

RISE

RESEARCH ON IMPROVING
SYSTEMS OF EDUCATION

Diagnosing education systems

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ADB Education Group Strategy Session

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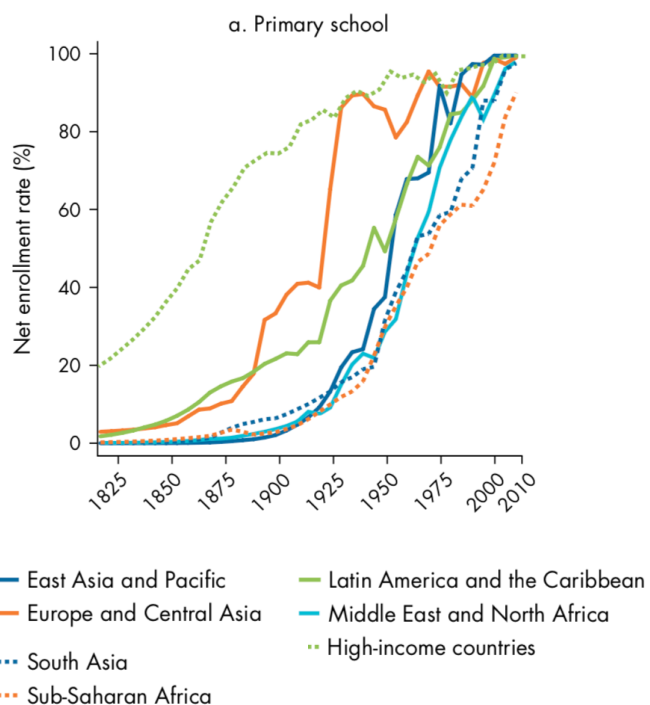


BILL & MELINDA
GATES *foundation*

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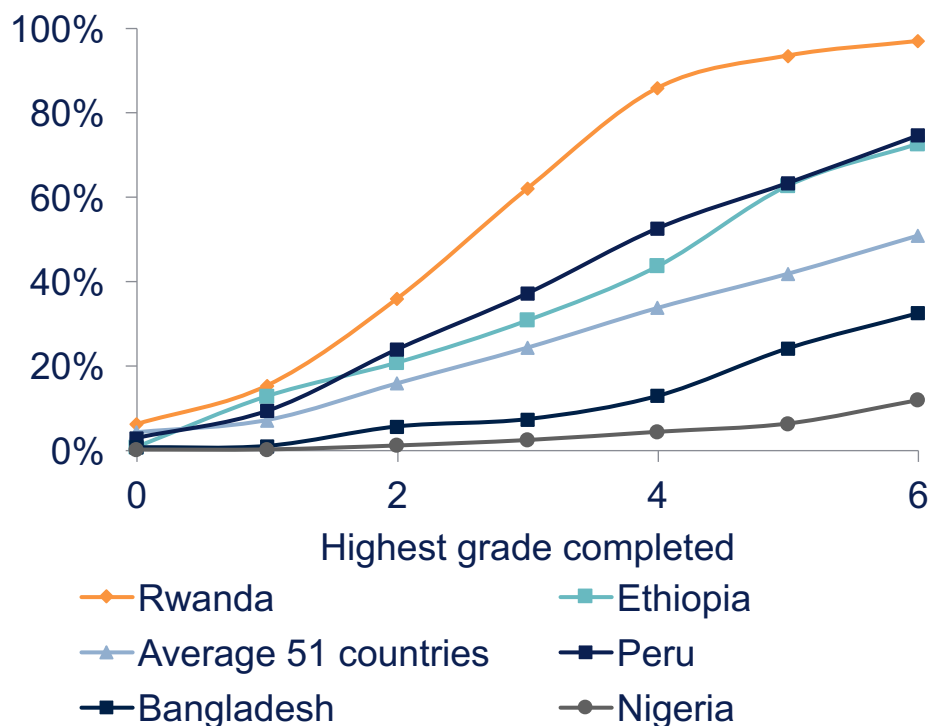
The world has seen schooling success yet a persistent learning crisis

Nearly all children today enroll in school



Yet fail to master basic skills

Percent of young adult women (25-34 yrs) who can read a single sentence by grade completed



Learning is the result of interactions of teachers and students but that is embedded in a system



“Problems cannot be solved by the same level of thinking that created them”- Einstein

Learning is an interaction between individual teachers and students.

