

THE AGEM APPROACH

MAKING EDUCATION MEANINGFUL

AGEM

August 16, 2011

- 1 INTRODUCTION
- 2 GOALS OF THIS SESSION
- 3 FUNDAMENTAL CHANGES
- 4 WHAT IS THE ROLE OF COMPLEXITY IN DECISION MAKING
- 5 HOW IS DECISION MAKING AFFECTED WHEN THE PROBLEM IS CHANGING WITH TIME?
- 6 HOW DO WE ACQUIRE DECISION MAKING SKILLS
- 7 HOW DOES PARTICIPATION IN DECISIONS AFFECT OUR DEVELOPMENT?
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- 9 HOW DO WE CREATE LEARNING OPPORTUNITIES IN THE CLASSROOM
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INTRODUCTION 1

COMMENTARY

INTRODUCTION

- Thank you for the opportunity
- Purpose of this session

INTRODUCTION 3

COMMENTARY

INTRODUCTION

- A little story

REFLECTION

COMMENTARY

REFLECTING

- A little reflection - thinking about that remark

UNINTENDED CONSEQUENCES

COMMENTARY

THE SIDE EFFECT

- A little story

PASSION AND LEARNING

COMMENTARY



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GOALS OF THIS SESSION

The specific goals

The goals of this session are to:

- Provide you an overview of AGEM's approach to education.
- Allow you a chance to experience that approach as it would apply in the classroom
- Provide some insights derived from recent research into how education can be enhanced.

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WHAT ARE THE PROBLEMS OF EDUCATION THAT WE NEED TO ADDRESS?

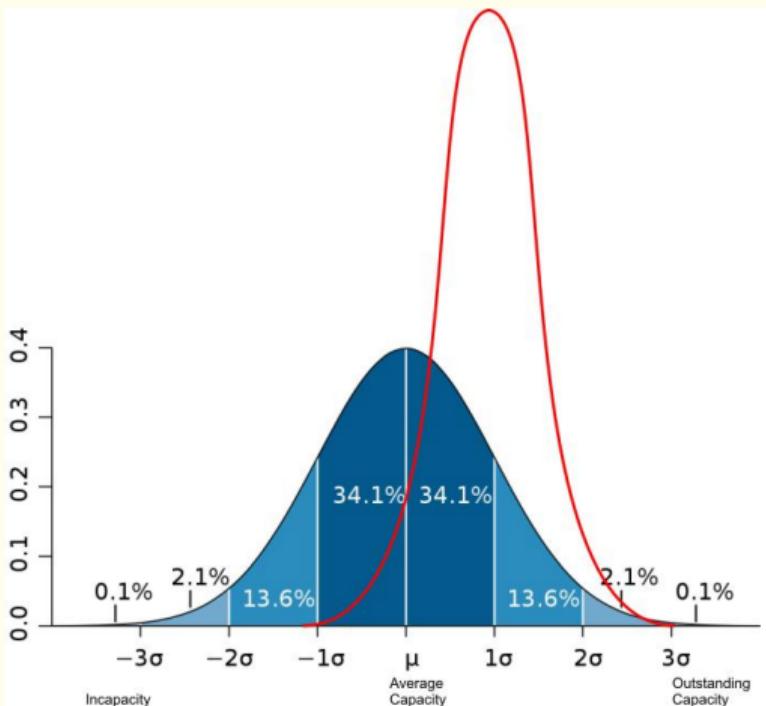
THE FIRST ONE - VOID BETWEEN CAPACITY AND WORKPLACE REQUIREMENTS. COMMENTARY

MANISH SABHARWAL - TEAM LEASE

As a staffing firm, TeamLease sadly doesn't hire 95% of the youngsters who come to it for a job. As a training firm, it estimates that 40% of these job-interview rejects need more than a year of "repair" or "preparation" to make them truly job-ready.

WHAT ARE THE PROBLEMS EDUCATION SHOULD ADDRESS?

THE SECOND ONE - PREPARING FOR THE FUTURE. COMMENTARY



HISTORICAL RECORD

So far India has grown by a process of filtering people for jobs. This is largely achieved by incorporating those at the far end of the scale largely after 3 sigma. These people are statistically not impacted by either bad or good education. They will succeed with high probability of success regardless of the quality of education provided by schools.

WHAT WE NEED TO DO FOR FUTURE GROWTH

We need to change the shape of the bell curve and move it to the right. This means a narrower range of capacity while increasing the mean level of capacity.

HOW DO WE DO IT

In a word - Meaningful Education

SUCCESS IN THE WORKPLACE ≈ DECISION MAKING ABILITY

COMMENTARY

HOW DECISION MAKING BECOMES MORE DIFFICULT IN THE WORKPLACE

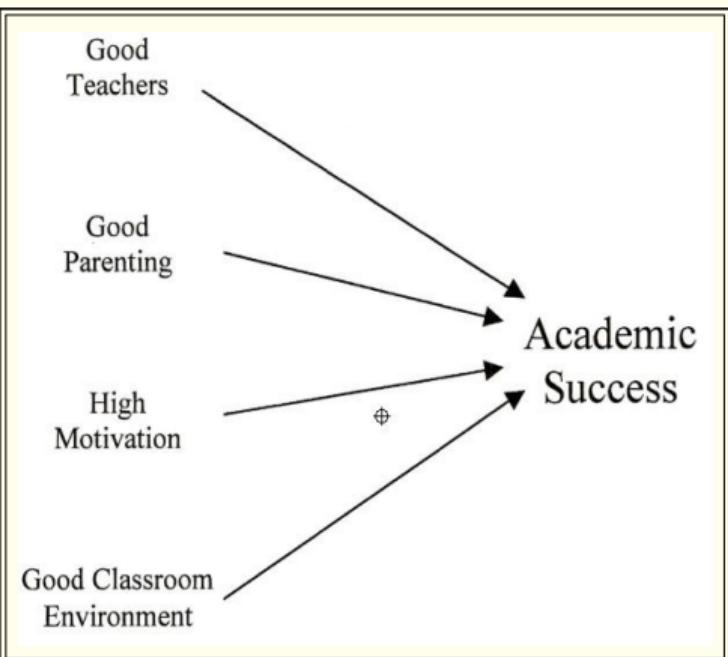
Decision making is the essence of success in the workplace. It becomes more difficult when:

- The problem is complex
- The problem environment is changing
- One does not have decision making skills

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A LITTLE EXERCISE



CONTEXT

The arrows indicate that what is at the foot of the arrow leads to what is at the head of it i.e. academic success is the result of good teachers, good parenting, high motivation and good classroom environment.

