Learning to Teach by Learning to Learn

Vesall Nourani

November 4, 2025

The Work of a Teacher in Uganda

- Overflowing Classroom
- No Textbooks
- Administrative pressure
- Assess learning
- Manage students
- Engage with parents/community...

- Teacher Response
  - Draw from own experience from system that equates memorization with learning.

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    - "You can only teach the way in which you were taught"

↓

Hierarchical, "Top-down," pedagogy

Improving the Quality of Education

- Poor pedagogy $\implies$ factor for poor learning outcomes
- Policy Response: Invest in Teacher Development
  - Despite large investments (> $1 Billion USD), most professional training of teachers does not improve student outcomes (Loyalka et al., 2019; Akyeampong et. al, 2023)
- With the exception of "Structured Pedagogy"

(e.g. Banerjee et al., 2010; Banerjee et al., 2007; Piper et al., 2014; Muralidharan et al., 2019; Bando et al., 2019)

  - "A package that includes structured lesson plans, learning materials, and ongoing teacher support"
  - In the extreme, this is a minute-by-minute scripted lesson plan (Graylobe et. al, 2022)
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Learning to Teach by Learning to Learn

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  - By **learning to learn**, teachers learn how to teach.

Questions: Can TPD in which teacher "learn how to learn" (produce knowledge) improve student outcomes? If yes, how?

Methods: Randomized evaluation across 35 schools over 2 years. Small-group semi-structured interviews with 32 teachers and 9 tutors

Intervention: Use of *Preparation for Social Action* curriculum.

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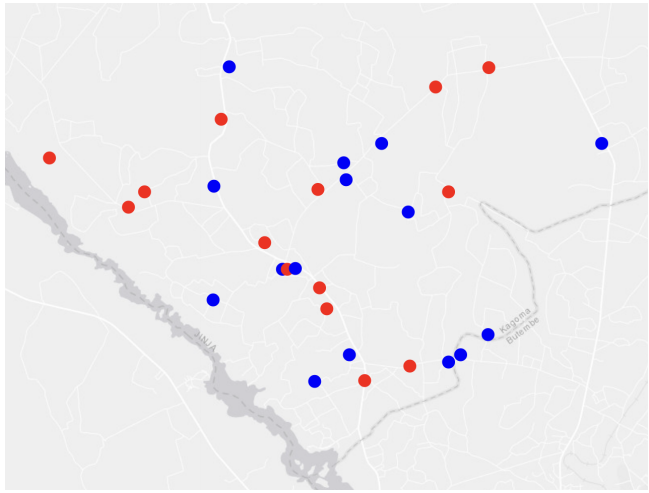
Randomizing Schools into Treatment



