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Education in the Digital Age

IPR Policy Research Briefing

May 19, 2015

Washington, D.C.



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“Parents, Pencils, and iPads: Developing Pre-K Curriculum Standards for Technology in the Classroom”

by **Ellen Wartella**

Al-Thani Professor of Communication and IPR Associate

“Digital Native or Digital Naïves:
The Internet Skills Gap Among Young Adults”

by **Eszter Hargittai**

Delaney Family Research Professor of Communication Studies and IPR Associate

“Learning in Cyberspace vs. Classrooms:
Can Online Education Replace Traditional Instruction?”

by **David Figlio**

IPR Director and Fellow, Orrington Lunt Professor of Education and Social Policy



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Our thanks to:

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and

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Parents, Pencils, and iPads: Developing Pre-K Curriculum Standards for Technology in the Classroom

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Report from Two National Studies

- Parenting in the Age of Technology (2014)
- Technology in the Lives of Early Childhood Educators and Early Childhood Programs (2013, 2015)

Parenting Study

- Surveyed 2,300 parents of children from birth to age 8 about how parents incorporate new digital technologies (iPads, smartphones), as well as older media technologies (TV, videogames, computers) into their family lives and parenting practices.

Main Findings

- Parents use media and technology as a tool for managing daily life, but books, toys, and other activities are used more often
- Only 21% of parents report that negotiating media use causes conflict in their homes
- Parents believe in the educational benefits of media, except for video games
- Parents set the media ecology in the home

Parenting Styles and Children's Media Use

- **Media-centric parents** spend 11 hours a day with media (4:28 with TV, 3:37 with computers, 1:48 smartphones, :36 videogames). Their children spend 4:29 hours per day with screen media
- **Media-moderate parents** spend 4:42 hours a day with screen media (2:14 TV, 1:25 with computers, :32 on smartphone, :18 iPad, :12 videogames). Their children spend 2:53 with screen media
- **Media-light parents** spend 1:48 hours per day with screen media (:56 TV, :33 computers, :10 smartphone, :06 iPads, :3 videogames)

Technology in Preschool Programs (2013, 2015)

- Surveyed preschool teachers from NAEYC data base.
- 1,356 teachers surveyed in 2013; 945 surveyed in 2015.
- Predominantly female, white, averaging 20 years of teaching.

Main Findings

- Technologies most available in classrooms both years: TV/DVDs (71%), Computers (4/5ths) and Digital Cameras (9 in 10)
- Smartboards in about one-quarter of classrooms; e-readers in 1 in 5 classrooms
- iPads increased from 29% of classrooms in 2013 to 55% in 2015

Main Findings

- Few differences in access to technology by income level of children in classrooms
- More educators in 2015 report professional development in educational technology
- Barriers to using technology in classroom include:
 - Lack of parent approval (65%),
 - Financial resources,
 - Time to learn how to use digital technology, and
 - Their own comfort in using digital technology.

Main Takeaways

- Parents set the media ecology in the home for preschool children's engagement with technology
- Preschool classrooms are adopting tablets quickly (doubling in two years)
- Barriers to using technology in preschools are not access issues, but teachers' comfort, training, and parental expectations.



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**“Learning in Cyberspace vs.
Classrooms:
Can Online Education Replace
Traditional Instruction?”**

David Figlio

Director, Institute for Policy Research

Washington, DC, May 19, 2015



Benefits of online instruction

- Access to higher education
 - flexibility over space and time
- Pedagogical benefits
 - study pace, opportunity to review
 - new technologies for engagement
- Potential cost savings
 - especially with mass instruction



Costs of online instruction

- Pedagogical costs
 - value of face-to-face interactions
 - issues regarding instructional scale
- Student accountability
 - easier to fall behind?
 - opportunities for dishonesty
- Potential loss of community feel



Evaluating the evidence

- Hard to compare F2F to online
 - different kinds of students
 - different kinds of instructors
 - different kinds of courses
- Few studies to date deal with “selection”
 - randomized trials
 - very careful observational studies



