

This report is a summary of what was studied in MIT India Reading Group from June '06 to August '06. It compiles different papers discussed in the group with active involvement of Ajay Deshpande, Sayan Mitra, Aditya Undurti, Anna Agarwal, Lavanya Marla, Pavithra Harsha, Anup Bandivadekar and Varun Aggarwal among others. References to all work used in the report is present at http://scripts.mit.edu/~varun_ag/readinggroup The report is not final and maybe considered as a working paper.

ELEMENTARY EDUCATION IN INDIA

How do we get a 20 year jump?

Varun Aggarwal
MIT India Reading Group
Cambridge, USA

1. LITERACY TRENDS IN INDIA IN LAST 50 YEARS:

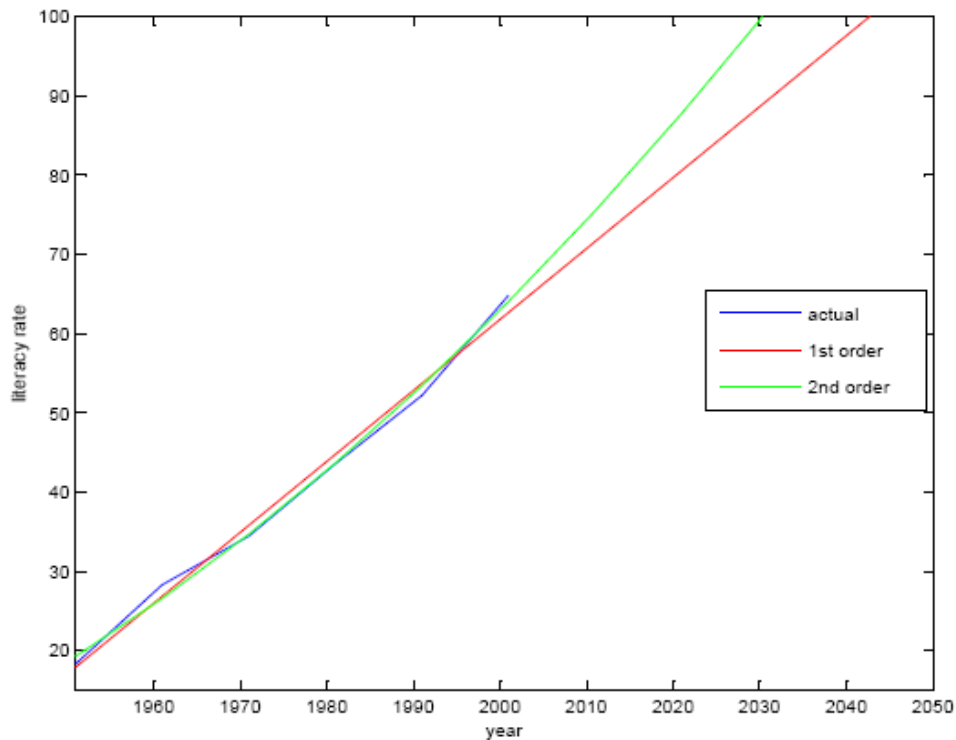


Figure 1: Literacy Rate vs. year

This shows a pessimistic view (approx. calc) of when India will be completely literate, if all trends follow status quo. I have fit a first order and a second order model to the data of last 6 yrs. If no catastrophe strikes and no miracle takes place, India should be completely literate some time between 2030 and 2040. Achieving the last 10% is in general tough, but one could assume that is balanced by the pessimism of the predict (population will stabilize, newer methods and technologies, etc.) [Data collected from Wikipedia]

BIG QUESTION: Is there a way to get a 20 year jump and be literate by 2010? ¹

¹ (Even if we assume that we will grow at the same rate as from 91-01, we will reach literacy by 2025)

A MORE ANNOYING QUESTION: Literacy here means to be able to read and write ones name. By when India will have 100% population be able to read and write their native language.

GOI's PLAN/PREDICTION/DREAM: All children complete 5yrs of education by 2007. All children complete 8 years of education by 2010. (Sarva Shiksha Abhiyaan, [Anup's slides, Meeting 7])²

THE 'GIVE US 10 MORE YEARS' SYNDROME: In 1950, government claimed to provide free and compulsory education till age of 14 in next 10 years. In 1992, they claimed they would implement the same by 2000. In 2004, the claim is that they will achieve UEE by 2015.

