

Is there a Role for Evidence in the Future of K-16 Technology?

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CRESST Conference 2015

Redondo Beach, CA
August 19, 2015

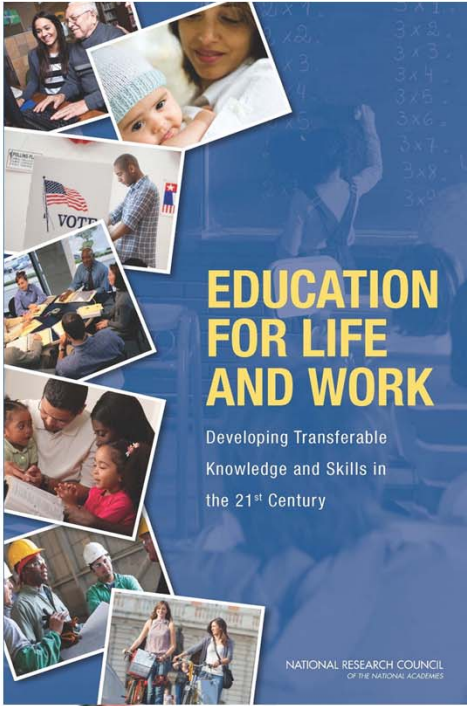
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ANSWER

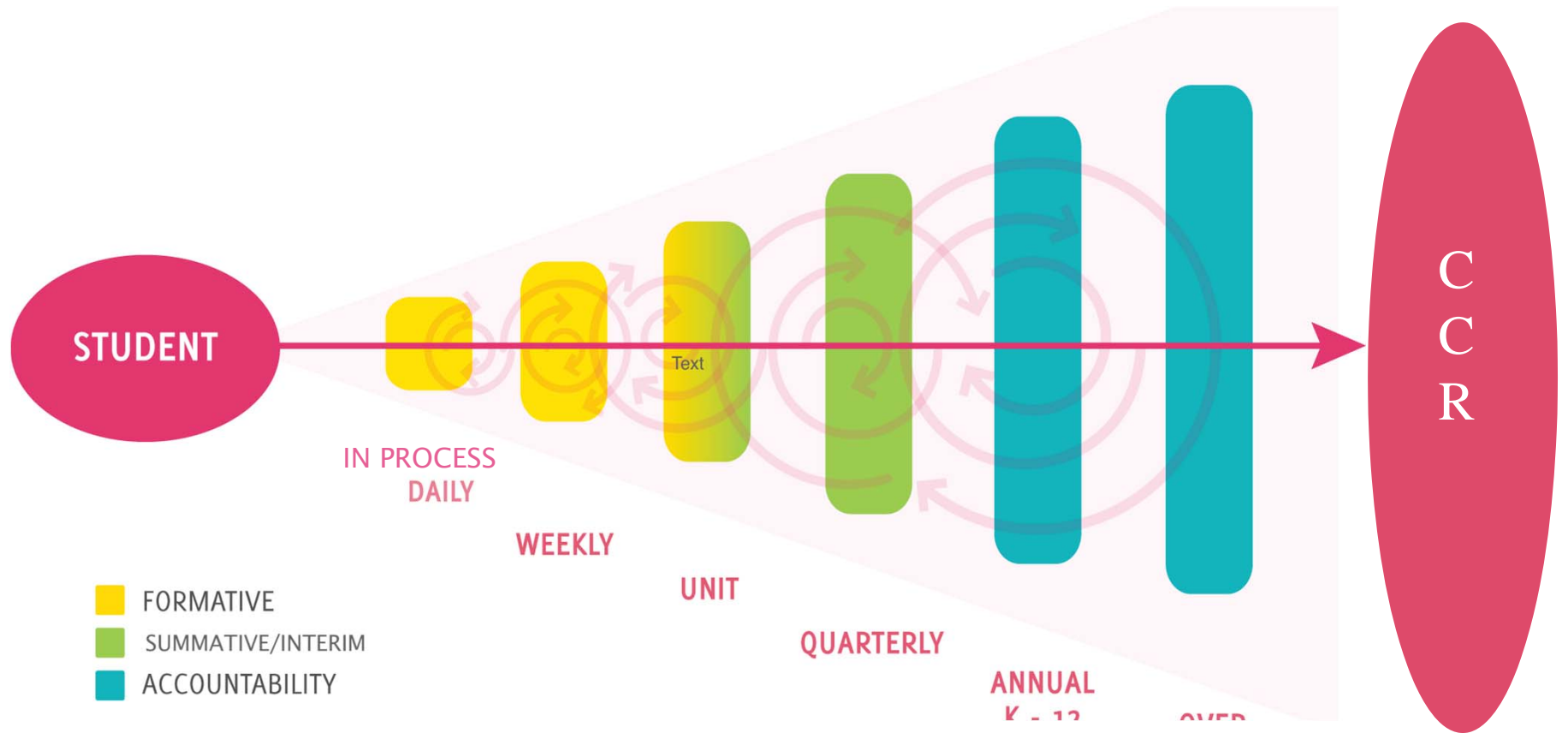
- YES!
- Endless possibilities
- I'll talk about three