First experimental evidence

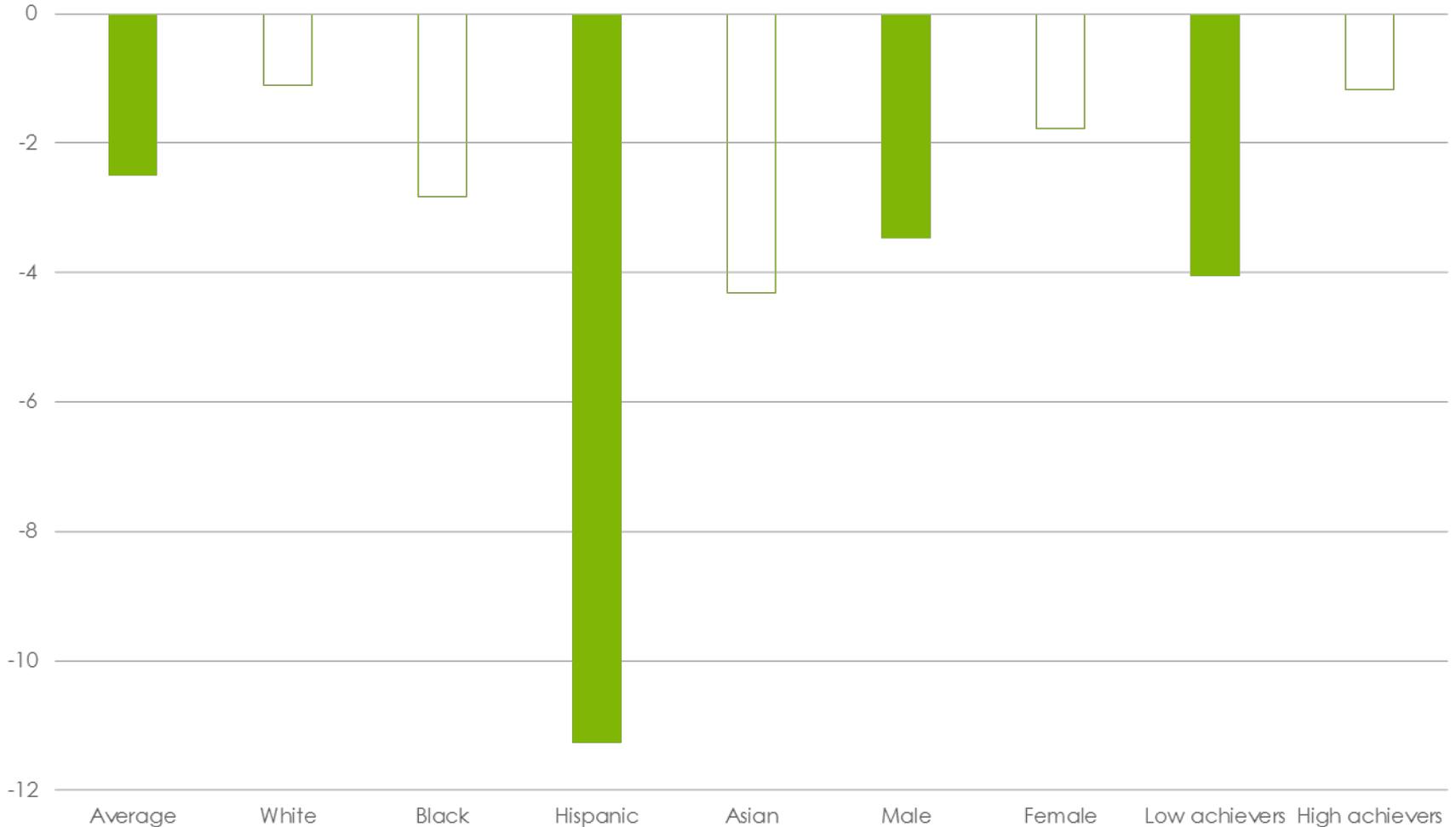
Figlio, Rush, and Yin, *Journal of Labor Economics*, 2013

- Flagship state university
- Introductory economics class
- Large lecture with online resources vs. online equivalent
- Same instructor, same class, same exams



Figlio, Rush, and Yin (2013)

Estimated effect of online vs. F2F instruction
(final grade out of 100 points)





Experimental evidence: hybrids

Bowen, Chingos, Lack, Nygren, *Journal of Policy Analysis and Management*, 2014

- Six public university campuses
- Introductory statistics class
- Traditional F2F instruction vs. hybrid (machine guided + 1 hour/week F2F)
- Random assignment, different instructors, selection into teaching



Bowen, Chingos, Lack, Nygren (2014)

