Supporting Joy in STEM

What is the issue?

- How young people feel in informal STEM learning (ISL) is central to how and to what extent they are able to be and become in STEM. Supporting joy in ISL is closely intertwined with embracing humanity in ISL. Many youths do not feel like their "whole self" is invited into learning spaces, as if their feelings, experiences, histories, hopes, and fears are not central to what happens.

- Acknowledging and centering joy in STEM includes acknowledging and centering youth as people whose ideas, happiness, and ways of being matter. Supporting joy in STEM is about cultivating relationships and spaces that expand opportunities to feel positive, welcome, and happy both *while* in STEM engagement and because of STEM engagement.

- Joy can describe a spectrum of emotional experiences, from shallow and fleeting amusement or silliness that one might feel while joking with a friend, to a deeper sense of fulfillment or meaning that one might feel while reflecting on that friendship's journey. Both ends of that spectrum of emotional experience are valid and important in ISL. Small acts of joy, for example, can support enhanced ways of being and doing in STEM spaces and activities, while deeper experiences of joy can support sustained engagement in STEM programs and disciplines over time.
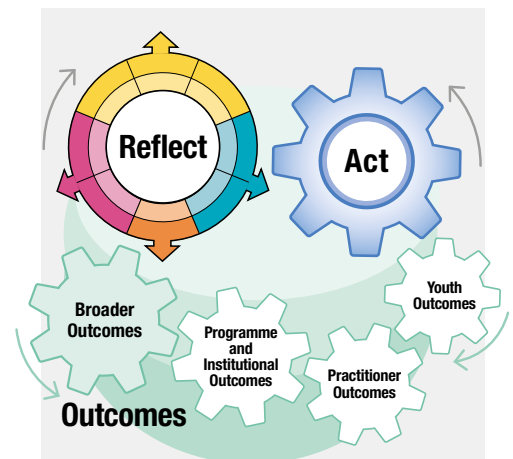
YESTEM Model for equity in ISL

The Equity Compass is the basis of the Reflect component of this model. Please see **yestem.org** for the full model and related Insight documents detailing each component.

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What is the practice?

Supporting joy in ISL is when educators engage in purposeful actions to encourage joyful moments of youth expression and sharing with both their peers and trusted adults in their learning space. Creating a sense of joy in STEM provides youth confirmation that STEM can be a space of happiness for them. This joyful experience in STEM can be carried by youth across spaces and support their persistence in STEM.

Supporting joy in STEM looks like:

1. Planning activities that include (and responding in-the-moment to youth calls for) playful youth expression

2. Encouraging and supporting youth to engage in STEM projects in personally meaningful, inspiring, or uplifting ways over time

For youth, supporting joy in learning also supports their agentic participation in the learning process without worry, judgment, reluctance, or hesitation. When educators and youth see one another as worthy of joy, they grant each other room to engage in STEM differently. This enhanced engagement can be a transformational opportunity to connect, to deepen relationships to STEM, and to accomplish personally meaningful and community-centered goals, all while being themselves within STEM learning spaces.

Importantly, joy supports youth to engage as they authentically are, and supporting youth in engaging as they are supports experiences of joy in learning. In this way, joyful engagement and engagement as one's full self-work like a positive feedback loop. This means that educators and designers can enter this practice from multiple dimensions to reach the same goal of transformative, justice-oriented engagement in which youth feel they can a) be themselves and b) be joyful.

As was typical during Youth Action Council (YAC) sessions at the local Science Center, educator Addison had music playing in the background for the youth to enjoy. Youth often sang along as they worked on their current maker project. On this particular day, frustrations were mounting as several youths struggled with the focal activity. When the song "Let It Go", from the movie Frozen, began to play, several youths immediately sprang out of their chairs to the carpeted area of the room and began to sing with gusto at full volume while dancing along.

Within a matter of seconds, everyone, Addison and other adult educators included, began singing too. People were laughing, dancing to the song together, making eye contact, and enjoying the moment. When the song ended, one of the youths stated that she had not wanted that moment to end because it really captured how they were feeling. They all needed that moment of emotional release to let their in-the-moment maker frustrations go before they could move on with their projects.

How to use this practice: Reflect

Reflection questions

1. How are youth currently encouraged to express joy in your learning space?

2. What are some ways you could create spaces for youth to express joy in STEM?

3. What obstacles could be addressed to support youth authority more broadly at your institution?

How to use this practice: Act

Things to do

1. Activities help create opportunities

Welcome fun activities youth bring or request, even when these activities do not seem directly connected to your focal STEM goal that day (e.g., mini dance parties, hide-and-seek, singing).

2. Design can mediate opportunities for joy

Designing to inspire and cultivate moments of joy can start with taking inventory of the physical and material dimensions of ISL experiences, to critically consider what messages they send and what atmosphere they produce for youth who enter them. What kinds of activities, movements, and interactions are facilitated in the space?

3. Youth can define joy for themselves

This can also start with asking youth to define what joy in STEM means to them and what is required for them to feel "safe" and/or "allowed" to be fully joyful and to be expressive in sharing their joy externally with each other.

4. Youth as designers of joyful spaces

Youth have shared how co-constructed/co-designed learning spaces can support self-expression, sharing, and embodiment of "realness" in a learning space, so that adult attempts to support joyful experiences feel more authentic and more central to informal STEM learning.

Additional tools and resources

Reflect on the day's agenda and activity plans

If youth express a desire to engage in a different activity and your first response is "no", ask yourself why this is. Then consider, could you offer a short "try-out" period for the activity? **"Let's try it for 5 minutes."**

Take a "Joy inventory" of the learning space

For instance, think about what materials are available, how a space is physically arranged, what and whose artifacts hang on the wall, how lighting is arranged, what the space sounds like, etc. Is there space to move around, to play games, to be flexible in the ways youth engage in the space?

Support multiple dimensions of youth joyful expression

Do youth break into song and dance while they work?

- Use a sound system to play music. Share who gets to choose the playlist/song.

- If you can move chairs, provide options to sit or stand while working. Create an open space to take short dance breaks.

Do youth make friends easily in your learning space?

- Encourage youth to work with people they have not yet spent time with, and facilitate friendly introductions.

- Appoint youth to be program ambassadors for new visitors or new members, to show them around and introduce them to additional peers.

- Regularly remind youth how much you enjoy being there with them too.

About our project

- Over four years, our project involved researchers, ISL educators and young people working in partnership to develop new understandings and insights about how ISL might better support equitable outcomes for young people aged 11-14 from minoritized communities.

- Our project partnership involved data collection in the UK and the USA with partners in two science centres, two community STEM clubs, a zoo and a digital arts centre.

- Overall, 260 young people and 30 practitioners took part.

- In the wider project we also conducted surveys with 2,783 young people.

For the full range of Insights documents summarizing the project's tools and resources, including Core Equitable Practices and Equitable Youth Outcomes Model, please see **yestem.org**

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@yestem_uk