ADVANCING COHERENT AND EQUITABLE SYSTEMS OF SCIENCE EDUCATION

Facilitator's Guide for ACESSE Resource A: Introduction to Formative Assessment to Support Equitable 3D Instruction

Resource Overview

Intended Audiences This resource was developed to be broadly used with PK-12 science teachers (inservice and preservice) and professional development providers.

Brief Description In this professional development session, we will develop a shared, basic understanding of how formative assessment works and different approaches that have been developed. This professional development session supports the following specific goals for educators:

- They explore how equity and social justice goals relate to the use of formative assessments
- They develop a shared understanding of formative assessment purposes and processes
- They learn how cognitive formative assessments and cultural formative assessments can build capacity for equitable 3D instruction
- They learn about the kinds of professional learning resources available to support the development of 3D formative assessments

Resource Link https://www.oercommons.org/courseware/module/12294

Schedule & Time This resource is designed to be delivered in one 60 to 70 minute professional development session. It can also be used by individuals wanting to refine their teaching practice.

Group Work This session involves brief periods of small group discussion followed by whole group sharing.

Delivery Format This resource is provided through the OER (Open Educational Resources) Commons platform. It can be delivered directly from that platform or it can be remixed and ported to a range of other Learning Management Systems (LMS) platforms as described below.

Contact Information	We have developed this resource with the goal that it could be broadly useful to support coherent and equitable 3D science instruction. If you have questions or suggestions related to this resource, please email STEMteachingtools@uw.edu
Facilitator Exit Survey	Complete this "exit survey" after using the resource.
Background	With financial support of the National Science Foundation, this resource comes from a series of PD sessions on formative assessment developed by the ACESSE team: Philip Bell, Shelley Stromholt, Bill Penuel, Katie Van Horne, Tiffany Neill, and Sam Shaw. Initial resource development happened as part of the Research+Practice Collaboratory.
Preferred Citation	Bell, P., Stromholt, S., Penuel, W. R., Van Horne, K., Neill, T. & Shaw, S. (2016). *Introduction to Formative Assessment to Support Equitable 3D Instruction*. [OER Professional Development Session from the ACESSE Project] Retrieved from http://stemteachingtools.org/pd/SessionA

Customizing this Resource to your Local Context & Using Different Delivery Platforms

We strongly encourage facilitators using this resource to customize it to deeply fit with their local educational context. This can involve: (a) using local examples that will be quickly understood by the audience, (b) highlighting how a particular strategy fits with—or relates to—an existing local approach or system, or (c) connecting the work to local communities or populations that are served.

This resource is an open educational resource and can be freely shared, modified, and used. This resource is provided through the OER (Open Educational Resources) Commons platform and provided through a Creative Commons license (CC BY-SA) in order to support its broad and free use. It can be delivered directly from the OER Commons platform or remixed and ported to a range of other Learning Management System (LMS) platforms.

OER Commons is a digital library of education resources developed to support the open education movement. Many education organizations are now using this site to openly share education resources. ACESSE chose this site to distribute our professional learning resources because it supports two important functions. First, ACESSE supports efforts to make quality educational resources more accessible as a way to promote educational equity. Second, the OER Commons site will soon allow users to easily export the resource in formats such as Google Classroom, EPUB, or a SCORM package. In the meantime, if you need to export the resource directly into an LMS via LTI access, please contact STEMteachingtools@uw.edu.

This resource is available as a PowerPoint file, but you can also work with the resource directly within OER Commons via the "remix" feature. This allows you to easily edit the tasks in each module and add material to customize it for your local context (as described above). For more information, see:
https://www.oercommons.org/authoring/4460-creating-a-remix-on-oer-commons/view

How to Prepare to Use this Resource

These are the recommended steps for preparing to use this resource with a group:

1. **Read all of the materials** related to the resource—including this Facilitator's Guide, the slides, the speaker notes provided for each slide, and the referenced resources.