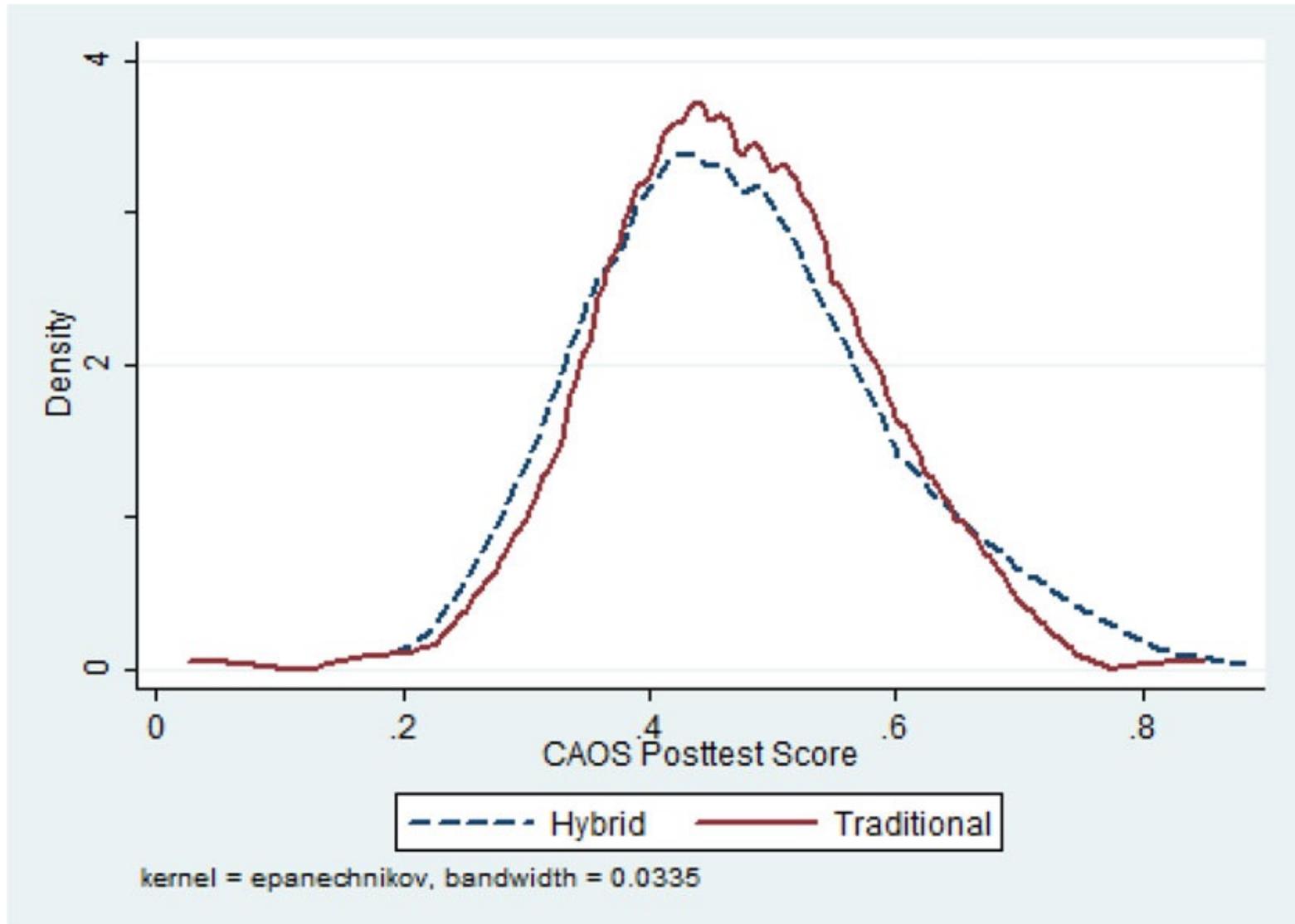
On average, students in hybrid classes

- had higher completion rates
- had no different test scores
- thought they learned less
- had lower overall impressions
- thought the class was harder

than did students in traditional classes



Bowen, Chingos, Lack, Nygren (2014)





Experimental evidence: hybrids

Joyce, Crockett, Jaeger, Altingdag,
O'Connell, CUNY working paper (2014)

- Moderately selective public univ.
- Introductory economics class
- Traditional F2F instruction vs. hybrid (machine guided + 75 mins/week F2F)
- Hybrid underperforms by 2.6 pts/100
- Results appear driven by non-native English speakers



Experimental evidence: 3 mode

Alpert, Couch, and Harmon, UConn working paper (2015)

- Introductory economics class
- Traditional F2F instruction vs. hybrid (machine guided + 75 mins/week F2F) vs. online only
- Hybrid no different from F2F, but online scored 4.2-10.3 pts/100 worse
- Results appear driven by those with low prior GPAs



