

# Cultivating Capital: Sustaining the STEM Identities of Rural Latinx Youth

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## Abstract

This paper seeks to explore how rural Latinx students' STEM identity development can be fostered by utilizing their cultural capital. By both a community cultural wealth and science identity model, this paper reviews previous literature to conceptualize how and why rural Latinx youth are continuously underrepresented within STEM education and future career pathways. When forming STEM identities and aspirations for the future, Latinx students draw from six forms of capital- *aspirational, linguistic, familial, social, navigational, and resistant*. Throughout this paper, we discuss each of these six forms of capital wealth and the value rural Latinx students can bring into STEM educational spaces. Supporting rural Latinx students' STEM identity development is a vital key to the disruption of systemic inequalities that perpetuate societal and institutional spaces. Conclusions drawn from the literature showcase how cultural wealth sustains the development of Latinx students' STEM identities. Future considerations need to focus on the STEM disparities that still exist for this population of students, specifically those in rural communities.

**Keywords:** STEM, science identity, cultural capital/wealth, Latinx youth, rural education

**H**istorically, Science, Technology, Engineering, and Mathematics (STEM) fields have been overwhelmingly represented and led by cis-white men, who have shaped the dominant cultural norms that have created the barriers and lack of Latinx representation we see today in the U.S. (Ambrogio et al., 2018). These dominant cultural norms consist of valuing competition and individualism - shaping how STEM is practiced and understood by the world. This dominant culture has also created a false perception of who can engage, who has the expertise, and who belongs in STEM, reinforcing larger society assumptions that Latinx people lack the social and cultural capital required for social mobility (Ambrogio et al., 2018; Yosso, 2005). There are numerous factors and barriers throughout the STEM pipeline that contribute to Latinx underrepresentation in STEM; making up 12% of STEM degrees awarded and only 8% of workers in STEM careers in the United States (Fry et al., 2021; Hernandez et al., 2018).

Latinx students are overrepresented at under-resourced K-12 schools, having less access to rigorous math and science courses, and qualified math and science teachers (Museus et al., 2011; Rincón & Rodriguez, 2021). Further attention needs to be placed on rural Latinx students, as research has found that students have more exposure to science in urban areas (Hill et al., 2018). When comparing urban and rural students' informal science experiences, rural youth reported lower rates of participation in after-school science clubs due to accessibility, few STEM resources (i.e., books in the home), and fewer visits to science museums and centers, although they had a greater desire to participate in STEM programming than urban youth (Hill et al., 2018). Research such as this eliminates the notion that rural youth lack an interest in STEM opportunities

and calls attention to the vast geographical disparities and inequities faced by rural communities and specifically Latinx students. These barriers are substantially present for rural Latinx students which often leads to the misconception that these students are “at risk” and “as problems to be fixed” (Castro, 2014, pp. 414-415). These challenges can create steep barriers for rural Latinx students to pursue and develop STEM identities.

As Latinx students transition into higher education STEM programs, having an insufficient amount of preparation, guidance, and STEM resources in high school (Hernandez et al., 2018; Taningco et al., 2008) can hinder Latinx students' success in postsecondary settings. In addition, Latinx college students are exposed to racial microaggressions, gender stereotypes, and subtle cues about who belongs in STEM and who is marginalized (Rodriguez & Blaney, 2021). Rodriguez & Blaney (2021) found that Latinx students expressed resiliency as they navigated through stereotypes and self-doubt because of their racial ethnicities and developed a sense of belonging in higher education by connecting with on-campus Latinx-based organizations. Although there is little research that describes how Latinx students' experiences lead them toward or away from STEM, there remains evidence that Latinx college students are not only completing their degrees at lower rates, but they are earning lower degrees and certifications than their white counterparts (Excelencia in Education, 2019; Rodriguez & Blaney, 2021). For example, 24% of Latino adults have completed an associate degree or higher in comparison to 44% of all U.S. adults with the same degrees (Excelencia in Education, 2019). Additionally, Latina students continue to remain underrepresented within higher education institutions by only representing “3.5% of STEM degree recipients”, despite their increased enrollment in higher education institutions (Gándara & The White House