2. NEED FOR EDUCATION

A tricky question to answer, more on this later. It is refreshing to see however the correlation of education with life expectancy (positive) and infant mortality rate (negative) [Anup, slide 7]³

3. CURRENT SITUATION

| Units | Year | Value | Info. |
|-----------------------|---------|---------------------------------------|--|
| Enrolment Rate | 2000-01 | 82.5% | |
| Dropout Rate | 2000-01 | ~ 40% | High in Ist and 5 th class [Ajay/Sayan's ppt] |
| Literacy Rate | 2000-01 | 64.8% | |
| Teacher Absenteeism | 200x | 25% (45% of present were teaching) | Based on survey (Ajay/Sayan's ppt) |
| Money spent on EE | 2002-07 | 28750 CR | Spent on EE |
| Money spent on EE | 2004-05 | 5075 CR | Spent on EE |
| Population | 2001 | 102.86 CR | Total |
| Population (age 6-14) | 2001 | 22.62 CR | |
| Money/child | 2000's | 1000.00 | Rough Calc. (for all children) |
| Schools | 2000-01 | 0.066 CR | Basic and Primary |
| Children per school | 2000-01 | 372 | Rough Calc. (for all children) Private/public? |
| | | | |

Table 1: General Education Statistics

² See Meeting 1, http://scripts.mit.edu/%7Evarun_ag/readinggroup/images/f/f7/Overview_edu.pdf, there the report 04-05 sets target of UEE by 2015. Is this in contradiction to Anup's slides???

³ The data doesn't claim causality, but correlation.

Some more statistics:

- Target expenditure on education is 6% of GDP, actual amount spent is around 4.35 (Meeting 2, Ajay and Sayan's summary)
- School quality in a nutshell: PROBE (1999) survey found the following with respect: (a) only 1/4 sample schools had at least two teachers, two all-weather classrooms, and some teaching aids; (b) one-third of the headmasters were absent, one-third of the schools had a single teacher present, and about half of the schools had no teaching activity
- See Table 2 for infrastructure statistics. (Ajay's ppt)

| Infrastructural Element | % Elementary Schools | Comments |
|------------------------------------|----------------------|-----------------------------------|
| Drinking Water | 77.89% | Basic Need What in summers? |
| Common toilet | 42% | Basic Need |
| Separate toilet for girls and boys | 28.24% | Basic need given social structure |
| Blackboards | 90.5% | |
| Electricity | 25.23% | What in summers? |
| Book bank | 43.34% | |
| Computer | 7.68% | |
| Medical Checkup | 51.54% | |

Table 2: Basic Infrastructure in school (Ajay's presentation)

The primary correlated quantity with literacy is the number of students studying in schools. The observation is hence very high enrolment rate, but marred by very high dropout rate.

4. A HYPOTHESIS FOR HIGH DROPOUT RATE ANALYSIS AND IDEAS

Figure 2 presents a network which tries to establish causality between various factors which lead to high dropout rate. Arrows represent causal relationships. The decision to dropout is either that of the student or the parent, so what causes them to take this decision forms level 2 of the diagram and it feeds to the high dropout bubble. The first level of diagram explores the systemic reasons which lead to the parents/students decision. The diagram is based on statistical data, deductive logic, my experience, personal biases and honest whims!

The bubbles in yellow represent the primary systemic causes for the high dropout rate. These blocks have been analyzed in Figure 3. It is a table of analysis and ideas. The points in red are open questions, which are either factual or qualitative. Points in blue are project ideas, which can be explored for projects. They require conceptualization, feasibility analysis and then implementation.

