Identifying Indicators, Approaches and Tools to Measure and Monitor the Quality of Education –

By Sandeep Srivastava
A (more) pertinent self-introduction –

Over 12 years with school education

‘Slid’ from Higher Ed. to K-12

Technologist + Author + Educator

And ‘Homeschooled’ my only child
Need for this research is obvious ...

‘Quality is in the eye of the beholder’

FRIGHTENGLY SO!
EVERY stakeholder has
his/her own vision
and ‘theory of education’ and fairly
rigid at that!
The study presented here is in fact a work in progress towards the mission of creating the most
- naturally scalable
- ambitious and
- global*

K – 12 quality ECOSYSTEM

* India stands a fair chance of creating it ...
However, a part of the ongoing ‘action (live) research’ which is not reflected in this paper but implicitly the foundation of this paper is our unique definition of what’s ‘A GOOD SCHOOL’.
A GOOD SCHOOL is one in which **GUARANTEE OF OVERALL DEVELOPMENT** (OF EVERY STUDENT) IS THE GOAL.

The rest of the study is in this context.
What to expect in 20 min?

4 ‘universal’ indicators of quality (+ 1)
3 ‘universal’ (obvious) approaches to achieve quality
5 ‘universal’ ways to measure (and monitor) quality
The action research showcases 4 dimensions:

- Identifying **indicators**
- Identifying **approaches**
- Creating **tools for measuring** quality of education
- Strategies for **monitoring** quality of education
For the sake of focus and time, we’ll simply address the four over the coming slides:

Indicators
Approaches
Measurement
Monitoring

More in Q &A, the day, email, Apps ...
We discovered the four most universal indicators of quality education to be:

A. Minimum dispersion in scholastic subject
B. ‘Normal distribution’ in every ‘co-scholastic subject’
C. Student-teacher relationships, pride in teachers …
D. Cumulative progress reporting

+ Tuition-free ‘homework’ submission (A S-Asian issue)
A. Minimum dispersion between the top and bottom performance of classes in every scholastic subject
B. ‘Normal distribution’ of performance of classes in every ‘co-scholastic subject’
c. Open and respectful student-teacher relationships – four of the indicators used

- Teachers’ respect for the bottom quartile of the students
- ‘Privacy quotient’ of the teachers, as judged by the students
- ‘Fairness quotient’ of the teachers, as judged ...
- No paid-for tutoring support for any of the students taught in school
c. Four of common denominators used to 'find' proud teachers

• Making students passionate about their subjects
• A role model adult for the students
• Well informed of the going on among students*
• Mostly a distinguishable ‘style’ of teaching

* A recently added dimension to the measure
C. Four common denominators that defined ‘stress-free families/parents’

- ‘Healthy’ students, e.g., BMI, dental, hygiene ...
- Longitudinal trend in student performance, *specially in the two academic languages – English and Math*
- The definitiveness in educational routines at homes
- Investments in purchasing books (by the families)
D. Cumulative progress reporting

Longitudinally cumulating every student’s progress across subjects is critical to ensuring quality; it’s the only way to really personalise educational context for quality.

A sample of cumulative ‘progress report’ for Math for Class X
E. Problems with tuition for ‘homework’ submission – a typical south asian feature

• Students came to class with little independent academic activity at home

• Lack of parental involvement as well as children not involving parents in educational tasks

• Children dependent on tutors, develop little ability to think, self-help altitude in academics
Four key strategies on how homeworks assigned were redesigned (in just 1 school as yet)

- Assessment of homework can focus on quantity of work done, rather than the quality
- The homework content can be changed in a way that the need for tutoring support is completely avoidable
- Homework content can be reading - flipped class reading materials
- Homework are checked for student’s known ability, softly penalised for tutoring support for homework completion of homework.
II. Universally applicable institutional approaches to achieve quality
1. Continuously motivated teachers

Recommendation:

• A proud teacher with open and respectful relationships with students is the most complete avatar of a motivated teacher.
2. Student-centric teaching and learning materials

Current status:

• Made for teachers
• More like coffee table books - nice, colourful, lovely and informative book
• Books not meant to be read but seen
• ‘Out of life’
• The content, style and presentation of ‘textbooks’ is very typical, irrespective of authors
Recommendation:

- Rewrite the books and make them student centric, readable, ‘real-life lab’ (as Kenneth called ‘sharpening the intuition with connect to living environment of the students’).
3. Enabling parents to perform

Current situation

• Interaction with parents is kept limited PTMs and exceptional situations.

• Little appreciation for the fact that there is a need to make homes (the 18 hours of the day) effectively complement and supplement the education at school.

