

“My Child Will Be Respected”: Parental Perspectives on Computers in Rural India

Joyojeet Pal, Meera Lakshmanan, Kentaro Toyama

Abstract— Computer centers in rural Indian public schools raise questions about the value of expensive modern technology in starkly poor environments. Arguments for or against spending on computers in low-income schools have appeared in policy circles, academia, teacher conferences, and philanthropic discussions, with passionate rhetoric from all sides. One shortcoming of the debate has been the absent voice of parents and children themselves. We present the results of a qualitative study of computer-aided learning centers in four districts of rural Karnataka, South India, where we discussed with parents issues such as aspirations, quality of schooling, and the perception of computers more generally.

The research reveals a range of voices on hopes for the next generation, perceived value of computer courses and higher education, and views on the arrival of computers into their village schools. It emerges that in the minds of many parents, the computer has an immense symbolic value – separate from its functional value – that is tied to social and economic ascendancy. We find that this symbolic value derives from associations that parents imbibe from their various interactions with people using computers in a range of situations. Despite a large number of parents not entirely clear on what a computer does, the sense of mystical quality about technology is a feature we find across the board. In discussions with rural parents, we find an environment of great fear about the future of agriculture, because of which computer-aided learning centers have become a symbol of future aspirations of jobs for their children. The research also reveals varied related concerns of parents from the dowry implications of having computer-trained daughters to the relative value of English versus computer literacy as the key to social mobility.

Index Terms—Developing nations, Human factors, Rural areas, Technology social factors

Manuscript received August 30, 2007.

This material is based upon work supported by the National Science Foundation under Grant No. 0326582.

Joyojeet Pal is at the University of California at Berkeley in the Department of City and Regional Planning. He can be reached at +1.510.510.8679 or at joyojeet@berkeley.edu.

Meera Lakshmanan is an independent consultant on technology and education issues in Bangalore. She can be reached at meeragargi@gmail.com.

Kentaro Toyama is the Assistant Managing Director of Microsoft Research India, Bangalore. He can be reached at kentaro.toyama@microsoft.com.

I. INTRODUCTION

COMPUTER-aided learning (CAL) projects are active in over 20,000 public primary schools in India. These programs are designed as aids to the curricular program in schools and typically include a computer center with 3-5 machines set up per primary school of about 200-400 children in a rough 1:50 machine/child ratio. While the general model varies regionally, in Karnataka, the state government typically pays for all infrastructure and fixed asset costs, as well as operating costs for the first year, following which, schools are expected to fend for themselves. The typical CAL class has about 3-5 children sitting at each computer in the lab, often with a supervising teacher. The multimedia content that the students use at their workstations ranges from curricular mathematics, sciences, and languages, and is usually delivered in the local language (Kannada). In Karnataka, set up and initial functioning of the CAL centers, as well as the content creation, are managed by the Azim Premji Foundation (APF), a local NGO partnering with various state governments for CAL programs. Teachers as well as school administrators are provided training sessions at the educational department’s block offices for the use of the content and administration of the centers in general. Although the program is envisioned for use by all primary school children, it is typically children from the 3rd grade and above who are given weekly computer classes [2].

II. PREVIOUS WORK

There are two bodies of work that are of relevance. The first is the existing work on computer-aided learning in India and on the impact of computer use on children. Second is literature in the science and technology studies space on discourses around technology.

A. Studies of Computer-Aided Learning in India

Studies of CAL projects in India have covered outcomes in computer-aided learning generally [1], the social and organizational factors impacting the success and failure of such projects [2], and the learning impacts of children with no prior experience with computers [3]. On the more general issue of the learning and social impacts of computers among children, the academic literature leans towards a more critical look [4] from a policy perspective. On learning issues, however, there is general agreement that there are two sides to

outcomes in schools [5] as well as among young children more generally [6].

B. Discourses of computers among parents

Very few studies have considered the parental perspective on CAL. There is some work on middle-class American families of interest in this area [7][8]. Significant work has been focused at the discourse at the macro-level of state policies with an eye on informing or critiquing policy initiatives [9]. There is also a good amount of micro-level work that looks at computers and children within the family; much of this work has been more focused towards computer games [10] in homes in the developed world. Finally, there has been important work in looking at the role of children in the adoption of technology by adults [11]. This paper complements this line of work by examining parental views on CAL directly.