Projects to address learning crisis have to change teacher-student interactions.
But, teachers and students are embedded in broader systems.

To make meaningful, lasting improvements in teacher-student interactions you need to understand why they are poor to begin with. Need an analysis of the system that explains why actors behave the way they do. Then you can think about how to improve things.

Talk today makes the case for systems analysis, and an approach, anchored in an accountability framework that can be used to develop projects that help move countries towards meaningful reform

Projects can fail for two reasons either devil in details or devil in system

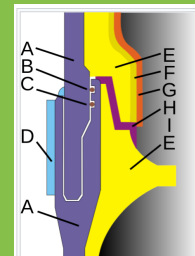
Devil in the system



Challenger disaster



Devil in the details
(O-rings)

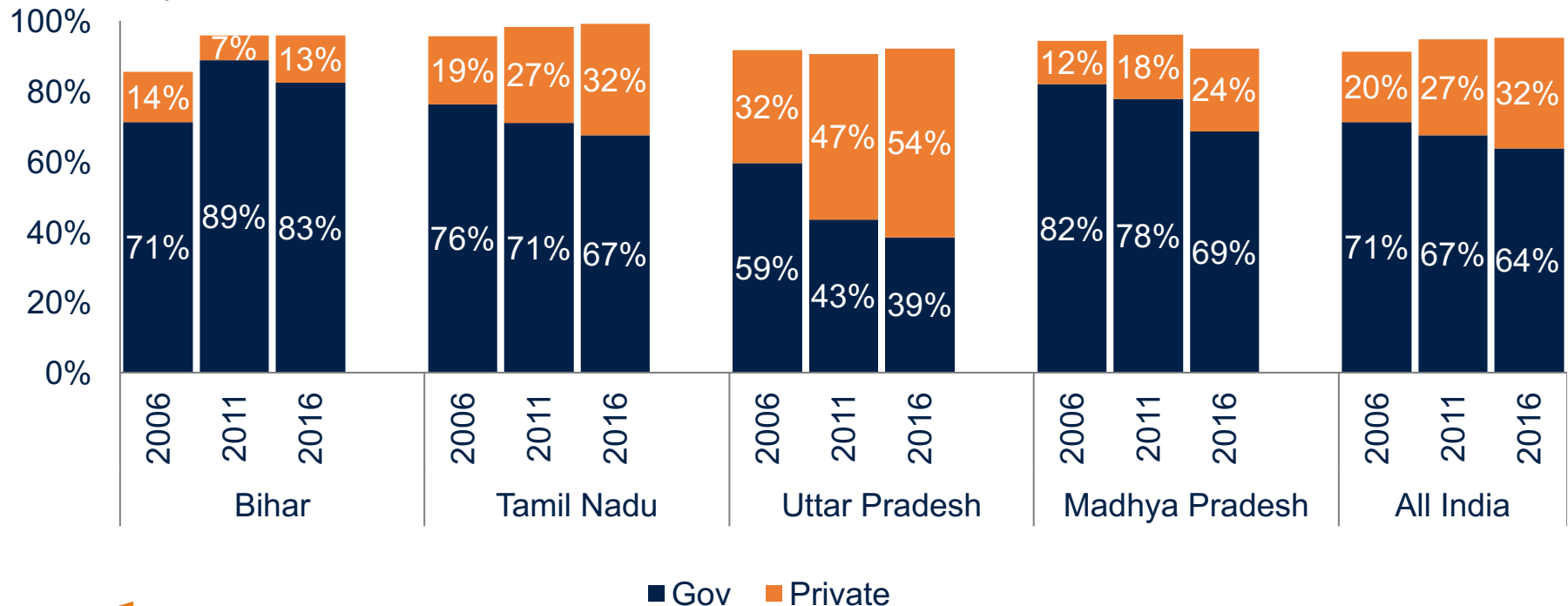


Education initiatives are much more likely to fail because of the devil in the system

Example: SSA in India

- Starts in early 2000's. Goal for all children in India to complete primary school of satisfactory quality.
- Improvements in enrollment in government schools in some states, but in many improvement in enrollment comes from switching to private sector.
- In Bihar missing schools may have been the problem, in UP they were not.

