

Lessons on Technology in the Classroom

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The Sum of Our “Knowledge” on Technology in the Classroom

This Blank Space Actually Means Something

Early Evidence...

- Kirkpatrick and Cuban (1998): Any impact of computer use on achievement is “questionable”
- Angrist and Lavy (2002): negative or zero effects
- Goolsbee and Guryan (2006): nothing from internet connectedness
- Rouse and Krueger (2004): nope, nada, no-can-do, no impacts
- Leuven et al (2007): no impact at all



But I am a believer....

- Why could the results be so bad?
 - Maybe the authors are biased (evidence is too strong)
 - Maybe technology doesn't work or the underlying structure doesn't support the technology
 - Maybe we ask the wrong questions (computers vs. software)
 - Maybe we have the wrong mediums
 - Maybe new industries take time to develop
 - Maybe we don't know all of the successes

What do Computers do Well?

- Routine processes both cognitive and non-cognitive
- Substitute in the Routine
- Complement in the Nonroutine

Where are the Routines?

- Data transmission to educators
 - Standardized tests provide a wealth of data on strengths/weaknesses of students
 - Computers may facilitate transmission of information, targeting, and so forth.
- Examples:
 - Teacher notification in San Francisco (Loeb and colleagues)
 - Real-time probabilities of success in online courses



More Routines?

- Data transmission to parents
 - Students are not the best couriers to parents
 - Phone calls are expensive to schools in Brazil
- Examples:
 - Text messages to parents in Brazil
 - Text messages to parents in San Francisco
 - Gains were over .2 standard deviations



Even More Routines

- Scheduling
- School Announcements
- Data transmission from students to teachers (e.g. coursework, dropbox)
- Filling out forms
- Maybe some basic math (e.g. remediation in college)
- Basic Instruction vs. Flipped classrooms
- Many, many more already discovered and to be discovered

What about the Nonroutine?

- When are computers complements to classroom instruction
- This is where we need more evidence.
 - Most studies are very localized
 - Dissemination is problematic
 - Hype vs. Hard Facts Difficult to Infer
 - The politics of evaluation
 - “endless speculation” may be preferred to the hard facts

Other Considerations

- Timing
 - Evaluations take time
 - Planning, fund raising, waiting for the intervention, waiting for outcomes, measuring, analyzing, writing
 - Technology changes rapidly
 - Pace of technology often is faster than evaluation cycle
 - Technology may be hard to ration
- Costs
 - Current studies focus on *whether* technology matters rather than cost effectiveness
 - Cost proposition matters for scale

Final Considerations

- Training
 - Early failures documented that teachers did not know how to integrate
- When is Instruction Routine or Nonroutine?
 - Counterfactual is often live instruction, but poor quality live instruction may be inferior
 - MOOCs and their future
 - With the flexibility of instruction, opportunities may exist that previously did not.