

**Aurora Institute National Research Convening:
Building the Evidence Base for K-12 Personalized Learning**

**HOW DO WE MEASURE PERSONALIZED LEARNING?
INSIGHTS FROM SOCIAL, EMOTIONAL, ACADEMIC
DEVELOPMENT, AND THE LEARNING SCIENCES**

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TO MEASURE PERSONALIZED LEARNING, WE NEED A PRACTICAL AND EVIDENCE-BASED FRAMEWORK ROOTED IN THE LEARNING SCIENCES

- Growing awareness of power and value of personalized learning to achieve education goals with equity
- Supported by growing understanding from the Learning Science on Learner Variability
 - “there is no average learner”
- To spread personalized learning approaches from early adopters to the mainstream, we need to be able to show a range of stakeholders
 - *students, teachers, school and district leader, parents* –
 - that it leads to better outcomes than more customary approaches, and is worth the **effort AND expense** involved

THE NEED FOR A PRACTICAL AND EVIDENCE-BASED MEASUREMENT FRAMEWORK (CON'T)

- Existing measures of student learning are predominately based on average outcomes and normative references
- They are likely to mis-measure or underestimate the current and potential impacts of personalized learning
- Any new or different measures, however, not only have to be evidence-based,
 - But also practical, useable by students, and teachers under typical conditions,
 - And neither burdensome nor disruptive

THE CASE FOR BASING A MEASUREMENT FRAMEWORK FOR PERSONALIZED LEARNING ON THE LEARNING SCIENCES

- **If students:**
 - build better knowledge bases and are able to access them over time more readily – knowledge, development and retention
 - more readily learn how to learn – executive function, metacognition, self-regulated learning
 - more motivated to learn and able to do the work required to learn and apply their learnings – motivation, social-emotional development
- Then, you have demonstrated academic, cognitive and social-emotional outcomes, and made a case for Personalized Learning



HOW CAN WE DO THIS?

INSIGHTS FROM A TWO-YEAR JOURNEY TO THINK IT THROUGH INFORMED BY SIX DATA SOURCES

- Learning from early adopters (interviews and document scans)
- Review of scientific literature on measuring academic knowledge, executive function/metacognition, and motivation/social-emotional development
- Field study with 8th grade instructional design team
- Large scale quantitative study of social-emotional development and academic outcomes
- Design thinking sessions with diverse groups of teachers including experienced users of personalized learning and novices interested in trying it
- COVID-19 experiential learning

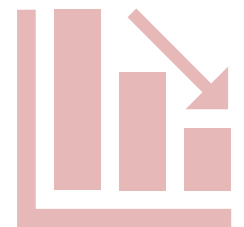
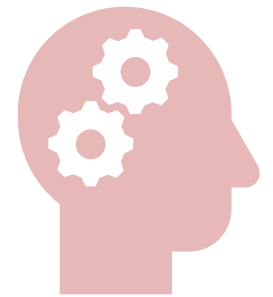
KNOWLEDGE DEVELOPMENT, ACTIVATION, AND RETENTION



- Majority of early adopters use norm-referenced tests and/or learning management systems built into software/apps and largely happy with it, as they tend to show “progress”
 - Ex: NWEA MAP is a favorite
- Voluminous and contested scientific literature on how to measure academic knowledge, but limited studies on knowledge activation and retention in authentic learning situations
- Annual tests implicitly capture the sum total of knowledge development, activation and retention, but do not provide any insight into how different learning approaches impact each of these

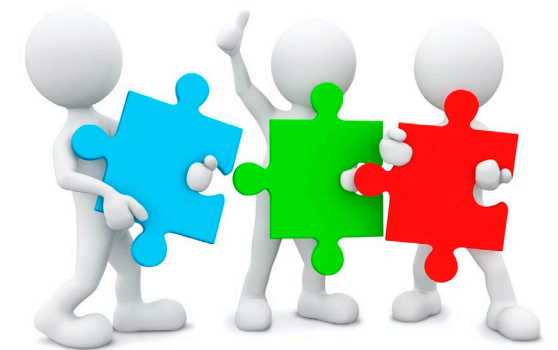
KNOWLEDGE DEVELOPMENT, ACTIVATION, AND RETENTION (CON'T)

- Field study with 8th graders showed that even a month later – when students asked to re-take an end of unit test, “learning loss” was substantial
 - On the order of 20% with greatest losses occurring for traditional instruction (no attempt to re-activate their knowledge prior to re-test)
- Lack of existing **measures for knowledge activation and retention** is a challenge to be met



WHERE DOES THIS LEAVE US?