III. KEY CONTRIBUTIONS

The novel contributions from this study are on discourses of technology among parents generally, and among the rural poor in India specifically. Despite the plenitude of work on ICTs and development in India, there is little documentation of rural adults who may never be technology users themselves but are parents of computer users. In the CAL space, work has been primarily focused either on service delivery or on learning outcomes, but very little exists on the ‘second order’ effects of technology in India, which to our knowledge is this study’s unique contribution.¹

IV. METHODOLOGY

The research was conducted only in schools with projects coordinated by the Azim Premji Foundation for the government of Karnataka in south western India, to avoid bias caused by differences in implementation. We selected the four districts of Shimoga, Bangalore Rural, Bellary, and Kodagu, based on regional demographics as well as the number of completed years of the CAL program at these locations. Though a combination of research instruments were used in this project, this paper discusses only the outcomes of the parent interactions, for which the main tool used was an open-ended questionnaire administered to parents of children in neighborhoods around where computer-aided learning centers had been established by the state government.

A. Instrument Design

The data presented is based on opinions from 173 respondents to a structured, open-ended questionnaire. The questionnaire was designed based on 20 free-form conversations with parents, four focus groups, followed by 20 structured interviews based on themes that emerged from the free-form conversations. These preparatory interviews and

focus groups were conducted in January 2007 in Shivanahalli and Karahalli, two of the locations in the current sample. The free-form conversations followed a general conversational format in which parents were asked to speak generally about their opinions on the school and on the computer aided learning program. Eight of the free-form conversations were conducted on site in a rural school, and the remaining were done at the homes of parents. Following this, the actual instrument was iterated with eight participants in May 2007, and with some minor modifications, the final questionnaire was designed in June 2007 of which the data from 173 parents is used for analysis here. From the original sample of 20 mothers in the free form interviews, we interviewed 10 again in the second phase in June to try and understand some of the changes over time and to check for consistency of the responses. A separate questionnaire was created for locations without the CAL program, which deleted some questions and added others as necessary.

The main themes that emerged from the free form discussions in January can be broken into two categories. Some issues were of overarching lifestyle questions that impacted parents’ interest in schooling and their inclination to send children to school:

1. *The issue of an existing crisis in agriculture and a consequent interest in investing in children’s schooling*
2. *Familiarity with the idea of computers, but a very limited understanding of a computer’s function*

The specific issues that emerged with regard to computers included the following:

1. *A belief that the CAL program was increasing their children’s interest in school*
2. *The computer as an artifact of pride in the village, and a symbol of the school’s rise in status*
3. *Gender dimension to the use of computers – such as selective willingness to spend for computer classes by gender, concerns about the dowry implications of computer education*

The final questionnaire was prepared around these themes, and was administered by an interviewer in Kannada, the local language. Each interview took between 45-120 minutes.

B. Sampling and Recruitment

Our primary interest was with rural schools. Thus, to get as broad a rural computing experience as possible, we selected four districts in Karnataka – Bangalore Rural, Bellary, Shimoga, and Kodagu for our sample. Of these, Bangalore Rural is a water-shortage affected agricultural area which also has the increasingly common characteristics of proximity to a large metropolitan area. Kodagu was selected because the economy there is primarily coffee and rubber, and most of our participating parents were estate labourers. Shimoga was selected as a remote agricultural inland area with limited urban connection. Bellary was selected as it is a mining region, and a number of the local residents have livelihoods dependent on the nearby steel industry. The schools themselves were

¹ The data from this study has been last updated in August 2007, it is formerly unpublished.

selected based on the number of years that the school had the CAL program. Three comparison group schools were selected – two in Bangalore Rural, one in Bellary. Parents were selected by going through student registers for classes 5, 6, and 7 in schools and looking for the children’s homes in the village to see if someone would speak to us. Grades 5-7 had a higher probability of children who had actually used computers, unlike younger grades where the teachers sometimes did not allow computer usage.

The interview process was challenging for us as well as for the parents. Our choice of a qualitative research design broke the anonymity of a faceless check-mark survey form and made us engage each other in discussions, with the questionnaire only setting loose boundaries. The interaction with outsiders to the village, from a different social and economic context was by no means easy, especially given that our visits were unannounced and often intrusive as we met at the respondent’s home. Several of the questions on the research were sensitive, and interviews sometimes turned emotive as parents expressed strong opinions on questions that by their own admission, they had never discussed with outsiders in the past. One particularly difficult issue for us to reconcile with was the grimness of the future prospects for many of the children. For instance, one uncomfortable question was that of migration. Over three fourths of the parents were keen that their children migrate away from the villages towards the cities. Most of these parents mentioned specific goals and aspirations for their children’s career paths. However, many of the same parents later in the interview discussed issues of migration and the poor prospects of local migrants who often ended up as unorganized laborers in big cities. In such conversations, parents often confronted their own fears about the aspirations they set for their children.