Proportion of rural children enrolled in school

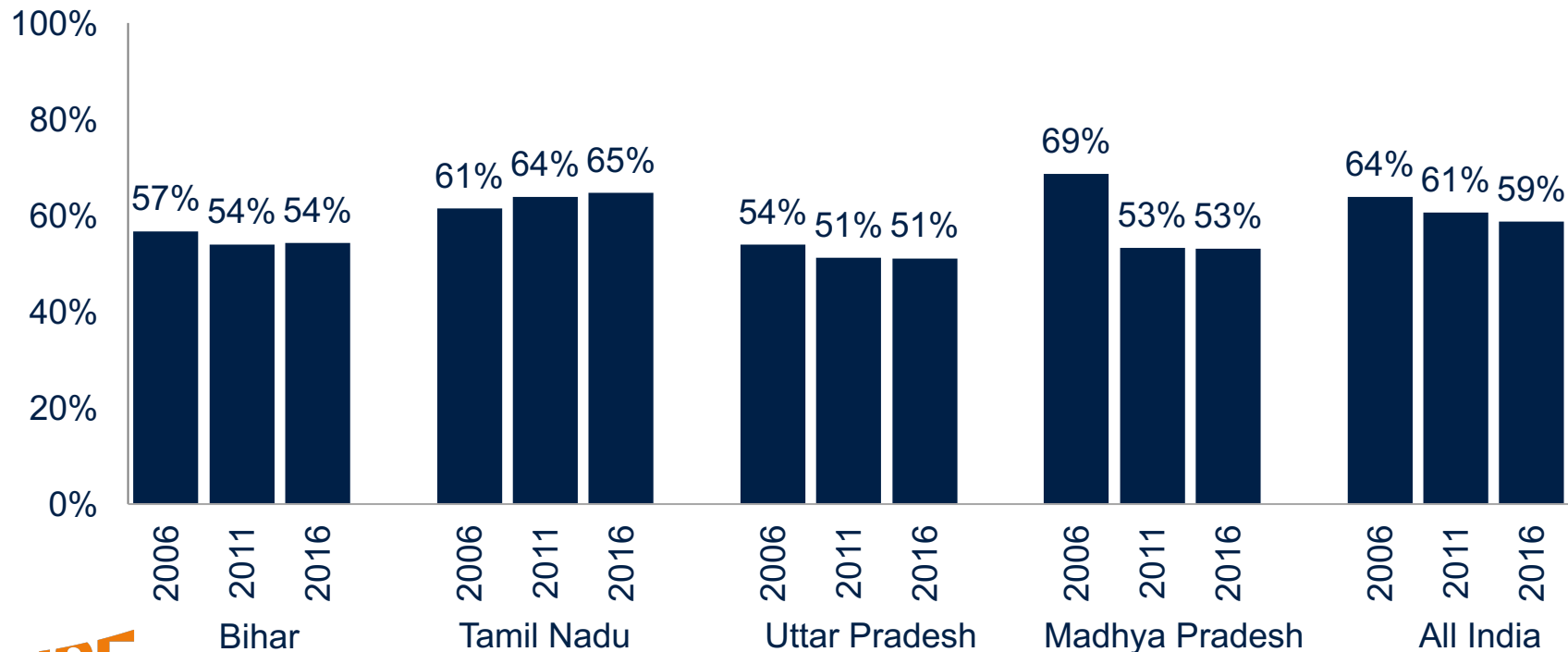


Education initiatives are much more likely to fail because of the devil in the system

Example: SSA in India

- What about quality? It was low and falling throughout this time period.
- Decentralized authority to districts, focus on monitoring inputs with DICE, more finance, but all of this cannot produce learning gains in a system that is not oriented for learning.

Proportion of rural enrolled students age 5-16 who can read at least a paragraph of text



When someone is sick, it is tempting to treat the immediate symptoms

- Symptom treatment tries to relieve each symptom one by one.
- Might make patient feel better temporarily (or not) won't cure disease.
- Some treatments are at cross purposes.

