Parental Aspirations and Computer Aided Learning in Rural India

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Motivation

Environment of Need / Discourse of Technology

Approach

Study second-order impacts of computers in rural India

- Research Group: Parents of children in villages allotted computers under the Computer Aided Learning (CAL) program
- Questions:
  - How do parents perceive computers
    - Where do they get information about computers
    - What is the economic environment, expectation
  - What perceived in village since coming of CAL
    - Any changes in the child's behaviour?
    - Occupational expectations for the child
  - Aspiration: Computers v/s English

Methodology

Background Study

140 Interviews, 4 focus groups, 35 group observations

Dates: 2005-2006

Locations: Orissa, Karnataka, Maharashtra, Tamil Nadu

- Initial stakeholder interviews
- Child observations
- Parent focus group

Interviews of parents

203 Parent interviews

Dates: 2007

Locations: 14 locations in 4 rural districts of Karnataka

- Open ended thematic discussions
- Structured questionnaires

Sample

- BELLARY sub-set – 66 interviews (primarily factory/mine workers)
- BANGALORE RURAL sub-set – 68 interviews (primarily small farmers)
- KODAGU sub-set – 18 interviews (all estate workers)
- SHIMOGA sub-set – 20 interviews (farmers and day laborers)

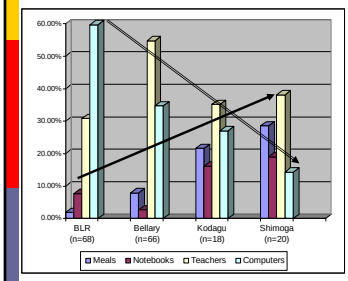
Environment: Occupational Push

- Only 2 from 117 agricultural families desired continuing in agriculture
- Only 13.7% agricultural families wanted their children to continue living in their villages, as compared to 28.6% non agricultural families
- Most desired occupation is government jobs – specially teaching

"The price of rice has multiplied twice since Vasantdada Patil's government (1970s) here, but look at the price of living. Small farmers can become labourers, but if you have 5 acres, you may as well commit suicide because you won't be able to degrade yourself to digging holes and laying tar," **mid-sized farmer (15 acres), Vidarbha**

"Move to a city and get a government job. That is like a horse for a long race."
small farmer, Bangalore Rural

Demand: Computers, Teachers, or Meals?



Response "mid-day meal" rises from poorest to richest district

"I'll feed my children at home. Anyway don't like them eating the food they make in the school, sitting next to dirty children," **parent, Udupi**

"If the mid-day meal is stopped, I will withdraw my child from the school. What is the need for him to go to school then?" **parent Shimoga**

BUT…

"If the computers are not fixed for months, nobody cares. If the mid-day meal does not happen on time, we'll have a riot," **headmaster, Pondicherry**

Majority view teachers / state as primarily responsible for their children's education, contrast with urban/rich parents.

Demand: Computers or English?

Perceived importance: Computers v/s English

	Choice: Kannada medium with computers	Choice: English-medium without computers
BLR (n=68)	96.2%	3.8%
Bellary (n=66)	59.7%	40.3%
Kodagu (n=18)	70.6%	29.4%
Shimoga (n=20)	65.0%	35.0%
Total (n=172)	73.5%	26.5%

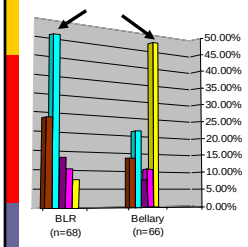
"I have seen the security guards using the computers. Even coolies can use computers nowadays," **factory worker, Bellary**

"I have seen my son working on the computer, making designs. He knows how to use it in less than one year. You see all these boys in the 7th standard, after three years of learning English if you ask them for a glass of water in English they will run away. Even the English teacher will not talk to you in English," **marginal farmer, Bangalore Rural**

"Children become intelligent when they use computers. If you know computers, you can learn English through a computer," **marginal farmer, BR**

Perceptions of Change

Parents' perception of changes in school since CAL



"My children have become more active, they seem more interested in things and have even started directing their parents (referring to herself) in many things. They want to go to school everyday, even during the holidays to play with the computers. The whole village respects the school now," **seamstress in Bangalore Rural**

"This is all a waste. Children in the 7th (grade) don't even know how to read. Computers are never running," **casual labourer, Bellary**

Key differentiators b/w BLR and Bellary

1. **Summer program**
2. **School selection**

Technological Expressions

The Symbolic Value of Computing….