V. ANALYSIS

The analysis of the data was done by manually coding all the responses. For instance, a response was coded as follows:

Question:

“Have you ever thought of putting your child in a private school? Why or why not?”

Answer:

“Yes, I have thought about it but income is an issue. For a while, I put my younger son into private school, but had to remove him too. This school is good enough, but does not have the same discipline as the private school.”

Codes:

- * Stated preference for private school
- * Economic barrier to moving to private school
- * Opinion of private schools being better disciplined
- * Some experience with a private school

Most of the analysis presented here includes tabulations of some of the codes as well as excerpts from interviews. The use

of tabulations allows us to place some context of scope, rather than offer statistically significant trends.

A. Overarching Themes: Shift from Agriculture

To set the context of what people’s expectations are from the schooling system, it is useful to look at how parents see the macro-economy within which their children are living. We had expected that a sizeable number of respondents would mention a preference for their children moving away from their traditional occupations, but the scale was surprising. Only 1 participant from the 117 respondents directly involved in agriculture specified a preference for their child to work in agriculture. While the move away from agriculture is not a surprising trend overall, especially in areas around growing cities like Bangalore, the responses of small land-holding families is of particular importance. In three of the four districts that we researched, such land-holding was multi-generational and traditional, and yet, of the 70 land-holding agriculturists, not a single parent wanted their child to continue in agriculture as their primary source of income. The most typical answer we heard on questions like this was “We are suffering in agriculture. Why must our children suffer?”

Indeed, it is difficult to precisely quantify how much of a ‘trend’ without presenting corresponding data on other occupations, but the data is interesting nonetheless both because of the near unanimity of the responses and because the move away from agriculture usually means a corresponding move away from their traditional homes in the village.

TABLE I
DESIRE FOR CHILDREN TO MIGRATE BY OCCUPATION OF PARENT

	NR	Prefers child migrate away from village	Prefers child stay in the village
Agriculturist (n=70)	7.1%	80.0%	12.9%
Agriculture labor (n=47)		85.1%	14.9%
All agriculture (n=117)	4.3%	82.1%	13.7%
All non-agriculture (n=56)	3.6%	67.9%	28.6%
Total (n=173)	4.0%	77.5%	18.5%

Despite slight regional variations in these figures, the net indication is complementary to the occupation change preference – which is what parents want, and a desire that the children migrate for opportunities. Both these factors strongly support the idea of staying longer in school, supported by the interviews and data from our survey. Although we only have stated preferences, 91.9% of all interviewed said that they would like to see their children get college degrees and a response showed a median amount of Rs. 5000 (~US\$125) per year as the intended spend on college per year per child, though less than 20% of those interviewed had actually started any kind of saving (more had started saving for daughters’ marriages).

In terms of occupational preferences, the overwhelming preference is for government jobs, both for male and female children. This agrees with commonly accepted norms, given

that the drive away from agriculture is primarily one of stability than high income. Government positions in India are known to be lifelong appointments with levels of income that are fairly high by rural standards. One respondent used a famous idiom from Indian cinema to explain his preference for a government job, “We think about it this way, a government job is a racehorse for long races. It never goes very fast, but it always stays until the end.”

Top aspirations of parents on jobs for male children are: government job, factory job, teacher. There was some regional variation on aspirations. People in rural parts of Shimoga, Bangalore Rural and Kodagu had a fairly low opinion of private sector jobs, partly because all the villages sampled from those locations were primarily rural, and not a single household from those had a primary wage owner working in any industrial sector. In comparison, the proportion of parents preferring office or factory jobs made up almost half the responses in the steel-belt district of Bellary. Within the realm of government jobs, there was a fair amount of variation: while some parents specifically mentioned desk jobs at district headquarters, others wanted their sons to have jobs as policemen or bus conductors, either of which would be permanent positions. In the more interior villages, these types of job associations with the government were definitely more pronounced, since the face of the state is often only seen through these workers.

For female children, the top preferences were: teacher, nurse, or housewife. The comparatively lower preference for government (desk) jobs among females is explained by the fact that there are rarely female government officials visiting the village, and the general assumption is that for females, a government job would typically be a teaching position in a government school. There was some reporting of parents wanting their daughters to be ‘engineers’ but when probed, ideas of what an engineer did were somewhat unclear, and the rationale behind wanting to do engineering (as with medicine) was the social respect behind those professions.

