science Learning (ISL) environments.
- Facilitate and strengthen professional relationships.
- Identify recommendations, emerging research questions, and actionable insights with an outlook toward the future.
- Contribute to a more informed ISL field.

A total of [91 participants](#), a mix of practitioners, community leaders, media specialists, government officials, policy professionals, and researchers from across the United States and Puerto Rico participated in the Summit. This document provides overall context for the GENIAL Summit, executive summaries of articles by GENIAL advisors and panel conveners on important topics discussed during the Summit, and a call to action for the ISL field. Also available are a [summary of the proceedings in English](#) and in [Spanish](#), as well as a [full report of the proceedings](#).





A family at the Exploratorium engaged in ISL. Photo by Amy Snyder.

CONTEXT AND MOTIVATION FOR THE GENIAL SUMMIT

Over the past few decades, a variety of efforts at local, national, and global levels have focused on Latino engagement in ISL to increase access and participation by Latinos in science, technology, engineering, and mathematics (STEM) informal learning, formal education, and careers. Despite sustained work, a divide still exists between Latinos and STEM at all levels. The GENIAL Summit responded to a timely opportunity for the ISL field to come together and improve its ability to engage Latino communities in STEM. By bringing together diverse groups of national stakeholders to integrate and synthesize theoretical approaches, practical methods, and evidence-based findings, the GENIAL Summit was designed to inform the ISL field about effective strategies and approaches for sustained and authentic engagement of Latinos in STEM.

The GENIAL Summit set up the conditions for sharing knowledge and fostering discussions on topics and strategies for how ISL environments can provide access, support, and sustain the engagement of Latinos. Authentic engagement takes into account the long-standing cultural and scientific legacy of Latinos; the GENIAL Summit provided rich opportunities for highlighting the diversity and richness of Latino contributions to STEM.

The GENIAL Summit also acknowledged that Latinos are underrepresented in STEM education and workforces, an issue of critical concern to Latino communities and the United States. While STEM skills are recognized as essential to compete in a global economy, in the United States there are currently two science

and technology job openings for every qualified job seeker, and not enough students are pursuing degrees and careers in the STEM fields to meet the increasing demand.¹ The situation is particularly dire concerning Hispanics.² Even though Hispanics comprise the largest growing segment of the United States population, their participation in STEM is not on par with their demographic representation.³ This table provides a summary of Hispanic population growth in the United States and STEM degree and workforce statistics.

Hispanics in the United States and STEM Fields⁴

	1980	2015	Projection to 2060
Population of Hispanics in the United States	14.8 million	56.5 million	119 million
% of Total United States Population	6.5%	17.6%	29%
<p>In 2014, less than 10% of all STEM bachelor’s degrees were awarded to Hispanics and Hispanics represent only 2% of the STEM workforce.</p>			

For moral, equity, sustainability, and workforce reasons, increasing Hispanic participation in STEM fields needs to be a key priority for the United States. The benefits of engaging Latinos in STEM today extend beyond the individual because they will have direct impact in their communities and will serve as essential role models for future generations. Informal science learning environments have a key role to play in igniting the STEM spark.

GENIAL provided a renewed and strengthened platform for exchange of knowledge to inform novel types of ISL experiences for Latinos. Additionally, GENIAL results can inform practitioners, researchers, policy makers, and community-based organizations focused on increasing STEM engagement of diverse communities generally.

1 Fayer. S., Lacey, A., and Watson, A. 2017. [“STEM Occupations: Past, Present, And Future.”](#) Bureau of Labor Statistics.
 2 [An article on the usage of terms of identity](#) is provided on the GENIAL website.
 3 American Institutes for Research. 2013. [“Broadening Participation in STEM: A Call to Action.”](#)
 4 [census.gov/content/dam/Census/library/publications/2015/demo/p25-1143.pdf.](#)



CHISPA Family Science Day. Photo by Alfonso Juárez.

