

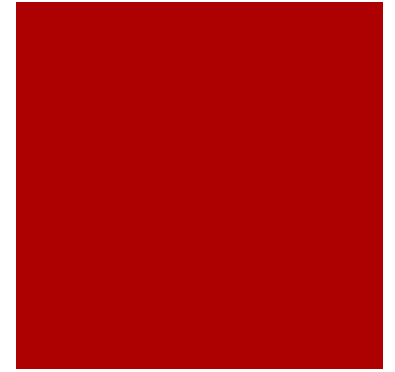


Learning Modules Focused on Learner-Centered, Knowledge-Centered, Assessment-Centered, and Community-Centered Environments

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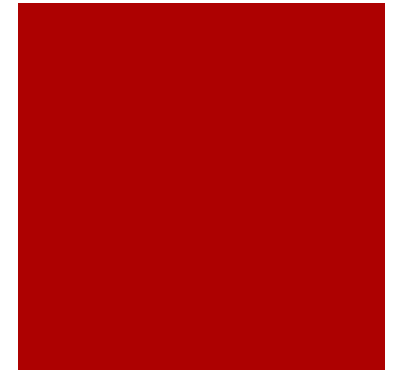


Introduction

- Approximately 40% of the agriculture-related employment opportunities in the United States go unfilled each year (Goecker et al., 2015)
- Students studying the natural sciences often do not view agriculture careers as attractive career choices (President's Council of Advisors on Science and Technology, 2012, p.41)

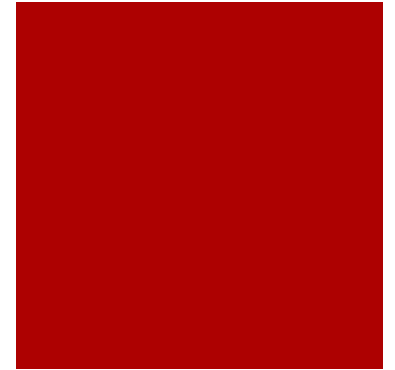


USDA-NIFA-PD-STEP Purpose



- Create and evaluate a Science and Agriculture Academy (SAA)
 - community of high school science and agriculture teachers who receive two years of professional development
 - instructional support aimed toward:
 - increased awareness of the multidisciplinary nature of agriculture
 - Increased awareness of related degree and career opportunities in the food, agricultural, natural resource, and human sciences



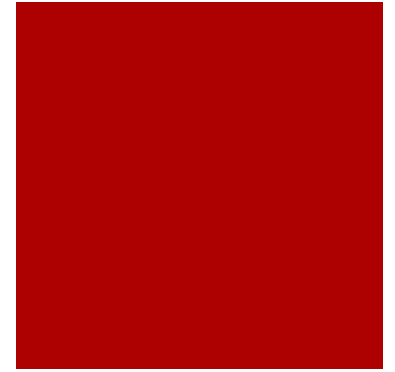


Module Development

- Preparation and training for curricula development
- <https://ag.tennessee.edu/alec/lab/Pages/Modules2.aspx>
- Learning environments (National Research Council, 2000)
 - learner-centered
 - knowledge-centered
 - assessment-centered
 - community-centered



Learner-Centered (Constructivism)



- "The essential core of constructivism is that learners actively construct their own knowledge and meaning from their experiences" (Fosnot, 1996; Steffe & Gale, 1995; as cited in Doolittle & Camp, 1999).
 - Creating an authentic learning environment for students
 - Linking new knowledge to prior knowledge
 - Transitioning teacher roles from instructors to facilitators of learning (Doolittle & Camp, 1999)
- What do you do in your classroom that would align with a constructivist classroom?



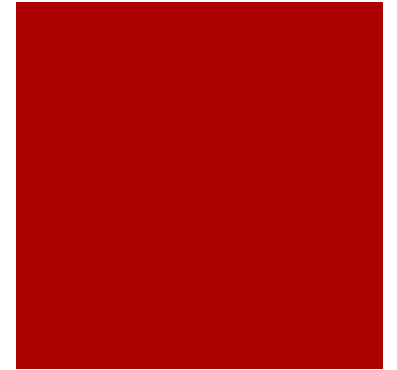
Learner-Centered (Culturally Responsive Teaching)



- The teachers sense of what students know and can do as well as what each student cares about and wants to do
- Learner-centered teachers respect and understand students' prior learning experiences and use them as a foundation to build and connect new concepts
- Recognize that students attach their beliefs, understandings, and cultural practices to the academic content