Overall, the data from discussions on this issue highlighted that doing just about anything outside of agriculture would be preferred (the exception being urban labour professions – about 55% of all participants said they would rather be agricultural daily wage laborers than work in urban unorganized labour). Parents also felt that generally having a school education instantly raises a person’s ability to earn, though both teachers and young graduates interviewed in the process of this research tended to disagree with that. When asked what earning expectations were for various sectors, the rural parents responded with figures that indicated an expectation of a starting monthly salary for a high school graduate was about 25% higher than that of a householder small farmer or an agricultural laborer (a median multiplier of 1.25 for about 111 respondents), and that someone who graduated out of college could expect to earn exactly twice (median, $n=111$) in their first job what an established small farmer makes. Repeatedly, we were also told by parents that

not only does a farmer not only makes less money than any other ‘job’ holder (generally meaning factory or office worker positions), but that they perceived being a farmer as also less respected in society.

There are two key points that emerge from the discussions on the overall subject of occupation, and they lay a foundation for our further investigation into attitudes towards PCs. First, we found that there is an extremely sharp drive towards more schooling and an almost 80% prevalence of parents wanting even their daughters to be preparing themselves for some career regardless of whether marriage was a pre-destined eventuality. Second, we found that much as parents talked about the importance of their children using computers, technology rarely ever featured in any of the jobs they aspired their children to have. The sum of ‘government job’ or ‘teacher’ as a preferred occupation exceeded the combined sum of all other occupations, and there were only a handful of parents who said they would like their children to be engineers or professionals in the computer trade. More parents mentioned, ‘computers will get my child respect’ than said ‘computers will get my child jobs.’ Regardless of whether the two ideas were proxies for one another, this is an important difference to highlight. The computer was not seen as the tool that will get them a job; rather it was a device that was an indicator of modernity, of an ascendance in class.

B. Overarching Themes: Responsibility for schooling

In our preparatory work, we spoke to parents in middle-class urban households, and posed them the question, “Who is responsible for ensuring a child’s education?” For most of them, the answer was obvious, “The parents.” When we included the question in the free form conversations with parents in the rural schools that had been given CAL centers, the responses were very different.

TABLE II
WHO IS RESPONSIBLE FOR ENSURING QUALITY EDUCATION FOR CHILDREN
(N=165)

Parents themselves	15.8%
Teachers and the School	43.6%
Panchayat (Village Council) School Committee	29.7%
The Government	18.2%
* Parents responded to who they felt was primarily responsible	

We found that rural parents especially looked to teachers and to the government (including the village elected representatives) to be responsible for ensuring a child’s good education. One perspective on this was given by an illiterate mother from Bellary, “We send our children to school because the teachers have been appointed and we trust them. They are educated, they must educate our children, too.” The sense of individual disempowerment because of being illiterate is compensated in the minds of many by being part of a collective, which in turn explains the reliance on the village council. Another mother echoed the response of several others

in Bangalore Rural, “They (the Panchayat, or village administrative body) are the elders here, the government has given them, and them only, the right to oversee the school.”

This last point is of particular significance because in interviews with parents it was often clear that parents did not feel the school or teachers were individually answerable to them. In parallel, there was also the transference of responsibility – in that the children got only what the government deemed reasonable – whether mid-day meals, computers, or free notebooks or uniforms. There was no sense of activism over poor service.²

In visiting a number of places where the computers were not working, the standard answer prevailed “The government has given these, it alone will fix them.” For instance, a number of parents complained about un-rectified teacher shortages in their children’s school, but none had an answer as to what exactly could be done about it, or what role the Panchayat, which they sought out for such tasks, had the right to do. In the case of the CAL centers, there was no sense of ownership over the computers; instead, only a deep gratitude towards both the government and the Azim Premji Foundation prevailed. This lack of sense of right also explains why several CAL centers have been unable to financially support lab managers even at monthly costs much lower than what parents even in the poorest areas are willing to afford. Typically, after the government stops paying for the lab assistant at the end of one year as is usually stipulated, the lab simply ends up without a manager. In most such cases, our experience shows that there is no sense of monetary responsibility towards anything available at the government school, so when parents are asked to self-organize to pool for one CAL lab assistant’s monthly wage, the funding is not forthcoming. Rounding together even the small amount turns difficult because the question of parental responsibility for a worker at the government school is itself absurd. In two of the schools visited, the computers had been non-operational for over a year, and no action had been taken by the parents about it.

Interestingly, interviews with teachers reveal that they do not feel answerable to parents either, and find instead that the block officers are the ones they answer to, a finding supported by significant research from several parts of India [12]. Teachers can also be whisked away for a range of other governmental initiatives, especially in rural areas where such alternate appointments such as electoral duties can be a weekly affair. The school thus becomes one out of many responsibilities that the teacher has in his or her ‘government job’ (albeit the primary one). Consequently, there is a general perception that private schools are preferable. One parent from Pondicherry at a preliminary stage of our work said, “The government school here is better in every way – bigger building, free uniforms, computers, meals – but I still removed my children from this school and sent them to the private

school nearby, even though we have to walk to get there and the government school is right here. There, I visit the school every week; if I don’t like something, I can tell the teacher.”

