

Drawing on Multiple Sources of Knowledge

Research in education has increasingly emphasized the value of integrating students' diverse backgrounds and life experiences into classroom learning. This integration, often termed as drawing on students' "funds of knowledge," significantly impacts student engagement and comprehension, especially in subjects such as mathematics. Moll et al. (1992) describe "funds of knowledge" as the historically accumulated and culturally developed bodies of knowledge and skills essential for household or individual functioning and well-being. By acknowledging and utilizing these funds of knowledge in mathematics instruction, teachers can create more relevant and engaging learning experiences.

The 5 Equity-Based Practices

1. Going Deep With Mathematics
2. Leveraging Multiple Mathematical Competencies
3. Affirming Learners' Mathematical Identities
4. Challenging Spaces of Marginality
5. **Drawing on Multiple Resources of Knowledge**

Aguirre, et al, 2013



The "How!"

In traditional math education, there is often a singular approach to problem-solving and knowledge dissemination. However,

research suggests that when educators tap into the varied resources of knowledge that students bring from their home and community environments, it can lead to deeper understanding and increased engagement. This practice not only supports academic growth but also affirms students' identities and experiences, contributing to a more equitable educational environment. Implementing this practice involves several strategies.

- **Cultural Contextualization:** Incorporating examples and problem-solving contexts that are culturally relevant and reflect the diverse backgrounds of the students.
- **Collaborative Learning:** Encouraging students to share their own methods and understanding of mathematical concepts, which can originate from their cultural or familial experiences.
- **Community Involvement:** Engaging with the community to bring local knowledge into the classroom, which could involve guest speakers, community projects, or field trips that link mathematics to real-world contexts familiar to students.

What Does This Look Like?



- Create assignments that allow students to explore mathematical concepts through the lens of their cultural practices and everyday lives.
- Facilitate classroom discussions where students can share their backgrounds and relate them to the mathematical concepts being taught.
- Encourage students to apply their out-of-school knowledge to solve real-world problems, thereby making learning more practical and relevant.
- [Drawing Multiple Sources of Knowledge Quick Look](#)

Planning with Your PLC

Questions to Consider:

- What do you know about the cultural, social, and economic backgrounds of your students?
- How can you learn more about the interests, experiences, and everyday practices of your students?
- How can you enhance the curriculum to allow for student contributions based on their backgrounds and experiences? What avenues are available for incorporating local community resources and experts into the learning experiences of students?



Drawing on Multiple Sources of Knowledge



Many culturally and linguistically diverse students come from backgrounds that value collectivist approaches to learning, such as interdependence, cooperation, and collective problem-solving. However, they may receive mathematics instruction in schools that prioritize individualism and competition, such as direct instruction that promote a dominant society's learning patterns.



How Drawing on Multiple Sources of Knowledge is Connected to Equity

Drawing on multiple resources of knowledge is a vital practice for promoting math equity because it directly addresses disparities in access to quality education. By valuing and incorporating the diverse knowledge that students bring from their homes and communities, educators can connect mathematical concepts to real-life situations familiar to students, thereby **increasing engagement** and the **perceived value** of mathematics. When students see their backgrounds and experiences reflected in the math classroom, they are more likely to feel included and respected. This inclusive atmosphere can **boost confidence and participation**, particularly among those from underrepresented or **marginalized groups**.

Integrating various resources of knowledge in math education helps in constructing a positive mathematical identity and agency. It empowers students by allowing students to express their understanding and approaches to solving problems based on their cultural and personal experiences. This practice validates their backgrounds and enhances their **sense of belonging** in the math classroom. When students engage with math in ways that go beyond traditional methods, it often leads to deeper critical thinking and problem-solving skills. This is crucial for students who might feel **alienated** by conventional approaches that do not **resonate** with their lived experiences.

Using multiple resources of knowledge supports transformative practices that aim to **rectify historical and systemic inequities** in math education by broadening perspectives. Educators and students gain a broader perspective on how mathematical concepts can be viewed and applied differently across cultures and contexts. Also, this practice challenges the norms and biases of mainstream math education, which often overlooks the cultural assets non-dominant groups bring to their learning experiences. **Varied learning needs** of students are better understood when the whole student is taken into consideration.

Connecting School and Community

Conducting home visits or community tours to better understand the cultural and economic resources of the families they serve better connects schools to the communities they serve. What other ways have your schools made connections?

Tasks that Can Be Used to Draw on Multiple Sources of Knowledge:



- Middle School Mathematics Lessons to Explore, Understand, and Respond to Social Injustice (Conway, et al., 2023)
- NCTM Social Justice and Equity Resources @ <https://www.nctm.org/socialjustice/>
- Funds of Knowledge Toolkit: https://ospi.k12.wa.us/sites/default/files/2023-10/funds_of_knowledge_toolkit.pdf
- NC School Report Card data: dpi.nc.gov/data-reports/school-report-cards
- Community walk <https://www.middleschoolmathman.com/middleschoolmathmanblog/math-is-everywhere-tiles-a-math-project-for-upper-grades>

Want to Learn More?



Abdurahim, N. & Orosco, M. (2020). Culturally responsive mathematics teaching: A research synthesis. *The Urban Review*, 52, 1–25.

Demmert Jr., W. G. (2001). Improving academic performance among Native American students: A review of the research literature. U.S. Department of Education.

[The Impact of Identity in K-8 Mathematics: Rethinking Equity-Based Practices](#) (Aguirre et al., 2013).

Johnson, E., & Johnson, A. (2016). Enhancing academic Investment through home-school connections. *Journal of Language & Literacy Education*, 12(1), 104-121.

Ladson-Billings, G. (1995). Toward a theory of culturally relevant pedagogy. *American Educational Research Journal*, 32(3), 465-491.

Moll, L. C., Amanti, C., Neff, D., & Gonzalez, N. (1992). Funds of knowledge for teaching: Using a qualitative approach to connect homes and classrooms. *Theory Into Practice*, 31(2), 132–141. <https://doi.org/10.1080/00405849209543534>

NCSM Essential Actions: Culturally relevant leadership in mathematics education. mathleadership.org.

Teachers who are culturally competent engage in critical reflection about race and culture which informs their mathematics teaching and supports the sustainable development of practices that are culturally responsive.

Abdurahim & Orosco (2020, p. 18)

Adapted from: Aguirre, J., Mayfield-Ingram, K., & Bernard Martin, D. (2013). *The Impact of Identity in K-8 Mathematics*. NCTM. <https://www.nctm.org/Store/Products/The-Impact-of-Identity-in-K-8-Mathematics-Rethinking-Equity-Based-Practices>