Initiative on Educational Excellence for Hispanics, 2015, p.11). Some researchers suggest that Latinx students' ongoing underrepresentation in STEM might be better understood through the lens of identity (Ceglie, 2011; Rincón & Rodriguez, 2021). Critical perspectives and frameworks are needed to understand the cultural assets that rural Latinx students bring into the under-resourced classrooms that play an essential role in their educational and career pathways. In this paper, we utilize Yosso's (2005) community cultural wealth framework and Carlone & Johnson's (2007) science identity model to examine how rural Latinx students develop their STEM identities. We present research on the vast ways Latinx students showcase the six forms of community cultural wealth in STEM education. Specifically, we aim to push future researchers and educators to recognize these subsets of cultural capital within rural Latinx students. By doing so, we can transform learning experiences that can sustain future STEM aspirations, innovations, and identities among these students. We conclude this paper with broader impacts that can ultimately help address the underrepresentation of rural Latinx students in STEM, while simultaneously dismantling the dominant cultural norms.

## **Theoretical Frameworks**

### **Community Cultural Wealth**

Critical scholar Tara Yosso (2005) stated that one of the “most prevalent forms of contemporary racism in U.S. schools is deficit thinking” (p. 75). ‘Deficit thinking’ views minoritized individuals as lacking various knowledge or skills deemed valuable by normative cultural standards and continues to dominate U.S. educational systems. Furthermore, these discriminating views about communities of color are directly tied to the banking method of education (Freire, 1970/2005). The banking method posits that

effective teachers are to passively fill students with dominant cultural knowledge and norms (Yosso, 2005). To frame this discussion and research around rural Latinx students' STEM identity development, we utilize Yosso's (2005) framework of community cultural wealth to disrupt these systemic forms of inequity. The community cultural wealth framework highlights six forms of capital that Students of Color bring into the classroom and are often overlooked. These six forms of cultural wealth include aspirational, social, familial, navigational, linguistic, and resistant capital.

Together, these call attention to cultural wealth that isn't deemed admissible by our dominant society (Yosso, 2005). To further expand upon this idea, Yosso (2005) articulates that cultural capital "refers to an accumulation of specific forms of knowledge, skills, and abilities that are valued by privileged groups in society" (p.76). Communities of color have continued to be portrayed as culturally deficient in comparison to white, middle-class standards (Yosso, 2005). By adapting this framework to educational spaces, teachers and researchers can begin to disrupt these forms of deficit thinking, legitimize the cultural wealth that rural Latinx students carry into the classroom, and support the development of their STEM identities.

### **STEM Identity**

In addition to Yosso's (2005) community cultural wealth framework, we employ the use of a science identity model. Carlone and Johnson (2007) developed the initial science identity model based on a study of women of color in STEM to include three overlapping dimensions: competence, performance, and recognition. The dimension of competency refers to the expertise or ability to comprehend science materials, while the performance dimension encompasses one's ability to use or talk about scientific tools.

The final dimension of recognition captures an individual's intent to be seen or their peers' recognition of being seen as a “science person” (p. 1191). These three dimensions are interrelated and influenced by “one’s gender, racial, and ethnic identities” (Steinke, 2017, p. 5). The process of developing a science identity occurs over the course of many years in a person’s educational journey.

As we continue to support Latinx students and their science identity development, it is important to note that any “aspiring scientist relies on the judgment and invitation of practicing scientists throughout every phase of [their] educational and career process” (Lewis, 2003, p. 371; cited by Carlone & Johnson, 2007). Therefore, it is vital that rural Latinx students are provided with continuous equitable educational experiences and mentors that are committed to the development of their science identities within these three dimensions. The use of Yosso’s (2005) community cultural wealth framework along with Carlone and Johnson’s (2007) science identity model help demonstrate how culturally responsive learning experiences can foster the development of Latinx youth STEM identities.