GENIAL SUMMIT STRANDS

The GENIAL Summit was implemented by an Exploratorium organizing committee led by Co-PIs Dr. Isabel Hawkins and Verónica García-Luis and project managers Liliana Blanco and Amy Oates, who worked in collaboration with a group of advisors with knowledge and experience in research and practice in engaging Latinos in STEM. The advisors also served in the role of Summit strand leaders and panel conveners. The four strands and corresponding advisors/leaders follow:

STRAND 1. LATINO AUDIENCES

Advisor/Strand Leader: Cecilia Garibay, Garibay Group, Chicago, IL

STRAND 2. MARKETING, COMMUNICATIONS, AND MEDIA

Advisors/Strand Leaders: Lorraine Yglesias, Monterey Bay Aquarium, Monterey, CA, and Julie Nunn, Exploratorium, San Francisco, CA

STRAND 3. COMMUNITY COLLABORATION AND EMPOWERMENT

Advisors/Strand Leaders: Salvador Acevedo, Scansion, Inc., San Francisco, CA, and Paul Dusenbery, Space Science Institute, Boulder, CO

STRAND 4. RELEVANT STEAM⁵ EXPERIENCES

Advisors/Strand Leaders: Cheryl Lani Juárez, Phillip and Patricia Frost Museum of Science, Miami, FL, and Verónica Núñez, Oregon Museum of Science and Industry, Portland, OR

⁵ The GENIAL team, advisors, and panelists agreed that it was important to broaden the STEM content focus to STEAM, which includes the arts as an effective strategy to engage Latino audiences in informal science learning (Sousa, D. A. and Pilecki, T. 2013. *From STEM to STEAM: Using Brain-Compatible Strategies to Integrate the Arts*. Sage: Thousand Oaks, CA: Sage).

EXECUTIVE SUMMARIES OF STRAND ARTICLES

LATINO AUDIENCES: EMBRACING COMPLEXITY

Cecilia Garibay, Principal, Garibay Group

Patricia Lannes, Museum Consultant

José González, Executive Director, Latino Outdoors

Efforts to understand the complexity and diversity of Latino audiences are essential for authentic collaboration in any field, including informal science learning. Latinos, like any other cultural group, bring to bear in any endeavor the entirety of their diverse experiences and knowledge. Often, when asked about strategies for engaging Latino audiences in informal learning experiences, we find unexamined assumptions and stereotypes or limited ways of thinking about Latino communities. Discussions tend to oversimplify the issues, leading to overly facile approaches to working with Latino communities. The capacity to embrace and value complexity goes hand in hand with any effort to understand Latino audiences. Indeed, the very notion of “Latino audiences” itself is problematic. What exactly are we referring to when we say our organization hopes to engage Latino audiences? Any initiative that aims to engage Latinos cannot approach such a heterogeneous group as if it were monolithic.



Children exploring the immersive digital exhibition River of Grass at the Phillip and Patricia Frost Museum of Science, Miami. Photo by Alfonso Juárez.

This article explores a number of ideas that we hope provide a more nuanced narrative of Latino communities; it is not intended, however, to be comprehensive or provide definitive answers. In that spirit, we offer four key ideas—or building blocks—that can serve as foundations for considering Latino audiences: identity

and culture, amplification, decolonization, and risk-taking. The content of these ideas speaks to the need to shift from binary and reductionist perspectives to more holistic models that understand the dynamic and fluid nature of Latino audiences and move from cultural appropriation toward more authentic collaborations with the communities that informal learning organizations seek to reach.



Children learning about helping birds impacted by oil spills during the CHISPA afterschool science program at Brighton Park Neighborhood Council, Chicago. Photo by Cheryl Flores.