Learner-Centered (Instructional Implications of Constructivist Design)



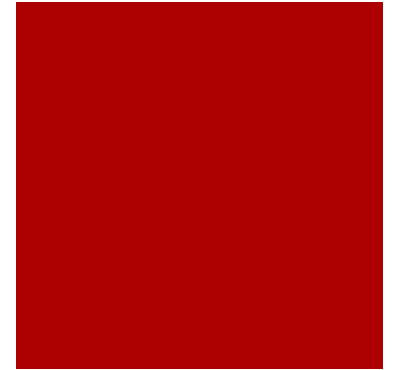
- Discovery learning
 - Process that requires students to construct and test hypotheses (Schunk, 2012)
 - Learners reach a result on their own

- Peer Tutoring
 - learning occurs through “social negotiation within a cultural context, with language as the primary enabling tool” (Clarkson & Luca, 2002, p. 2)

- Cooperative Learning



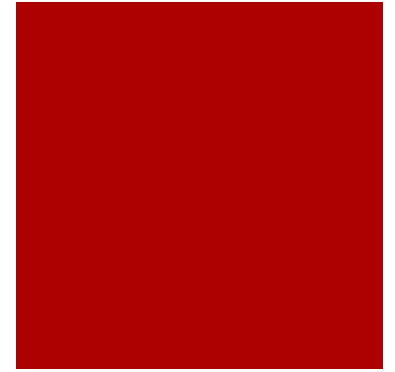
Knowledge-Centered (Teaching for Depth & Progressive Formalization)



- Provides depth in student learning by assessing comprehension rather than factual memory
- Academic Language
 - Students engage in a content area in a meaningful way through vocabulary and discourse (Stanford Center for Assessment, Learning, and Equality, 2016)
- Metacognition
 - A learner's capacity to assess their ability to complete a task and monitor their current level of understanding (NRC, 2000)
- What have you done in your classroom to encourage students to monitor their own understanding?



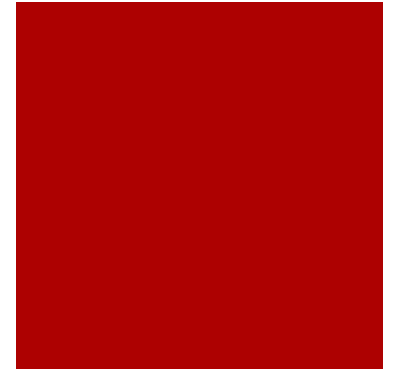
Knowledge-Centered (Conceptualizing & Generalizing)



- Students need to re-conceptualize misconceptions they have that might interfere with learning
- What have you done in your classroom to help students re-conceptualize misconceptions?



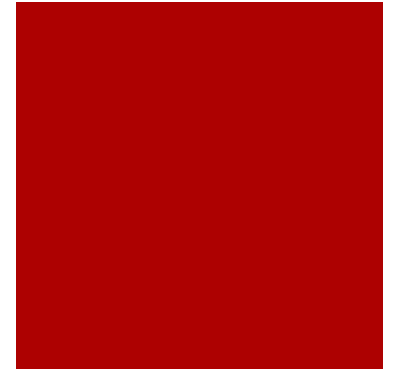
Assessment-Centered (Congruency in Assessment & Learning)



- Purposeful Feedback
- Revision opportunities
- Assessment should be continuous
- Backward Design (Wiggins & McTighe, 2005)
- What type of assessment has been successful in your classroom?



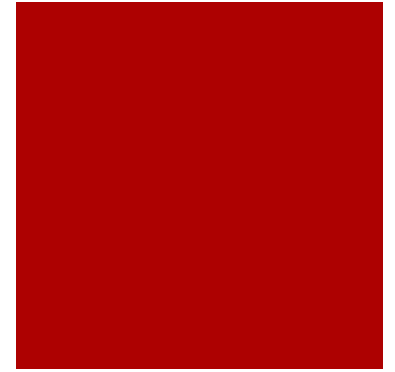
Community-Centered (Connecting School and the Broader Community)



- The school should be connected to the outside world (NRC, 2000)
- What are some best practices we can use to connect our classrooms and schools to the broader community?
 - Experiential learning-Internships, service learning, etc
 - Guest speakers
 - Project-based learning



Final Product



- Participants will use the teaching and learning concepts to:
 - Develop curricular materials that are aligned with the disciplinary core ideas of the Next Generation Science Standards
 - effectively teach both agriculture and natural science students



Thank You!

Any Questions?