### **Influences on STEM Identity Development**

There are multiple complex influences that can impact Latinx and their STEM identity development. When investigating how women of color form science identities, Ceglie (2011) found that the cultivation of a robust science identity correlates directly with the type and quality of science-related experiences throughout one's life. Within this study, important elements identified as critical to participants' identity formation were race, ethnicity, gender, and economic well-being (Ceglie, 2011). Additionally, Jackson and Suizzo (2015) interviewed Latina college students who were pursuing a science-

related career and were able to identify similar common factors that influence their STEM identities. Directly relating to Celgie's (2011) findings, the eight infinities (factors) that arose were home environment, teacher influences, school experiences, contextual factors, media, using your brain, emotions, and career planning (Jackson & Suizzo, 2015). Together, these findings identify key factors that influence how Students of Color form STEM identities and therefore could be determined by future research as factors to how rural Latinx students build their identities in STEM educational environments.

STEM identity influences can form from the strong connections that are built between the home and school environments. Drawing on the complexities of family and school influences on Latinx engineering identity formation, Mein et al. (2020) found that having positive school-based support, especially in the form of teachers and mentors, can play a pivotal role in helping guide first-generation Latinx students in engineering. Another finding further suggested that families where the father was an engineer also played a pivotal role in influencing students' choices to become an engineer. In contrast, families without a parental engineering figure, school-based teachers, and mentors thus played a significant role in recruiting these students into engineering fields (Mein et al., 2020).

Just as these strong connections are built between home and school environments, STEM identities can also become shifted and shaped by subtle and covert microaggressions. For example, these racist and sexist acts that occur frequently to marginalized groups were found to shape the academic and social aspects of the undergraduate engineering educational climate for women (Camacho et al., 2011). In order to be successful within this harsh school climate, it was found that women students

adopted a variety of strategies. More specifically, Latina students claimed that their engineering identities were shaped by ethnicity/culture first and would likely join engineering societies that offer support to women of color. These students utilized their resistant capital through the adaptation of “learning how to fail” as a keyway to persist. Despite the experiences of microaggressions, Latina students' resiliency helped them persist in the consistently male-dominated field of STEM.

These STEM identity influences all fall within the six capitals of the community cultural wealth framework (Yosso, 2005). For example, studies conducted by Celgie (2011) and Jackson & Suizzo (2015) highlighted Latinx students' use of aspirational and social capital, while Mein et al. (2020) focused on how the influences provided by mentors, teachers, and family were used to foster a strong sense of social and familial wealth. In conclusion, students arrive at learning spaces with cultural resources based on their values, beliefs, skills, traditions, language(s), preferred learning styles, experiences, and worldviews which shape their prior knowledge to future learning experiences (Sharkawy, 2015). When we devalue or contradict students' cultural resources, it can lead to profound disengagement in science education. Valuing every form of cultural wealth that students bring with them into the classroom counteracts this disengagement.

### **The Six Forms of Community Cultural Wealth**

The following section provides supporting literature for each of the six capitals of the community cultural wealth framework: aspirational, linguistic, familial, social, navigational, and resistance. We focus on how cultural wealth sustains the development of rural Latinx students' STEM identities.

## **Aspirational Capital**

*Aspirational capital* is defined by Yosso (2005) as an individual's "ability to maintain hopes and dreams for the future, even in the face of real and perceived barriers" (p.77). Latinx students' aspirational wealth can be used to mitigate these perceived social, economic, and institutional barriers (Martinez et al., 2020). As Latinx students consider STEM career and college opportunities in the face of such systemic barriers, their aspirational wealth may derive from relationships with family, peers, or individuals within their local communities. Recent research has even found that aspirational capital is overwhelmingly used as a form of support by Latinx parents to support their child's perseverance in academic settings (Grosso Richins et al., 2021; Guzmán et al., 2018). Therefore, this form of capital ultimately contributes to students' science identity development and their career aspirations. When Latinx students fulfill these aspirations, they are often inspired and supported along the way through the stories shared by family members or educators that have expressed ways of how to overcome adverse experiences (Martinez et al., 2020). Teachers within the K-12 classroom also have the power to harness Latinx students' aspirational capital by providing learning opportunities that align with other forms of capital, which allow them to share lived experiences or perspectives that may challenge oppressive discourses (López & Pérez, 2018). Ways of doing this can include classroom or small group counseling sessions led by recent or currently enrolled Latinx graduates who are employed within science careers. These types of mentoring sessions can be used to provide realistic examples that showcase the accomplishments that current Latinx high school students can aspire to (Gonzalez et al., 2015). Consequently, when Latinx youth

are able to connect with other Latinx community members who are showcasing their science endeavors, they can begin to recognize themselves as individuals who can aspire to work in the same scientific fields (Martinez et al., 2020).

