# *Case Study Analysis III*

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TechBridgeWorld

# Case Study HW

- Objective:
  - Encourage critical reading of ICTD case studies
  - Teach good case study writing skills
- Lessons learned from last year:
  - Make sure you pay attention to the instructions
  - Make sure you pay attention to the distribution of grades for sub-sections
  - Make sure you analyze the technology
  - Summarizing your analysis effectively but succinctly is an important skill
  - It is important to first ask yourself many relevant questions and spend the time and effort to seek the answers to these questions
  - It is not a good excuse to say you don't have a background in policy/technology/???

# Case Study HW

- Part 1: Brief summary of case study
- Part 2: Technology evaluation
- Part 3: Evaluation of needs assessment, deployment strategy, and sustainability
- Part 4: Summary of your evaluation of the case study
- *Remember to cite ALL sources of information*

# Some Guidelines

- 7/12 Habits of Highly Effective ICT-Enabled Development Initiatives
  http://www.bridges.org/12_habits
- Sustainable ICTs: Lessons Learned
  http://www.sustainableicts.org/infodev/infodevreport.pdf
- Participatory research for technology evaluation
  http://www.cimmyt.org/Research/Economics/map/research_tools/manual/pdfs/prm_all.pdf

# Evaluating Technology

- Relevance to need
  - Does the technology adequately address the need?
  - What compromises were made?
- Infrastructure
  - Power requirements and availability
  - Voltage fluctuations
  - Impact of environmental conditions such as temperature, dust, rain, snow, monkeys, etc.
  - Connectivity
  - Operating systems
- Required training
  - Required knowledge for users
  - Required knowledge for administrators
  - Potential fears/dislikes of technology
  - Barriers: language, time, etc.

# Evaluating Technology

- Required maintenance
  - Maintenance knowledge
  - Availability of “spare parts”
  - Expected lifetime of solution
  - Identifying likely problem conditions
- Economics
  - Cost of solution
  - Methods of payment
  - Implications for ownership
- Technology trends
  - Likelihood of technology becoming obsolete
  - Timing for introducing particular technologies

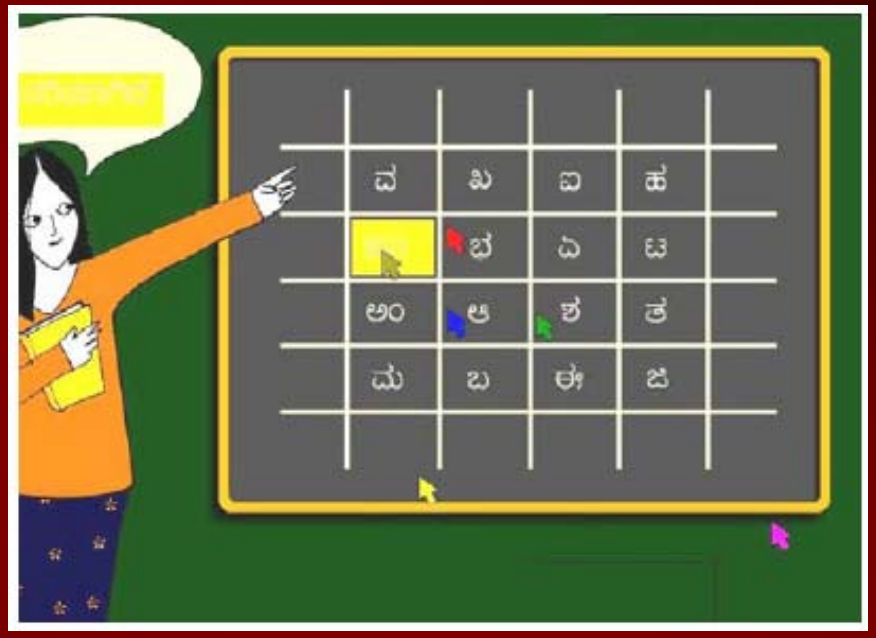
# Evaluating Technology

- Alternatives
  - What alternative technologies could be used to address this need?
  - What non-technology solutions might one consider instead?
  - Are there more effective ways to deploy the proposed technology?
- Content
  - Who will create relevant content?
  - How will this content be kept updated?
  - Will content be culturally relevant and accessible?
- Implications
  - Cultural and societal implications
  - Implications to power structures
  - Environmental impact

# Evaluating Technology

- Barriers
  - Cultural resistance
  - Negative perceptions/fear of technology
  - Perceived excess of cost
  - Resistance from individuals/organizations that may stand to lose from the solution
  - Perceived lack of value
- Enablers
  - Buy-in from key members of community
  - Strong partnerships in implementation
  - Ease of deployment/maintenance
  - “Coolness” factor
  - Fulfillment of a perceived need

# Multiple Mice



Udai Singh Pawar, Joyojeet Pal and Kentaro Toyama, Multiple Mice for Computers in Education in Developing Countries, ICTD 2006
http://tier.cs.berkeley.edu/docs/ict4d06/multiple_mice-jp.pdf