Symptoms	Symptom treatment
Fever	Ice Bath
Aches	Stretching
Weakness	Eat a good meal
Chills	Warm clothes
Sweating	Air conditioning

Many (most) education projects are symptom treatment plans

Missing diagnosis of underlying disease. Knowing this allows for formulation of a coherent, diagnostic treatment plan

Symptoms		Symptom treatment plans
Fever	Missing diagnosis of the condition.	Ice Bath
Aches	Diagnosis tells us why the symptoms are happening.	Stretching
Weakness		Eat a good meal
Chills	Once we know why, we can treat to cure the underlying condition.	Warm clothes
Sweating		Warm clothes

To cure disease: review symptoms, test, diagnose, then treat

Symptoms	Possible diagnoses	Possible treatment plans
<ul style="list-style-type: none">• Feverish• Aches• Weakness• Chills• Sweating	Viral flu	<ul style="list-style-type: none">• Rest• Fluids
	TB	<ul style="list-style-type: none">• Antibiotics• Rest• Fluids
	Malaria	<ul style="list-style-type: none">• Anti-parasitic• Rest• Fluids• Bed net

To cure disease: review symptoms, test, diagnose, then treat

Symptoms	Possible diagnoses	Possible treatment plans	Diagnostic tests	Findings
<ul style="list-style-type: none">• Feverish• Aches• Weakness• Chills• Sweating	Viral flu	<ul style="list-style-type: none">• Rest• Fluids	CBC Sputum test Blood smear	CBC- normal white blood cells
	TB	<ul style="list-style-type: none">• Antibiotics• Rest• Fluids		Sputum normal
	Malaria	<ul style="list-style-type: none">• Anti-parasitic• Rest• Fluids• Bed net		Blood smear – shows malaria parasites

To cure disease: review symptoms, test, diagnose, then treat

Symptoms	Possible diagnoses	Possible treatment plans	Diagnostic tests	Findings	Diagnosis	Treatment plan
<ul style="list-style-type: none"> Feverish Aches Weakness Chills Sweating 	Viral flu	<ul style="list-style-type: none"> Rest Fluids 	CBC Sputum test Blood smear	CBC- normal white blood cells, anemic Sputum normal Blood smear – shows malaria parasites	Malaria	<ul style="list-style-type: none"> Anti-parasitic Rest Fluids Bed net
	TB	<ul style="list-style-type: none"> Antibiotics Rest Fluids 				
	Malaria	<ul style="list-style-type: none"> Anti-parasitic Rest Fluids Bed net 				

- Symptoms and treatment plans are both multifarious, diagnosis is simple.
- Going straight from symptoms to treatment plan could be wasteful or even harmful, since all interventions have side effects, if wrong treatment plan is chosen.
- Also need to mind coherence, anti-biotics would be deadly if you were allergic.

Similarly in education, first instinct is to treat visible symptoms

Symptoms	Symptom treatment plans
No text books	Buy books
Teacher absenteeism	Cameras classrooms
Student drop out	Scholarships
Bad teaching practices	Teacher training
Bad management	Management training program

- But we know so many examples where projects like these fail
- They fail because the devil is in the system
- Without knowing why we are seeing the symptoms (a diagnosis) we can't treat effectively

But treating visible symptoms first often fails because of the devil in the system

Providing textbooks to Kenyan schools has no affect on pedagogy or average test scores.

- Books are in English, which many students struggle with.
- Curriculum is too far ahead of most students, books don't help.
- Both of these reflect the elite orientation of the system

(Glewwe, Kremer, Moulin, 2009)

Symptoms

No text books

Teacher absenteeism

Weak teaching

Student drop out

Weak teaching

Weak management

Symptom treatment plans

Buy books

Cameras classroom

Teacher training

Scholarships

Teacher training

Management training

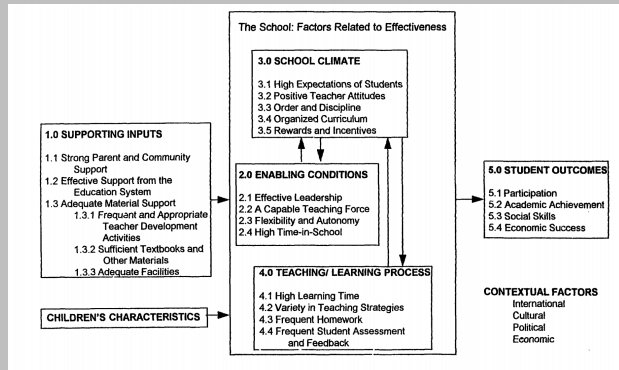
In Madhya Pradesh State of the art school governance (external assessments, individualized improvement plans, in person and ICT monitoring) did not affect teacher attendance or effort, nor student effort, nor test scores.