CA community colleges

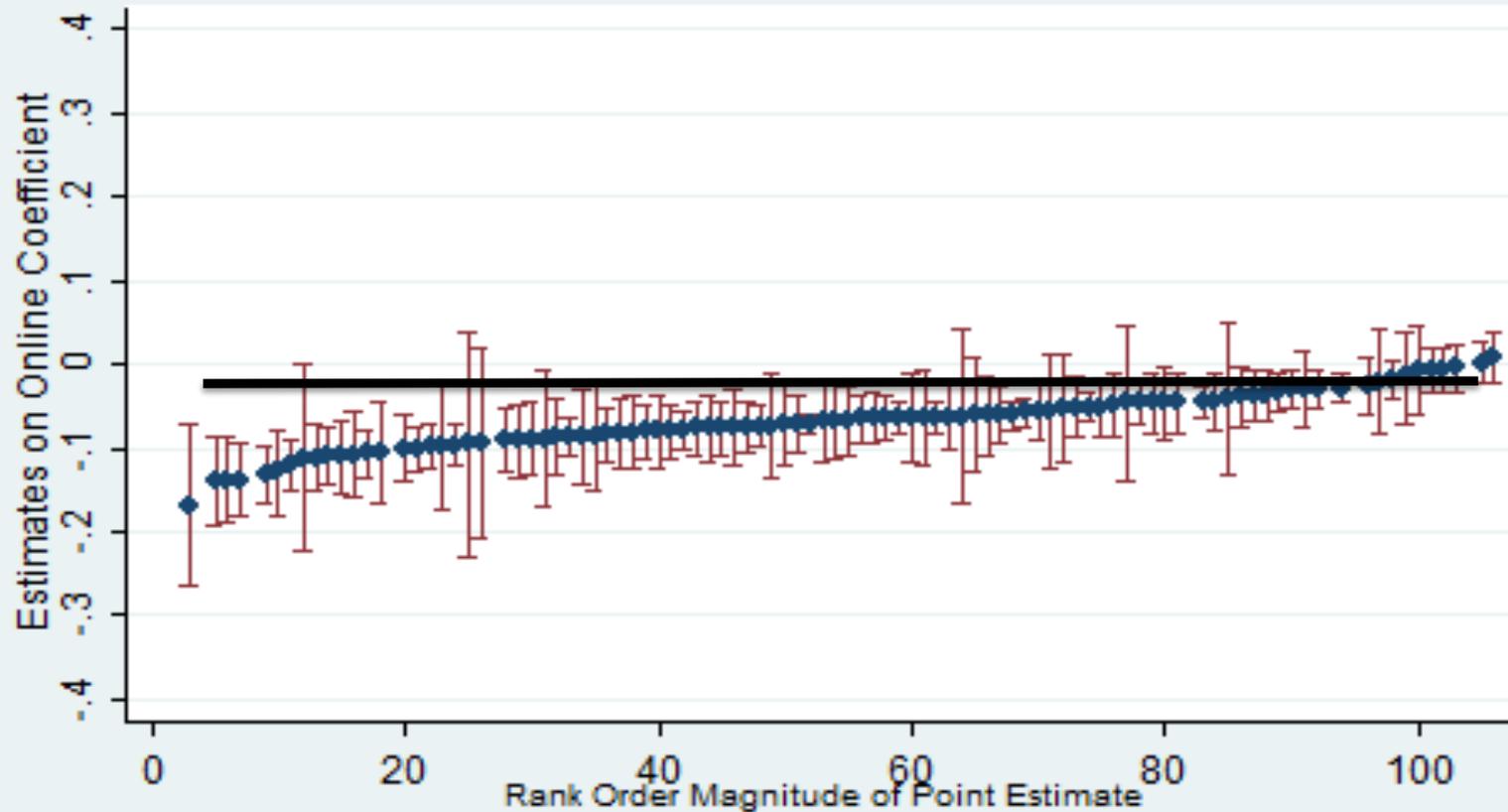
Hart, Friedmann, and Hill, UC-Davis working paper (2015)

- Every class in 110 community colleges, nearly 1 million students
- Traditional F2F instruction vs. online
- Not experimental, but very compelling controls for selection
- Focus on course completion, grades