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# Introduction

- Addresses the challenge of lack of resources
- Computers can be expensive but mice aren't
- Often many children use one computer in developing communities
- Group engagement can be a positive element in the learning process
- Should allow several children to share a single computer with multiple mice
- Needs relevant software applications

# Results & Challenges

- Developed several educational games
- A cursor with a unique color is “attached” to each mouse
- Games were implemented in English, Hindi, and Kannada
- Preliminary field trials were conducted

- Questions answered:
  - Can children understand and use the multiple-mouse paradigm when the number of mice is as many as five?
  - How do children interact with each other with respect to multiple mice? How do they share or not share?
  - Does the multiple mouse paradigm increase interest and engagement?
- Observations:
  - Gender difference in sharing
  - One child didn’t like competitive element

# Future Work

- Build more educational applications
- More extensive field tests
- Evaluate tangible learning outcomes
- Adaptive software for simultaneous multiple users
- Joint decision making mechanism
- Collaborative applications

# Evaluating Technology

- Relevance to need
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- Economics
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- Alternatives
- Content
- Implications
- Barriers
- Enablers

# Project Kané


M. Bernardine Dias, G. Ayorkor Mills-Tettey, and Joseph Mertz, The TechBridgeWorld Initiative: Broadening Perspectives in Computing Technology Education and Research, 2005

http://www.ri.cmu.edu/pub_files/pub4/dias_m_bernardine_2005_4/dias_m_bernardine_2005_4.pdf



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# Introduction

- Ghana is seeking means to improve English literacy
- One major shortcoming with available resources is the opportunity for guided reading practice
- Carnegie Mellon's Jack Mostow and group had developed an automated English reading tutor – project LISTEN


# Results & Challenges

- Field study designed as TDC class project
- Pilot study was implemented over the following summer with good results
- Searched for follow-on funding and partnership
- UNESCO funding and partnerships secured in 2006 summer

- Many challenges in implementing follow-on study including very limited funding
- Difficulty in ensuring attendance for long-term study
- Initial phase was carried out in Internet café; wasn't possible for follow-on
- Being a remote partner is difficult

# Future Work

- Complete on-going field study – comparison to guided practice with an older youth
- Seek creative ways to overcome recent licensing of the tutor
- Seek creative means of funding follow-on work
- Find other partnerships
- Lots of demand!
- English tutors for adults are also in high demand



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# Evaluating Technology

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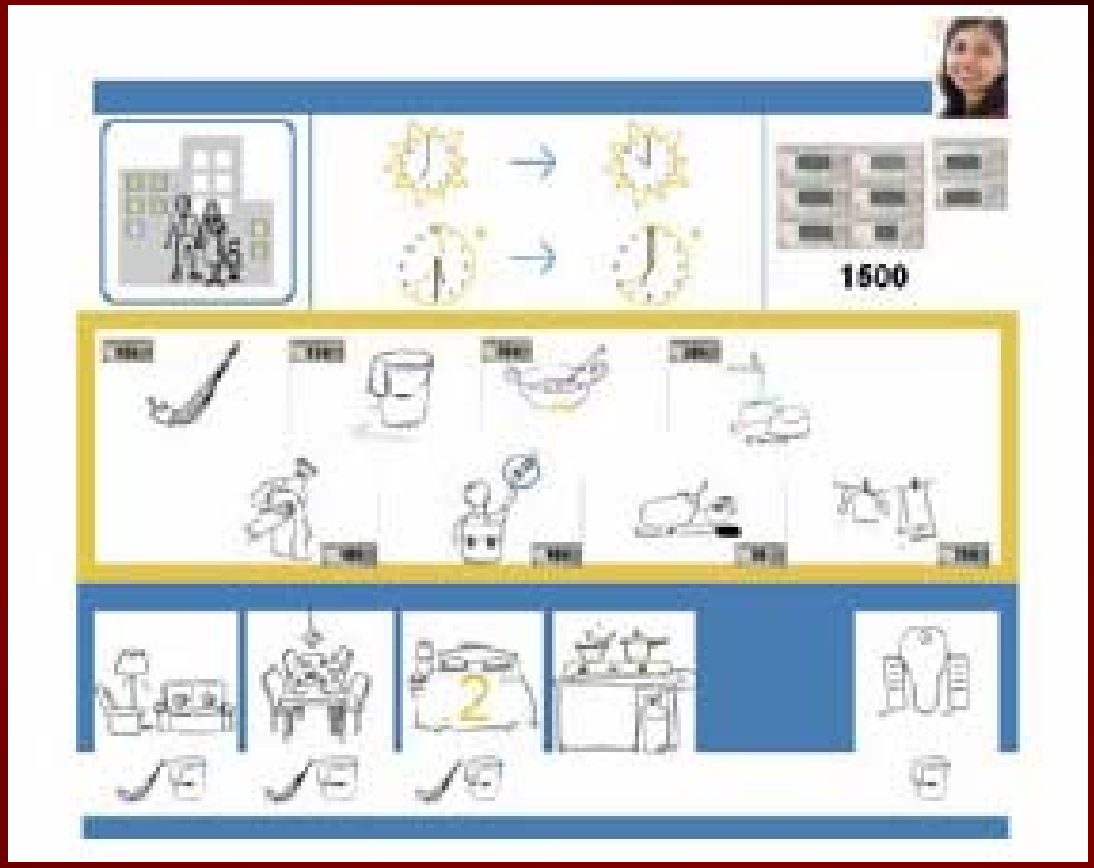
# Text-Free User Interfaces