Although there have been many conversations and actions put into place to change these barriers within higher educational spaces, Native Americans, African Americans, and Latino Americans continue to be underrepresented in science fields (Chemers et al., 2011). In regard to rural Latinx student populations who are considering STEM careers or college pathways, a closer look into how aspirational capital fuels science identities need to be accounted for. Studies such as the one presented by Rincón and Rodriguez (2021) investigated how Latinx college students' pursuit of their STEM majors was supported by the aspirational capital they received from fellow peers and local community members. One student from their study even highlighted “how seeing other Peers of Color being successful in STEM inspired her to overcome challenges and gain the confidence needed to combat the imposter syndrome she felt as a woman, minority, and first-generation college student in STEM” (p.155). In addition to this, she felt that these experiences allowed her to feel recognized as a current and aspiring STEM college student. Another participant described how resources from their community and visions of contributing to the community enabled them to persist toward their dreams. Latinx youth also draw from the same types of aspirational capital to fuel their commitment to STEM careers and college pathways. The use of mentoring programs, such as community outreach initiatives is positive reinforcement that can reaffirm students' aspirational capital.

As previously noted, Latino students remain underrepresented in STEM career fields in comparison to the overall population (NSF, 2013) and students are continuing to become disinterested in these fields before high school (Lindahl, 2007). Mentoring opportunities such as creating sustained relationships between pre- and post-secondary educational institutions (Moskal & Skokan, 2011) can therefore support rural Latinx students' aspirational wealth in nurturing their STEM identities and abilities to pursue careers in science fields. Examples of this have been recorded by studies such as those by Hernandez et al. (2018) which utilized the *Pathways to College Program*. This mentoring program was designed for high school Latinx students to pique their interest and engagement in STEM fields and careers while increasing their access to resources or those that could provide expert guidance to aid in college or career preparedness. Using such programs, students can view how their proficiency in scientific phenomena and use of scientific tools can directly influence their future in a scientific career.

The use of such community initiatives and partnerships can therefore support previous literature which notes the importance of providing STEM career aspirations to students. Additionally, these types of initiatives have proven to be a leading factor in supporting youth in applying for and completing a science-related college degree (Legewie & DiPrete, 2014; Saw & Agger, 2021; Tai et al., 2006). Latinx students, especially those living within rural communities, can also be supported by the aspirational capital that is drawn from collaborative and affirming community programs such as these.

### **Linguistic Capital**

Along with aspirational wealth, students support the development of their STEM identities by drawing from their *linguistic capital*. Yosso (2005) describes this linguistic capital as a true reflection of the “idea that Students of Color arrive at school with multiple languages and communication skills” (p. 78). A student’s linguistic capital can also encompass the student’s vast knowledge of expressive and artistic skills using outlets such as music and poetry. Many Latinx students live in households where their multilingualism supports their communication and relationship-building skills with others (Martinez et al., 2017). Being able to communicate in multiple languages or expressive forms of art also highlights how Latinx students hold unique interpersonal intelligence skills as cultural and linguistic innovators (Burciaga & Erbstein, 2012). Within higher educational STEM experiences, interviews taken by Rincón & Rodriguez (2021) showcased how some students leaned heavily on their linguistic capital to build trust with patients from a community clinic. Another student saw their linguistic capital as an asset to building a stronger STEM identity that connected to her life at home and with her profession. However, when thinking about rural Latinx students who are considering STEM pathways, structured supports that build upon this wealth can also allow for a sustained science identity to be formed.