CA community colleges

Online Coefficient and Confidence Interval
on Course Completion, by college

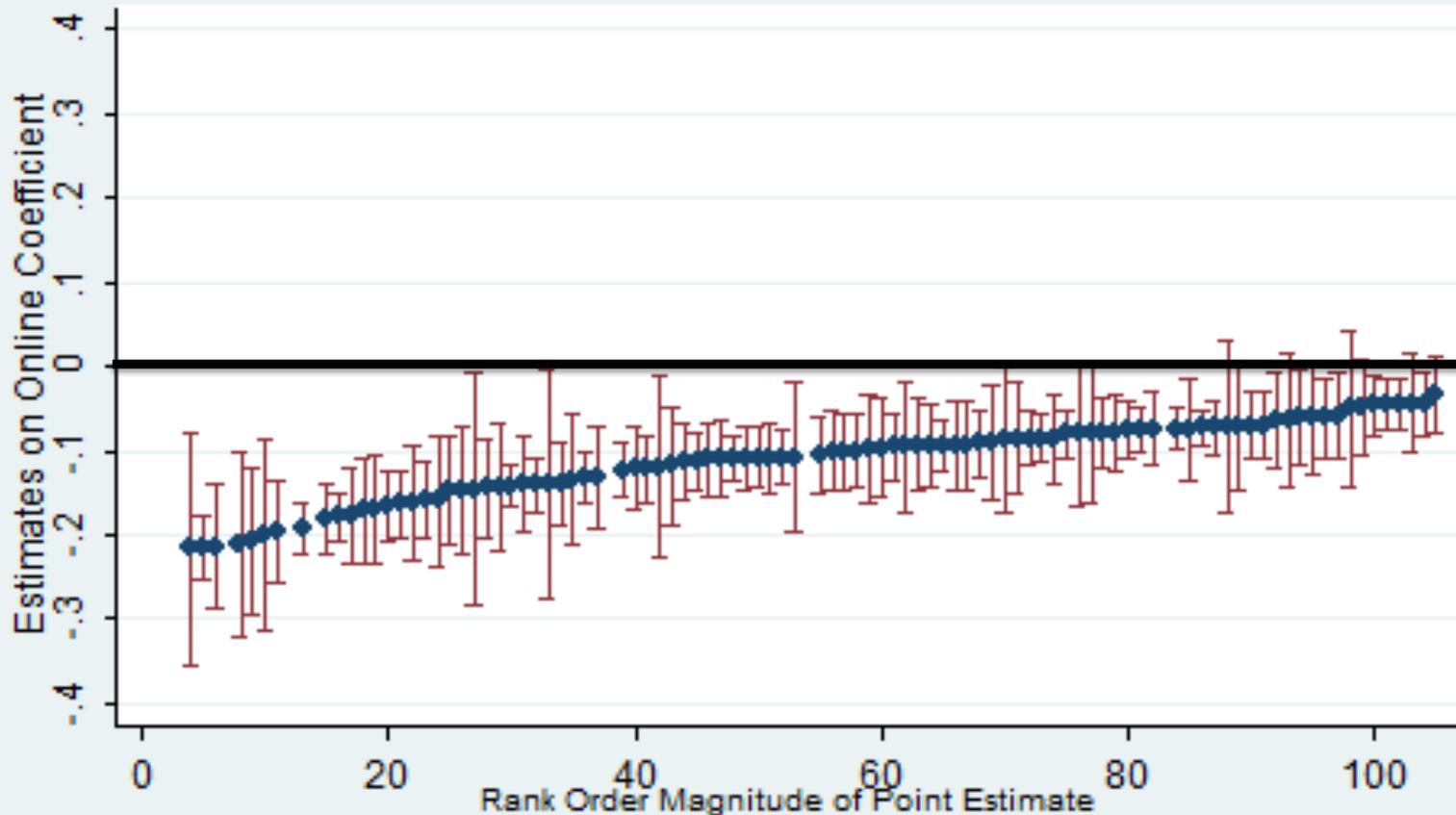


Estimates and 95% confidence intervals from school-course FE models. Excludes colleges with fewer than 1000 student-course-term or fewer than 100 online enrollments (13 schools)



CA community colleges

Online Coefficient and Confidence Interval on Course Success (Pass with C or Higher), by college



Estimates and 95% confidence intervals from school-course FE models. Excludes colleges with fewer than 1000 student-course-term or fewer than 100 online enrollments (13 schools)



The bottom line

- There are lots of very successful online education models, but those being taken to scale don't seem to realize their potential
- Students are more successful in F2F vs. online formats...especially so for those more likely to struggle in college
- Investing in online education may be worth it...but (for now) there's no free lunch

Digital Natives or Digital Naïves? The Internet Skills Gap Among Young Adults



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Digital Divide

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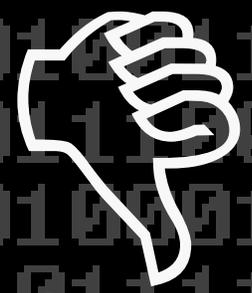
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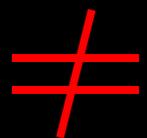
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Digital Divide