AN HYPOTHESIS FOR HIGH DROPOUT RATE

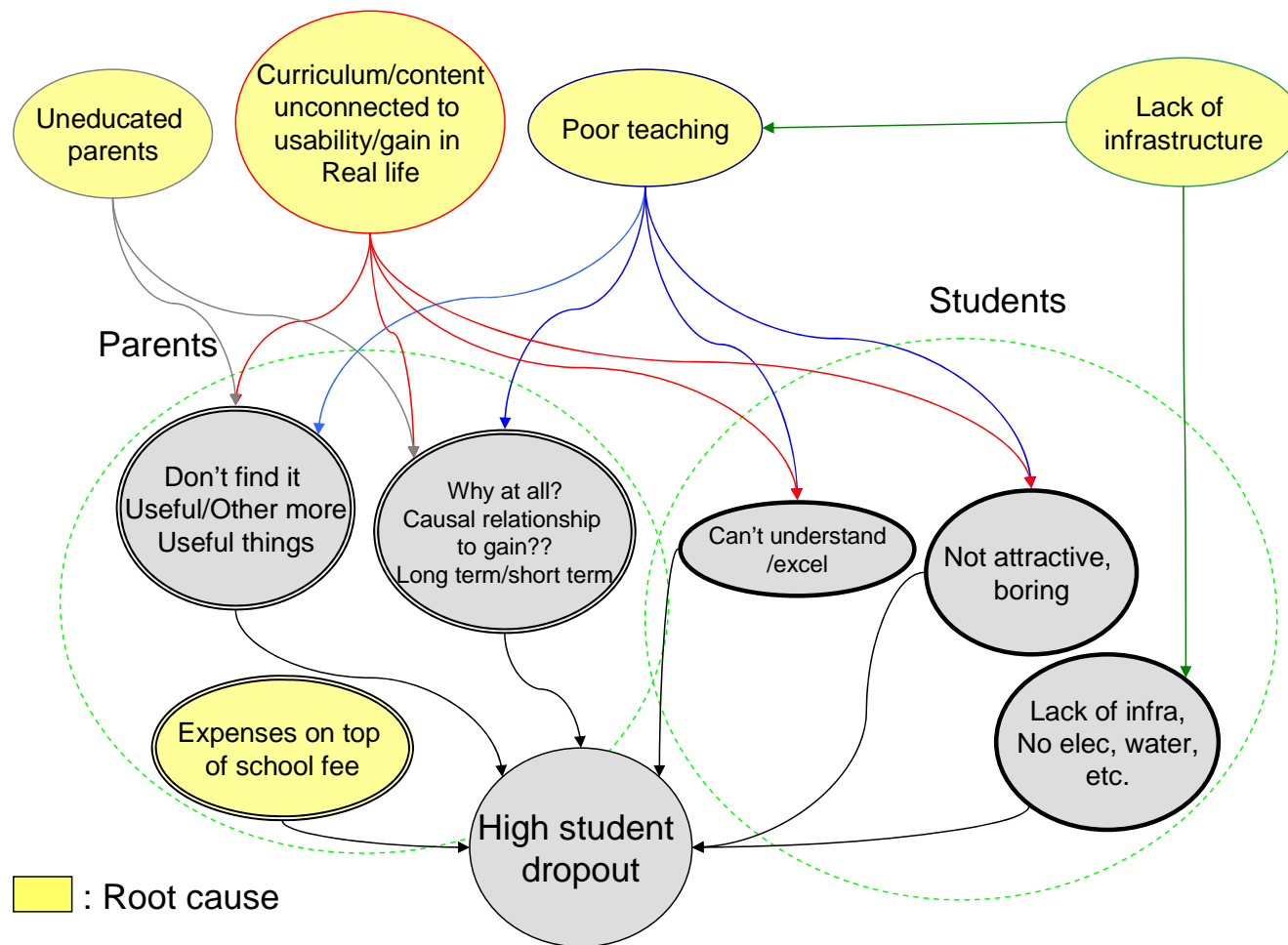


Fig 2: A Hypothesis for High dropout rate. (A bubble for health has not been included, see text.)

