

## A Few Comments on PISA

The results of the Programme for International Student Assessment (PISA) had recently come on the front page of English medium newspapers across India. Why? Because the results for the two states in which the test was administered (Tamil Nadu and Himachal Pradesh), were at the bottom of the international scale: Indian students are not getting good education.

For those of us who have been working in the field of pedagogy in India, and particularly science pedagogy, these results do not come as a surprise. Our reaction is that we "don't think we need the PISA to tell us that our public education system is in a bad shape. We are all deeply aware of it."<sup>1</sup>

However, it is important to understand **why** the Indian education system is in such bad shape. Some of the main reasons are corroborated by the PISA results.

### **(1) Education is poor because it is not equitable.**

As we know, children in India are bifurcated into separate streams: one for elite students and the other for those for whom we do not think education is important or even necessary. Because the elite stream is very small relative to the other, and because even the elite stream is defective, it is not surprising that a student assessment which includes both streams will result in low marks for India.

### **(2) Education is poor because people are poor.**

The PISA results show, as any educator already knows, that there is a strong correlation between scores and how economically advantaged a student is. Economically advantaged students tend to perform well no matter what kind of education they receive. Even by the government of India's own statistics, most children in India are so poor that they cannot even get adequate food to eat.

### **(3) Education is poor because the government does not fulfil its responsibility.**

We should not need PISA to tell us that education should not be commercialised, and that schools should not be privatised. Good quality education is a necessity and a right for all children, and according to the Constitution of India (Article 21), it is the responsibility of the government to provide education for all.

The PISA study finds a rough correlation between the national scores of 15-year-old school students and the percentage of government vs private schools in each country. A country with very few private schools, such as Finland, has a high PISA score. This is because in Finland the emphasis is on equity in education rather than excellence in education.<sup>2</sup> In India the emphasis is on producing - or rather, identifying - a few 'excellent' students rather than on ensuring education of equitable quality for all children. PISA reported a high percentage of private schools in the parts of India they studied. If there is a causal relationship between the high percentage of private schools and low scores, it is to be expected that the PISA score will be low in these areas. We have good reasons to believe that there is such a causal relationship in India.



<sup>1</sup> CN Subramaniam, Eklavya, Hoshangabad, MP

<sup>2</sup> Anu Partanen, [http://www.theatlantic.com/national/archive/2011/12/what-americans-keep-ignoring-about-finlands-school-success/250564/#disqus\\_thread](http://www.theatlantic.com/national/archive/2011/12/what-americans-keep-ignoring-about-finlands-school-success/250564/#disqus_thread)

#### **(4) Education is poor because children are not attending school.**

**The fact is, most 15-year-olds in India do not even go to school.** Even according to the way the constitutional right to education has been interpreted in the RTE bill passed in 2009, Indians do not have any right to education past the age of 14. PISA only studies students who are currently in school. It is an enormous shame on the Government of India that most 15-year olds in the country are not even eligible for a PISA study. This fact in itself is enough to prove the lack of a need for a PISA test in India. By this fact alone we should realise that the education system in the country is failing.

#### **(5) PISA results are poor because the questions are biased in favour of higher social classes.**

Science is not separate from culture and social/political/economic effects. PISA has made an effort to check the "cultural appropriateness and linguistic equivalence" of their test. However, if they think that they have made an 'objective', 'unbiased' test which does not reflect culture; they are fooling themselves as well as others. Here is an example of a PISA science question:

##### **Question 1<sup>3</sup>: BUSES** S127Q01

A bus is driving along a straight stretch of road. The bus driver, named Ray, has a cup of water resting on the dashboard:

Suddenly Ray has to slam on the brakes.

What is most likely to happen to the water in the cup?

A The water will stay horizontal.

B The water will spill over side 1.

C The water will spill over side 2.

D The water will spill but you cannot tell if it will spill at side 1 or side 2.

Of course a student who has spent a lot of time sitting in cars or buses with a drink in their hands will be more apt to give the correct answer to this question than a student who walks or rides a bicycle, and may not even know what a "dashboard" is. The answers will reflect this bias.

#### **(6) PISA results are poor because the questions test more than just 'factual' recall.**

Rather than testing the students' memory of some 'fact' they have memorised from their textbooks, many of the PISA questions test how the students DO science. This is shown, for example, in the following question:

##### **Flies Text 1<sup>4</sup>**

*Read the following information and answer the questions which follow.*

##### **FLIES**

A farmer was working with dairy cattle at an agricultural experiment station. The population of flies in the barn where the cattle lived was so large that the animals' health was affected. So the farmer sprayed the barn and the cattle with a solution of insecticide A. The insecticide killed nearly all the flies. Some time later, however, the number of flies was again large. The farmer again sprayed with the insecticide. The result was similar to that of the first spraying. Most, but not all, of the flies were killed. Again, within a short time the population of flies increased, and they were again sprayed with the insecticide. This sequence of events was repeated five times: then it became apparent that insecticide A was becoming less and less effective in killing the flies.