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Mere connectivity



Effective, efficient uses

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Digital Inequality



Mere connectivity \neq Effective, efficient uses

Digital Inequality





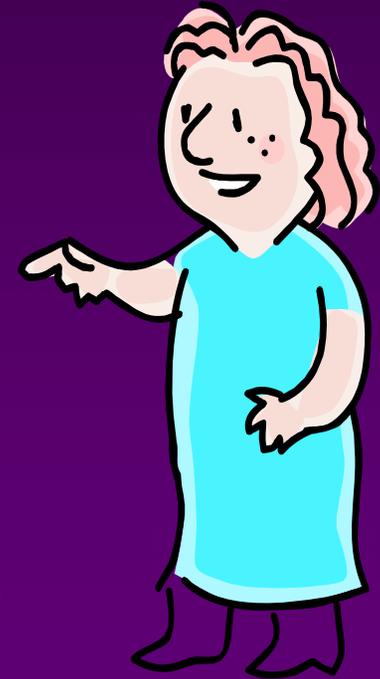
Web-Use Skills



- Awareness and understanding
- Efficient information seeking
- Credibility assessment
- Participation
 - joining communities
 - contributing content
- Knowledge of privacy, security issues

Generational Myths

- A) All young people are digitally-savvy
- B) Young people are savvier than older people



Generational Myths

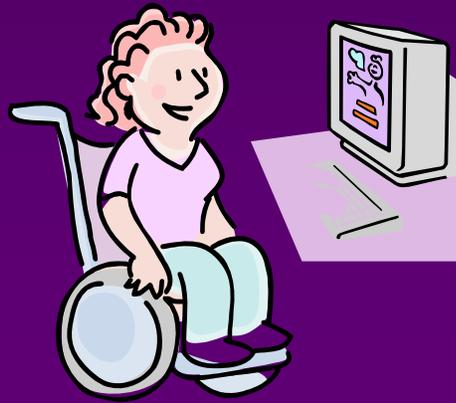
- A) All young people are digitally-savvy
- B) Young people are savvier than older people



“Net Generation” Characteristics

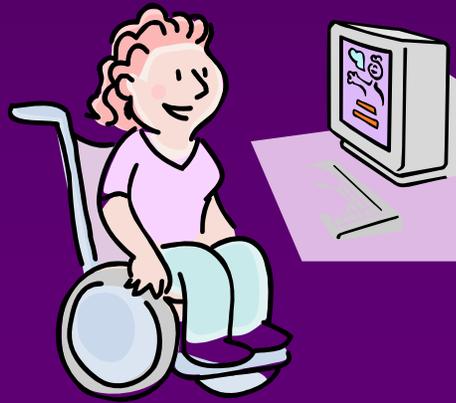


- Have been using digital media for many years
- Spend a lot of time online
- Engage in lots of online activities
- Are savvy about the Internet and Web tools



“Net Generation” Characteristics

- ✓ Have been using digital media for many years
- ✓ Spend a lot of time online
- ✗ Engage in lots of online activities
- ✗ Are savvy about the Internet and Web tools



Awareness and understanding

Bcc (on email)

2.51

1

5

- Send messages with special encryption for security
- Send email without the recipient's address appearing in the message
- Include graphical icons in the body of an email message
- Send compressed picture files attached to a message

Bcc (on email)

2.51

1

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34% could not identify the correct description of bcc functionality on a multiple-choice question

- Send messages with special encryption for security
- Send email without the recipient's address appearing in the message
- Include graphical icons in the body of an email message
- Send compressed picture files attached to a message

Not Understanding URLs

Which of the following sites is most likely to be the Web site of a bank?

- `www3.da-us.citibank.com/cgi-bin/citifili/portal/I/I.do`
- `www.citibank.ve/rify.com`
- `www.us.citibank.businessportal.ru/citiportal/index.php`
- `www.krezmin.nu/citibank.com`