• Some of the schools treat ‘parents as undesirable influence’ on their children.
Recommendations:

Involve parents with the help of

• **Micro-progress reports** for better utilization of tutoring support at home

• **Actionable, micro-remedial inputs** – ‘readable, self-explanatory’ concept conversations for children and parents

• Special classes for parents on the critical concepts in math and science (till class VIII)
## Assessment reports for students

### Student Performance Report

<table>
<thead>
<tr>
<th>S.N</th>
<th>Concept Name</th>
<th>Level -1</th>
<th>Level -2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Score (Right question/Total question) attempted by you on the basis of</td>
<td>Score (Right question/Total question) attempted by you on the basis of</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wrong Answer (Total of your wrong response)</td>
<td>Wrong Answer (Total of your wrong response)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not Attempted</td>
<td>Not Attempted</td>
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<td></td>
<td>Status</td>
<td>Status</td>
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<td>-----------------------</td>
<td>--------------</td>
<td>--------------</td>
</tr>
<tr>
<td>1</td>
<td>Frequency and tally marks</td>
<td>2/2</td>
<td>0</td>
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<tr>
<td></td>
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<td>0</td>
<td>0</td>
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<tr>
<td></td>
<td></td>
<td>Qualified</td>
<td>Qualified</td>
</tr>
<tr>
<td>2</td>
<td>Pictograph</td>
<td>2/2</td>
<td>0</td>
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<tr>
<td></td>
<td></td>
<td>0</td>
<td>0</td>
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<tr>
<td></td>
<td></td>
<td>Qualified</td>
<td>Qualified</td>
</tr>
<tr>
<td>3</td>
<td>Bar Graphs</td>
<td>1/2</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Remedial needed</td>
<td>Remedial needed</td>
</tr>
<tr>
<td>4</td>
<td>Histogram</td>
<td>0/2</td>
<td>2</td>
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<tr>
<td></td>
<td></td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Remedial needed</td>
<td>Remedial needed</td>
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<tr>
<td>5</td>
<td>Pie charts</td>
<td>0/2</td>
<td>1</td>
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<tr>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Remedial needed</td>
<td>Remedial needed</td>
</tr>
<tr>
<td>6</td>
<td>Probability</td>
<td>2/2</td>
<td>0</td>
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<td>0</td>
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<tr>
<td></td>
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<td>Qualified</td>
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</table>

Qualifying Criteria: 90% per concept
# Assessment reports for specific remedial

## Micro-Progress Report

<table>
<thead>
<tr>
<th>Class - VIII A</th>
<th>Name - Garie Matimbe</th>
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</table>

## Chapter Name

### Data Handling

<table>
<thead>
<tr>
<th>Level</th>
<th>Set 1</th>
<th>Set 2</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Concepts in which you demonstrate confidence</td>
<td>Concepts in which you need revision</td>
</tr>
<tr>
<td></td>
<td>Frequency and tally marks</td>
<td>Bar Graphs*</td>
</tr>
<tr>
<td></td>
<td>Pictograph</td>
<td>Histogram</td>
</tr>
<tr>
<td></td>
<td>Probability</td>
<td>Pie charts</td>
</tr>
<tr>
<td>L1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Frequency and tally marks</td>
<td>Histogram</td>
</tr>
<tr>
<td></td>
<td>Pictograph</td>
<td>Pie charts</td>
</tr>
<tr>
<td></td>
<td>Bar Graphs</td>
<td>Probability*</td>
</tr>
<tr>
<td>L2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
III. Among the various strategies and tools recommended for sustained measurement of quality
1. The literary-level reading skills in any language

Current status:

• Very poor reading skills.

• Without being able to read, children cannot progress in education system.
Recommendations:

- Children **develop reading competence in the mother tongue**. Later the acquired reading skills can be used to achieve reading competence in English to transact in academics in English.

- Children develop reading competence in English language and children steadily become comfortable with transacting academics in English.
2. ‘Public knowledge of the lesson plans’

Current status

• Lesson plans are private, if at all available …

• Communication is teacher-centric, e.g., fulfils teachers’ need to communicate

• First principle of communication violated in schools – there is no sharing of ‘agenda’
Recommendation:

• Lesson plans for every subject, teacher, and period, be shared with students at least a week in advance.
3. Level of pre-class preparation by students

Current status

• NONE, for over 9/10 students
• Parents discourage/don’t appreciate
• Very limited post class revision within 24 hours, week, month, quarter etc.
Recommendations:

• Enabling teachers to communicate (with just a click on mobile) to parents on lesson plan contents, activities/lab

• Online pre-class brief assessment

• Online post-class assessments at three levels, immediately after the classroom teaching

• Live reports to teachers on reading at home, pre- and post-class assessments
### Impact