In practice, the Panchayat, despite an official mandate in signing off on major initiatives in the school, does not get involved in any of the micro-level decisions, and for that matter has no control over the appointments of teachers. In short, contrary to the parental perception that the village council can supervise the school on their behalf, it actually has very little control. The idea of empowerment is an important emergent theme in our work and has policy implications for how such projects should be introduced into schools.

C. Overarching Themes: Conceptions of Computers

In every village we conducted this research, the CAL center was the first ever instance of computers coming to the village. Early interviews with children revealed that information on computers were mainly from television and movies. Among adults, there was a degree of basic understanding of what a computer is (“a machine to do calculations and other things”). However, we found that the sources of information about computers were diverse, and these in turn affected the individual parent’s choices around computers.

TABLE III
PLACES WHERE SEEN COMPUTERS IN USE / USES FAMILIAR WITH

	(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%
* Multiple Answers allowed	

This data is particularly important for the concept of ‘What kind of people use computers?’ To several of the parents who cited their long term aspirations for their children as eventually becoming government officers, it was critical that the two top locations with computers encountered were directly associated with the government. Only one parent in our sample had ever actually used a computer, and only 8 from the 166 who spoke about the computers had a conceptual understanding of computers outside of basic billing functions (which alongside accounting was the most identified functional area of computers). As we see in Table III, a fifth of the parents had never actually seen a computer, and from those that had seen computers in multiple places, a further fifth knew what a computer was, but did not know what its functions were.

Given that the actual knowledge of computer applications was generally low, the physical place of experience with computers became of particular significance, as did the impressions of the users. We found that those who worked in

² This was further supported by those respondents who cited wanting to consider private schools. For them, one of the key draws was the fact that the school is answerable to them, and therefore “more disciplined.”

agriculture had developed the greatest sense of aura around computers (“Computers can make you powerful; you can do anything nowadays with computers”). However, these also tended to be those respondents who did not actually know anyone in their immediate circles who used computers, and in discussion stated that most cases of computer use they had seen were from in front of the user, watching the user work on a computer rather than seeing what happens on a screen. Consequently the aura assigned to computers was abstracted to the users. In comparison, factory workers had a different view of computers. Despite the same sense that computer literacy was important, interacting with office security guards who had been trained to use computers to assign gate-passes, or factory floor assistants who used computers for time-stamping made the machine less mysterious. Here, we found that sharing the same class with the computer users gave a different conception of where power and class really lay. Conversations with factory workers showed that they did not see computers as being inaccessible, given that people from their own classes and communities were daily computer users, and none the smarter or elevated from class for being able to do so. For the factory workers, real power that separated the haves and have-nots derived from a different ability – being able to speak English.

D. CAL-Specific Themes: Perceived Impacts of Computers on the Schools

On the whole, a consistent theme from all our discussions was that children become more interested in school following the introduction of a CAL center. Although we do not have empirical attendance information on this, it is consistent with discussions with teachers who claim that children are more regular in attending school since the CAL centers have started. One teacher in Shivanahalli, Bangalore Rural District, told us, “Whether or not they show up at any of the other days, whenever they know they have a computer class they are here without fail.” A parent from the neighbourhood confirmed that the apparent nuisance of truant children was on the wane, “Earlier the kids would go to school in the morning and then run away after some time. Now they seem to be in the school all the time.”

TABLE IV

PARENTS’ PERCEPTION OF CHANGES IN SCHOOL DUE TO CAL BY LOCATION

Location	Change Code 1	Change Code 2	Change Code 3	Change Code 4	No Changes
Bellary (n=66)	13.6%	21.2%	7.6%	10.6%	47.0%
BLR** (n=68)	23.5%	45.6%	13.2%	10.3%	7.4%
Kodagu (n=18)	50.0%	38.9%	5.6%	0.0%	5.6%
Shimoga (n=20)	10.0%	30.0%	20.0%	25.0%	15.0%
Total (n=172)	20.9%	33.7%	11.0%	11.0%	23.3%

* Code 1: Responses indicate perception of children learning
 * Code 2: Responses indicate children more interested in going to school

* Code 3: Responses indicate parents themselves more interested in school

* Code 4: Responses indicate perception that school has improved overall

** Bangalore Rural District

From Table IV, we see that the most positive changes are in Bangalore Rural district, and the least positive changes are in Bellary. These are partly explained by the functioning of the computer centers in both locations.