- **Necessity**:
  - "Computers are needed for everything" v/s "Computers can do anything"
- **Tangibility**:
  - Short term gratification of "My child can use computers" – no 'levels' of proficiency "
  - Mastery of machine" possible, English impossible
- **Systemic Empowerment**:
  - Interface with the non-human: neutrality of computer

Places where seen computers in use (n=166)

Bank	36.1%
Taluk (Administrative) Office	31.9%
Bus Stand	19.9%
Hospital	16.9%
Factories	16.3%
Electricity Bill Office	11.4%
Market Place / Shops	8.4%
Never actually seen a computer myself	20.5%

Computers contextualized socially

- Shared resource
  - Sense of communal gain – "our village has computers"
  - My child uses it (with / as well as) the rich
- Generational change
  - Familial Pride
  - Increasing generational schism
- Gender
  - Dowry concepts of farmers vs. labourers (more savings for weddings than education)
- Teacher as class symbol
  - Local computer teacher as class breaker v/s Traditional state teacher as class vestige

Implications

Short term

- Child attendance
- Household propensity to invest (Rs. 10 - Rs. 50 per month for computers)
- Parent involvement (this may be the clincher – research unable to show other investments make significant differences)

Long term

- Raised graduation rates?
- State interest in continued investment
- Risks of expectation

Thanks

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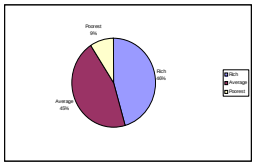
Seating Patterns

- Strong suggestion that seating patterns reinforce social and classroom inequalities
- Using the ANOVA test for Statistical Significance we find:
  - The correlation between the position occupied by the student during the computer class and
    - the **student's family's economic position** is statistically significant to over 95.1%
    - and to a **student's performance in class** is statistically significant to over 99.8%

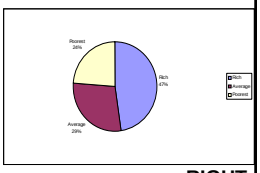
	Seating Position (n=102)				
	L2	**L1**	**T**	**R1**	**R2**
Class Performance	**1.50**	**2.00**	**2.68**	**1.95**	**1.50**
Economic Affluence	**2.00**	**2.36**	**2.68**	**2.24**	**1.00**

Position :: Family Affluence



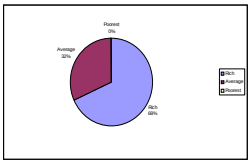
LEFT

SD=0.66



RIGHT

SD=0.83



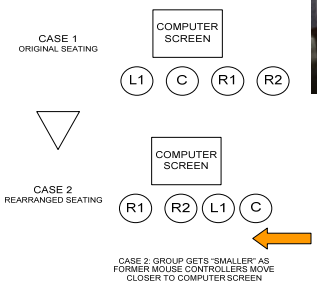
CENTER

SD=0.48

Computer control patterns

- Narrative modules less popular
- Center scrolls w/o much collaboration
  - Eye contact with screen poor for R1
  - Sense of 'computer pride' hurts scroll pace
- Choice of CAL module usually on center user
- Over time, the mouse controller gains automatic default position in usage

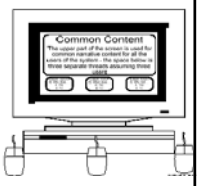
Seat Shuffle



Design Intervention

Seat shuffle found effective only in short run, thus we concluded that two factors were critical to make CAL more effective:

1. Modular design for short seating length
2. Multi-user system design
   - Pedagogical Design – needing children to talk
   - Physical Design – shared input/interaction

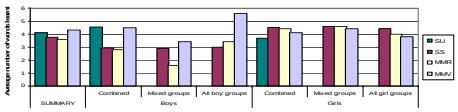


First Design Iteration: Multiple Mice

- **MSR-India wrote driver and application for MultiMouse**
- **Finding: Children learn basic retention tasks better in shared/collaborative scenarios**

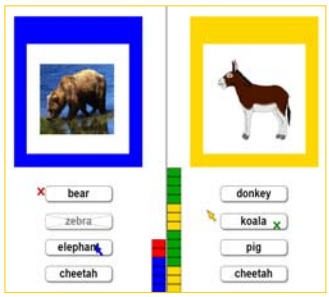
	Words Learnt	Engagement	Decision-making	Response error	Conflict (Boys)	Conflict (Girls)	Intra-group Competitiveness	Dominance by a child
SU	4.11	High, tails off	Individual	Low	n/a	n/a	n/a	n/a
SS	3.77	Low	Collaborative	Very Low	High	Low	Medium	Varied
MMR	3.6	Very High	Individual	Mid-High	Low	Low	Very High	None
MMV	4.3	High	Collaborative	Very Low	Medium	Low	Low	Varied

Table 1: Findings Matrix for qualitative observations from experiments E1 and E2, N=238 ('Words Learnt' from E2)



Second Design Iteration: Split Screens

- *Based on finding that both collaboration and competition are needed*
- Split screen
- Playing in teams
- Turn taking
- Collaboration
- Competition
- Scoring



Second Iteration Findings

- Split screen interface very easy to understand
- Children prefer playing in small teams than individually
- Inactive mouse users help with partners with visual cues
- Without design intervention, sharing is highly unequal