<table>
<thead>
<tr>
<th>Children’s reactions</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>It has improved my grades</td>
<td>39%</td>
</tr>
<tr>
<td>I am more relaxed in school and home</td>
<td>17%</td>
</tr>
<tr>
<td>My parents are able to help me better</td>
<td>17%</td>
</tr>
<tr>
<td>It has helped me get better help from friends/classmates</td>
<td>12%</td>
</tr>
<tr>
<td>It has improved by reading skills</td>
<td>12%</td>
</tr>
<tr>
<td>Others</td>
<td>3%</td>
</tr>
</tbody>
</table>
4. The micro nature of assessment and reporting, micro-remedial efforts at home and school

Action taken:

- Micro-assessments,
- Micro-progress report
- Micro-remedial

Inputs given to the teachers for remedial in school to parents so that they could support their children or use tutors for the required support.
Assessment reports for teacher

Formative Assessment - Maths (Section Wise Analysis)

Comparing Quantities (Level 1)

<table>
<thead>
<tr>
<th>Code</th>
<th>Concept Name</th>
<th>VIII - A</th>
<th></th>
<th>VIII - B</th>
<th></th>
<th>VIII - C</th>
<th></th>
<th>VIII - D</th>
<th></th>
<th>VIII - E</th>
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<tr>
<td></td>
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<td>RN</td>
<td>TS</td>
<td>RN</td>
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<td>TS</td>
<td>RN</td>
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<td>TS</td>
</tr>
<tr>
<td>KC 1</td>
<td>Percentages</td>
<td>12</td>
<td>32</td>
<td>9</td>
<td>28</td>
<td>17</td>
<td>25</td>
<td>14</td>
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<td>11</td>
<td>33</td>
</tr>
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<td>KC 2</td>
<td>Profit and Loss</td>
<td>14</td>
<td>29</td>
<td>6</td>
<td>20</td>
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<td>29</td>
<td>17</td>
<td>31</td>
<td>22</td>
<td>33</td>
</tr>
<tr>
<td>KC 3</td>
<td>Discount</td>
<td>5</td>
<td>32</td>
<td>7</td>
<td>32</td>
<td>8</td>
<td>30</td>
<td>6</td>
<td>32</td>
<td>3</td>
<td>33</td>
</tr>
<tr>
<td>KC 4</td>
<td>Sales tax/Value Added Tax</td>
<td>18</td>
<td>31</td>
<td>22</td>
<td>31</td>
<td>25</td>
<td>32</td>
<td>21</td>
<td>31</td>
<td>26</td>
<td>32</td>
</tr>
<tr>
<td>KC 5</td>
<td>Compound interest</td>
<td>14</td>
<td>32</td>
<td>32</td>
<td>27</td>
<td>17</td>
<td>25</td>
<td>21</td>
<td>32</td>
<td>12</td>
<td>32</td>
</tr>
</tbody>
</table>

Qualifying Criteria: 90%

RN = Remedial Needed
TS = Total Student
## Performance Based Report of Students in Class VIII, Section A

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Student Name</th>
<th>Frequency and tally marks</th>
<th>Pictograph</th>
<th>Bar Graphs</th>
<th>Histogram</th>
<th>Pie charts</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>L1</td>
<td>L2</td>
<td>L1</td>
<td>L2</td>
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<tr>
<td>1</td>
<td>AMAN</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>2</td>
<td>ANUP</td>
<td>x</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>17</td>
<td>JANVI</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>18</td>
<td>KARAN</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>x</td>
<td>x</td>
<td>✓</td>
</tr>
<tr>
<td>19</td>
<td>KHUSHI</td>
<td>?</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>x</td>
<td>✓</td>
</tr>
<tr>
<td>22</td>
<td>NISHIKA</td>
<td>✓</td>
<td>✓</td>
<td>x</td>
<td>✓</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>24</td>
<td>PRANJAL</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>x</td>
<td>✓</td>
</tr>
<tr>
<td>25</td>
<td>RAGHAV</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>x</td>
<td>✓</td>
</tr>
<tr>
<td>27</td>
<td>ROHAN</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>29</td>
<td>SHREYA</td>
<td>x</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>30</td>
<td>SHREYAS</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>x</td>
<td>x</td>
<td>✓</td>
</tr>
</tbody>
</table>

Qualified Student / Total Student Attempted: 8/29, 4/30, 8/30, 11/30, 26/30, 17/30, 21/29, 18/29, 27/30, 9/30, 8/29, 22/29
## Section Remedial Report for Students in Class VIII, Section A