MARKETING, COMMUNICATION, AND MEDIA

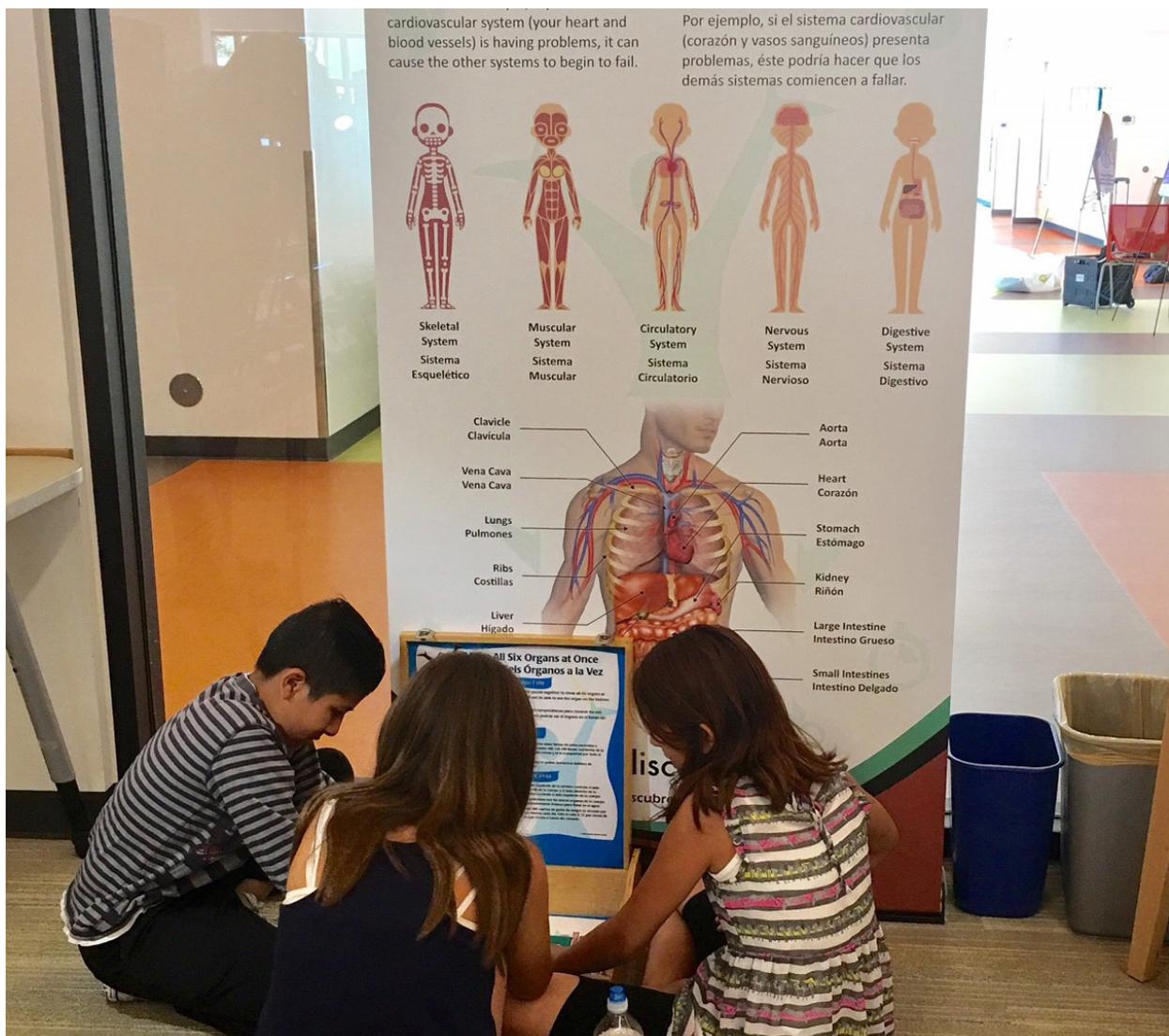
Julie Nunn, Director of Marketing, The Exploratorium

Lorraine Yglesias, Director of Advertising and Promotions, Monterey Bay Aquarium

During the GENIAL Summit, the Marketing, Communication, and Media strand examined the role of marketing and communications in connecting Latino audiences with STEAM in informal science learning (ISL) environments. ISL organizations do not generally think to include a marketing perspective early on in the process of developing audience experiences. When ISL practitioners seek to connect with key audiences, specifically, Latino audiences, marketing efforts are often considered when an exhibit or program is fully developed, in production, or already launched. This causes an immediate and inherent disconnect with ISL content and those for whom it is intended (i.e., culturally diverse audiences). To eliminate this disconnect,

marketing and communications teams must be integrated into the core functions, or DNA, of ISL organizations. This begins by developing and building relationships of mutual trust and respect with key stakeholders and by understanding basic marketing and communications functions and principles at a fundamental level.

Panelists and GENIAL participants discussed a series of strategies to enable a more seamless integration of marketing and communications throughout ISL organizations. It involves embracing the value of marketing and communications within ISL environments, stepping into the shoes of the intended audiences by understanding current research and market trends, and recognizing and leveraging resources inside and outside the organization. This article offers insights and ideas emerging from the Summit discussions to inform the ISL field in moving forward toward new and more effective ways of collaborating with marketing professionals to best engage Latino audiences.