- Some of the key pieces needed to create a practical and evidence-based measurement framework based on a learning science approach for personalized learning to exist, or soon will
 - Practical, evidence-based, measures of motivation/engagement, and social-emotional development are here or near
 - Some of the key pieces await further development
 - Measures of knowledge activation and retention
 - Formative measure of metacognition and self-regulated learning

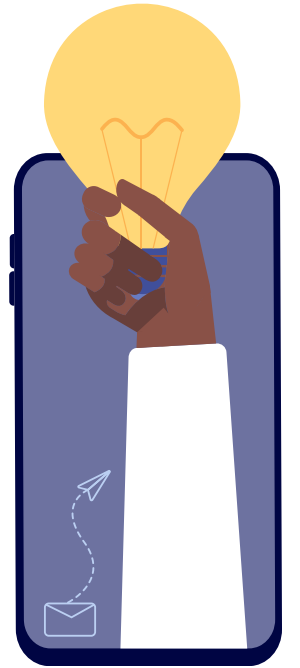


IMPACTS OF COVID-19 ON ENABLING EXPANDED VIEWS OF MEASURING STUDENT PROGRESS?

- COVID-19 shows parents its more than knowledge development
 - metacognition and motivation matter
- COVID-19 also spreads 1-to-1 computing
- Stressed need/power of iterative, collaborative learning among teachers and school leaders – could open door for more innovation or new ways of doing things
- Balance against frustrations with online learning as experience during COVID-19



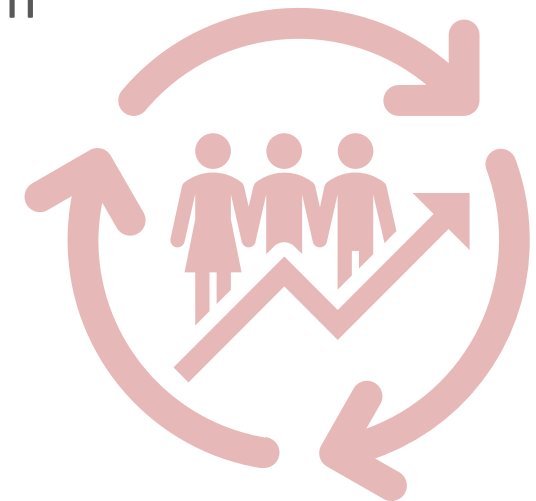
MOTIVATION AND SOCIAL-EMOTIONAL DEVELOPMENT (CON'T)



- Surveys vs adult rating debate
 - Evidence on both sides
 - Two tools in toolbox
- New tools are emerging
 - 8th grade instructional design team use of emojis and cell phones as measurement collection tools
 - short cycle surveys (PERTS)
- Large-scale quantitative study shows
 1. Large improvement in social-emotional development associated with large learning gains
 2. Building social-emotional skills while developing academic skills leads to independent impacts on academic outcomes, and raised attendance
- The challenge of thinking about both short term academic gains and longer term educational outcomes

MOTIVATION AND SOCIAL-EMOTIONAL DEVELOPMENT

- Many measurement instruments available based on different underlying theories
 - The challenge is selecting **which one for what purpose**
- Key factor in selection – practical usefulness for teachers, how actionable are the results?
- Both individual motivation and classroom learning environment matter



LEARN TO LEARN



- Most existing measurement instruments for executive function and metacognition are not practical for on-going classroom use
 - individually administered, multiple items and complex scales
- Some group assessments are starting to emerge
 - practical usefulness still not known
- Interesting work on interactive trace technologies built into online learning systems emerging in higher education space in Australia
 - to create formative feedback and development system for meta-cognition-self-regulated learning
- 8th grade instructional design group
 - pilot tested a weekly student survey to get at meta-cognitive impacts of different instructional approaches
- COVID-19 remote learning
 - drives home value of self-regulated learning