Laptops and Literacy in K-12 Schools: Can One-to-One Computing Level the Playing Field?

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Backdrop: Relationship of ICT to Educational Equity

- Differential home access to computers and the Internet
  - About 15% of students in low-SES schools in California lack home computers
  - Also differences in
    - How many computers per family
    - Quality of computers
    - Software available
    - Internet access and type
    - Social support

- Differential use of and benefit from computers at home
Issues with School Computing and Equity

- Differences between low- and high-SES schools in number and quality of computers
- Competition for limited resources within schools
- Difficulties of integrating technology in “by appointment” situation
- Impact of lack of home access on school computing
- Solution: One-to-one computing?
Laptops in K-12 Schools

- 43% of US schools have at least some laptops (mostly on mobile carts)
  - 19% increase in one year
- Maine: all 7th and 8th graders (~44,000)
- Henrico County, Virginia: all middle and high school students (~23,000)
- Programs under consideration in Michigan, Fullerton School District, and elsewhere
- Parent-funded programs increasing
- Grant-funded pilot programs
- Handheld programs growing (e.g., Costa Mesa)
Research Questions

- What is the contribution of school laptop programs in facilitating literacy development and learning among at-risk students?
- What is the contribution of laptop programs in increasing diverse students’ access to IT-related careers?
- Do school laptop programs hinder or help educational equity?
- What are best practices for using laptops with diverse students?
Conceptual Framework: New Literacies Studies

- Literacy beyond decoding: ways of making meaning in particular social and economic contexts
- Literacies as plural
  - Academic literacies
  - Digital literacies
- Literacies as intertwined with issues of culture, identity, and power
Research Sites:
State Contexts

- California
  - Large-scale immigration/language needs
  - Huge educational and social inequities
  - Technologization of economy and culture
  - Pilot laptop programs through parents and/or grants

- Maine
  - South-North socio-economic and educational divide
  - Pockets of urban poverty and immigration
  - Statewide laptop program
  - Small class size, relatively progressive education
California Schools

- **Adelante Elementary (4th grade):**
  - 97% Latino enrollment in low-SES post-suburban school
  - Issues: Reading to learn, academic language, 4th grade slump
  - Laptop program: Grant-funded, one 4th grade class

- **Alternative Middle (8th grade):**
  - Alternative education program in low-SES Black/Latino urban school
  - Issues: 8th grade cliff, avoiding drop-out
  - Laptop program: Grant-funded, one 8th grade class

- **Academic High (9th-12th grade):**
  - Mostly White enrollment in high-SES post-suburban school
  - Issues: College preparation, gender divide
  - Laptop program: Parent-funded in special laptop sections of classes
Maine Schools

- **Urbania Middle (7th-8th grade)**
  - 25% refugees, 50% poor white, 25% middle+-class white
  - Issues: Overcoming inequality and conflict
  - Laptop program: state-funded for 7th and 8th grade

- **Suburbia Middle (7th-8th grade)**
  - Wealthy high-test score suburban district (white)
  - Issues: Meeting parent demand, reaching all students
  - Laptop program: State-funded for 7th and 8th graders

- **Village High (9th-12th grade)**
  - Poorest rural county and district in Maine (white)
  - Issues: Overcoming isolation, providing rural opportunity
  - Laptop program: Grant- and business-funded, 9th-12th grade
Data Collected

- ~200 hours of classroom observation
- ~20 teachers interviews
- ~20 parent interviews
- ~30 case study students (several interviews plus access to school work)
Initial Findings: Literacy

- Autonomous
  - Homework, ThoughtPot, Political Cartoons
- Collaborative
  - SubEthaEdit, Presentations
- Visible/Public
  - SmartBoards, Gathering at Screens, Web Publishing
- Analytic & Reflective
  - Graphic Organizers, Freezing Video Frames
- Data- and Research-Based
  - Internet, online encyclopedias, online data bases
- Multi-modal
  - Attention to design features, slide presentations, video
Initial Findings: Equity

- Amplified good (and equitable) practices
  - Engagement of “multiple intelligences”
  - Greater attention to student texts
  - Making research easier and more accessible
  - Special benefit to special education students

- Amplified bad (and unequitable) practices
  - Fact-collecting vs. research
  - Cutting-and-pasting vs. originality
  - Glitz vs. design
  - Time-wasting: games, surfing, instant-messaging
  - Laptops as means of control and resistance

- Example: the two (and a half) Maines
- Gender issue needing greater exploration
Initial findings: Implementation

- School leadership and vision
  - Commitment to excellence and equity
- Teacher expertise
  - Pedagogical
  - Technological
  - Subject-specific
- School and state resources
  - Total cost of ownership
  - Technical and instructional support
- Planning
  - Lengthy lead time
  - Involvement of key stakeholders
Future Research

- Complete data-gathering and analysis in this study
- Follow-up in California laptop schools (follow Latino students over entire year)
- Extend to hand-helds in California
- Proposed national study
  - Interviews, observations, and cross-sectional surveys
  - Long-term impact on skills, attitudes, and aspirations vis-à-vis IT and careers