### Class Section - VIII - A  Subject - Maths

**Chapter 'Data Handling' and Key Concepts Attempted Through Assessments**

### Formative Assessment

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Concepts</th>
<th>Level - 1</th>
<th>Level - 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Frequency and tally marks</td>
<td><strong>Students who need remedial</strong> - AARUSHI, ROHAN, SHREYA</td>
<td>ROHAN</td>
</tr>
<tr>
<td>2</td>
<td>Pictograph</td>
<td>NISHIKI, ROHAN</td>
<td>KARAN, ROHAN, SHREYAS</td>
</tr>
<tr>
<td>3</td>
<td>Bar Graphs</td>
<td>AARUSHI, AYUSH, JANVI, KARAN, NISHIKI, KHUSHI, NISHIKI, RAGHAV, ROHAN, SHREYA</td>
<td>ARSHYA, AYUSH, JANVI, NISHIKI, PRANJAL, ROHAN, SHREYA</td>
</tr>
<tr>
<td>4</td>
<td>Histogram</td>
<td>AYUSH, JANVI, KARAN, NISHIKI, ROHAN, SHREYA, SHREYAS</td>
<td>JANVI, NISHIKI, RAGHAV, ROHAN, SHREYA</td>
</tr>
<tr>
<td>5</td>
<td>Pie charts</td>
<td>AARUSHI, ARSHYA, AYUSH, JANVI, KARAN, KHUSHI, NISHIKI, PRANJAL, RAGHAV, ROHAN, SHREYA</td>
<td>JANVI, KARAN, ROHAN</td>
</tr>
<tr>
<td>6</td>
<td>Probability</td>
<td>AARUSHI, AYUSH, JANVI, KARAN, NISHIKI, RAGHAV, ROHAN, SHREYAS</td>
<td>AARUSHI, ARSHYA, AYUSH, KHUSHI, NISHIKI, RAGHAV, ROHAN, SHREYAS</td>
</tr>
</tbody>
</table>
5. Professional commitment of teachers to the lower quartile students with respect to performance of students of every classroom

Current status

• No one seemed to be accountable for the presence of ‘slow learners’ in the classrooms
• None of the schools measured their ‘performance’ in terms of the performance of the bottom quartile of the students
Recommendations:

• Fine-tuning the school’s remedial input contents and processes
• More focus on improving the academic language competence of such students
• More and consistent communication and support to the parents of such children
• Informal acknowledgement of the role of school and teachers in the poor achievement levels of such children
Impact:
Schools have started to internally take special cognizance of the lowest quartile of performance.
CONCLUSION
1. A universal definition of quality for K-12 education is a pre-requisite for measuring quality

THANKS VERY MUCH.

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INTRODUCTION
Enrolment in school

96.7% Children go to school in India
Half of the Std V students enrolled in rural India could not read a Std II level text, or perform basic mathematical operations of Std II level (ASER report 2014)

Source: ASER Report 2014
The children are going through schools with little learning, hence the need to measure and monitor quality of education.
Indentifying quality of indicators was about definition; the definition that is measurable.
Identifying approaches was about ....
• Creating tools for measuring quality was about ....
• Strategies for monitoring quality of education was about
REVIEW of LITERATURE
What is quality in education

- Quality education is a complex and contested concept
- Parents perceived a school to be quality education provider if the school was an English medium school and teachers taught ‘nicely’ and took ‘care’ of the children
- Quality education is composed of three interrelated dimensions:
  - the quality of inputs available (human and material resources),
  - the processes (management and teaching/learning processes)
  - the quality of output of outcomes (result)
An education indicator provides information about the health of the educational system. A statistics becomes an indicator when it is useful in a policy context. These indicators help in monitoring changes, assessing impact, encouraging good practices and focusing on problem area (Kagaan and Smith 1985).

When ranking or assessment is limited to information, it has little impact on the performance
Methodology: Research Setting

- 9 urban schools North and East India
- Children from educated middle class families
- Over four years of work
- Questionnaire, personal interview, digital data of class performance
Research Design elements which did not significantly change till date

1. Deconstructing teaching and learning to the level of concepts

2. Micro-progress reports

3. Continuous, formal and informal feedback from all stakeholders.
Research Design elements which changed to varying degrees over the year of research

1. Cumulative progress reporting

2. ‘Public lesson plans’

3. Students – centered learning resources
RESULT DISCUSSION and RECOMMENDATIONS
Meaning of quality education as stated by the 6 principals

- Making the life of children meaningful
- Create worthy citizens
- Making future leaders
- Enabling a child to excel in the chosen field
- All round development
- Responsible environment conscious citizens
Schools convey quality education by boasting about

- the curriculum followed,
- the building, ac, swimming pool, CCTVs, smart boards,
- achievement of students
- transportation

School leaders glorify their school for some or the other child who simply did better than the other.
I. Discovery of the foundational pillars of universal definition of quality