A mother with a small tailoring business in Karahalli, Bangalore Rural said, “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.”

All the schools from our sample in rural Bangalore had active support teachers in the CAL centers who were running the computers regularly, including on holidays. This was partly because they were allowed to run the computers on off-days, and partly because the support teachers would sometimes go to the computer center to learn to use the computers themselves, and in doing so, leave the center open for other children to come by and use. As a result, children started flocking to the computer center on off-days, including during the vacation (a period through which the support teacher is paid, though no specific academic duties exist).

In Kodagu, we found that the schools themselves were being taken more seriously. Some of our interviews were at a site called Arecaud, where the families are not only poor and landless, but also migrant labourers from other states who do not speak the local dialect. Schools that cater to such populations face a frequent student turnaround, since they have the problem of migration, primary language incompatibility and parental employment instability to deal with. One migrant father from West Bengal said with some surprise, “My children are now very interested in school and have started attending daily. So we cannot even go to any place with the family for visits because the children always want to go to school.” In other words, taking a week off here and there to visit family away from the estates (usually in neighboring states) was in the past not an issue, but less so now with more demand from below.” Parents are not often clear on exactly what it is that the children are doing better academically in school, but do realize that they are more interested in going to school.

However, not all the parents we met were comparably enthusiastic about the new state of affairs. A mother in Joga, in the Bellary district said, “This is all a waste. Children in the 7th grade don’t even know how to read.” She found no difference in her children’s interest in schooling or in computer use. Others from her village had also reiterated that there were a lot of fundamental problems such as issues with the teaching. The computers themselves had not been in working order for most of the time that they had been in the village.

For a CAL program to make significant positive changes, a number of basic pre-requisites must be in place. In the Bellary

case, the computers came as donations from the philanthropic arm of the steel manufacturer located in that area, rather than through the standard process of selection by the government. Some of these schools had a lot more fundamental struggles with resources to deal with (usually, teacher shortages are the most crippling of all), and the computers became an imposition, as discussions with teachers revealed. In the Bangalore Rural district, the schools were selected for the CAL program by the Azim Premji Foundation based on a ‘contest-oriented’ selection criteria that involved visits to schools to evaluate interest, followed by infrastructure surveys. Also, the existence of a regular support teacher and the opening up of the computer center on off -days seems to have a high pay off where implemented.

E. CAL-Specific Themes: Computers versus Teachers, Meals, English

The standard question one is likely to hit against in policy and development circles evaluating computers for rural schools is, “Why not books or teachers instead?” This is a tricky and politically charged question, and extremely difficult to measure. It is also hard to say who is to answer that question and whether the answer from established education research is contextually more credible than the opinion of an unlettered parent. From our point of view, understanding the choices of rural parents, and getting some insight into the information informing these choices was a valuable short-term goal. We found in our initial conversations that parents’ preferences on the question of computers were based on a combination of practical and symbolic considerations.

TABLE IV

PARENTS’ PERCEPTION OF WHAT IS MOST NEEDED IN THEIR LOCAL SCHOOL

Location	Meals	Notebooks	Teachers	Computers
BLR** (n=68)	1.9%	7.7%	30.8%	59.6%
Bellary (n=66)	8.0%	2.7%	54.7%	34.7%
Kodagu (n=18)	21.6%	16.2%	35.1%	27.0%
Shimoga (n=20)	28.6%	19.0%	38.1%	14.3%
Total (n=172)	11.4%	8.6%	42.2%	37.8%

** Bangalore Rural District

The figures in Table IV are particularly telling. Notice that the preference for meals (referring to the free mid-day meals offered to children in schools) moves in a direction inverse to computers, and also maps with the median incomes of the region (Bangalore reported the lowest incidence of financial difficulties in sending children to school; Kodagu reported the highest).

Within the realm of our small sample, the more a family needed meals, the less computers interested them. One father,

a worker at an estate in Kodagu, when asked what he would do if the mid-day meals were stopped, stated blankly, “I would withdraw my child from the school. What is the use for him to go to school then?” His threat is not without merit. Participants who stated a preference notebooks or meals were a lot more concerned about the immediate consequences of not having access to those, than those who wanted more computers. In the past, the mid-day meal has been found to be one of the most successful schemes in getting children to school [12], and a lower proportion of people prioritizing meals does not map proportionately to the consequences of redirecting funds from one to the other. However, we did take a look to see how much parents would be willing to ‘pay’ if mid-day meals and computers both ceased to be state funded. We found that the 27.3% parents said they would basically refuse to pay for mid-day meals and feed the children at home, whereas 10.5% said they would not pay if the CAL became a paid service. The range that people were willing to spend went from a lower median of Rs. 5 in Shimoga to an upper median of Rs. 20 in Bangalore per month for mid-day meals, and from Rs. 7.50 in Shimoga to Rs. 50 per month for CAL lessons.

