STEM and Culturally Responsive Pedagogy for K-12

Welcome

The WEEAC Virtual College is an online learning format designed for educators to participate in workshops that increase awareness in equity related topics. These courses will be self-paced and free of charge to all participants. The content aligns with the mission of the Equity Assistance Center grant funded by the United States Department of Education.

All areas highlighted in GRAY are video and document links that can be activated by clicking on the active link. The videos work best in the Google Chrome Browser. If your computer is set to open in different browsers, you might have to copy and paste the url address into Chrome to view open the link.

Course Overview

This course introduces culturally responsive teaching through an exploration of what it means to be culturally responsive in order to meet the needs of culturally and linguistically diverse students. Participants will learn practical ways to ensure that all students in their STEM classes are engaged, actively learning and connecting the learning to their personal, school, and local community experiences.

While student populations continue to become more culturally and linguistically diverse, the STEM workforce remains mostly homogeneous in terms of race, ethnicity, and gender. Many of our top fastest-growing industries require some type of STEM education and training. Our most pressing global issues – health, climate change, and economic growth – need people who possess the problem-solving skills rooted in STEM. However, despite this need for a diverse STEM workforce, only a small percentage of students from marginalized backgrounds complete baccalaureate STEM degrees. The percentages are even smaller for students with marginalized identities completing graduate STEM degrees. This course aims to help give K-12 STEM teachers the tools to provide their culturally and linguistically diverse students access to challenging, rigorous STEM education in order to help students build their identity in STEM and become prepared for postsecondary STEM programs, persist, and ultimately join the STEM workforce. It begins and ends with pre-and post-assessments to help participants gauge their level of learning and understanding before and after taking the course. Each module will consist of a learning activity, reflective exercise, and post-module assessment.

STEM and Culturally Responsive Pedagogy for K-12 – General Course Overview Video

Western Educational Equity Assistance Center (WEEAC)

This content was prepared by Dr. Jasmine J. Yap, Consultant with the Western Educational Equity Assistance Center. Watch the introduction video below to get to know Dr. Jasmine J. Yap.

Introduction Video

Dr. Jasmine J. Yap – Click for introduction video

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Western Educational EQUITY Assistance Center

Communication Policy

If you have any questions, feel free to reach out via email or phone.

STEM and Culturally Responsive Pedagogy for K-12: Pre-Assessment

Before we get started with the first module in this course, please take some time to test your knowledge on STEM and Culturally Responsive Pedagogy for K-12.

➢ Pre-Assessment - Click to begin

Next Steps

When ready, continue to module 1.

Module 1.1: Introduction to Culturally Responsive Pedagogy

Overview

Learning Objective: By the end of this module, participants will be able to define culturally responsive pedagogy, articulate why it is important in the teaching of STEM, and have a foundational understanding of how the sustaining of students' cultural backgrounds in the classroom impacts learning.

➢ What Does It Mean to Be Culturally Responsive? - Video

➢ Module 1.1: Mini-Quiz – Click to begin

Next Steps

When ready, continue to the next section in this module.

Module 1.2: The "Why": Why Is Culturally Responsive Pedagogy Important When Teaching STEM?

➢ Why Is Culturally Responsive Pedagogy Important When Teaching STEM - Video

Next Steps

When ready, continue to the next section in this module.

Module 1.3: Dimensions of Equity

➢ Dimensions of Equity - Video

Next Steps

When ready, continue to the next section in this module.

Module 1.4: Collectivist Versus Individualist Cultures

➢ [Collectivist Versus Individualist Cultures - Video](#)

Next Steps
When ready, continue to the next section in this module.

Module 1.5: Relationship-Building as a Culturally Responsive Practice

➢ [Relationship-Building as a Culturally Responsive Practice - Video](#)

Next Steps
When ready, continue to the next section in this module.

Module 1.6: Asset-Based Mindset Versus Deficit Mindset

➢ [Asset-Based Mindset Versus Deficit Mindset - Video](#)

Next Steps
When ready, continue to the next section in this module.

Module 1.7: Module 1 Post-Assessment & Resource List

Now that you have completed all sections in this module, it's time to do the post assessment!

➢ [Module 1 Post-Assessment – Click to activate](#)

➢ [Module 1 Resource List – Click to activate](#)

Next Steps
When ready, continue to the module 2.

Module 2.1: CREDE Standards for Effective Pedagogy

Overview

The Center for Research on Education, Diversity, and Excellence (CREDE) developed a set of standards for effective pedagogy, based on Vygotsky's social constructivist learning theory and over 40 years of research on effective instruction for diverse students. A substantial body of empirical research has demonstrated that the use of CREDE Standards in classrooms raises the achievement of culturally and linguistically diverse students and improves their motivation to learn. In this module, we will explore the standards, look at some examples of implementing these standards in the STEM classroom, and provide an opportunity to revise a current lesson plan the participant uses to be in line with the CREDE Standards.

