Rural Connectivity: What Difference does it Make?

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What difference did it make?
Historical Context

• Early studies on mass media
  – Educational radio and TV

• Early research on interactive communications
  – Telemedicine, satellite experiments
  – Impacts of rural telephony

• Internet and mobile communications
  – Studies on community access to the Internet
  – Mobile applications in developing regions

• Digital divides
  – Measuring access and lack of it
  – Telephony, Internet, broadband
Key Concepts

• Power of networking
  – Metcalfe’s Law:
    • Value of the network: potential connections $n(n-1)$

• Externalities
  – Indirect benefits, often overlooked
  – Benefits accrue to others besides users

• Infomediaries or Digital Navigators
  – Help others to find information
  – May provide training in digital skills

• Diffusion
  – Early adopters, laggards, etc.
  – Importance of collecting demographic data about users

• Chain of inference
  – Links between early use and eventual benefits
  – E.g. educational certification $\rightarrow$ jobs
Connectivity: Necessary but not Sufficient

• Context
  – Economic:
    • existing economic activities
  – Cultural
    • Languages, traditions such as consulting with elders
  – Infrastructure:
    • Electricity: availability, reliability, affordability
    • Transportation: roads, aviation, public transportation

• Content
  – Relevance
    • To local population and conditions
  – Languages
    • Is content available in local languages?

• Capacity
  – Digital literacy:
    • Finding information
    • Assessing quality and veracity of content
    • Using popular software and apps
  – Organizational capacity
    • Putting information tools to constructive use
Research and Evaluation

• Need for micro, not only macro, studies
• Need research on users and usage
• Research from several disciplines
• Sector-specific research
  – Distance education
  – Telehealth, telemedicine
  – Businesses and organizations
• Costs and benefits
• Sustainability
Distance Education

• What we know:
  – Motivated students can learn from anything:
    • Teachers, books, audio, video, games …
  – Dropout rates for distance education are high
  – Interactive support can reduce dropout rates
    • Tutors, study groups, online mentors
• What we are learning from pandemic research
  – Many students fell behind because of lack of motivation, technical problems, distractions at home, poor teachers’ skills, or combination of these
  – Students with better home Internet access experienced fewer problems
• We need a better understanding of how or under what conditions online instruction CAN become more effective
Connectivity during the Pandemic

Increased reliance on ICTs
• Telemedicine and telehealth
• Education from home
• Data on COVID 19
• Ordering supplies
• Substitution for travel

Challenges
• Affordability
• Bandwidth
• Quality of service
• Digital skills
Telemedicine

• Early research: daily audio consultation between village health aides in Alaska and regional doctors improved both diagnosis and treatment
• The Alaska Native Tribal Health Consortium (ANTHC) now provides telemedicine services to all Indigenous Alaskans
  – Research on teleconsults for Medicaid cases over six years found that travel was avoided for 75 percent of cases, resulting in net savings to Medicaid of more than $2.8 million.
  – For every dollar spent by Medicaid on reimbursement, $10.54 was saved on travel costs.
  – Teleconsultations that resulted in avoiding travel prevented an estimated 4,777 lost days at work and 1,444 lost days at school for patients
• But telemedicine (diagnosis and treatment) and telehealth (training and patient outreach, etc.) were not widely adopted in the U.S., mainly because of institutional barriers
• Adoption increased dramatically during the pandemic:
  – What have we learned?
Telemedicine in Alaska: Rural clinics linked to regional hospitals and major referral hospital: Alaska Native Medical Center, Anchorage
Business and Institutional Benefits

• Back office functions to support rural businesses such as fisheries and retail
  – Logistics, benefits, payroll, etc.
• Improved connectivity can support tourism
  – Marketing, ecotourism, guest services
• Connectivity for “guest workers” reduces turnover
• Electronic funds transfers help community businesses such as general stores
• Online shopping offers more choices, better prices
  – But requires reliable transportation
• Training:
  – Webinars offer online training for employees
• Governance:
  – Videoconferencing can replace and augment in-person meetings
But We need more Research...

• What difference did it make – or could it make?
• Distance education:
  – How to improve completion rates at all levels
  – How online ACP courses can enhance rural education
  – What difference these offerings can make:
    • In future careers? In savings? In economic impact?
• Telemedicine and Telehealth
  – Analysis of cost savings
  – Analysis of patient impact
• Businesses and organizations
  – Savings in time and/or money
  – Employee recruitment/retention
  – New economic activities or jobs
Research Design

• Beyond anecdotes
• Case studies: helpful, but not conclusive
• Defensible field study research designs:
  – Before and after surveys, data
  – After-only with retrospective data
  – Matched communities: with/without
  – Multiple measurements
• Engagement
  – On research plans
  – Local interviewers, etc.
• Sharing results
  – Accessible formats
Challenges to Effectiveness: Sustainability

- Often ignored in evaluation research
- Why do positively evaluated projects die?
- Funding:
  - Capex vs. Opex
  - Short term vs. longer term
- Organizational issues
  - Volunteers vs. paid staff
  - Training in management and planning
- Covering operating and maintenance costs
  - Grants
  - Subsidies
  - Providing services to anchor tenants
  - Charging users
Challenges to Effectiveness: Engagement

• Consultation with community members in project planning

• Getting “buy-in” from community
  – Donated facilities, people to be trained, etc.

• Meaningful consultation
  – Need for follow-up and evaluation

• Involvement in project evaluation
  – What have we learned?
  – What would you tell other communities?
Challenges to Effectiveness: Digital Literacy

• Training for Users
  – Use of popular software, platforms, apps
  – Searching for information
  – Evaluating content
  – Privacy, security of personal data

• Training for Staff
  – Infomediaries (digital navigators)
  – Technical skills for jobs: installation, operation, maintenance of community networks
Rural Challenges

• High energy costs
  – Use of smart renewable energy technologies
  – Computer controlled wind power

• Climate change
  – Floods
  – Erosion
  – Changing vegetation, wildlife

Need for more information
Infrastructure Funding: Billions for Broadband!

- Need for evaluation of these initiatives
- Rigorous research designs
  - Starting now!
  - Before/after, multiple measure field research
- Demographic data
- Historical data
- Sustainability analyses
- FUNDING for this research
  - From federal funding?
  - From other sources
- Important for:
  - Identification of success factors
  - Identification of gaps and barriers
  - policies: federal, state, local
Conclusions:

• Lessons from previous research are still relevant
• Still many unanswered questions:
  – Can short term outcomes contribute to long term benefits?
  – What do we know about diffusion and adoption; do demographics of adopters change over time?
  – How should externalities or indirect benefits be assessed?
  – Under what conditions is connectivity necessary but not sufficient to achieve socio-economic benefits?
  – What conditions are necessary for networks to be sustainable?
• We need to seize the opportunity for research on post-pandemic and broadband infrastructure initiatives!
Thank You!

For more information:

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