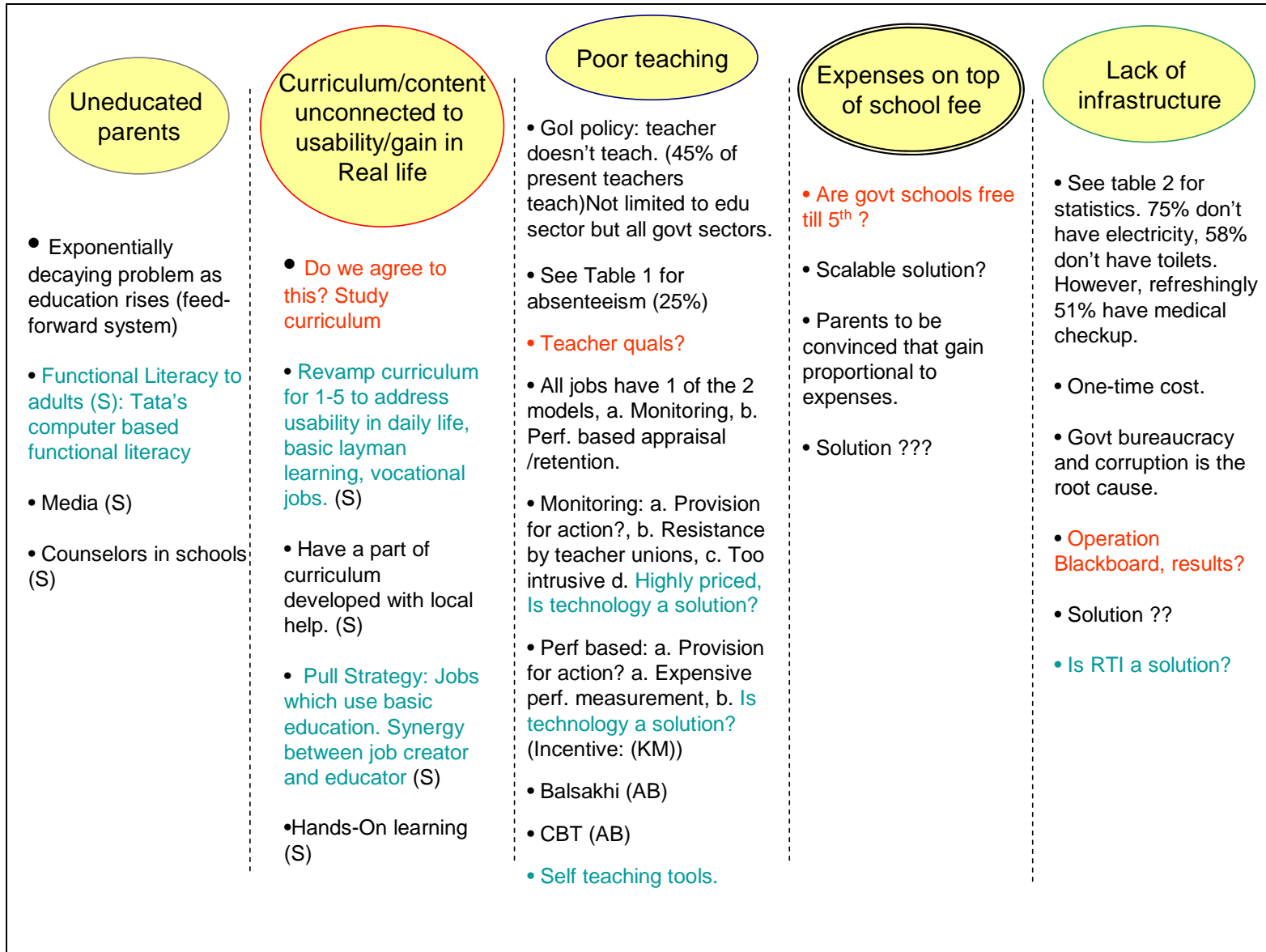


Figure 2: An analysis of the root causes for high-dropout. KM: Kathik Muralidharan, AB: Abhijit Banerjee, Red: Open questions, Blue: Potential projects

The root causes thus are:

- Curriculum/content unconnected with usability or gain in real life.
- Uneducated parents
- Poor teaching quality
- Lack of infrastructure
- Expenses apart from school fee, even if school is free.
- **Health of student** (Suggested by Anna, read Appendix I)

A few potential projects:

1. Invoke Right to Information RTI: The 5th vertical of 'lack of infrastructure' simply suggests that either government didn't put enough money in infrastructure or the money put was not utilized properly. If this information is public we should get hold of it and read it. If this information is not public, we could invoke RTI to get the information as to the money allotted for infrastructure and how each paisa was spent! That data will be an important addition to public information and can become a basis for PIL and future deterrence.
2. Function literacy to adults: Tata came up with a software which could teach an adult to (read and write a language which he can speak) in 40 hours. See www.tataliteracy.com The story doesn't stop here, there is more to innovate, more to understand. Can the software be improved further. Can such a software be made for other teachings other than reading and writing... A project which involves computer science, neuroscience, psychology, media and education. Can we port Tata's solution on a hardware device of Rs. 500 than needing a complete computer?
3. Curriculum/Content/Content Delivery for 1-5: Study the curriculum of class I to V to assess their usefulness for a student in rural/city setting. One needs to see, i. Is the stuff taught relevant, ii. Is the stuff taught achievable by the age group it is taught, iii. Can the delivery made better, hands-on?. A second approach, Back to the basics: could be to begin with a clean state and re-think education, its purpose and what elementary education should comprise of. We can read some papers on education by visionaries, educationists and experimentalists. (Seymour could be a choice).
4. Technology to cut middle-man and cost: Technology is becoming a powerful tool to cut the corruptible middle man and also the cost for inspection and monitoring. Is it really a viable tool, there is no electricity in 75% schools, does it remain feasible. What is its cost, what are the relating issues? Can it also be used for delivering education? What is the coverage and cost of internet? Is video-on-demand possible with the bandwidth in India?
5. Many more.