Not Understanding URLs

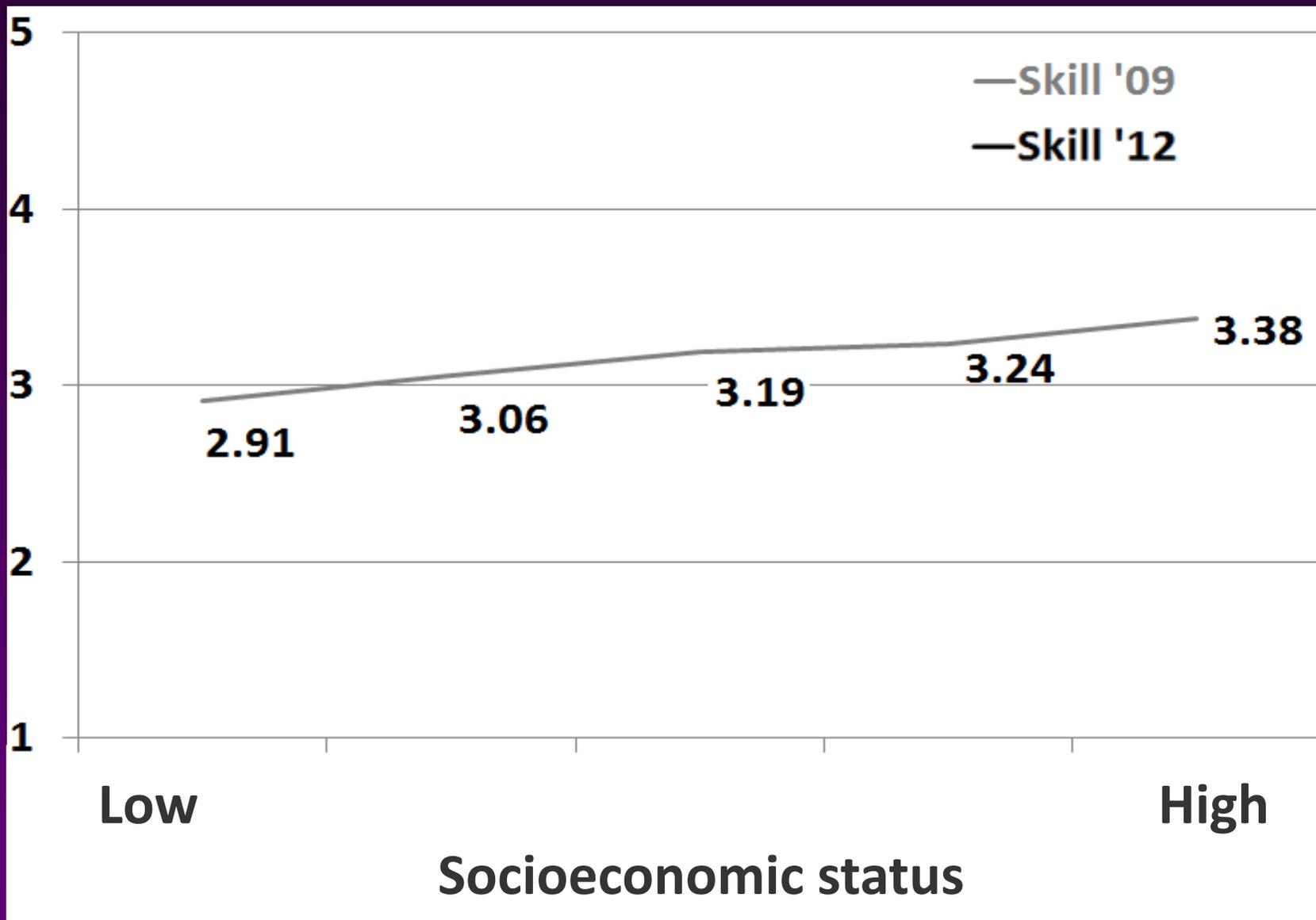
Which of the following sites is most likely to be the Web site of a bank?

- `www3.da-us.citibank.com/cgi-bin/citifili/portal/I/I.do` 12%
- `www.citibank.ve/rify.com` 37%
- `www.us.citibank.businessportal.ru/citiportal/index.php` 50%
- `www.krezmin.nu/citibank.com` 1%