For example, multilingual and bilingual students can be supported in the sustainment of their STEM career aspirations when educators or school counselors invite multilingual students who are currently navigating postsecondary institutions to connect with them at their school sites. Furthermore, these students consistently build their linguistic wealth as they develop their English language skills over time and honor their native languages (Martinez et al., 2020). Latinx students’ linguistic wealth is an

asset to their personal lives but also to their budding professional and STEM career choices. The formation of rural Latinx students' science identity is greatly influenced by the recognition of being seen as a scientist. Recognizing Latinx students' bilingual and multilingual identities within the context of STEM allows their linguistic capital to prosper and further transform what a scientist can be. To support rural Latinx students, educational spaces must continue to value the varying linguistic repertoires that students bring into the classroom.

### **Familial Capital**

*Familial capital* accounts for the “cultural knowledge nurtured among familia (kin) that carry a sense of community history, memory, and cultural intuition” (Yosso, 2005, p. 79). It is this type of capital that also accounts for the support students receive from their immediate family but also those in their extended kinship, or community networks. Scholars such as Rincón et al., (2020) have recently found that Latinx students utilize their familial capital to foster their STEM passions. Latinx students thus place a heavy emphasis on following their STEM aspirations into post-secondary education while considering family responsibilities, health concerns, or financial circumstances (Mein et al., 2020; Rincón et al., 2020). Familial solidarity or *familismo* has even been described by previous scholars as a core value that focuses on the collective whole, rather than a sole individual (Gonzales, 2019). The value of *familismo* has further been placed as a contributor to students' aspirational capital or resiliency to continue pursuits in secondary but also leading to positive post-secondary settings (Consoli & Llamas, 2013; Gonzales, 2019). By acknowledging the deep familial connections and relationships that rural Latinx

students have with their families and community members, they build a strong sense of who they are, and who they aspire to be in the scientific world.

Scientific research in higher education studies has also showcased how participants rely on their parental “consejos (advice) and apoyo (support)”, which are common parental strategies that Latinx families use to show involvement in their child’s education (Morales-Chicas et al., 2022, p. 7). This advice and support have been shown to foster students’ persistence in STEM due to the unwavering mentorship and solidarity expressed by close familial connections (Morales-Chicas et al., 2022). The “*familismo*” or “sense of loyalty toward the family” (Hernandez et al., 2016 p. 357) displayed within Latinx families showcases how “conversations about educational topics, including science, tend to include all members of the family” (De Leon & Westerlund, 2021, p. 49). Familial capital can thus support Latinx students in their scientific educational endeavors by providing informal support such as verbal encouragement and motivation (De Leon & Westerlund, 2021). Previous scholars have noted that there is a limited amount of research regarding the validation of familial knowledge that students learn and bring with them into the classroom (Grosso Richins et al., 2021; Gutiérrez, 2012; McWayne & Melzi, 2014). However, Latinx students’ familial wealth acknowledges and values the extended community knowledge they have access to. These expanded familial connections have even been noted by Students of Color as critical to their pursuit of “college and career aspirations” while they view this persistence to “honor the significant work and sacrifice of their family members” (Means, 2019, p.10). It is evident that extended kinship connections can create supportive networks that affirm the development of STEM career aspirations and scientific identities of Latinx students.

## **Social Capital**

*Social capital* can be understood as having a network of people and community resources who can provide both instrumental and emotional support to navigate through institutions (Yosso, 2005). Rural Latinx students carry their own social networks such as family, friends, school, and local communities that not only can help cultivate their aspirations but also nurture their identity development. To cultivate STEM identities, Rincón et al. (2020) found that Latinx students utilize cultural assets, such as social networks, to develop culturally grounded understandings of themselves as STEM individuals, to sustain their persistence, and also provide mutual support to other Students of Color. For example, one participant demonstrated his ability to leverage his social networks, through his father's professional connections to learn about STEM graduate programs and scholarships that are specifically for students from marginalized backgrounds. By leveraging his social networks, he was able to identify resources to successfully apply to STEM graduate programs. Promoting social capital, allows Latinx students to claim their non-traditional social networks within STEM spaces. This can further foster their STEM identity formation and reaffirm their aspirations to become competent and proficient scientists.