5. SOLUTIONS AND RELEVANCE TO MIT INDIA READING GROUP

The MIT India Reading Group has been reading education statistics for the last 3 months. We now have an understanding of a spectrum of problems. We have some suggestions for the GOI with our analysis, but neither are our ideas that mature, nor is GoI looking for our advice/suggestions! What is relevant in this case:

- The mass implementation projects: Do feasibility and cost analysis. Identify issues, challenges and possible roadblocks with solutions. Produce a white paper and put it up on our site. The next step is for an NGO to take it up, do a pilot, shows its advantage and ask govt to incorporate it in their policy. We can ourselves enter the second step if we are kicked about it, use the 50K platform or others. Otherwise we end on our white paper. (P4 fits in here)
- The do-projects: We can indeed mature these ideas more and collaborate with others to do this. We could actually implement the project in collaboration or in a team, *if we really want to do it*. (Content delivery and curriculum fits in here; software for education fits in here). The platform could be 50K, social entrepreneurship or collaboration with an MIT lab. However, we can call it stop on a white paper. (P2, P3 fits in here)

6. WHAT WE HAVE MISSED OUT

Most of the stuff we have read about is centered on what GoI has done in the last 50 years and what has it resulted in. We completely missed out the NGO/social entrepreneurship side of the story. As it seems, we are not going to be hired as a consultant by the GoI!! Can something be done independent of GoI which is scalable and sustainable⁴ and gives us the much needed 20 year leap in UEE. Can we do a microfinance with education? We could now follow a pull strategy to figure this out (Some of the ideas discussed in this doc can carry meaning independent of the GoI.)

What needs to be done:

- Read about what NGOs have been doing, innovative social entrepreneurship projects;
- Invite NGOs/Social entrepreneurship people for talks.
- Take up specific ideas and ask questions, discuss to flesh them out or throw them off. Read in their context. (Not the whole grp?)
- We will have a new set of questions now to answer which are related to implementation. I have put some of them here: http://scripts.mit.edu/~varun_ag/readinggroup/index.php?title=Questions (Not the whole grp?)

7. THINGS TO DO WRAP UP SUMMERS

- Make an ordered list for all ppts and what they covered on the web. This will become a great reference for others. I went through the ppts and the conclusions; they are a lot of great data in there.
- Close open links with other organizations we were talking with.
- Have a strategy for the fall so that we don't fizzle out?
- Do we want to give a talk at Sangam now on our findings over the summers?
- More later

⁴ The argument against NGOs is that they do not scale. However even if they don't scale, they could act as prototype for what the government can later implement.

Appendix I

<http://www.international.ucla.edu/article.asp?parentid=8943>

Tara Gopaldas

Director, Tara Consultancy Services, India

Improved Effects of School Meals with Micronutrient Supplementation and Deworming

Tara Consultancy Services (TCS), India -- a member of the Partnership of Child Development, Oxford University -- evaluated Gujarat's Improved Mid-Day-Meal Program (1993-1996). The implementer was the Commissionerate of MDMP, government of Gujarat, and the program involved nearly 3 million school children. The nutrition health problems of the deprived school children included raw hunger, unsafe water, intestinal worms, URI and GIT infections, malaria, IDA, VAD & IDD. The older boys and girls (11-15 years) were more undernourished than younger children. Impediments to active learning were: impaired cognition, and physical work capacity, night blindness and impaired vision, absenteeism due to illness, tiredness and irritability. The improved MDMP consisted of deworming and vitamin A dosing twice a school year; ferrous sulphate (60 mg elemental iron tablets) 2 times/week in the classroom and iodized salt in the cooked meals. In 2003 the "health package" inclusive of capacity building and IEC may cost US 50 cents per schoolchild per year. Some of the major results were:

Focus Group Discussions: The government, the teachers, the pupils, the parents and the community actively participated. A high level of awareness was created.

Process Evaluation: Logistical delivery by the pharma companies was 100%; efficiency of logistics to the schools was 100%; coverage as stated by the implementer was 94-100% (urban) and 42-94% (rural), and as stated by the school children was 71-79% (urban) & 50-67% (rural).

Impact Evaluation: On average, the dosed vs. the undosed schoolchild was 1.1 kg heavier and 1.1 cm taller; Hb levels were >12 g / dl; intestinal parasite prevalence rates dropped from 71% to 39%; prevalence of night blindness and vitamin A deficiency fell from 67% to 34%.

Important Lessons Learned: India must give top priority to the improved MDMP, and it should follow the 'Gujarat model'; e-governance, good management, forward planning, and an adequate flow of finances and stocks are essential. Take care of your "walking injured," namely 90% of school children in the classroom.