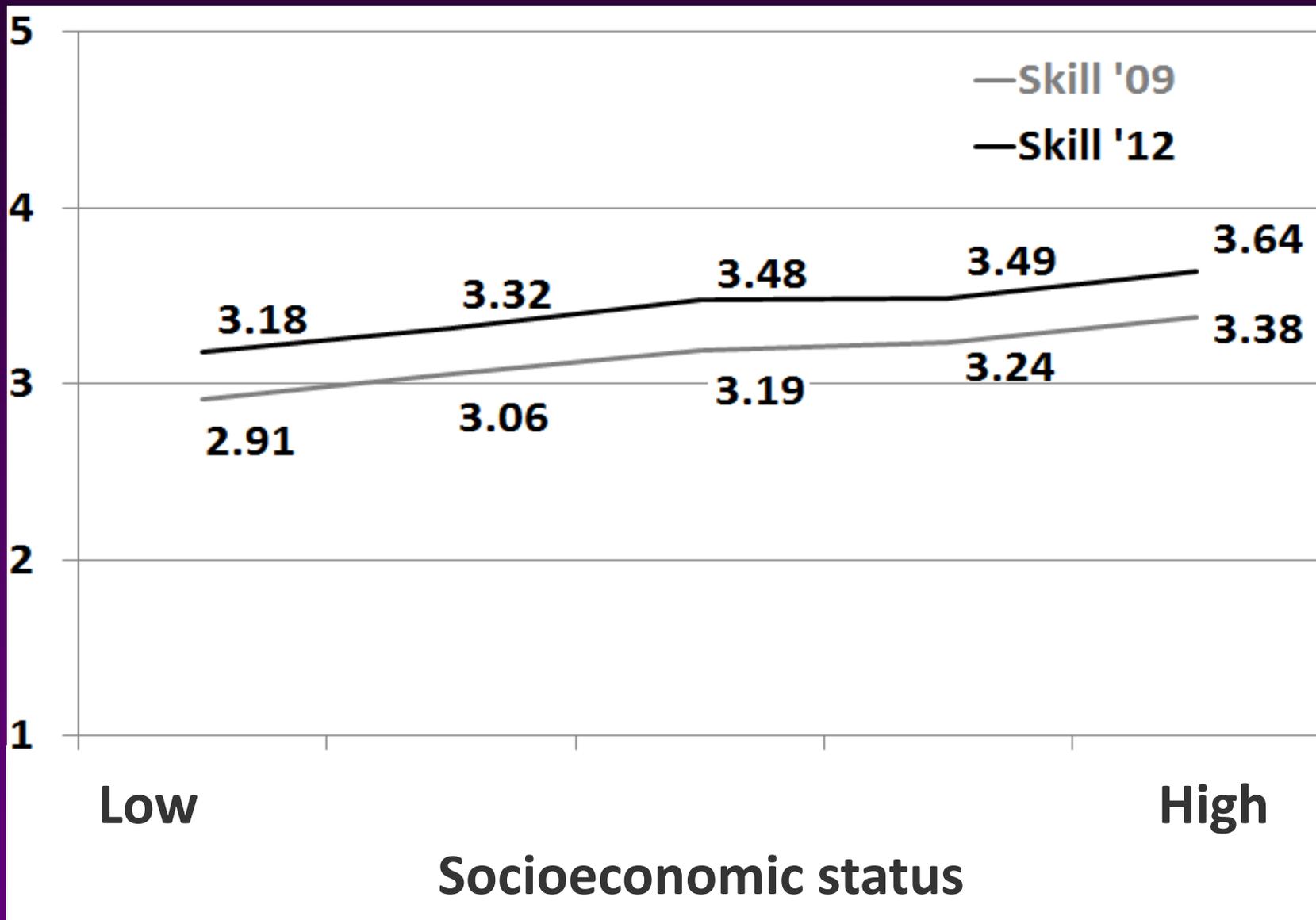
Are certain types of people more skilled than others?

Relationship of skill & socioeconomic status

Relationship of skill & socioeconomic status



Relationship of skill & socioeconomic status



Who benefits most from their digital media uses?

Health information seeking

Looking for jobs

News consumption

Political participation

Sharing content



Skill

Why is it helpful to focus on skill?



How about skill differences across generations?

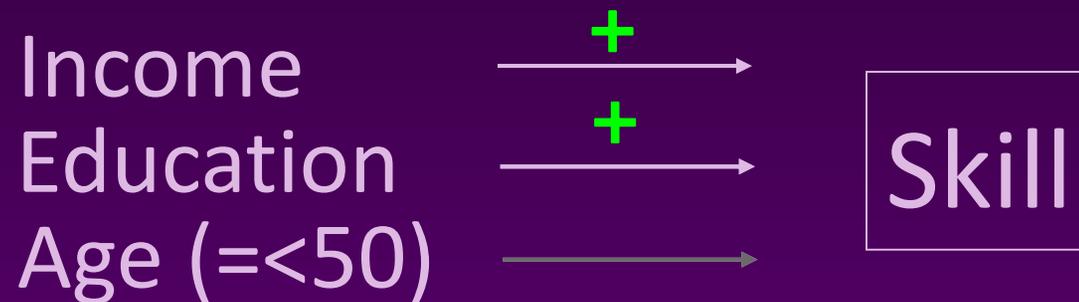
Income
Education
Age (≤ 50)

?

Skill

Source: Federal Communications
Commission broadband survey, 2009

How about skill differences across generations?



Source: Federal Communications
Commission broadband survey, 2009

Take-aways

- **Digital inequality** signals the spectrum of differences among users beyond mere Internet access
- **Web-use skills** differ considerably by user demographics and socioeconomic status
- **Young adults are not universally savvy with technologies**, generational myths should not dictate public policy

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