- System did not have the capacity to sustain this type of program.

(Muralidharan and Singh, forthcoming)

There are many excellent tools available for assessing symptoms

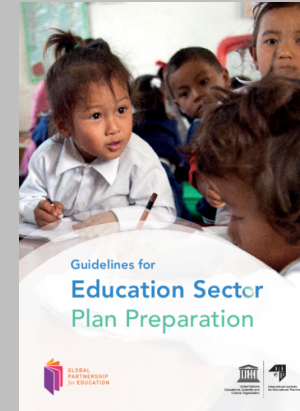
E.g. Ward Heneveld, 1994



SDI and SABER



Education Sector Analysis & Plans



Many others

Recent review commissioned by USAID found 14 active, including RISE and SABER

- Not ignoring or displacing these.
- Proposing something different, that tries to surface the reasons why these symptoms are present.

We are proposing something very different

Diagnosing underlying cause

The existing “symptomatic diagnostics” give a fine grained assessment of all of the symptoms of the learning crisis

Teachers

Gender
Certification
Tenure Teacher
Student ratio
Attendance

Schools

Classrooms
Desks
Toilets
Grounds
Textbooks
Notebooks

Students

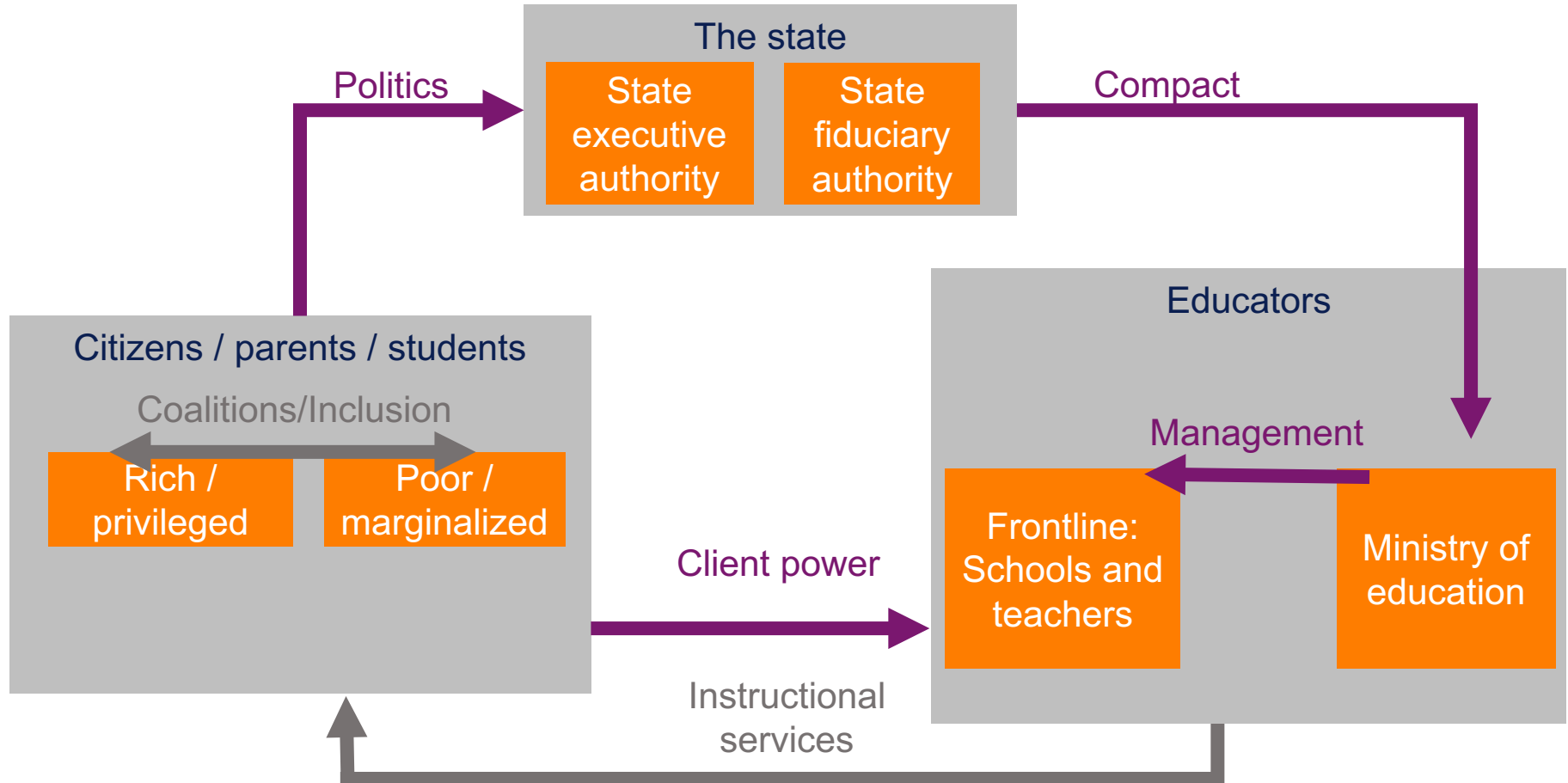
SES
Enrollment
Grade progression
Learning outcomes

