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

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ANSWER

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

Intermediate/Level Assessment

Formative Assessment

End of Program/Game Success
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