These figures require more investigation. We recognize that having a lengthy discussion on a range of issues that seem to revolve around computers can certainly induce bias. While there has never been an unruly incident over a computer center being closed, no headmaster would dream of giving his students a week free of mid-day meals, and no political party would risk taking mid-day meals off public spending. The mystique of computers yet again plays an uncanny role here. Village Panchayats are not known to question schools when computer centers stop working, because the computer is itself considered a peculiar beast, one the village doesn’t entirely understand. Communities act grateful, seeing the computer as a gift and not as a right.

It is instructive to look at the contrast between parents who prefer computers vis-à-vis those who do not. We asked parents if they had to choose between two “free” schools for their children – one with computers, but teaching in the local language, and another without computers, but teaching English, to see which they would pick.

TABLE V

COMPARISON OF PERCEIVED IMPORTANCE: COMPUTERS V/S ENGLISH

Location	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%

** Bangalore Rural District

As discussed in the prior section, the main trend we see in the data is that people with some connection to industrial zones seem to find English a more useful skill, whereas people

in rural agricultural zones tend to feel knowledge of using computers is more important. Besides the symbolic meaning of a class separation from English, the question of attainability for a specific skill also rises in discussions. One father noted, "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."

Within the limited realm of what computing one can learn, in a CAL center, becoming a 'computer user' still seemed a much more attainable task to the parent than ever becoming an English speaker. There was an element of shared class that one needed to become an English-speaker, one that was beyond the parent's reach. The most common complaint from English language teachers is the lack of other English speakers for the children to interact with in practicing the language. In the case of the computers, that is no longer (understood to be) valid. Everyone starts at the same level, there is a lot more one can learn from the device and possibly a good intermediary without recourse to a community. The device in itself is seen to have an impact on and a direct relationship with the child.

In speaking about computers, the single most common response for why parents would choose a computer school over English was that "children become intelligent" by learning computers. Parents also referred to a computer as a repository for wisdom. "By learning computers, we gain awareness," said a high-school graduate mother from Kodagu with a high-school degree, grooming her son to join the police someday. Whether or not her son ends up using computers in his work, the fact of his being familiar with technology makes him wiser.

Most surprising of all was that a number of parents felt that children could pick up English easily once they learnt how to use computers. This unusual expectation was part of the larger sense of omnipotence about computers, making its learning a critical future skill. "There is respect only for people who have learnt computers nowadays, so computer education is of utmost importance," said one parent, in Bangalore Rural, rating computers practically at par with literacy.

F. CAL-Specific Themes: Computers and Power

An unusual outcome of the discussions was a series of discussions that highlighted changing power relations in computer-aided learning scenarios. The first surprising idea was that of dowry, and its connection to computer learning. The idea first came about in a discussion with a landowner in Bellary at the first stage of our research. Intuitively, we thought a computer-literate girl would probably have to pay a smaller dowry, but this was not the case.

The landowner told us that it was problematic to get a girl "too educated" in his village, since the more educated she became, the more expensive her groom. When we interviewed people asking their opinions on the issue, the opinion was split

between about half the people who agreed with the landowner's thinking, and another half who felt that a computer-educated girl was valuable in the job market, and therefore could be married with a smaller dowry. One thing that most people agreed on however was that becoming computer literate positively affected the girl's choice. Striking a chord on the empowerment issue was a father from Shimoga: He said, "A girl who has learnt computers is a more competent and powerful person and she does not have to accept whatever man the family gets for her, including one who wants more dowry. She can instead choose to wait till she gets the right man."

An equally complex question of power was raised in discussions with illiterate parents watching their children learn to use computers. One statement we heard frequently was, "So what if we are illiterate, our children can say that they learned computers." Mothers spoke with mixed emotions about this for themselves, noting that the computers had made them wish they had a chance to go to school and learn about new things longer. However, the unusual effect is the diminished credibility of the parents. Already, being illiterates is a difficult thing for many parents to reconcile with, especially, in terms of authority both at home and in interactions with teachers in the schools. With the computers coming to the villages, this has gone to a new level, and is reflected in the responses of parents on the importance of teachers. One mother, while speaking of responsibility stated, "If we advise children, they do not listen to us, the only person they will listen to is the teacher," Both the mother and her husband are illiterate, working as agricultural labour.