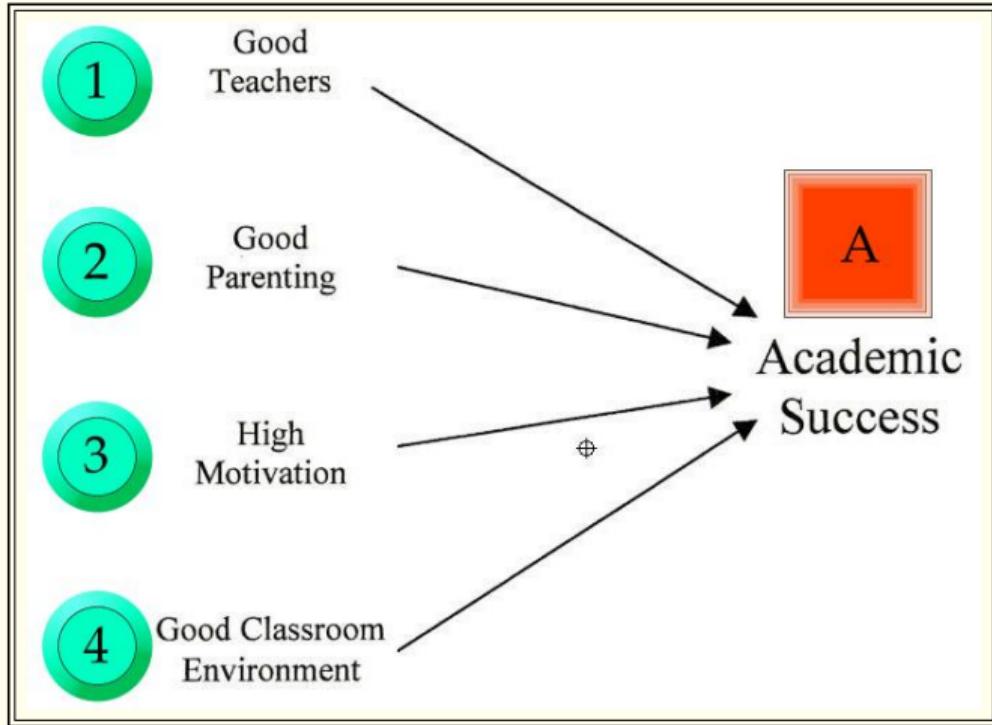
QUESTION 1: OTHER RELATIONSHIPS?

Which of the choices below best represents your thinking at this time

- ① Most people would agree with this assessment
- ② Most people would disagree with this assessment

Adapted from: "An Introduction to Systems Thinking" (ISBN 0-9704921-1-1) p.19

INQUIRING FURTHER



Adapted from: "An Introduction to Systems Thinking" (ISBN 0-9704921-1-1) p.19

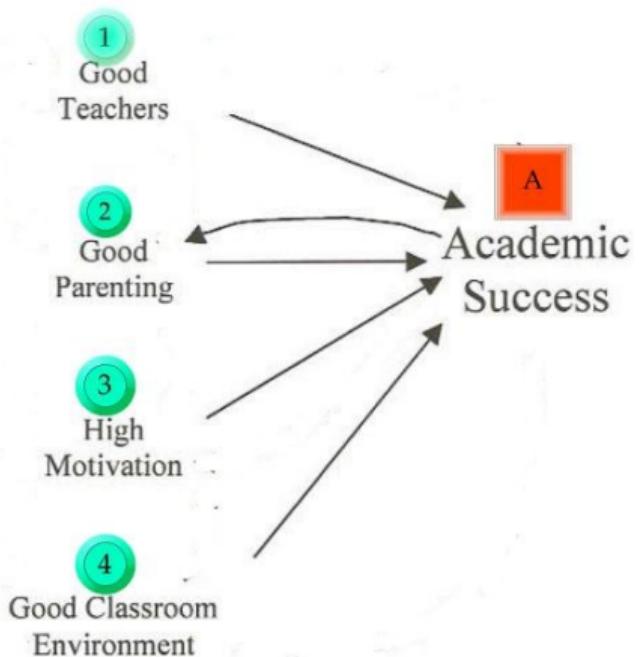
CONTEXT

Assume 1A means that 1 influences A or good teachers influence academic success, as a general statement.

QUESTION 2: OTHER RELATIONSHIPS?

What other "leads to" relationships exist here apart from 1A 2A 3A 4A

A LITTLE FOOD FOR THOUGHT



QUESTION 3: Yes(Y) or No(N)?