Latino youth learn about the human body. High Plains Public Library/Riverside Branch. Photo by Marina LaGrave.

COMMUNITY COLLABORATION AND EMPOWERMENT

Salvador Acevedo, Scansion, Inc.

Paul Dusenbery, National Center for Interactive Learning, Space Science Institute

Community collaboration and empowerment were identified by the GENIAL organizers as an important theme to include in the Summit. Informal Science Learning (ISL) organizations strive to engage Latino audiences in their science, technology, engineering, and math (STEM) programming on a long-term basis and recognize the importance of understanding the needs, motivations, interests, and challenges of the diverse Latino community in the context of STEM participation. An effective way to collaborate with a community is to involve them as equal partners in the co-development of ISL experiences. A key idea discussed during the Community Collaboration and Empowerment panel was “co-creating ISL programming *with*, instead of *for*, the Latino community.” Panelists also highlighted the need to implement organizational changes within ISL institutions and build the internal capacity of staff across the institution for working with diverse communities. During small group discussions, GENIAL participants were asked to consider a set of actionable insights and recommendations. Based on a synthesis of these discussions, the last section of this paper includes a list of recommendations and emerging research questions for the informal STEM learning community to address.

This paper covers three main topics:

- Principles for Co-Creation and Co-Design
- The Inside Perspective: Organizational Change Within ISL Institutions
- Looking Toward the Future

Principles for collaboration with communities include: respect, understanding the community by acknowledging its knowledge base and working with cultural connectors, and building trust through sustained relationship-building efforts. The importance of valuing resilience in communities is also highlighted with a call to recognizing that persistence is part and parcel of the Latino communities’ DNA.

The article also emphasizes the importance of identifying internal institutional practices to foster capacity for working effectively with diverse communities. These include a committed leadership, diversifying staff at all levels, and paying attention to power dynamics within the organization and with partners.

In looking toward the future, several recommendations and areas of emerging research are discussed in the context of program sustainability and building long-term community relationships.