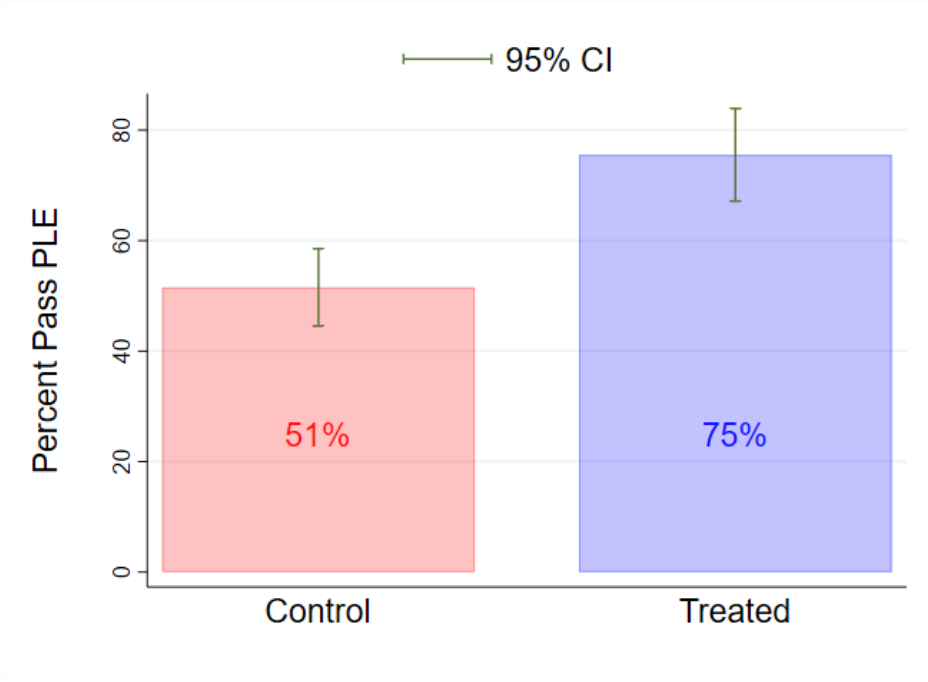
Pairwise Treatment

Pair 1	Control	School 1	
	Treated	School 2	
Pair 2	Treated	School 3	
	Control	School 4	
⋮	⋮	⋮	⋮
Pair 17	Treated	School 33	
	Control	School 34	
Pair 18	Treated	School 35	

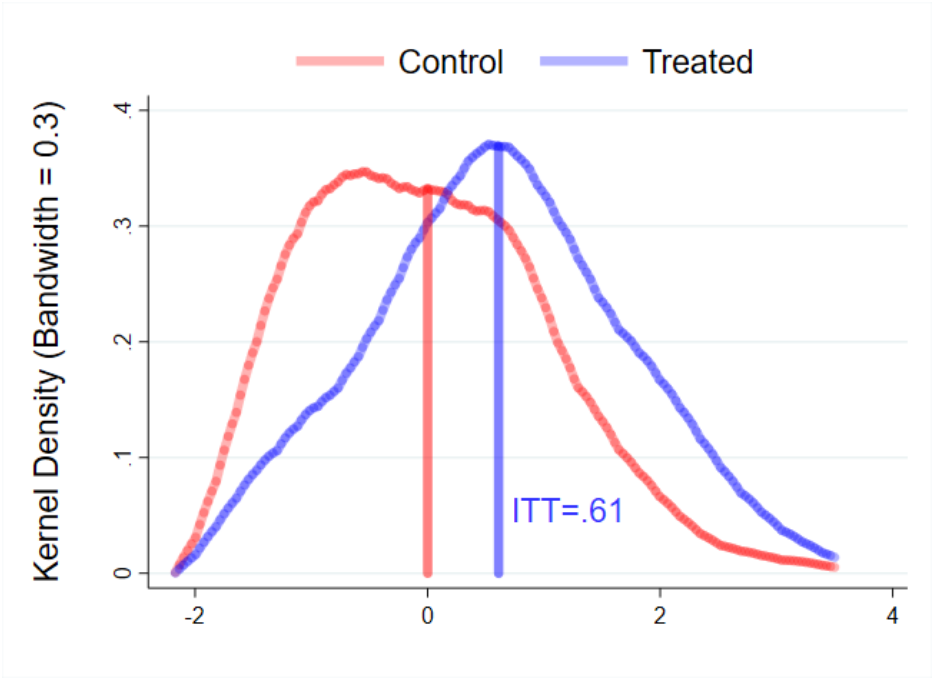
2018 Training 2019 Training Other teachers

Nourani, Ashraf, Banerjee (2025)

A Promising Approach — *Learning to Learn* Teacher Development Program



(A) 2019 Primary Leaving Exam (PLE) Pass Rate (Division III and better)