Learning Objective: By the end of this module, participants will develop an understanding of how to use the CREDE Standards and the CREDE Standards Rubric to effectively teach STEM to diverse student populations.

- Introduction to CREDE Standards – Video
- CREDE Standards Rubric (PDF Document) – Click to activate

Next Steps
When ready, continue to the next section in this module.

Module 2.2: Examples of Use of CREDE Standards

- Examples of Use of CREDE Standards – Video
- CREDE Standards Rubric (PDF Document) - Click to activate

Next Steps
When ready, continue to the next section in this module.

Module 2.3: CREDE-ify Your Own Lessons

- CREDE-ify Your Own Lessons – Video
- Peer or self-evaluation – Record this lesson when you teach students or ask a peer to observe your lesson. Use the CREDE Classroom Observation Rubric to evaluate how well the lesson met the CREDE Standards.
- Student evaluation of learning experience using Student Self-Evaluation Sheet

Next Steps
When ready, continue to the next section in this module.

Module 2.4: Module 2 Post-Assessment & Resource List
Now that you have completed all sections in this module, it's time to do the post assessment!

- Module 2 Post-Assessment – Click to begin

- Module 2 Resource List – Click to activate

Next Steps
When ready, continue to the module 3.

Module 3.1: Differentiated Instruction

Overview
Differentiated instruction is an inclusive student-centered pedagogical approach, considering each student's readiness, interest, and learning profile. This teaching strategy can accommodate a wide range of students who

are either at a low level of readiness and need intensive support or are at a high level of readiness and need additional challenge. The instructor adapts instruction to meet the learning needs of the student by proactively modifying curricula, teaching methods, learning activities and assessments to meet the diverse needs of students, thereby maximizing access to, motivation for, and efficiency of learning.

<u>**Learning Objective:**</u> By the end of this module, participants will be able to explain what it means to differentiate instruction and apply differentiation to their teaching and assessment practices.

<u>**Module 3.1: Introduction to Differentiated Instruction**</u>
Please watch the following videos:
- ➢ [What is Differentiated Instruction (YouTube Video) – Click to activate](#)
- ➢ [Carol Tomlinson on Differentiation: Proactive Instruction (YouTube Video) – Click to activate](#)
- ➢ [Differentiated Instruction: Why, How, and Examples (YouTube Video) – Click to activate](#)

Please take a few minutes to complete the module 3.1 mini-quiz:
- ➢ [Module 3.1: Mini-Quiz – Click to begin](#)

Next Steps
When ready, continue to the next section in this module.

Module 3.2: How to Differentiate STEM Instruction
Please watch the following videos:
- ➢ [15 Differentiated Instruction Strategies (YouTube Video) – Click to activate](#)
- ➢ [Station Rotation: Differentiating Instruction to Reach All Students (YouTube Video) – Click to activate](#)
- ➢ [Differentiation in the secondary classroom - 8th grade math (ESL) (YouTube Video) – Click to activate](#)
- ➢ [Tiered Instruction in a Middle School Math Classroom - Lory Schieler (YouTube Video) – Click to activate](#)

- ➢ [Learning Activity: Rewriting a Lesson Plan to Include Differentiated Instruction (Chemistry Examples of Differentiated Instruction) - Video](#)

Next Steps
When ready, continue to the next section in this module.

Module 3.3: Differentiated Assessment
Please read the following article by Tomlinson, Moon & Imbeau (2015):
- ➢ [Assessment and Student Success in a Differentiated Classroom](#)

Please watch the following video:
- ➢ [Differentiated Assessment (Ted Talk) | Erin Campbell](#)

Please take some time to watch the following recommended videos:
- ➢ [Differentiated Assessment Strategies: Ongoing Assessment](#)
- ➢ [Differentiated Assessment Strategies: After Learning](#)

➢ Differentiated Assessment Strategies: Assessment During Learning
➢ Differentiated Assessment Strategies: Learning Centers

Next Steps
When ready, continue to the next section in this module.

Module 3.4: Module 3 Post-Assessment & Resource List
Now that you have completed all sections in this module, it's time to do the post assessment!

➢ Module 3 Post-Assessment – Click to begin

➢ Module 3 Resource List – Click to activate

Next Steps
When ready, continue to the next item.

End-Of-Course "Wrap Up"
CONGRATULATIONS! you have completed all modules in this course, it's time to do the post assessment!

➢ End of Course - Video
➢ Getting Started with Reflective Practice
➢ End-Of-Course Video Playlist and Reflection

➢ Post-Assessment - Click to begin

Next Steps
When ready, continue to the next item.

Course Completion

Professional Development Units
The suggested amount of Professional Development Units for this course is 8 contact hours. MSU Denver will issue a certificate of completion and it is at the discretion of state licensing agencies, school districts, or local educational agency to recognize completion for professional development credits.

Certificate Requirements - Click to activate
Please fill out the following registration form in order to receive a completion certificate

Feedback survey - Click to activate
Please fill out the following exit survey to provide feedback on this course.