DESIGNING USABLE TECHNOLOGIES FOR PRACTICAL MEASUREMENT AND IMPROVEMENT EFFORTS

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How does the design of the technologies for data collection and representation of practical measures support improvement efforts?

Context

This project is part of Practical Measures, Routines, & Representations for Instructional Improvement (PMR²), a nation-wide research effort led by NYU, UC Riverside, Vanderbilt and the University of Washington. The goal of PMR² is to develop a system of practical measures, routines, and representations of the associated data to support instructional improvement strategies in middle-grade mathematics.

An integral part of PMR² is the development of a suite of dashboard tools allowing for the data visualization of student voice around specific middle-grade math practices.

Key Design Considerations for PMR² Dashboard Tools

- Common problems of practice among RPPs
- Adaptable and responsive to changing RPP needs
- Unique analytic needs for each RPP
- Current data representations privilege only certain narratives
- Usability
- Multiple needs across partnerships
- Real-time data provisions to RPPs
- Sustainability and scalability
- Whole solution approach: measure, survey, dashboard and reflection tool

Challenges

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<thead>
<tr>
<th>Challenges</th>
<th>Design Decisions</th>
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<tr>
<td>Common ontology of events, but inconsistent data structures and routines</td>
<td>Data structure and routines designed to be highly accommodating to inconsistencies and formats</td>
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<td>across partnerships. Multiple formats of data: pen and paper, Google</td>
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<td>Forms, Microsoft 360 and Scantron</td>
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<td>Multiple needs across partnerships</td>
<td>Partner feedback drove design decisions (e.g. color choices and layout of data representations)</td>
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<td>Accessibility</td>
<td>Choose color scheme respects accessibility challenges;</td>
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<td>Limiting the dashboard to three chart types minimizes cognitive load</td>
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<td>Current data representations privilege only certain narratives</td>
<td>Future iterations of the dashboard will aim to tell additional stories via other types of data representations</td>
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Next steps and ideas:

- Understand how specific affordances of data representations might contribute to patterns of interpretation.
- Develop a module for instructional coaches to prompt peer-to-peer reflection with teachers.
- Increase involvement of school-level professionals in future design work.
- Understand how EdSight informs learning design, beliefs and pedagogical decisions.
- Develop new forms of representation, to support other types of "stories."

We created EdSight, a visual analytics platform for improvement and research efforts in teaching and learning.

Our challenge: developing a platform that responds to our partner’s evolving needs and fits their improvement cycle.