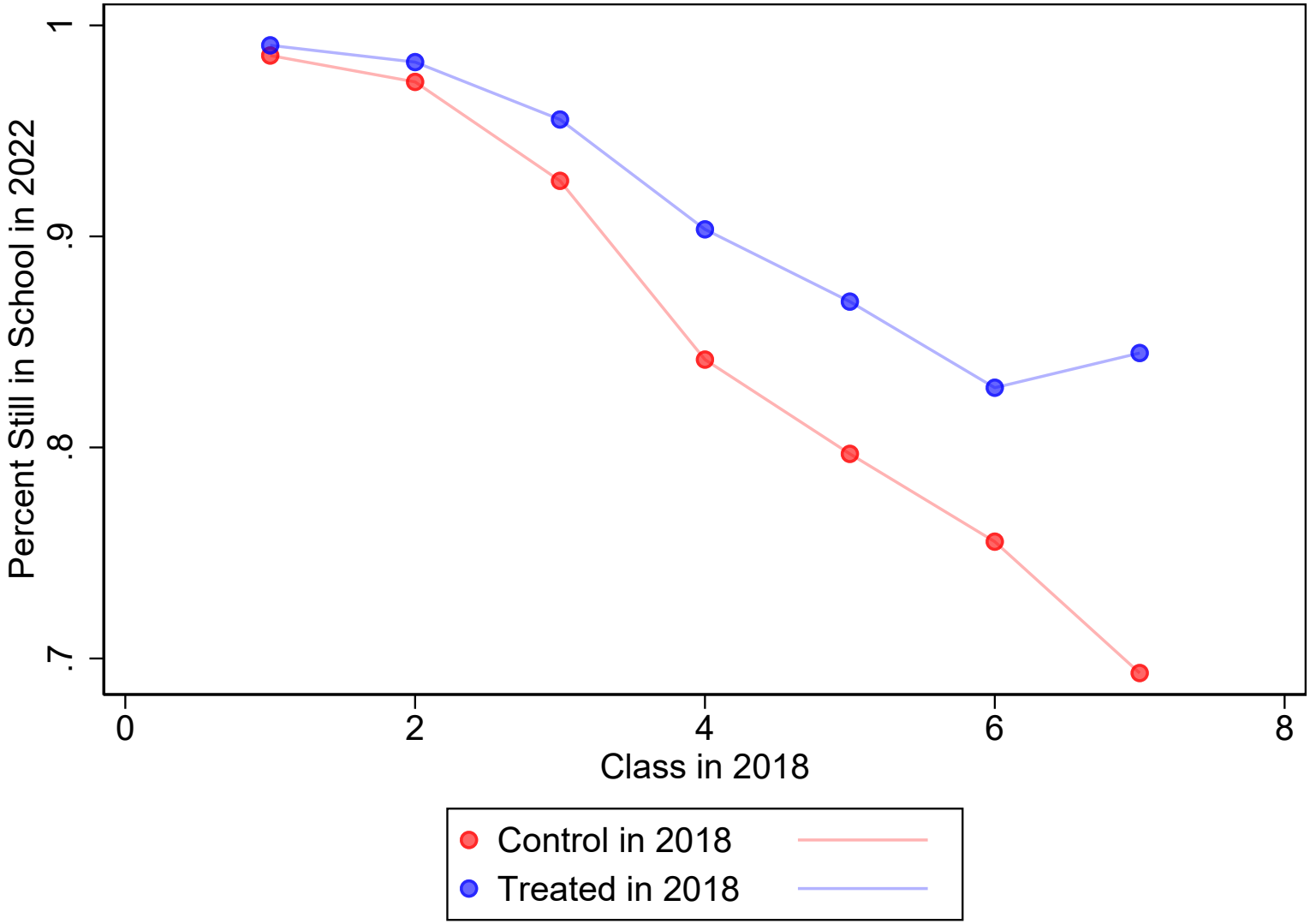


(B) 2019 Distribution of Standardized PLE Score

Source: Data purchased from the Uganda National Examination Bureau and Matched with Treatment Status of Schools.