Means (2019) similarly found that rural Black and Latinx middle school students' aspirations are shaped and supported by their social networks. Family members ranging from parents and siblings to aunts and uncles, schoolteachers, and youth-based organizations leaders helped them cultivate and sustain college and career aspirations. Specifically, it was found students' commitment to family and familial sacrifices drove them to pursue their STEM aspirations to honor them and seek financial stability for

themselves and their families (Means, 2019). Historically, communities of color have relied on social capital to attain necessary resources that they otherwise would not have access to. Social networks such as family and community, have been shown to help Students of Color attain the needed education and emotional support to cultivate and sustain their and their peers' STEM identities.

### **Navigational Capital**

*Navigational capital* refers to having skills or an inner set of resources to maneuver through social institutions that are historically not made for communities of color (Yosso, 2005). Scholars such as Rincón et al. (2020) have sought to reaffirm Latinx students' navigational knowledge and ability to thrive in their STEM educational careers. When Latinx students enter different spaces that uphold white dominant culture, they develop specific mental scripts, language codes, and intellectual or behavioral procedures (Rincón et al., 2020). For example, one participant demonstrated this form of capital through the search and use of blogs, YouTube videos, and other online resources to learn how to navigate postsecondary institutions independently. In addition, this participant shared their new knowledge with peers in similar situations; uplifting others while transcending adversity. Furthermore, this student showed their competency by supporting and sharing their science knowledge with others. STEM has been viewed as an individualistic field and competitive by nature (Ambrogio et al., 2018). However, Latinx students demonstrate the need for communities to develop and sustain STEM aspirations, therefore, dismantling traditional approaches and views.

Doran and Hengesteg (2020) found intervention programs that provide culturally affirming spaces can foster Latinx students' navigational abilities. Specifically, these

researchers examined a community college program that helped Latinx students learn how to effectively navigate the complexities of financial aid and transferring to a 4-year institution. This ultimately helped build confidence within each of the participants while they began cultivating a successful college student identity (Doran & Hengesteg, 2020). By implementing aspects of cultural capital into the program, it was shown to have successfully increased retention and transfer rates among Latinx college students. Generation after generation, Latinx students have drawn on their individual agency and resilience to navigate through the education system and learning spaces that are not culturally responsive or aware of the vast cultural wealth they bring with them.

### **Resistant Capital**

*Resistant capital* is inherited knowledge and skills fostered through oppositional behavior that challenges inequality and is grounded in the legacy of resistance to subordination exhibited by communities of color (Deloria, 1969; Yosso, 2005). Martinez and colleagues (2020) found that it is through culture shock and the experience of racial and gender microaggressions that Latinx students acquire resistant capital. Resistant capital thus becomes a tool for Latinx students when faced with academic and social obstacles. It is through oppositional identities and behavior that these students can garner the skills to challenge inequality, making Latinx students' pursuit of STEM a form of resistance. Recent research has found that Latinx students engage in both external and internal forms of resistance. Rincón and Rodriguez (2021) noted one form of internal resistance appears as the desire to disprove deficit views, like internal motivation while external resistance is verbal or a physical reaction. One student from this study intentionally sought spaces, such as tutoring centers, where his racial-ethnic identity was

underrepresented which empowered him to become a STEM tutor. Another example provided a description of how a student overheard a negative gender stereotype of women in science and openly challenged the dominant view being expressed (Rincón et al., 2020). Resistant capital can be utilized to reaffirm science identity among rural Latinx students who hold competency and should be recognized as science individuals.

This capital is a critical tool and source of empowerment for Latinx students to challenge oppressive forces that threaten the development of a STEM identity (Rincón et al., 2020; Sánchez-Connally, 2018). It is important to note that inherited resistance is rooted in the shortcomings of institutions that force additional labor onto Students of Color. We as educators must recognize how Latinx students use their resistance capital to grapple with and surpass institutional shortcomings and self-affirm their science identity.