Our goal is to go from this level of detail to a simplified account of why we observe these symptoms.

Coherence of treatment plan with system

- More textbooks did not raise learning outcomes in Glewwe, Kremer, and Moulin paper. Textbooks were in English, and overall curriculum moves too fast for most students.
- Better management structure did not raise learning outcomes in Muralidharan and Singh paper, because of low capability.

An analytical description of an education system names the actors and the relationships among them



Each of the four relationships of accountability (politics, compact, management, CP) has five design elements

Five design elements of an accountability relationship, actors choose what to do based on design elements

Delegation	What the principal asks the agent to do.
Finance	Resources principal provides to the agent to carry out the tasks
Support	Assistance and training principal provides to the agent to do their job. In education refers exclusively to teacher training, pre and in service.
Information	Information that principal uses to evaluate agents performance.
Motivation	Ways in which agent's welfare is contingent on their performance against objectives. Can be extrinsic (mediated by principal) or intrinsic (mediated by agent).

Outcomes of education system are the organic result of the choices principals and agents take based on design elements of each relationship

Five design elements of each relationship of accountability (Principal (P) to Agent (A))	Principal-agent relationships			
	Politics: Citizens to “the state”/politicians (many P to one A)	Compact: “The state” to organizations (one P to one A or one P to many A with non-state providers)	Management: Organizations to front-line providers (one P to many A)	Voice/ Client power: Service recipients (parents/children) direct to FLP/Organizations (many P to one A)
Delegation: Specification of what P wants from A				
Finance: Resources that P provides to A (either in advance or contingent)				
Support: P helps A to perform				
Information: P collects information on performance of A				
Motivation: How A’s well-being is contingent on performance. Change to motivation? i) Intrinsic; ii) Extrinsic; iii) Exit (force out)				
Performance of agent is endogenous to the features of the relationship System delivers learning when strong relationships of accountability align across design elements around learning objectives				

Most projects operate with cell by cell thinking and focus on getting design right within the cell

Five design elements of each relationship of accountability (Principal (P) to Agent (A))	Principal-agent relationships			
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Delegation: Specification of what P wants from A				
Finance: Resources that P provides to A (either in advance or contingent)				
Support: P helps A to perform			Teacher training designed to improve pedagogy	
Information: P collects information on performance of A				
Motivation: How A’s well-being is contingent on performance. Change to motivation? i) Intrinsic; ii) Extrinsic; iii) Exit (force out)				
Performance of agent is endogenous to the features of the relationship System delivers learning when strong relationships of accountability align across design elements around learning objectives				

When teacher training fails, do you go to the devil in the details or the devil in the system?

Devil in the system

Is your teacher training aligned with system? Embedded in dysfunctional system

Teacher training program fails to change teacher behavior or learning outcomes

Devil in the details

Is there something that can be improved about the design of the training program?

Systems function when there is alignment among the design elements of a relationship of accountability and across the relationships

Devil in the system is one of three types of incoherence

Within a column

Is

Within a row

For example in the delegation row: the “state” politicians disagree with the “ministry” bureaucrats about the objectives of schooling.


Conflict between relationships: teachers

Teachers are “accountable” both to their employer (“management”) and to the students/parents/community (“client power (voice)”). This can create incoherence if they are accountable for different things in these two relationships.