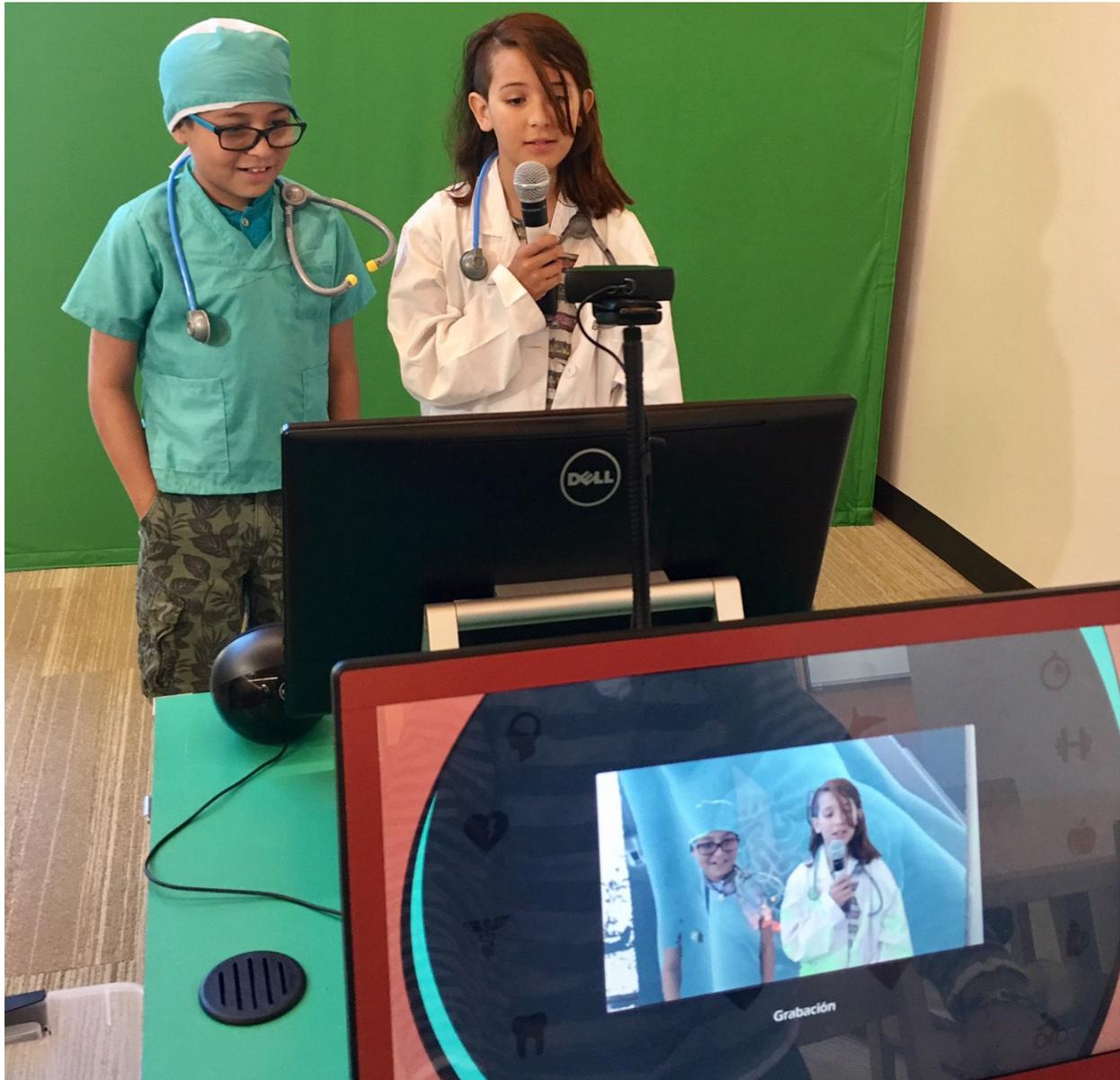
RELEVANT STEAM EXPERIENCES

Cheryl Lani Juárez, Phillip and Patricia Frost Museum of Science

Verónica Núñez, Oregon Museum of Science and Industry

Informal science learning (ISL) organizations that are successful at providing meaningful science, technology, engineering, arts, and mathematics (STEAM) experiences for Latino children, youth, and their families share some common traits. They have leaders and staff who believe in the importance of developing culturally relevant models and frameworks that meet the needs and acknowledge the legacy of STEAM in

Latino communities. Such organizations are willing to take risks to create experiences that are culturally meaningful, garner funding and implement programs by working closely with their local communities, and sometimes go beyond by partnering with other organizations to build regional and national networks based on trust, common goals, and deep relationships. They also respond to changes in their communities, from language choice to acknowledgment and appreciation of diverse preferences, interests, lifestyles, and ways of knowing and learning.



Latino youth learn about the human body. High Plains Public Library/Riverside Branch. Photo by Marina LaGrave.

These organizations exercise great flexibility, are sufficiently agile to adapt to rapidly changing conditions, and value community partnerships as key to the development of relevant STEAM experiences. These traits make such organizations effective in providing relevant STEAM experiences for Latinos because they recognize that when it comes to such experiences, “one size does not fit all.” The idea that STEAM experiences

need to be tailored to the nuances of a highly diverse Latino community was the focus of discussion for the Relevant STEAM Experiences panel during the GENIAL Summit.

This article offers recommendations for ISL organizations and their staff for cultivating qualities and behaviors to enable the development of relevant STEAM experiences that are attuned to the diverse needs of Latinos. They include developing the ability to take risks; valuing new perspectives, paying attention to the continually changing landscape of Latino audiences; seeking and responding to feedback from the community; becoming a good listener; empowering multiple generations and voices; and making space for the entirety of Latino cultural identities. Each recommendation highlights examples provided by the authors, the GENIAL panelists, and participants as a result of small group discussions.

CONCLUSIONS AND CALL TO ACTION

The themes that emerged from the GENIAL Summit speak to the importance of accepting and embracing diversity and inclusion from an asset-based, instead of a deficit-based, perspective. From an asset-based perspective, Informal Science Learning (ISL) institutions are authentically part of communities, not distinct from them. The work takes place on a “two-way street,” where all partners—ISL institutions and Latino communities—have things to learn, share, and gain from each other. Recognizing the great cultural capital of Latinos is the first step toward shifting the role of ISL institutions from providers of STEAM knowledge and content to facilitators and supporters of the long-standing legacy of STEAM inherent in Latino communities.