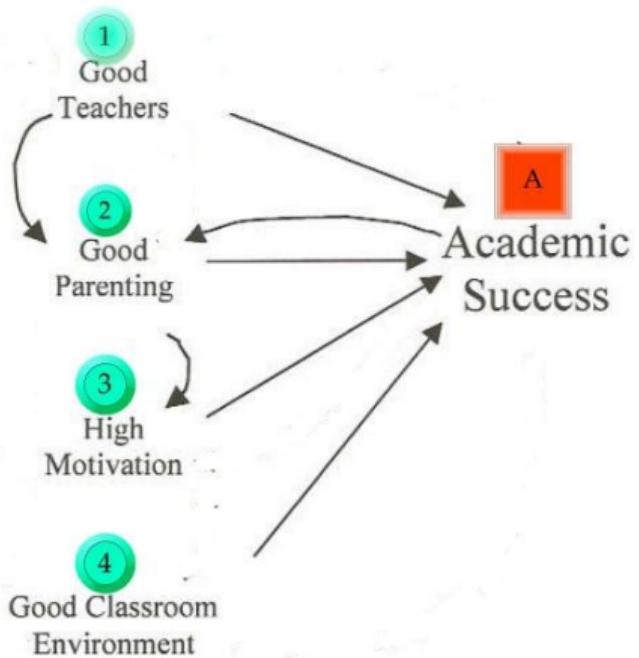
Does academic success lead to good parenting (A2)?

QUESTION 4: OTHER RELATIONSHIPS?

Please add any additional relationships that you can discern apart from 1A 2A 3A 4A and A2

Adapted from: "An Introduction to Systems Thinking" (ISBN 0-9704921-1-1) p.19

A BIT MORE FOOD FOR THOUGHT



THINK ABOUT IT

Do good teachers lead to good parenting (12)?

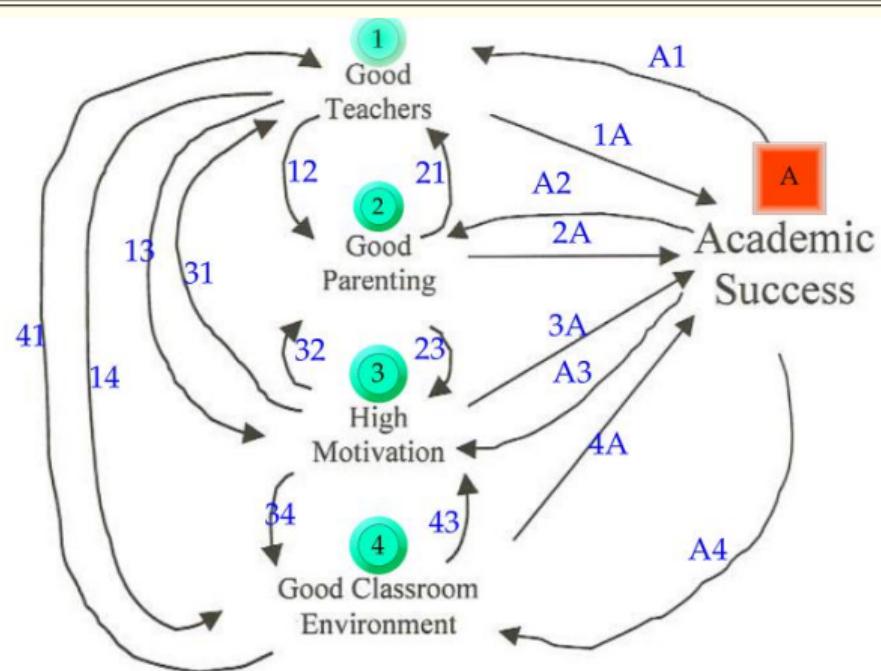
Does good parenting lead to high motivation (23)?

QUESTION 5: ANY MORE SUCH RELATIONSHIPS?

Try to identify more such relationships and type them out.

Adapted from: "An Introduction to Systems Thinking" (ISBN 0-9704921-1-1) p.20

YET MORE FOOD FOR THOUGHT



QUESTION 6: ANY INVALID RELATIONSHIPS?

Identify all the relationships shown that are not valid in your opinion to some degree. There is no implication that each is equally valid.

Adapted from: "An Introduction to Systems Thinking" (ISBN 0-9704921-1-1) p.21

SUMMARIZING

EXAMPLES OF COMPLEXITY IN DAILY LIFE

These include terrorism, climate change, water conservation, urbanisation, technology, governance, nuclear families, greater variety of professions, greater complexity in the workplace, greater problems in relationships as family dynamics change.

SOME QUESTIONS

- ① Will our children be required to handle more complexity in their decision making when they become adults compared to us?
- ② Does the education we give them prepare them for the increased complexity that they will need to handle?

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DECISION MAKING WHEN THINGS ARE CHANGING

AN EXERCISE IN PREDICTION - PART A

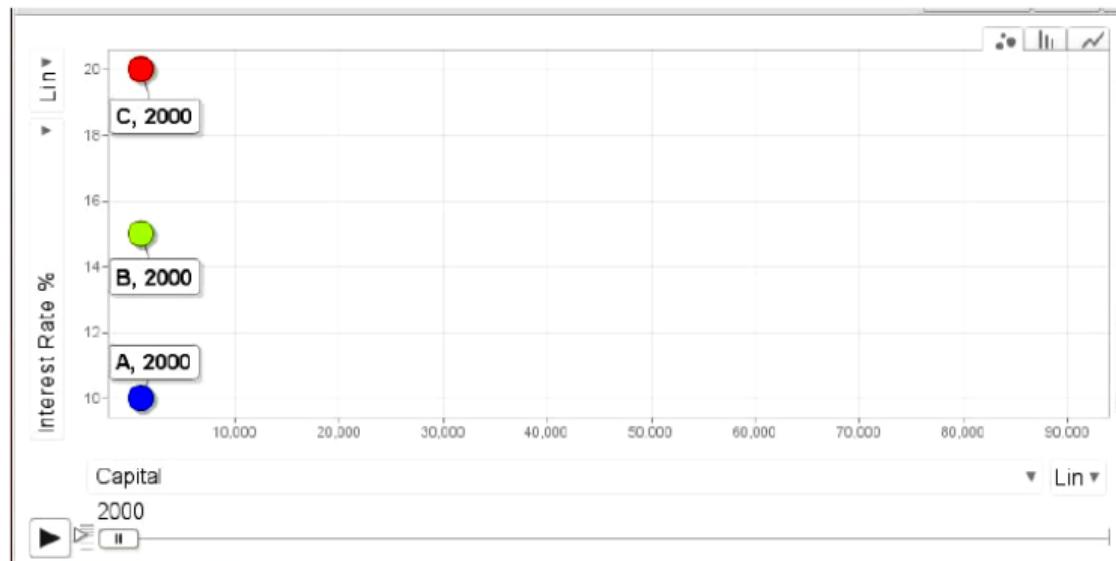


FIGURE: The Rate of growth of capital - Interest rates of 10%, 15% and 20%

INITIAL CONDITIONS

The initial conditions for this exercise are:

