



STEAM for ALL

Where the STEAM ISL Field Stands and Future Directions

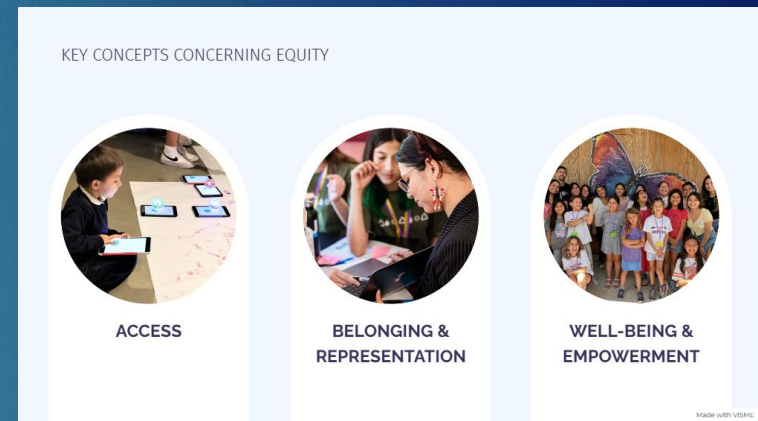
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Refined Definition: Equity in ISL

Equity in ISL and STEAM Education is the commitment to providing all learners with personalized, context-sensitive tools and resources that allow them to fully and effectively participate in learning experiences tailored to their individual needs.

It includes supporting educators with training and resources to create inclusive, culturally relevant learning environments and dismantling systemic barriers so all learners, particularly from underrepresented groups, feel valued and capable.



Key Findings

Systemic Barriers:

- Socioeconomic disparities limit access to resources and participation in STEAM.
- Lack of representation and cultural bias hinder engagement among marginalized groups.
- Existing structures often overlook the needs of diverse learners, reducing inclusivity in ISL.

Effective Practices:

- **Culturally Relevant Pedagogy:** Tailoring programs to reflect the cultural backgrounds and lived experiences of students improves engagement.
- **Community-Centered Approaches:** Co-designed programs that involve community input lead to better alignment with learner needs and increased participation.
- **Mentorship and Role Models:** Diverse mentors support underrepresented students, enhancing their sense of belonging and interest in STEAM.

Trends in Equity-Based Initiatives:

- Growing emphasis on diversity, inclusion, and access across STEAM programs.
- Partnerships with local communities and cultural institutions are expanding opportunities for engagement.
- Increasing focus on interdisciplinary approaches (like combining art and science) to appeal to broader audiences and foster learning identities.



Priorities for Future Research/Pilots



✦ **Expanding Culturally Relevant Pedagogy**

- ✦ Further develop frameworks that incorporate diverse cultural contexts, making STEAM more engaging and meaningful for underrepresented groups.

✦ **Bridging ISL and Formal Education**

- ✦ Design and test pilot programs that integrate informal STEAM learning with formal classroom settings to broaden access and continuity in STEAM education.

✦ **Supporting Long-Term STEAM Engagement**

- ✦ Research models that sustain student interest in STEAM over multiple years, particularly for marginalized communities. Explore the impact of continuous mentorship and hands-on learning.

✦ **Equity in Emerging Technologies**

- ✦ Investigate how tools like AI and VR can be used inclusively in ISL to enhance learning while reducing access barriers, creating a more equitable technology-driven learning environment.

Case Study

Touch Tours (Houston Museum of Natural Science)

- ↴ Program co-designed with blind community
- ↴ Uses tactile materials, trained guides, and accessible presentations
- ↴ Led to wider museum accessibility and deeper community trust



Best Resources

1. **Hinojosa, R., et al. (2021)**
 - ↪ *Focus:* Mentorship as a pathway to equity in ISL.
 - ↪ *Key Insight:* Tailored mentorship can help underrepresented students overcome barriers in STEAM.
2. **Dawson, E. (2014)**
 - ↪ *Focus:* Development of equity guidelines for ISL.
 - ↪ *Key Insight:* Clear guidelines help create inclusive learning environments by considering diverse cultural contexts.
3. **Gaskins, W. (2021)**
 - ↪ *Focus:* Addressing access, diversity, and inclusion in STEAM.
 - ↪ *Key Insight:* Equity involves ensuring access to resources, diversifying participation, and creating welcoming spaces.
4. **Ryoo, J., et al. (2018)**
 - ↪ *Focus:* Designing equity-oriented STEAM pedagogy.
 - ↪ *Key Insight:* Programs should integrate students' cultural backgrounds, challenging dominant narratives.
5. **Philip, T., et al. (2017)**
 - ↪ *Focus:* Multiple meanings of equity in ISL.
 - ↪ *Key Insight:* A shared understanding of equity among educators is essential for cohesive program design.
6. **Tzou, C., et al. (2019)**
 - ↪ *Focus:* Integrating Indigenous knowledge with STEAM.
 - ↪ *Key Insight:* Cultural connections in STEAM foster deeper engagement and respect for Indigenous knowledge systems.
7. **Bevan, B., et al. (2020)**
 - ↪ *Focus:* Integrating art and science to foster learning identities.
 - ↪ *Key Insight:* Combining art with science broadens engagement and helps students see themselves in STEAM.