An asset-based model moves the conversation from a simplified, homogenous view to a holistic understanding of community. In such a model, ISL institutions become reciprocal partners and facilitators working with communities to achieve positive change. Using their own knowledge, skills, and lived experience, all participants can thrive in support of sustainable communities.

The GENIAL Summit brought to light several values—beliefs and behaviors to anchor our professional practice—that are necessary and shared in an asset-based model,⁶ leading to community transformation.

Accept and embrace diversity and inclusion. Everyone has something to contribute; with an asset-based approach, members of Latino communities are active participants alongside ISL practitioners in content creation, not just empty vessels receiving external knowledge.

Respect one another. A respectful partnership values and understands the power of relationships built over time. Relationships are strengthened by trust and shared power to achieve mutual goals.

Continue to learn. Deep listening by all partners leads to growth and mutual enrichment. The benefit of continued learning is gaining skills while building our collective capacity.

Take risks to grow and evolve. Decisions that involve ongoing conversation and the willingness to shift

6 Kretzmann, J. P., and McKnight, J. L. 1993. “Building Communities from the Inside Out: A Path Toward Finding and Mobilizing a Community’s Assets.” Evanston, IL: Institute for Policy Research.

decision-making power builds trust and enables organizational change. Learning from taking risks is a necessary step toward growth and evolution.

These values can be operationalized into tangible actions, including:

- Spend time and resources understanding Latino communities and identities
- Restructure power dynamics for authentic reciprocity
- Co-create STEAM experiences *with*, as opposed to *for*, Latino communities
- Cultivate ownership of the work across every function of the ISL organization to break down barriers and prevent assigning diversity work to only a few staff
- Use data for analysis, reflection, and action in conjunction with community dialogue
- Celebrate successes, accept failure as part of the process, and work toward continual organizational change

As part of the ongoing work leading to the full inclusion of Latino audiences in STEAM, the asset-based collaborative community could approach any of these actions or cycle through them, with the starting point depending on the level of organizational maturity and readiness of the partnership.

As a professional field, the ISL community has an opportunity to develop novel and practical approaches for how partnerships for Latino audience engagement can thrive, including co-designing STEAM experiences and developing authentic measures of success. Eventually, and as a result of sustained effort, we envision a world where ISL organizations and Latino communities engage in mutually beneficial, collaborative work based on trusting relationships and commitment to ongoing organizational change and sustainable growth.

The Exploratorium GENIAL team and participants expressed a strong desire to build on the momentum of the GENIAL Summit and move the conversation forward. As a first step toward this goal, the Exploratorium's [GENIAL website](#) includes information about the Summit, reports, articles, and other resources to inform the ISL field. We call on the ISL and Latino communities to support each other, work together, and take action toward a future where the next generation of Latinos can bring the entirety of their cultural identity to bear in every positive endeavor, including STEAM.

REFERENCES

- González, N., Moll, L. C., & Amanti, C. 2005. *Funds of Knowledge: Theorizing Practice in Households, Communities, and Classrooms*. Mahwah, NJ: L. Erlbaum Associates.
- Gutiérrez, K. D., and Rogoff, B. 2003. "Cultural Ways of Learning: Individual Traits or Repertoires of Practice." *Educational Researcher* 32(5): 19–25.
- Kretzmann, J. P., and McKnight, J. L. 1993. "Building Communities from the Inside Out: A Path Toward Finding and Mobilizing a Community's Assets." Evanston, IL: Institute for Policy Research.

Nasir, N.S., Rosebery, A. S., Warren, B., and Lee, C. D. 2014. "Learning as a Cultural Process: Achieving Equity Through Diversity." In *The Cambridge Handbook of the Learning Sciences, 2nd Edition*. Cambridge University Press.

Rowland, S. 2008. ["What Is Asset Based Community Development \(ABCD\)?"](#) Collaborative of Neighborhood Transformation.

Yosso, T. J. 2005. "Whose Culture Has Capital? A Critical Race Theory Discussion of Community Cultural Wealth." *Race Ethnicity and Education* 8(1): 69–91.