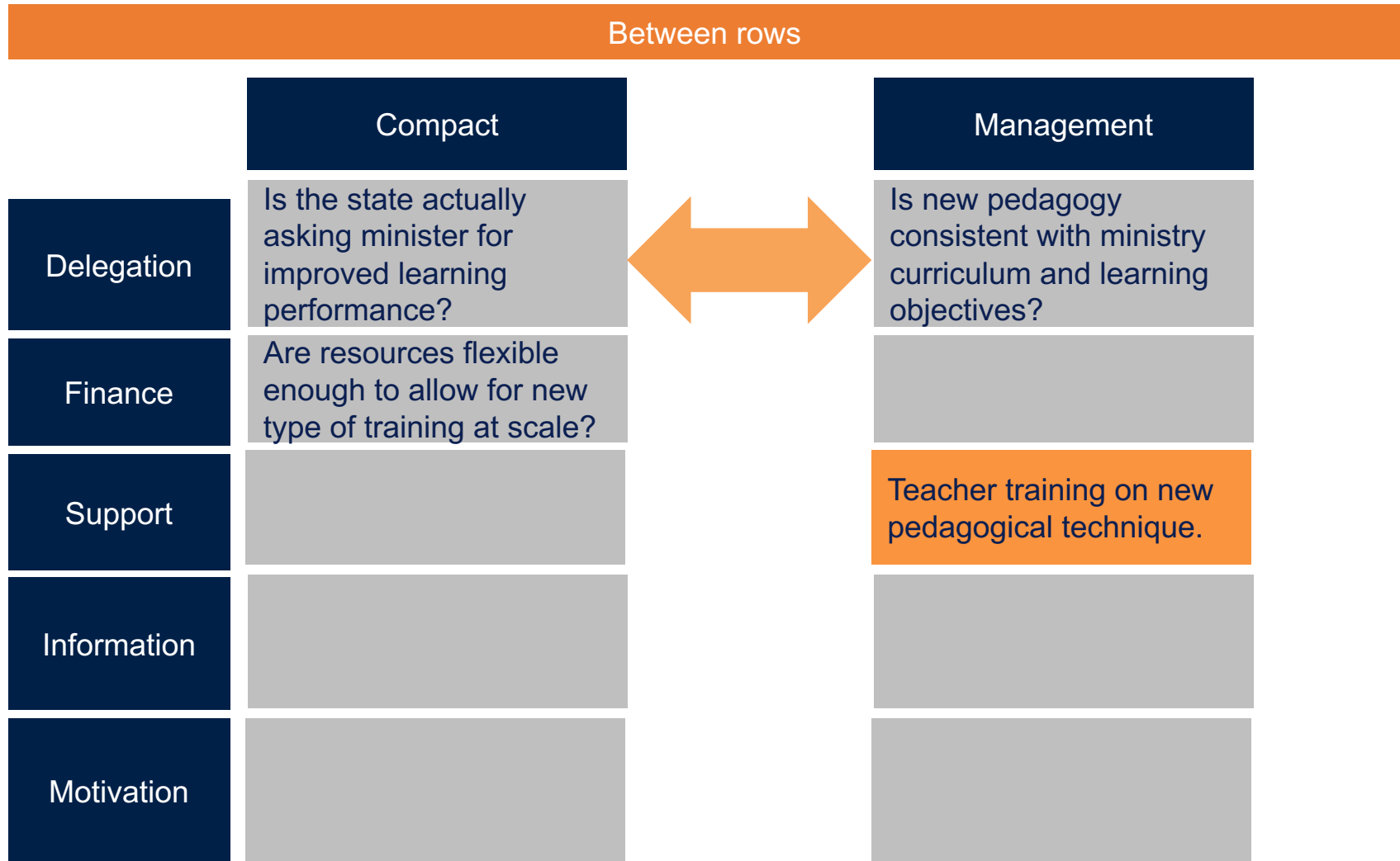
Need to surface these incoherences, in order to design projects and reforms that at minimum don’t exacerbate and at best alleviate them.

Devil in the system is one of three types of incoherences

Within a column		
	Compact	Management
Delegation		Is new pedagogy consistent with ministry curriculum and learning objectives?
Finance		Were sufficient resources allocated for training.
Support		Teacher training on new pedagogical technique.
Information		Does min of edu collect inform about training and pedagogy effectiveness?
Motivation		Are teachers motivated to adopt the new pedagogy?