- The capital of Rs 1000 was put on interest in the year 2000
- There are three alternative rates of interest with different levels of risk.
- The diagram of interest rate (y) vs value (x) shows the situation in 2000.
- We need to evaluate the alternatives in terms of risk and value

DECISION MAKING WHEN THINGS ARE CHANGING

AN EXERCISE IN PREDICTION - PART B

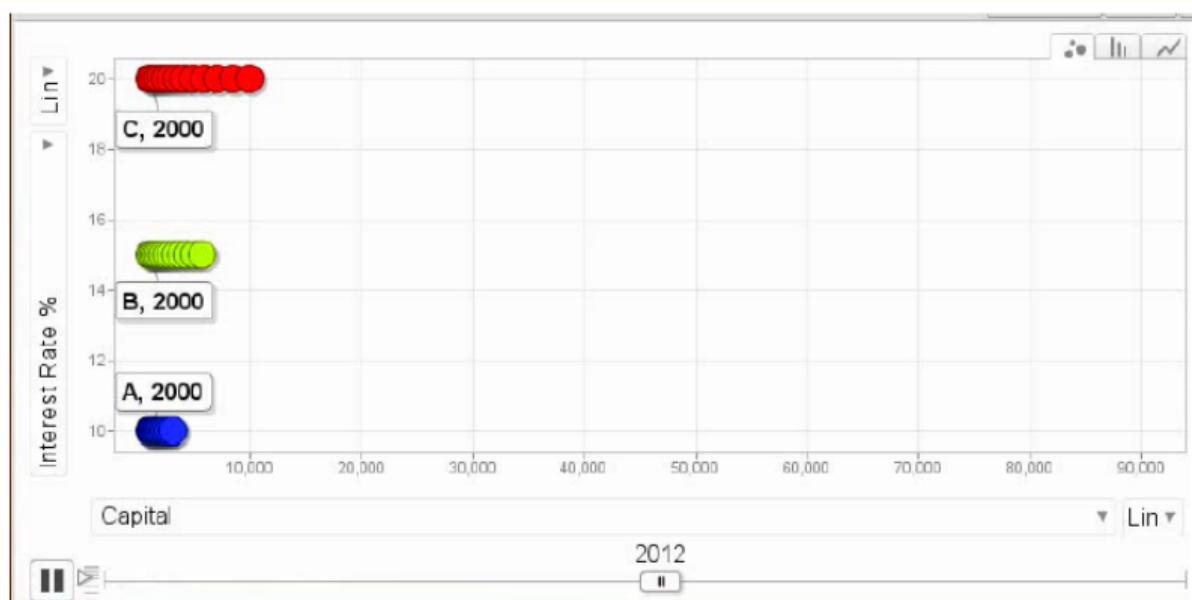


FIGURE: The Rate of growth of capital - Interest rates of 10%, 15% and 20%

INITIAL CONDITIONS

The Current conditions for this exercise are:

- We have moved 12.5 years ahead in time.
- We can see the values of our investment at the three rates of interest.

QUESTION 7: YOUR ESTIMATE

Please key in your prediction for the value for Option C in 2025 i.e. another 12.5 years later.

DECISION MAKING WHEN THINGS ARE CHANGING

AN EXERCISE IN PREDICTION - PART C

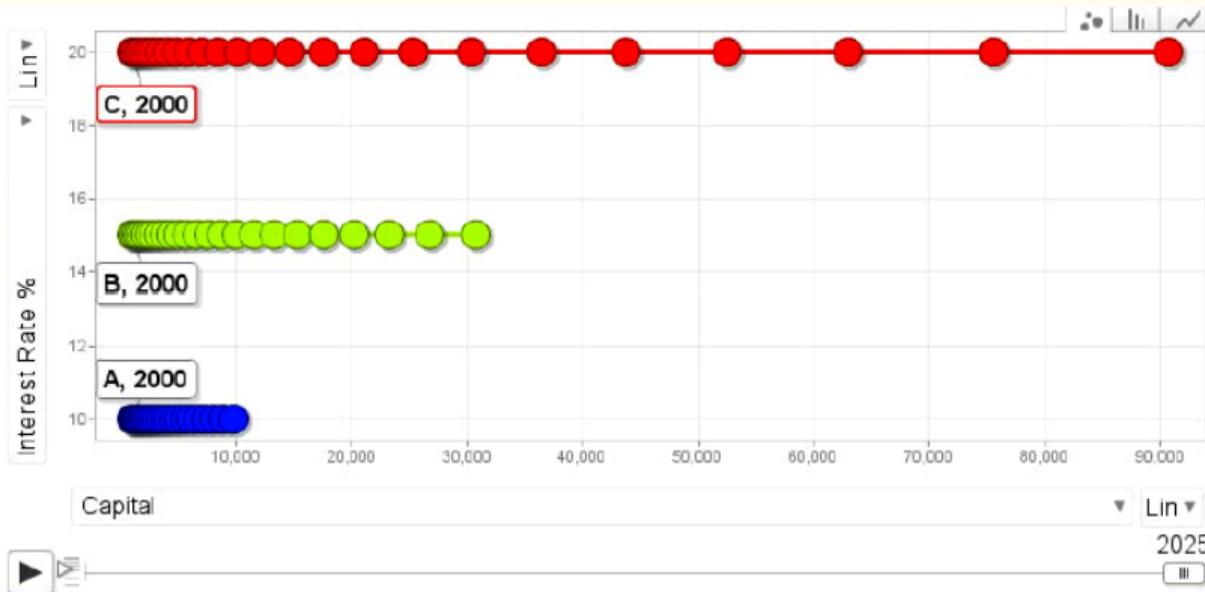


FIGURE: The Rate of growth of capital - Interest rates of 10%, 15% and 20%

Spreadsheet solution

INITIAL CONDITIONS

Please note:

- the difference between your prediction and the reality
- how it is hard to predict the rate of buildup of investment towards the latter half of the period.
- The curve that connects the end of each investment.