Deeper Learning



Evidence in Coherent Systems: Data-Based Decision-Making

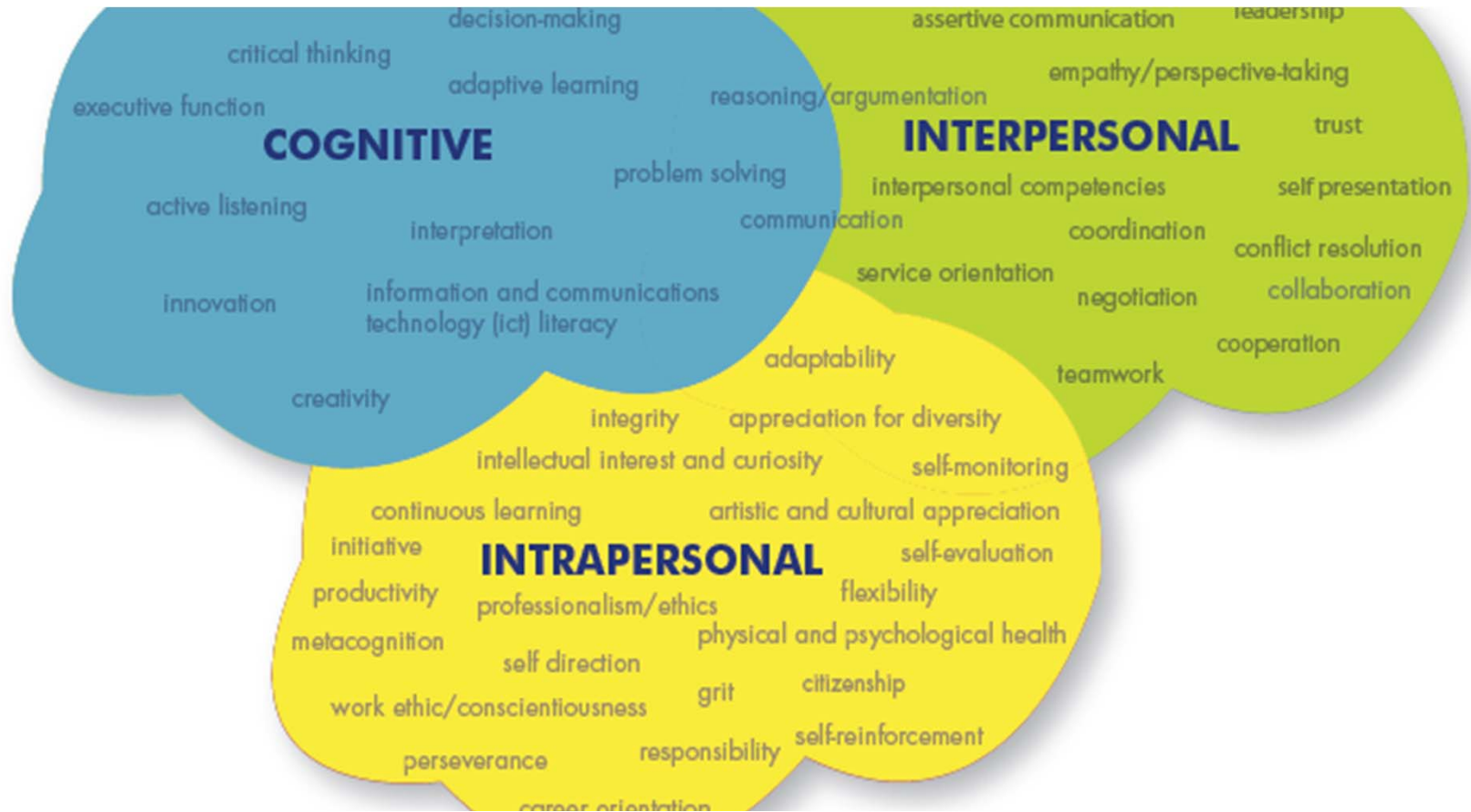


Rich, Accessible Data for Analysis and Use for Personalization

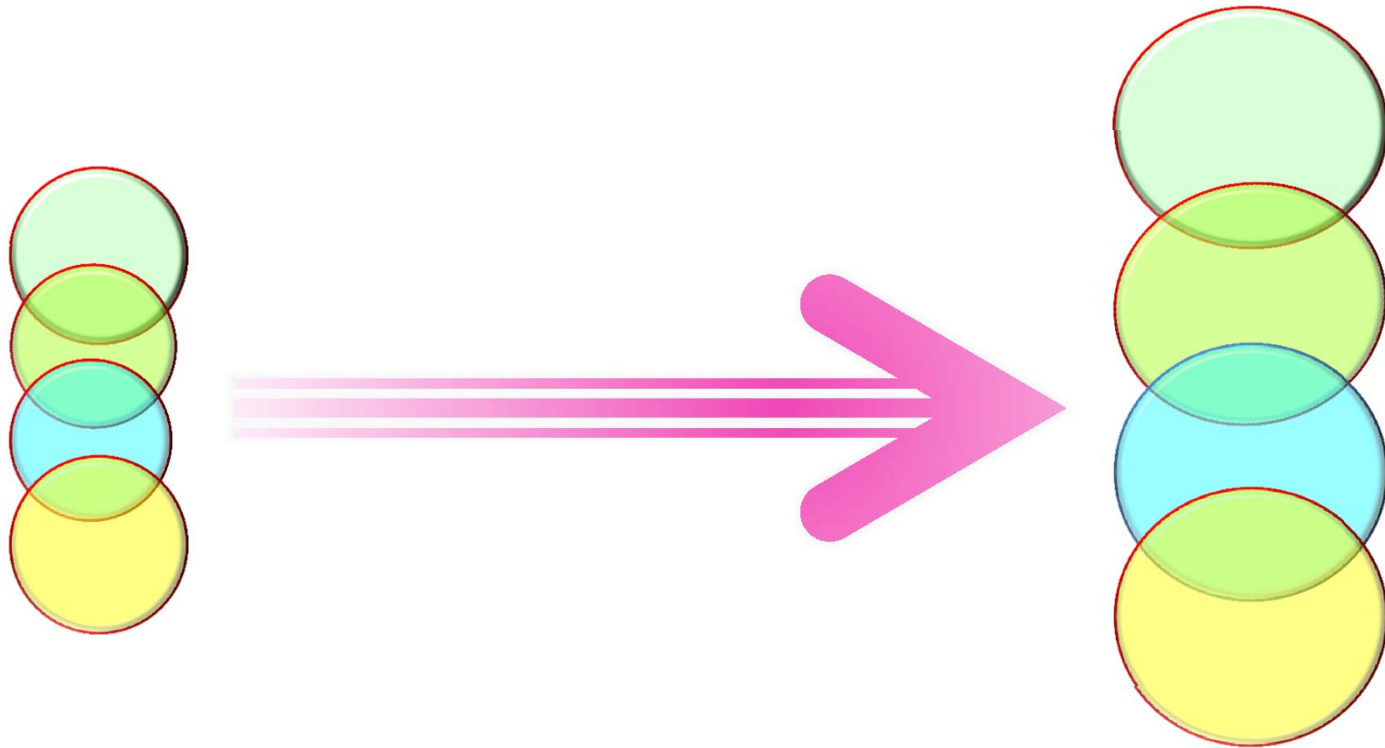




But: Meaningfulness of Data and Effectiveness of Use



Use of Evidence in Systematic Development



Learning Progressions

Assessment-Informed Development and Learning



Systematic Development – But Toward What Outcomes?



Evidence of Effectiveness

- Domestic sales of computer and video games
 - ✓ *\$11.7 billion in 2008*
 - ✓ *\$15.4 billion in 2013*

(Entertainment Software Association)
- 72% of US teens play video games *(Pew Research Center)*
- SRI's meta-analysis of K-16 digital games for learning *(Clark, Tanner-Smith & Killingworth (2014))*
 - ✓ *Journal studies 2000-2012*
 - ✓ *69 published studies across all subject areas and learning objectives (cognitive, intra-, inter-personal)*

Rigor of Studies

- Minimum requirements
 - ✓ *Experimental or quasi-experimental design*
 - ✓ *Pre-post testing*
 - ✓ *Treatment and control conditions described, etc*
- Challenge points
 - ✓ *Small sample sizes and diversity*
 - ✓ *Unit of analysis flaws*
 - ✓ *Game treatment sometimes confounded with curriculum*
 - ✓ *Little serious attention to retention/transfer*
 - ✓ *Generally mundane outcome measures*



Some Meta-Analysis Results

- Game versus non-game: .33 effect size (n=57 studies)
 - ✓ *Observed effect lower in randomized experimental*
- Theoretically augmented versus standard: .37 effect size (n=20 studies)

Variables Influencing Success: Other Hypothesis Testing

- Collaborative vs. individual; w/wo competition
- Time
- Sophistication of game mechanics
- Visual and narrative game characteristics

Bottom Line

- Research base is meager
- Influence of learning and game mechanic variables murky
- Important variables remain unexamined
 - ✓ *72% of teens play video games, 84% boys*
 - ✓ *83% African Americans*
 - ✓ *Important potential gender and student demographic effects*

Getting to Greater Effectiveness

- Target deeper learning goals
- Effective measures of deeper learning
- Big data and analysis techniques for hypothesis generation
- Rigorous design and measurement for hypothesis testing





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