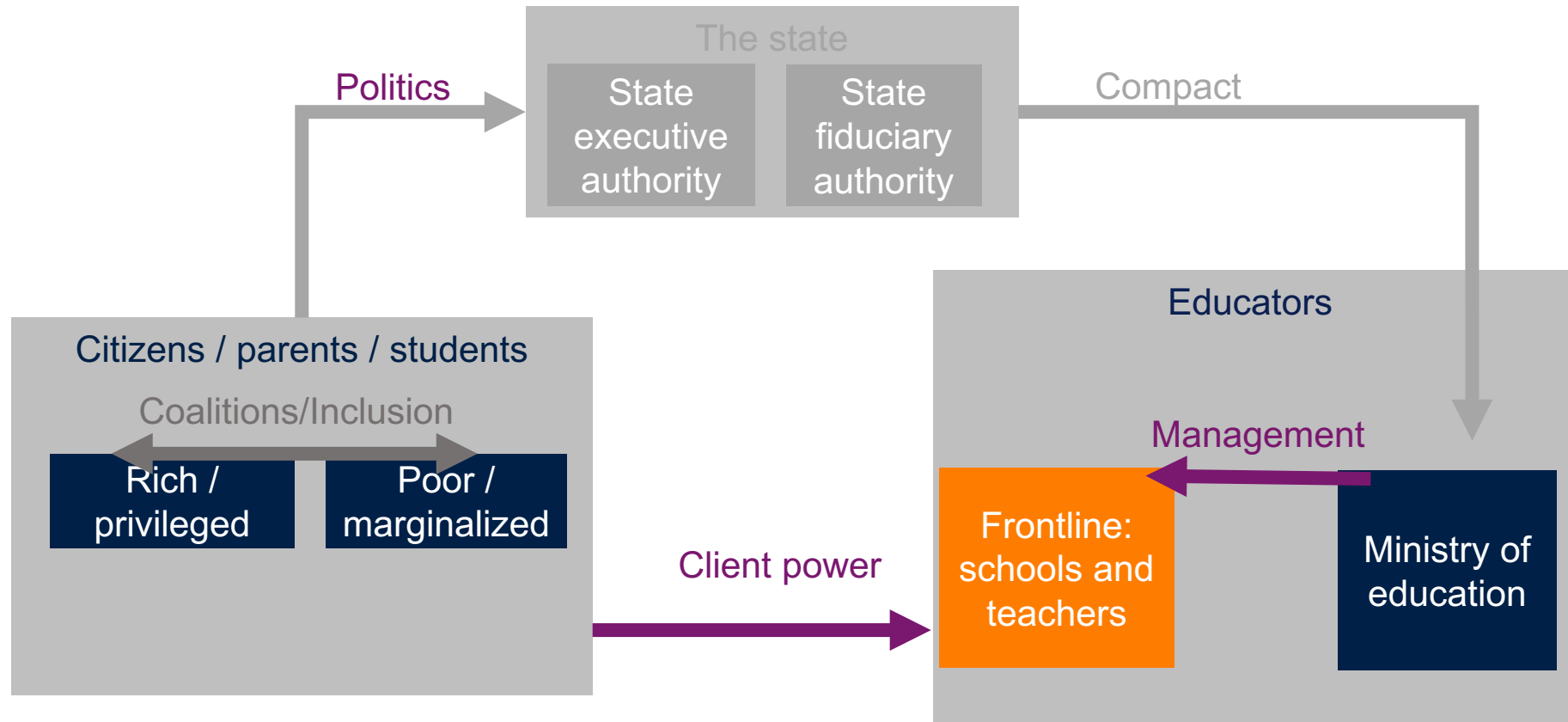


But project will only succeed if it is coherent with the rest of the system



But project will only succeed if it is coherent with the rest of the system

Within Relationships: teachers



Goal is interactions between teachers and students that produce learning. To achieve it, we need system analysis that compliments design.

Understand the system

- *Strength of relationships of accountability*
- *Coherence within relationships of accountability*
- *Coherence between relationships of accountability*



Explain and correctly intervene on the details

- *Teacher preparation*
- *Infrastructure*
- *Inputs*
- *Curriculum*

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