SUMMARIZING

FACTS OF LIFE

The last twenty years have seen unprecedented change - but also accelerating change. The future promises us even faster change. John Keynes is reported to have said - "When the facts change, I change my mind. What do you do.?"

QUESTION 8: A QUESTION

Through our education system are we doing enough to prepare our children for the rate of change they can expect to face?

Please enter 0 if you believe we are not doing enough and 1 if you believe we are doing enough

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DECISION MAKING - THINKING IT THROUGH

SOME THOUGHTS

- Infants have all decisions made for them
- Adults are expected to make competent decisions
- How does this transition take place?

QUESTION 9: PRACTICING DECISION MAKING IN THE HOME

- Do your children play an active part in making important decisions in the home?

QUESTION 10: PRACTICING DECISION MAKING IN THE SCHOOL

- Do your children play an active part in making important decisions in the school?

DECISION MAKING AND THE PLAYGROUND

WHAT HAPPENS IN THE PLAYGROUND

- The playground is really the only place where children get to make serious decisions
- Playgrounds are generally harmonious places
- Teachers rarely frequent playgrounds or exercise control
- Children sometimes have conflicts on the playground but usually resolve conflicts without intervention

CHARACTERISTICS OF PLAYGROUNDS

- Playgrounds have two fundamental characteristics:
 - The opportunity to learn how to make decisions - within defined bounds
 - The opportunity for individual participation by each player

QUESTION 11: PLEASE KEY IN YOUR OPINION ON A 1(ABSOLUTELY NOT) TO 5(OF COURSE, WE CAN) SCALE

- Can we make these opportunities, characteristics of our children's classrooms?

OUTLINE

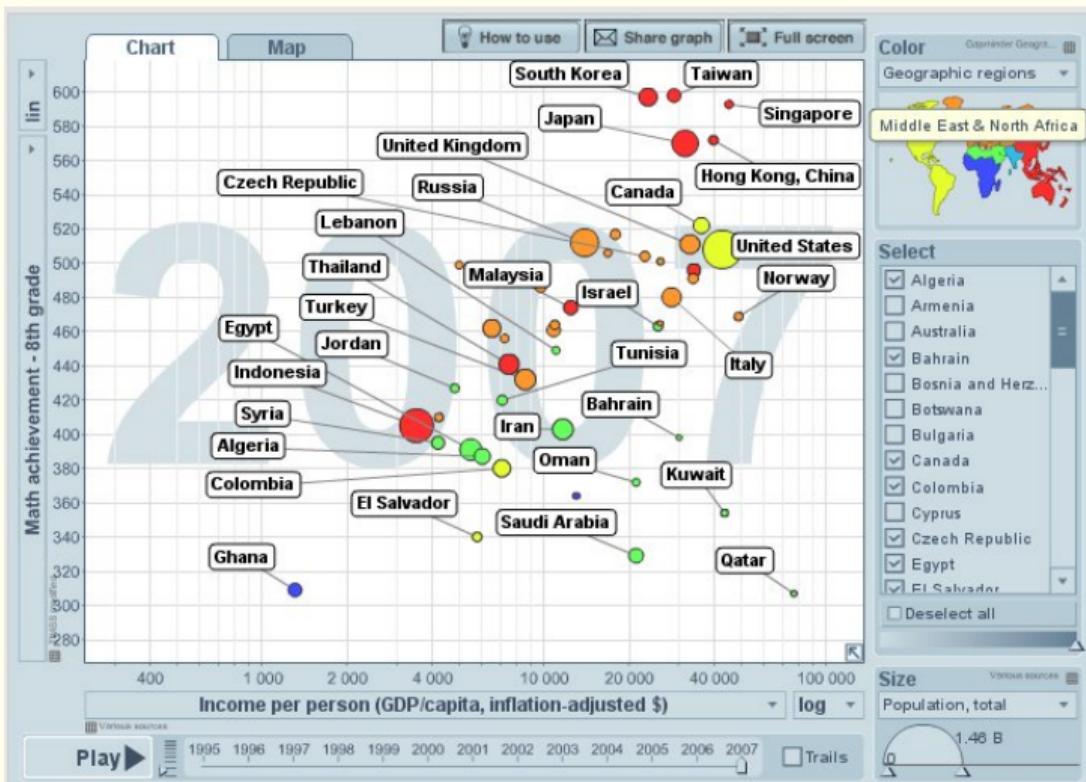
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THE IMPACT OF PARTICIPATION IN MAKING DECISIONS

COMMENTARY

THE IMPACT OF NON PARTICIPATION IN MAKING DECISIONS

COMMENTARY



LOWER RIGHT QUADRANT
Education tightly controlled.

UPPER RIGHT HAND QUADRANT
Education less controlled

NOT A QUESTION OF MONEY
Qatar and Ghana enjoy the same level of score.

OUR RESERVATIONS
The issues raised here are observations, not categorical fact.

