Teacher-Centric Design Process for a Dashboard to Support Formative Assessment

Robert P. Dolan, Emma L. Starr, Cara Wojcik, Kim Ducharme, and Jose Blackorby

CAST, Inc.

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Agenda

• Project Background
• Brief Introduction to Universal Design for Learning
• Teacher Dashboard Co-Design Methodology
• Design Findings
• Next Steps
But first ... a (loaded) question

If a “formative” assessment is administered but its results aren’t used to inform subsequent instruction, is it formative?
Project Background
I-SMART Enhanced Assessment Grant

- Four year project 2017-2020
- MD (lead), MO, NJ, NY OK
- KU ATLAS + CAST + BYC
- Builds from previous dynamic learning map (DLM) efforts in ELA, math & science
I-SMART Key Factors

• Deeply integrates the UDL guidelines into the instructionally embedded test design and development process
• Supports students with significant cognitive disabilities and students with and without disabilities who are struggling to meet grade-level expectations in science
• Designed for summative and formative use
• Provides a new, actionable dashboard to support teacher use of test results to inform instructional decision making, co-designed with teachers through a UDL lens
Learning Map Models
The problem

Teachers are swimming (drowning) in student data, too often presented in unusable & non-actionable ways.

How can we make data displays—and the way they are used—more empowering and effective for teachers?
The approach

Apply UDL to co-design with teachers an interface that supports their leveraging of learning map models in using student test results for instructional decision-making
Brief Introduction to Universal Design for Learning
Universal Design for Learning (UDL)

A framework for embedding options and supports into curricula and learning experiences to expand learning opportunities for all learners.
Dashboard Development
Teacher Co-Design Cadres

Main Cadre:
• 11 educators from four DLM partner states
• 4 sets of meetings
• Meetings of 1-5 cadre members, 2-4 I-SMART team members
• 90 minutes
• Video conferencing

Gen Ed Focus Group:
• 1 meeting
• Same format as above
• 2 gen ed science teachers (grades 6 & 8) from a MA school
Cadre Participants

Cadre Members Current Primary Role

- Program Specialist: 9.1%, 1 (9.1%)
- District Staff: 18.2%, 2 (18.2%)
- Curriculum / Program Coordinator: 9.1%, 1 (9.1%)
- Classroom teacher: 63.6%, 7 (63.6%)
Cadre Participants

Previous DLM Experience

- Implemented DLM Assessments in Math and ELA: 8
- Implemented DLM Assessments in Science: 5
- Participated in DLM Item Writing or Map Review: 7
Iterative Discovery / Design Process:

Cadre Meetings 1-3

• Recap of the previous design’s principal elements and features
• Walk-through of newly introduced screens and functions spotlighting design solutions resulting from teacher-generated feedback
• Facilitated discussion of prototype focusing on areas of clarity/confusion, features to change/add, most/least useful functions, and “Five Ws”

Cadre Meeting 4

• “Scavenger Hunt” usability testing session - teachers completed usability tasks to uncover any areas needing further refinement
• Cadre process reflection
June 26, 2017

**Learning Map Model Neighborhood EE-MS.LS2-2:** Use models of food chains/web to identify producers and consumers in aquatic and terrestrial ecosystems.

**Disciplinary Core Idea:** LS2.B: Cycles of Matter and Energy Transfer in Ecosystems

**Science and Engineering Practice:** Developing and using models

Superior number indicates this node is also found in the first-level model. Superior node indicates a common model neighborhood.
Iterative co-design cycles
Iterative co-design cycles
Iterative co-design cycles
Test results: class overview

<table>
<thead>
<tr>
<th>Class Overview</th>
<th>B1: Science, Grade 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>View Student Overview</td>
<td>Choose a student</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name</th>
<th>Chemical Changes</th>
<th>Food Webs</th>
<th>Trait Inheritance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Notes</td>
<td>Notes</td>
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<tr>
<td></td>
<td>Instruction</td>
<td>Initial</td>
<td>Instruction</td>
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<td></td>
<td>Precursor</td>
<td>EE List</td>
<td>Precursor</td>
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<tr>
<td></td>
<td>Target</td>
<td>EE List</td>
<td>Target</td>
</tr>
</tbody>
</table>

**Key:**
- Instruction Not Begun
- Instruction In Progress
- Instruction Complete
- Mastery Demonstrated
- Mastery Not Yet Demonstrated
- Mastery Not Demonstrated
Test results: student overview
Test results: detail view by class
Summary of Design Findings

• Teachers found the learning maps valuable for understanding student progress and supporting instructional decisions
• However, scaffolding teacher’s use of the map is necessary; there is a learning curve that can be supported through multiple representations of the same data
• Necessary to include aggregate view of class data to meet teachers’ instructional needs
Final Cadre Findings

• In final usability/interpretability testing, cadre members were able to complete tasks effectively
• Feedback from cadre about final design was positive
• In final reflection, cadre members reported that they felt positive about the process, including that their ideas were used and that they developed professionally through participating
Next Steps
Upcoming Research Study

• Pilot study of science assessment system in 2020
  • Including evaluation of teacher dashboard through …
    • Interpretability and usability studies
    • Teacher interviews and focus groups
Thank you

For more information:

bdolan@cast.org