### **Discussion and Future Implications**

The use of anti-deficit frameworks in social science research fields has continued to frame research over the past few decades (Acevedo & Solorzano, 2021). Therefore, these types of frameworks push back against the underlying deficit thinking models which do not leave room for educators to identify the various forms of cultural wealth that students bring with them into the classroom (Sánchez-Connally, 2018). The use of Yosso's (2005) community cultural wealth is just one of many ways we can begin to highlight the various forms of capital that rural Latinx students bring with them into the classroom.

Our review has shown that, when forming STEM identities and aspirations for the future, Latinx students draw from the six forms of capital- *aspirational, linguistic, familial,*

*social, navigational, and resistant*. Carlone and Johnson (2007) state that an “Identity is not just something an individual feels; it is not even what an individual does, although both feelings and actions are components of identity” (p. 1192). A science identity is nurtured when an individual’s competency, and performance as a science individual are recognized by educational institutions as a whole science individual. Therefore, rural Latinx students’ STEM identity development cannot flourish unless their aspirational, social, familial, navigational, linguistic, and resistant capital is valued within the U.S. educational systems. Acknowledging these forms of capital may be the first step in transforming educational institutions into supportive spaces for Latinx students in STEM. However, much of the current research surrounding Latinx students’ science identity and persistence in STEM fields focuses on students’ navigation of higher education spaces and their post-secondary degree completion (Martinez et al., 2020; Mein et al., 2020; Rincón & Rodriguez, 2021). Research needs to continue highlighting how rural Latinx students utilize their forms of cultural wealth within K-12 learning experiences to create more equitable transitions into STEM career and college pathways.

Equitable STEM learning spaces require the reauthorization and legitimization of Latinx students’ knowledge and cultural wealth. Research has shown that culturally affirming practices in STEM with greater compositional diversity, an inclusive curriculum involving social and familial opportunities, and a focus on social justice is more likely to foster STEM identities (Doran & Hengesteg, 2020; Means, 2019; Rodriguez & Blaney, 2021; Samuelson & Litzler, 2016). Valuing rural Latinx students as culturally whole individuals, whose knowledge, experiences, and resilient histories is critical. Valuing the multiple forms of wealth that students bring to their learning will allow educators to

acknowledge and address the racial inequities and oppressive systems currently in place within our educational systems. Legitimizing rural Latinx students' cultural wealth can also shift power dynamics and sense of belonging in STEM learning spaces. Thus, acknowledging rural Latinx students' as wise and culturally wealthy independent learners is integral for true reformation in learning and provides a critical lens for exposing and restructuring the injustices that marginalize and deem Students of Color as incompetent.

Yosso's Community Cultural Wealth framework can be used to counteract the historically rooted deficit thinking within our education system. Utilizing this critical race-based framework can disrupt the forms of systemic inequities found in education and more specifically in STEM to affirm Latinx student presence, power, and knowledge. In the words of Rodriguez (2016), the CCW framework provides a pedagogical approach that "not only gives us an opportunity, but requires a social, political, and educational commitment to be forthright and visionary so all our Latina/o students across the educational pipeline are recognized as agents of their own conditions and have the capacity to transform these conditions by growing, building, and thriving together (p. 87). Whether it's early in their K-12 education journey or within post-secondary institutions, Latinx students independently use their cultural wealth to persist, navigate and succeed in today's U.S. public education systems. It is urgent for educators and researchers to recognize and utilize these forms of cultural wealth in concrete ways that will foster success among rural Latinx students.

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### **Biographical Note**

**Corina De La Torre** is a first-generation Chicana scholar-researcher, born and raised in East Salinas, CA, where she learned the importance of hard work and community through her family's and neighbors' resiliency and now is a doctoral student in the department of Teacher Education and Learning Sciences at North Carolina State University. Her research focuses on rural Latinx youth identity development and cultivating racially and culturally inclusive, community-oriented learning spaces. Outside of the classroom, Corina is a community organizer advocating for long-term policy changes that will result in safe, thriving neighborhoods and schools.

**Corrie Dobis** is a Literacy and English Language Arts doctoral student in the department of Teacher Education and Learning Sciences at North Carolina State University. Her research interests include multiliteracy approaches to learning and how the use of culturally sustaining pedagogies support multilingual learners within elementary grade levels.

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