VI. CONCLUSION

The most important policy outcome we as authors can expect from such work is greater emphasis on including parents in planning and implementation of computer aided learning projects. However, this research is intended not to implicitly influence policy on computer-aided learning, so much as to start a discussion on ways of thinking about computers, parents and development. In discussing computers, we found that the real impacts of CAL projects went far beyond learning questions into issues of expectations from the state, of class associations, and of fears. But the area we find our greatest contribution may be that of aspirations.

Homophily with other members of their own class using computers reduced the sense of mystique among factory workers about computers, and in doing so, underlined their own contrast with parents more restricted to the agricultural domain.

The parents' sense of mystique around computers despite not having a strong grasp of computer functionality, highlights the fact that the *symbolic value* of the computer has a powerful effect in the rural space. Parents, while not understanding what a computer enables, nevertheless are witness to their children's increased interest in school because of computers.

The computer was seen as a means to social ascendancy and a range of powers were correspondingly attributed to them. From the fairly standard responses of computers being able to bring access to jobs and respect in society, to the more ambitious, 'children can learn English from a computer,' all of these ideas held a common thread of an underlying class negotiation.

As is typical in interview and participant-observation based research, several key learnings from the project came from questions we had not anticipated. In conclusion, we highlight one that may have important consequences for a number of projects active in providing technology to children in developing regions. A unique revelation for us was parents' thoughts on computers as shared resources. Twenty of the parents who took part in the study, at least once described, completely unprompted, that the computer is public good, and should be in schools rather than at homes, or as something that serves best when it is shared by all the children. The typical follow-up to such a statement was the idea that teachers were better equipped than parents to guide and supervise children as they used a device that they themselves (the parents) did not understand at all. But several parents added on another layer of complexity to it – their idea that computers are better used in groups, learning together. Although most parents did not discuss specifics of the device in learning questions, they did emphasize the importance of shared ownership and learning from one another, which applied across technological and non-technological resources. Not surprisingly, ideas of shared ownership also extended into a conception of local egalitarianism brought about by technology. As one father in Shimoga said, "My child now sits in the same benches and uses the computer alongside the rich children of the village."

ACKNOWLEDGMENTS

Thanks to S. Santhosh and Sukumar Anikar for consistent support and intellectual input. This work has also benefited from discussions with several other members at the Azim

Premji Foundation including Shripad Vaze, Prachi Gaur, and Indu Prasad. Thanks to Sudhama Rao at the Jindal Steel Works Foundation, and also to M. Yusuf, and S. Kotresh, MSW students at Gulbarga University for their valuable work on this project.

REFERENCES

- [1] Linden, L, Banerjee, A. Duflo, E. "Computer Assisted Learning: Evidence from a Randomized Experiment" Poverty Action Lab Paper No. 5, October 2003
- [2] Pal, J. Early-stage practicalities of implementing computer aided education: Experience from India, Fourth IEEE International Workshop on Technology for Education in Developing Countries (TEDC'06) pp. 26-30, 2006
- [3] Inamdar, P. Computer skills development by children using 'hole in the wall' facilities in rural India Australasian Journal of Educational Technology Vol. 20(3), 337-350. 2004
- [4] Cuban, L. Oversold and Underused: Computers in the Classroom. Harvard University Press, Cambridge MA. 2003
- [5] Wartella, E. Children and computers: New Technology, Old Concerns. 2000
- [6] Attewell, P., Suazo-Garcia, B, Battle, J. 2003. Computers and Young Children: Social Benefit or Social Problem? Social Forces, 82(1):277-296 2003
- [7] Lindlof, T. 1992. Computing Tales: Parents' Discourse About Technology and Family, Social Science Computer Review 1992: 10; 291
- [8] Downes, T. Children's and Parents' Discourses about Computers in the Home and School Convergence: The International Journal of Research
- [9] Resnick, M., Rusk, N., and Cooke, S. "The Computer Clubhouse: Technological Fluency in the Inner City". In Schon, D., Sanyal, B., and Mitchell, W. (eds.), High Technology and Low-Income Communities, MIT Press. pp. 266-286. 1998
- [10] Selwyn, N. 'Doing IT for the Kids': Re-examining Children, Computers and the 'Information Society' Media, Culture & Society, Vol. 25, No. 3, 351-378.2003
- [11] Selwyn, N. "Exploring the role of children in adults' adoption and use of computers," Information Technology and People, Vol. 17:1 pp 53-70. 2004
- [12] Dyer, C. Operation Blackboard: Policy Implementation in Indian Elementary Education, Oxford. Symposium books. 2000
- [13] Drèze, J. Kingdon, G. School Participation in Rural India Review of Development Economics 5 (1), 1–24. 2001