# Alternate Assessment Design–Mathematics

# Technical Report 5:

# Synergistic Use of Evidence-Centered Design and Universal Design for Learning for Improved Assessment Design

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# Synergistic Use of Evidence-Centered Design and Universal Design for Learning for Improved Assessment Design

The integration and application of evidence-centered design (ECD) and universal design for learning (UDL) in assessment design increases the likelihood that items and tasks will be well aligned with content standards and targeted constructs and accessible to student with diverse abilities.

## Evidence-Centered Design

**Evidence-centered design (ECD)** is a recommended approach for the development of educational assessments and can be applied to a range of content standards and assessment types. The rigorous, multilayer design process central to ECD allows designers to consider systematically the content, task, and learner characteristics that influence student performance. ECD provides a foundation for assessments that states can use to address the validity of their assessment systems.

A strength of ECD is the support it provides for the development of items and tasks for all students that focus on construct-relevant content, minimize the impact of construct-irrelevant skills, and take into account appropriate accessibility options. For example, in a mathematics examination, math content would be targeted and the need for non-construct-relevant skills such as reading would be minimized; designers would consider supports such as use of a large font or alternate response options during item design instead of modifying items and tasks after they have been written.

The ECD process involves five layers of activity. The layers focus in turn on the identification of the content to be assessed; the creation of a model of the assessment; the design of assessment elements such as potential observations, work products, rubrics, and psychometric models; the creation of these elements including the assessment tasks; and the design of the assessment delivery, scoring, and reporting. Each layer is described in more detail below.

1. **Domain analysis** involves determining the specific content to be included in the assessment. Use of the common core standards and existing state standards exemplify starting points for domain analysis.
2. **Domain modeling** entails creation and documentation of a high-level description of the assessment. Design patterns are one example of this type of activity.

3. **Conceptual assessment framework** specifies in detail the **knowledge, skills, and abilities (KSAs)** to be assessed, the evidence that needs to be collected, and the features of the tasks that will elicit the evidence. Also identified are nontargeted KSAs, which although required for successful performance on an item, are not the intended target of the assessment. By identifying nontargeted KSAs, construct-irrelevant variance can be minimized and accessibility can be maximized. Finally, the psychometric model and evaluative decision rules for task scoring are considered and assessment task features are detailed and carefully aligned with the targeted and nontargeted KSAs.
4. **Implementation** is the creation of the assessment items or tasks, along with appropriate accessible alternate representations of item or task content.
5. **Delivery** involves specification of the processes for the assessment administration, scoring, and reporting, including accessibility features that are allowed without violating the targeted KSAs.

## Universal Design for Learning

**Universal design (UD)** emphasizes the importance of addressing accessibility for the broadest range of potential users during the initial stages of designing a product and throughout the development and implementation of the product. The use of UD principles creates flexible solutions because designers consider from the start the diverse ways in which individuals will interact with a product and the environment.

The tenets of UD have been extended to the education arena; this extension is referred to as **universal design for learning (UDL)**. When sources of construct-irrelevant variance in an assessment are identified by ECD, the application of UDL principles can be used to minimize construct-irrelevant variance by incorporating appropriate options for how students interact within the assessment environment. In this way, ECD works synergistically with UDL. By considering multiple means of perception, expression, cognition, language and symbol use, executive functioning, and engagement, the application of UDL in the ECD process accounts for individual differences in how students recognize, strategize, and engage in learning and testing situations. This synergistic process minimizes the unintended negative influence that access needs may have on student performance and maximizes the opportunities for students to show what they know and can do.