The farmer noted that one large batch of the insecticide solution had been made and used in all the sprayings. Therefore he suggested the possibility that the insecticide solution decomposed with age.

Source: *Teaching About Evolution and the Nature of Science*, National Academy Press, Washington, DC, 1998, p. 75.

<sup>3</sup> [http://www.oecd.org/document/25/0,3746,en\\_32252351\\_32235731\\_38709529\\_1\\_1\\_1\\_1,00.htm](http://www.oecd.org/document/25/0,3746,en_32252351_32235731_38709529_1_1_1_1,00.htm)

<sup>4</sup> ibid

**Question 1: FLIES** S212Q01- 0 1 2 3 4 5 8 9

The farmer's suggestion is that the insecticide decomposed with age. Briefly explain how this suggestion could be tested.

An important part of doing science is designing experiments. Here students are being asked to design an experiment to find out whether the decrease in effectiveness of the insecticide over time is due to a change in the insecticide. Students will get full credit for their answer only if they design an experiment in which "three variables (type of flies, age of insecticide, and exposure) are controlled eg. Compare the results from a new batch of the insecticide with results from the old batch on two groups of flies of the same species that have not been previously exposed to the insecticide."

Those of us who have been working to improve science education in India realise that it is very rarely that students, even in elite schools, DO science as part of their science curriculum. They are mainly concerned with memorising the so-called 'facts', which actually leads them away from the essence of science. Science is essentially a method of asking questions and finding answers to questions. Science students should be learning to question the answers rather than memorise the answers.

**What kind of education does India want?**

On the other hand, if we realise that the goal of our educational system is not equity but excellence, and excellence for a very small minority, then we actually cannot say that the education system is failing. After all, most of us who are now working in science pedagogy are also products of the same system, and we consider ourselves to be well-educated, even if much of our education was in reaction to rather than in conformity with the institutions we attended.

If the objective of the Government of India is to provide cheap labourers for the 'global economy' and to ensure that those who produce goods and services do not get paid the true values for these goods and services so that others may profit, then it is clear that the Government is very successful. The fact that enormous wealth is accumulating in the hands of a few proves that education for all is not necessary in this framework. There is a real fear that this system would cease to produce such incredible wealth if more people received a better education.

We do not need PISA to tell us that our system of education is a system to systematically prevent education. This is proved by observation. For example, observe a typical institution for the training of teachers in Bihar:

PTEC, Sheikhpura was established in 1913, but is not yet recognized from NCTE. It is functioning in its own building constructed in 91,967 sq. ft. area. It has 6.20 acres of land with a playground of 0.17 acres. Posts of teaching and non teaching staff are vacant. It has no boundary wall or night guard. Out of 10 building blocks 7 need major repair. It has insufficient furniture and beds [a total of 7 tables, 10 chairs, 1 bench, and 10 unusable cots]. It has no blackboards.

All its toilets are in need of major repair.

The Institute has no electricity.

The institute does not have a single copy of the BCF, the Textbooks or the Syllabus (neither are these available in the market).

It spent Rs. 21.42 lakhs during 2009-10.

It has not offered or run or hosted any courses or programmes in the last 2 years.

The existence of even a few such institutes would signify that the government has no interest in educating teachers - but in fact is actively engaged in preventing the education of teachers. However, there are hundreds of such "Institutes for [sic] Teacher Education".

Those of us who are presently working in education need to understand who we are, what are our goals, and how do we fit into this system. If we think that most people do not have the right to a good education then we can work to support the Government effort to deny education to all. If we think education is needed for all in order that all people can play a useful part in building a better society, then we have to work against the Government's efforts to deny education to all. Especially those of us who are teachers or educators working within the Government system need to insist on the latter. As human beings and members of society we have the collective right and power to understand our present situation and to take action to guide its progress in ways that we decide are rationally justifiable, even if those ways are in contradiction to desires of the powerful few.

### **So what is to be done?**

Some would say that we need more testing of students, and more standardised tests. The example of Finland (a top PISA scorer) indicates that this is not the answer. Finland has almost no standardised tests (only one at the end of the 12<sup>th</sup> year). Teachers create their own in-house tests.

Some would say that we need to make teachers accountable: reward good teachers with merit pay and punish bad teachers. Again, the case of Finland shows that this is not necessary. In Finland all teachers have good pay, prestige, and a lot of responsibility.

Some would say that our schools need more competition. But in Finnish schools, the main driver is cooperation, not competition.

Then there is the push to privatise education. As we have already discussed, this is not the answer.

Rather, the answer is to not only talk about investing at least 6% of the GDP in education - we need to do it. Some may say that India is a poor country and cannot afford to spend more on education. However, we can all look up and see Ambani's house. We also read about the crores owed in taxes that are instead stashed in foreign banks. We can see the fighter jet that costs more than is required for an entire system of teacher education. "Ye jo public hai, ye sub janti hai". PISA is not required for our education.

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