

BETTER in STEM Equitable, Student-Centered Instructional Framework

How do we protect the potential of systemically non-dominant students in STEM?

Culture/Environment	Curriculum/Content
<p><i>Vision: The goal of Culture and Environment is to help students feel a sense of belonging in their classroom and STEM discipline and know what they need to do to succeed. To feel a sense of belonging, students need to feel they bring valuable ideas and resources to their classroom that are built upon through instruction. They need to feel they are part of the learning process and have agency in that process. Students see people of their positionality and backgrounds represented as contributors to the discipline, learn about how the discipline they are learning has been and is influenced by the dominant culture, and explore ways of understanding their discipline that come from other cultures. To know what is needed to succeed, students need to have a clear understanding of the learning goals as well as what a successful demonstration of their learning looks like.</i></p>	<p><i>Vision: The goal of Curriculum and Content is to ensure students are learning material that builds important understanding and skills coherently. To learn content deeply, students need to make connections between the knowledge they learn, and know how that knowledge builds to important concepts. Since learning is actively constructed by the learner, ideas and motivations students bring to the classroom need to be valued, and leveraged, as resources for learning. Students must see how their learning is connected to their career aspirations, work in their communities, and positions as citizens in a democracy. To help all students make these connections, they should learn about the history and current work in the discipline from multiple cultural perspectives, as well as see contributions of scholars with various identities to ensure they are able to see themselves in the field.</i></p>
<p><i>Transparency, Accessibility, and Engagement</i></p> <ol style="list-style-type: none"> 1) Students are held to clear expectations through challenge, collaboration, and engagement. 2) Students interact with course content, materials, activities, and assessments that are accessible and engaging. 3) Students co-construct, discuss, adopt, and regularly revisit community norms for constructive interactions, discussions, classroom and lab routines, and group roles. 4) Students have time to think and reflect individually and discuss with peers to identify learning goals and next steps. <p><i>Power, Cultural Competence, and Belonging</i></p> <ol style="list-style-type: none"> 5) Students work together to create a classroom environment that promotes connection, relationships, and collaboration that humanizes disciplinary learning and situates the classroom as a place of belonging. 6) Students participate in a classroom community that works to explicitly confront issues like stereotype threat, imposter syndrome, and microaggressions. 7) Students interact in a classroom that interrupts white supremacy culture by learning cultural and intellectual skills to meaningfully participate in a multicultural society. 8) Students engage in a classroom community that works to address inequities, power dynamics, and the role of identity within academic learning spaces. 	<p><i>Foundational Structure and Transparency</i></p> <ol style="list-style-type: none"> 1) Students anchor their learning to foundational Big Ideas in the discipline. 2) Students make connections between content in previous, current, and next lessons/courses. 3) Students discuss the purposes of assignments/activities and their alignment to the course's Big Ideas and lesson goals. <p><i>Connecting to Community/Equity Ethic</i></p> <ol style="list-style-type: none"> 4) Students' prior knowledge, experience, and cultural knowledge is elicited and integrated into learning activities. 5) Students engage in learning experiences that draw on, and value, diverse cultures, ways of knowing, prior experiences, and frames of reference. 6) Students interact with curricula that acknowledges/showcases contributions of scholars with a variety of identities, ensuring students can see themselves in the field. 7) Students have opportunities to think about their career goals and equity ethic. 8) Students explore how the STEM content they learn is applicable to their future careers while illuminating societal issues to improve their local and global communities. <p><i>Equity and Responsibility</i></p> <ol style="list-style-type: none"> 9) Students engage with content that confronts privileged knowledge systems and presents disciplinary history from multiple cultural perspectives. 10) Students learn the history of the discipline and understand how it was utilized to benefit and harm particular groups and ecosystems in the past and present.

Discourse & Language	Assessment for Learning
<p><i>Vision: The goal of Discourse and Language is to empower the diversity of student voices in the classroom toward the co-construction of important knowledge and skills. In order for all students' ideas and thinking to be part of the classroom's learning, students' native language and ways of communicating must be viewed as resources for making sense of disciplinary content as well as social issues in local and global communities. Historically dominant discourse and academic language must be challenged, and linguistic and nonlinguistic components of discourse and language attended to. Students need to learn through varied forms of communication that are available to make sense of the content. Students need supports and structures to feel safe sharing ideas, and to see their ideas are valued resources for building knowledge within the classroom community.</i></p>	<p><i>Vision: The goal of Assessment for Learning is to enact instruction responsive to students' assets and needs. Evidence of students' ideas and progress regularly drives instructional decisions. Students understand what success looks like, know where they are in relation to learning goals, and are supported in developing strategies to improve their understanding and skills relative to those goals. They regularly reflect on their progress and collaborate with peers to support each other in progressing toward learning goals. Students' learning is assessed in relation to learning goals and seen as evidence of progress, rather than inherent ability in the discipline. Students are involved in developing the criteria for high-quality work, and apply criteria to their peer's work as well as their own. Students need ample opportunities to make mistakes, and learn from them, without having their mistakes during the learning process negatively impact their grades. Students need to be able to effectively leverage feedback from instructors and peers related to their progress and understand what next steps are needed to move forward with their learning.</i></p>
<p><i>Structured Group Discussions</i></p> <ol style="list-style-type: none"> 1) Students co-develop parameters and guidelines for small and large group discussions. 2) Students participate in structured group discussions that privilege all voices and ways of communicating to make student thinking visible. 3) Students engage as co-inquirers during class discussions and activities. <p><i>Disciplinary Genres</i></p> <ol style="list-style-type: none"> 4) Students engage with disciplinary communication through a variety of styles, genres, mediums, and modalities, for a variety of purposes. 5) Students utilize different forms of communication as they develop their understanding of disciplinary specific language, vocabulary, discourse patterns, and communication through linguistic and nonlinguistic components. <p><i>Linguistic Diversity</i></p> <ol style="list-style-type: none"> 6) Students' native languages, dialects, and other forms of communication are drawn upon as resources. 7) Students practice listening, reading, and interacting with the diverse ways in which language is spoken, written, and embodied by multilingual scholars, teachers, and students. 8) Students challenge historically and systemically dominant ways of discourse and academic language of the discipline, and embrace multilinguistic, dialects, deaf speech, and other forms of language and communication within the class discussions, literature, and materials. 	<p><i>Transparency and Alignment</i></p> <ol style="list-style-type: none"> 1) Students connect lesson objectives to disciplinary Big Ideas to better understand relevance. 2) Students engage with learning activities, instructional materials, and assessment tasks aligned with program outcomes, course learning goals, and lesson objectives. 3) Students engage in dialogue about the assessment purposes, rationale, format, and processes. <p><i>Feedback and Reflection</i></p> <ol style="list-style-type: none"> 4) Students engage with tasks/activities to elicit and reflect on evidence of their current learning in order to identify next steps to support and/or adjust their learning strategies. 5) Students use actionable peer and instructor feedback to revise and resubmit assignments. 6) Students provide feedback that informs instructional practices used during class sessions (content, pedagogies, and pace). <p><i>Equitable Grading</i></p> <ol style="list-style-type: none"> 7) Student assessment and grading practices reflect a culture of practice through iteration, feedback, and revision that allows students to learn from errors without negative consequences. 8) Students engage in the assessment process through activities such as collaborating on rubrics and determining type and modes of feedback.