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THE HOW OF ENHANCING STUDENT LEARNING

MONEY AND KNOWLEDGE COMMENTARY

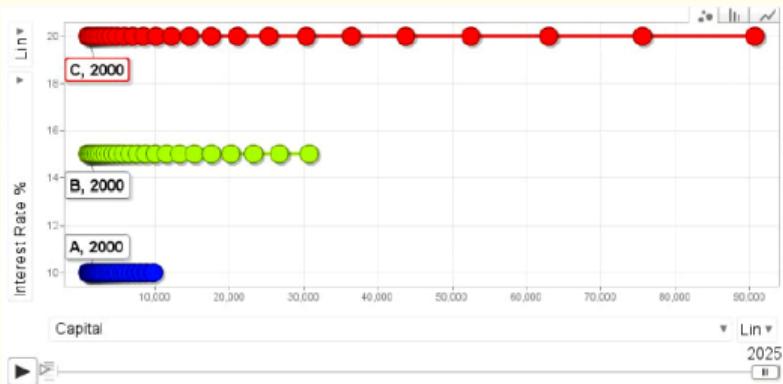


FIGURE: The Rate of growth of capital - Interest rates of 10%, 15% and 20%

Visualising it

BACK TO THE COMPOUND INTEREST PROBLEM

In the compound interest problem we saw:

- that the amount of money depended on the rate of interest as well as the amount of money already in the account
- that the rate of interest hugely impacted the money earned in interest annually especially at the end of the time scale
- doubling the rate of interest led to a much greater increase in money than was to be expected.

REPLACE MONEY WITH KNOWLEDGE

Lets replace:

- the money with the amount of learning
- The rate of interest with the rate of interest in knowledge acquisition that we can generate in the classroom

THE HOW OF ENHANCING STUDENT LEARNING

MONEY AND KNOWLEDGE

QUESTION 12: PLEASE ANSWER THE QUESTION WITH A Y (YES) OR N (No)

Do you think it is true that we can replace the rate of interest with the interest in acquiring information for rote memorization, and the amount of money with the amount of information we acquire. In other words would we get the same pattern of increase in the amount of information we could store over time?

THE HOW OF ENHANCING STUDENT LEARNING

KNOWLEDGE AND INFORMATION COMMENTARY

WHAT HAPPENS

In that case:

- the growth in knowledge acquisition would depend on the amount of knowledge already acquired as well as the rate of interest in acquiring knowledge at that time
- the major annual increments of learning would exponentially increase with time

OBSERVATIONS

- this logic cannot really be applied to the growth of information retention in the same way
- there is a limit to information retention so the more you retain the less you can retain which is the opposite with knowledge
- in reality what children pick up in school is a mixture of information retention and learning.
- what we need to do is to change the bias
- learning is needed to develop inference i.e. the capacity to apply in a new situation, the knowledge that one has acquired in the classroom
- inference is the key to success in higher education and the workplace

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THE HOW OF BRINGING OPPORTUNITY TO THE CLASSROOM

FOR DECISION MAKING AND PARTICIPATION

HIGH RATE OF INTEREST

- Structured learning in pre-prepared topic plans
- Embedded questions every few minutes as appropriate
- Specially designed wireless devices to allow a question to be answered simultaneously by all students
- Immediate graphical presentation of the response of the class as a whole. sample

PARTICIPATION

- Every student answers every question
- Teacher leads discussion of the class response
- Long term and medium term feedback provided periodically to each student for remediation

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THE STUDY PROFILE - MARIA NIKETAN SCHOOL

PROFILE OF THE STUDENT GROUP

COMPOSITION: 13 boys and 9 girls

TEACHER ESTIMATE OF STUDENT ABILITY IN MATHS ON 1 TO 5 SCALE

- Level 2: 7 students
- Level 3: 9 students
- Level 4: 5 students
- Level 5: 1 student

AVERAGE AGE

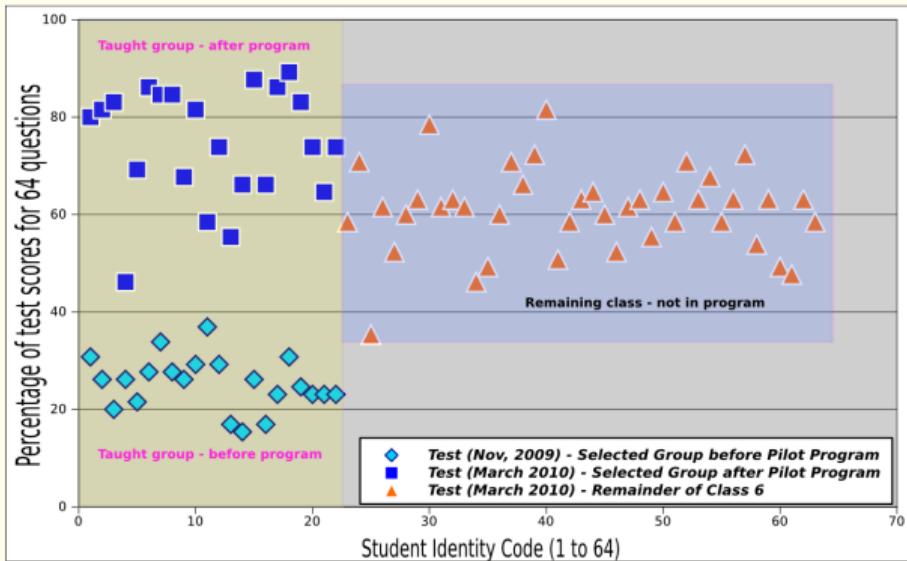
11.8 years on 1 January 2010

THE TIME DISTRIBUTION

Time in hours	Topic
3.75	Pre-test with experimental group
18.75	Topic Plans 1 to 5
11.25	Other activities
2.1	Post test for full group
35.85	Total Program

