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 environment, expectation perceived in village since coming of CAL?
- Any changes in the child’s behavior?
- 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 Vasantrao 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 dream for a long time,* small farmer, Bangalore Rural
Demand: Computers, Teachers, or Meals?

“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

Response “mid-day meal” rises from poorest to richest district

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

Perceptions of Change

Parents’ perception of changes in school since CAL

Demand: Computers or English?

Response “Computers” rises from poorest to richest district

Perceived importance: Computers v/s English

<table>
<thead>
<tr>
<th>Region</th>
<th>English (n=70)</th>
<th>Computers (n=70)</th>
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<tbody>
<tr>
<td>BLR (n=68)</td>
<td>40.3%</td>
<td>50.0%</td>
</tr>
<tr>
<td>Bellary (n=66)</td>
<td>26.5%</td>
<td>73.5%</td>
</tr>
<tr>
<td>Kodagu (n=18)</td>
<td>35.0%</td>
<td>65.0%</td>
</tr>
<tr>
<td>Shimoga (n=20)</td>
<td>29.4%</td>
<td>70.6%</td>
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</tbody>
</table>

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%
- **Hospital**: 26.9%
- **Electricity Bill Office**: 18.3%
- **Market Place / Shops**: 17.4%
- **Bus Stand**: 11.4%
- **31.9%**
- **36.1%**

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 92.1% and to a student’s performance in class is statistically significant to over 99.8%

<table>
<thead>
<tr>
<th>Seating Position (n=102)</th>
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<tbody>
<tr>
<td>L2</td>
</tr>
<tr>
<td>Class Performance</td>
</tr>
<tr>
<td>Economic Affluence</td>
</tr>
</tbody>
</table>

Position :: Family Affluence

- LEFT
  - SD=0.86
- CENTER
  - SD=0.40
- RIGHT
  - SD=0.83

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

- Seat shuffle found effective only in short run, thus we concluded that two factors were critical to make CAL more effective:
  - Modular design for short seating length
  - Multi-user system design
    - Pedagogical Design – needing children to talk
    - Physical Design – shared input/interaction

Design Intervention
First Design Iteration: Multiple Mice

- MSR-India wrote driver and application for MultiMouse

Finding: Children learn basic retention tasks better in shared/collaborative scenarios

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<tr>
<th></th>
<th>SU</th>
<th>SS</th>
<th>MMR</th>
<th>MMV</th>
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<tbody>
<tr>
<td></td>
<td>4.11</td>
<td>3.77</td>
<td>3.60</td>
<td>4.30</td>
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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