Indrani Medhi, Aman Sagar, and Kentaro Toyama, Text-Free User Interfaces for Illiterate and Semi-Literate Users, 2006
http://research.microsoft.com/users/indranim/Text-FreeUI.pdf



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# Introduction

- User interface for novice/illiterate users (with no other help)
- Domestic laborers in Bangalore slums were chosen
- Two applications:
  - Job search
  - City navigation

# Results & Challenges

- Design principles:
  - Avoid text
  - Numbers are ok
  - Use semi-abstracted graphics
  - Photo-realism with deeper interaction
  - Pay attention to subtle graphic cues
  - Provide voice feedback
  - Provide help at all stages
- Text-free but not click-free
- Landmarks were important for navigation
- Testing conducted in homes
- Used trusted contacts
- Bollywood Method to encourage feedback
- Collaborative use

# Future Work

- Ethnographic process: 180 hours with 80 men and women from Bangalore slums
- Strong preference for text-free interface
- Help on every “page” was important
- Include short movie that loops at the beginning
- Move towards use-studies with no external assistance

# Evaluating Technology

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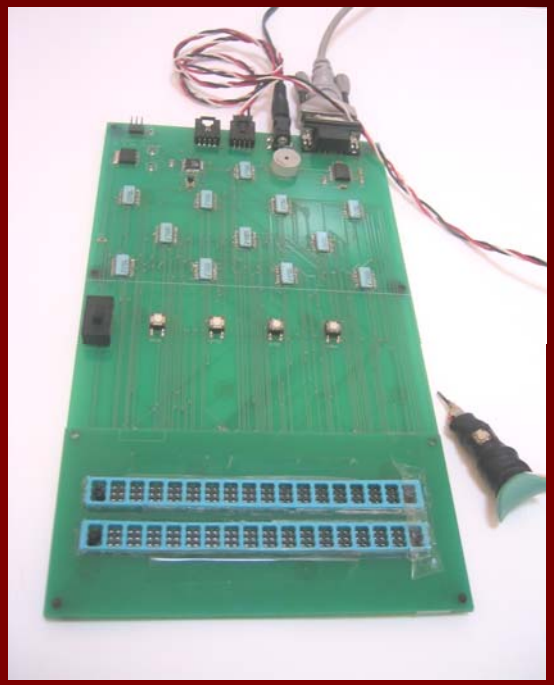
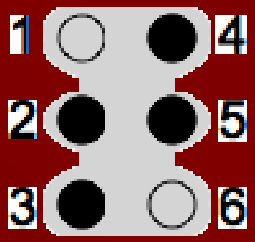
# Braille Tutor



N. Kalra, T. Lauwers, and M. B. Dias, A Braille Writing Tutor to Combat Illiteracy in Developing Communities, 2007
http://www.ri.cmu.edu/pubs/pub_5676.html

# Introduction

- Collaboration with Mathru School for the Blind
- > 90% of world's blind population live in developing countries
- < 3% of them are literate
- Braille:
  - Tactile writing system
  - Six dots per cell
  - Write by embossing paper
  - Traditionally with slate and stylus




# Results & Challenges

- Successful 6-week long field test in Summer 2006
- Tutor catered specifically to needs of students and teachers in under-resourced communities
- Designed to be low-cost and robust
- Currently has activities for 3 grade levels Quantitative predictions
  - dots - letters
  - words
  - sentences
- In use at Mathru
- Second version of tutor developed based on feedback

# Future Work

- Battery-powered
- Independent of computer
- Adaptive to skill level of user
- Longer, more extensive field study at Mathru
- Field studies at other locations
- Other languages (Arabic Braille)
- Games to increase enthusiasm

# Evaluating Technology

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# Summary

- Be critical in your reading and analysis of ICTD case studies
- Remember to ask questions about:
  - Date and author of case study
  - Author's motivations/biases for writing the case study
  - Needs assessments
  - Capacity building
  - Monitoring and evaluation
  - Technology feasibility and appropriateness
  - Infrastructural challenges and requirements
  - Sustainability and ownership of solution
  - Social/cultural implications and relevance
  - Equality of access and relevance
- Helpful suggestions of alternatives are more useful than criticisms alone