THE SCHOLASTIC IMPACT

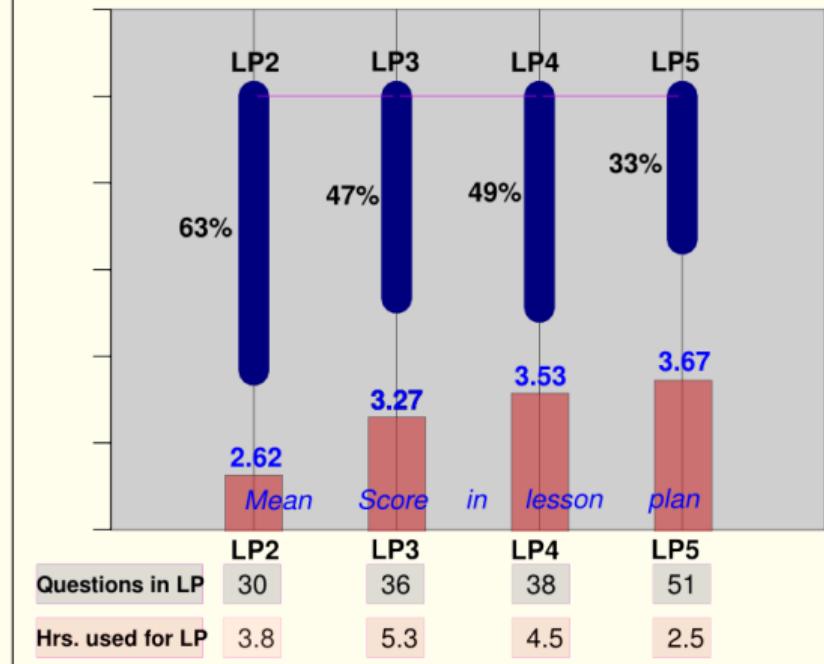
Comparison of Test Scores in Nov 2009 and March 2010



Test Score Statistics (%)				
	Mean	Max	Min	Std. Dev.
Experimental Group - Pre Test	24	50	5	9
Experimental Group - Post Test	75	89	46	12
Control Group - Test at end of session	61	82	35	9

THE SCHOLASTIC IMPACT

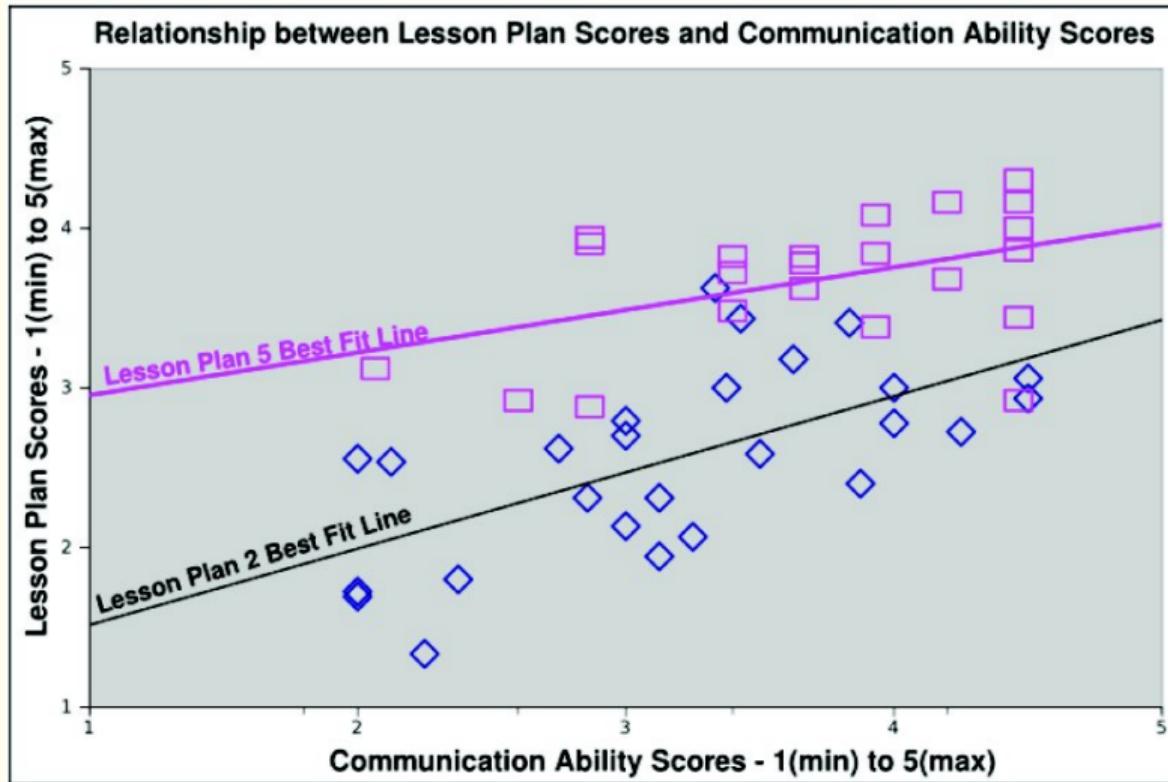
Gap - highest to lowest student score in successive lesson plans