2. **Make copies of resources referenced in the session.** We recommend that you make a copy of the following resource for all participants as a good starting point in the work:
    - STEM Teaching Tool #18: How teachers can develop formative assessments that fit a three-dimensional view of science learning

    We recommend having at least a few copies of these resources on hand for people to explore:
    - Overview: What Have We Learned about Improving Assessment for Learning?
    - STEM Teaching Tool #26: How can assessments be designed to engage students in the range of science and engineering practices?
    - STEM Teaching Tool #30: Integrating Science Practices Into Assessment Tasks
    - STEM Teaching Tool #33: How to design assessments for emerging bilingual students
    - STEM Teaching Tool #37: Beyond "misconceptions": How to recognize and build on Facets of student thinking
    - STEM Teaching Tool #41: Prompts for Integrating Crosscutting Concepts Into Assessment and Instruction

1. **Decide how you are delivering the professional development experience.** You can deliver it from: (a) OER Commons, (b) the PowerPoint deck, or (c) an exported version from OER Commons that you bring into another platform. More information about the importance and process of localizing the resource is above.

2. **For background, explore the short course on How to Develop 3D Formative Assessments for the Science Classroom**. It will provide you with a sense of where the formative assessment work is headed related to supporting 3D instruction. This topic will likely come up during this session.

3. **Please fill out this quick "exit survey" after you deliver this professional development session. (There is a separate survey for participants in the slides.)** We would like to get your feedback on how it went and how we can improve the resource. Thank you.

Building a Community and Developing Group Norms

Working to build community and establishing group norms is important for any group that will work together, especially if the participants have not worked together regularly before. Including time in each session for community-building shows participants that their time, experiences, and ideas are valuable and engages them as active contributors to the session. It can also help participants to

create a network of support for each other's work. Community-building can be as simple as including time for participants to introduce themselves to each other, or can include more extensive discussion and shared development of group norms. Extensive resources exist to support such work--here are just a few ideas to get started:

Discussion Prompts

Facilitators may include discussion prompts that allow for participants to share their experiences and interests with each other in a way that prepares the group to engage with the session topic. Discussion questions may include:

- What is your prior experience with today's topic?
- What do you hope to gain from today's session?
- What successes or challenges have you experienced in relation to this topic?

Developing Group Norms

Group norms can help to create a safe space where participants feel comfortable sharing their ideas and experiences. Group norms can be developed in several ways: they may be generated and negotiated by the participants, facilitators might generate and post them, or in a hybrid model facilitators might seed a "starter" set of norms to be edited by the participants. Some norms may include:

- Assume best intentions
- Listen carefully to one another
- Be open to new ideas
- Be open to working outside your comfort zone
- Ask questions
- Allow a chance for everyone to participate

Background on the ACESSE Project

This resource is brought to you by the ACESSE project. The Advancing Coherent and Equitable Systems of Science Education (ACESSE, or "access") project brings together partners from educational research and practice to tackle a pressing problem in education: how to make state systems of science education more equitable and coherent. The project is based on deep collaboration between the University of Colorado Boulder; University of Washington; and the Council of State Science Supervisors (CSSS). It is funded by the National Science Foundation (NSF) through Award DRL-1561300. You can follow ACESSE project developments on Twitter. Read the ACESSE press release to learn more about the project.

Background on STEM Teaching Tools

ACESSE resources are shared on the STEM Teaching Tools site — an initiative that develops and shares professional learning resources that can help educators teach science, technology, engineering and math (STEM). The initiative is currently focused on supporting the teaching of equitable 3D instruction as represented in the NRC Framework for K-12 Science Education. The tools are co-authored by teachers and researchers focused on specific topics and problems of educational practice. The STEM Teaching Tools effort

is primarily funded by the National Science Foundation (NSF) through the Research + Practice Collaboratory (DRL-1626365) and the ACESSE project (DRL-1561300).