Design Features Supporting Teachers' Use of a Dashboard for Diagnostic Assessment Results

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Agenda

- Background of Project
- Brief Introduction to Universal Design for Learning
- Dashboard Development Methodology
 - Participants
 - Process
- Design Findings
- Next Steps



Project Background



I-SMART Purpose

Help students with and without disabilities achieve proficiency on multidimensional science standards through an assessment system that is:

- learning map model-based
- instructionally embedded
- formative and summative



Builds on the work from DLM

- Deeply integrates the **UDL guidelines** into the test design and development process
- Supports not just students with significant cognitive disabilities, but also **students with and without disabilities** who are struggling to meet grade-level expectations in science
- Provides a new, actionable dashboard to support teacher interpretation of test results to inform instructional decision making, designed through a UDL lens



A Few Guiding Principles for Development

Instructionally relevant

Connected to the timing of instruction

Utilized maps - show teachers important nodes

Diagnostic information to guide decisions



Brief Introduction to Universal Design for Learning



Universal Design for Learning (UDL)

A **framework** that suggests embedding options and supports into curricula and learning experiences to expand learning opportunities for **all** learners







What is Universal Design?



Universal Design

"The design of products and environments to be usable by all people, to the greatest extent possible, **without the need for adaptation or specialized design**."

Source: Mace, R. (1997). What is universal design. The Center for Universal Design at North Carolina State University.











Necessary for **some**, good for **all**





What is Universal Design for Learning?





udiguidelines.cast.org | © CAST, Inc. 2018 | Suggested Citation: CAST (2018). Universal design for learning guidelines version 2.2 [graphic organizer]. Wakefield, MA: Author.



Internalize

Access

Build

The Goal of UDL: Expert Learners (and Teachers)





Dashboard Development



The problem

Teachers are swimming (drowning) in data generated by standardized tests; but it is often not presented in a usable, actionable way.

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



How can UDL principles inform data visualization design for teachers?





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The goal

Design an interface that supports teachers to use the Dynamic Learning Maps and test results as a planning tool for instructional decision-making



Cadre Design Process

Main Cadre:

- 11 Educators from DLM partner states
- 4 Meetings
- Meetings of 1-5 cadre members, 2-4 I-SMART team members
- 90 Minutes
- Video Conferencing

Gen Ed Focus Group:

- 1 Meeting during Cadre Process
- Same Format as Above
- 2 Gen Ed Science Teachers (6th and 8th) from a MA school



Cadre Participants





Cadre Participants

Previous DLM Experience





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



Iterative co-design cycles









Iterative co-design cycles



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Iterative co-design cycles

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Test results: class overview

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Instruction In Progress X Mastery Not Yet Demonstrated

Instruction Complete

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







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