THE INDIRECT IMPACT ON TERM EXAM RESULTS

RESULTS

RESEARCH OUTCOMES



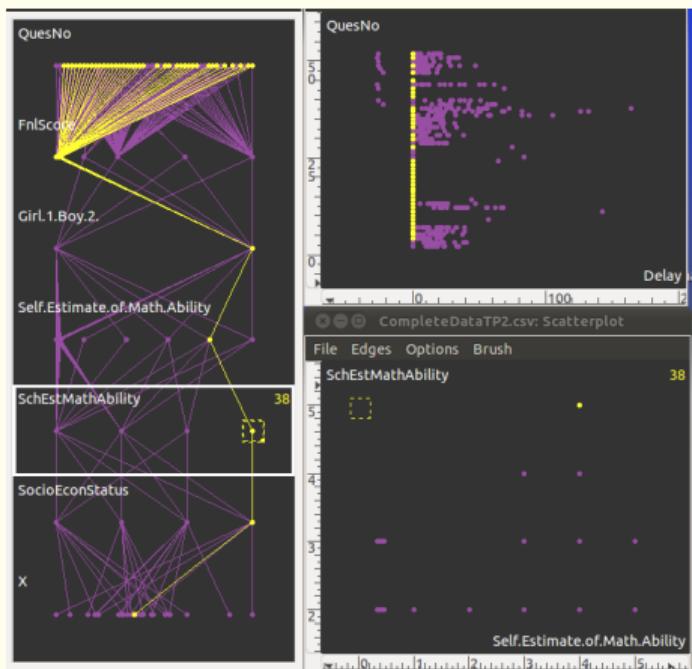
BREAKING UP MATHS OBJECTIVES

CALCULATION, INFERENCE, OBSERVATIONS AND REPORTING CAPABILITY SCORES - RESULTS

	Scores in %				Total Result
	Question Category	C	I	O	
Group					
Pre-Test (Experimental Group)	24	24	26	24	24
Post-Test (Experimental Group)	83	66	86	71	75

OTHER LEARNINGS - CALCULATION AS A PROXY FOR MATHS ABILITY

TRACKING THE BEST STUDENT BY SCHOOL'S ESTIMATE



First Video
Second Video
Third Video

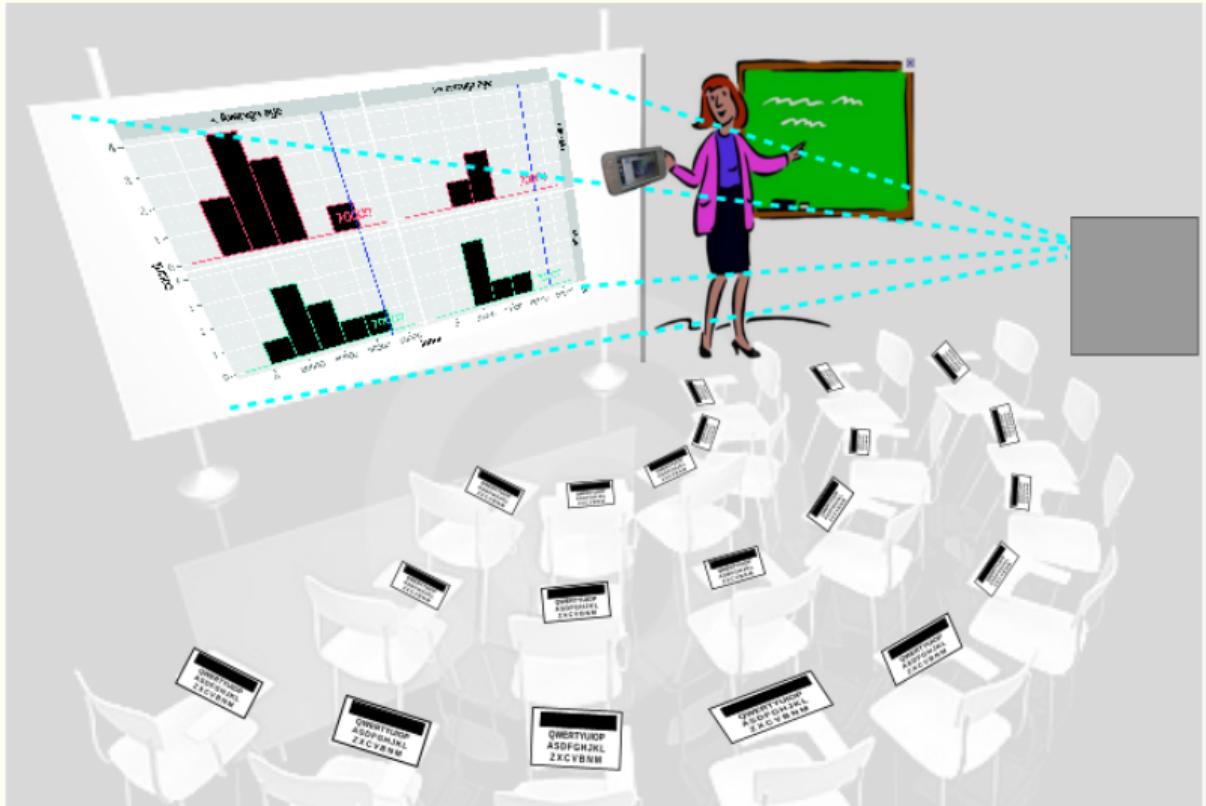
Teacher's Estimate of ability	No of students	Q Type				Total Result
		C	I	O	R	
Likert Level 2	7	0.74	0.63	0.9	0.65	0.7
Likert Level 3	9	0.83	0.67	0.78	0.71	0.75
Likert Level 4	5	0.95	0.69	0.93	0.8	0.82
Likert Level 5	1	0.92	0.61	0.83	0.57	0.74
Total Result	22	0.83	0.66	0.86	0.71	0.75

Table 6.4: Teacher estimate of ability compared to post test scores of experimental group

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THE OVERALL CONCEPT IN THE CLASSROOM



THE INITIATIVE

TOPIC PLANS

- Grades 6 to 8
- Carefully prepared topic plans - hours depends at the rate at which schools progress
- Initially only English and Maths
- Monthly reports of how student and classroom performance can be enhanced
- Long term analysis of intrinsic talent
- Comprehensive archive of student performance

A QUICK REVIEW OF SOME TOPIC PLANS

A FEW CLOSING ISSUES

WE EXPECT

- Material is expected to be covered in about half the time it would normally take
- Teachers can be guided on preparatory work if needed
- Problems of classroom management can be expected to dilute dramatically
- Spillover of performance into other academic areas can be expected
- Over time we expect to assist with other areas such as projects involving various types of sensors that we manufacture
- The number of subjects covered can be expected to increase every year
- Our system works better with larger classes. We could consider classes of 70.