Headline Results

Effects Persist in the Long Run

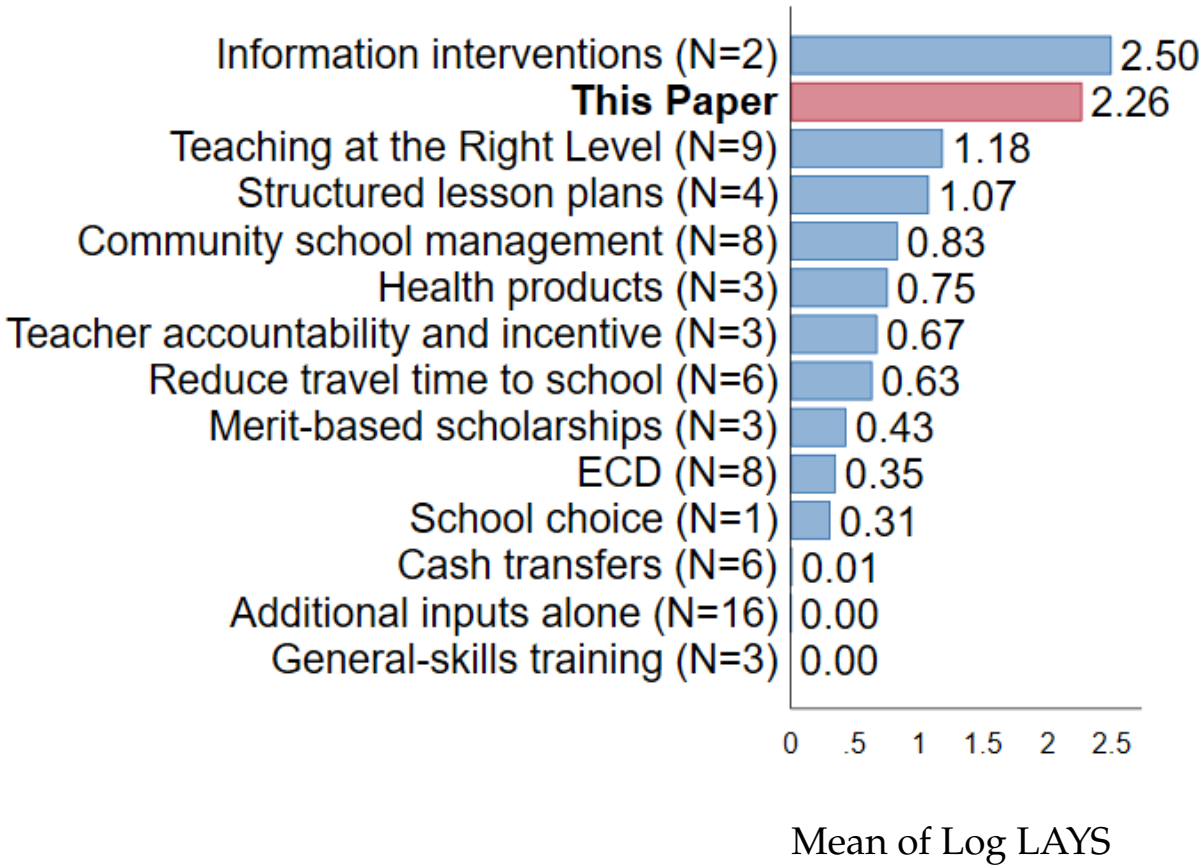


Source: Household Census data collected in 2022.

Cost-Effectiveness

More cost-effective than other approaches studied

- A $100 investment increases high quality years of schooling by close to 10 years.

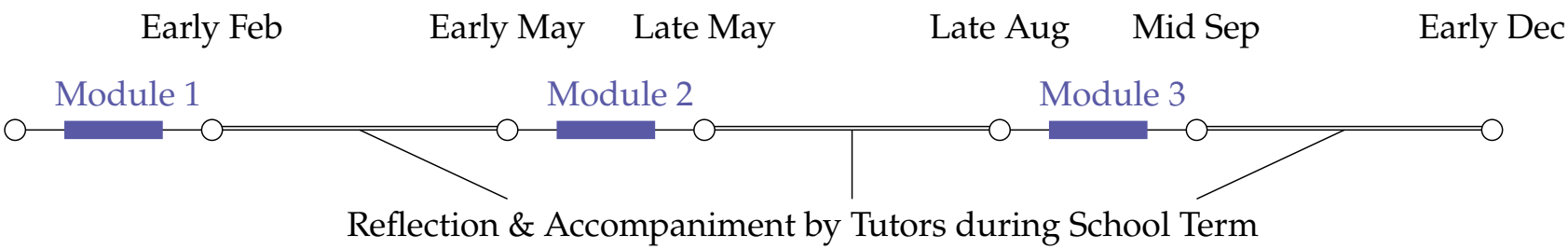


Source: Calculations in Blue from Angrist et. al (2020)

The Intervention

Curriculum — Adapting *PSA* and *DSA*

- FUNDAEC (Colombia) developing curriculum since 1974.
  - Raises capacity to integrate scientific and traditional knowledge through action-research in rural communities.
- 2000's: South-to-South transfer to Africa, including Uganda.
  - 2015, Kimanya Ngeyo Foundation CPD adaptation.
- Two curricula used in the teacher development program:
  - *Preparation for Social Action (PSA)*
  - *Discourse on Social Action (DSA)*
- One cohort of 40 teacher per year over 2 years.

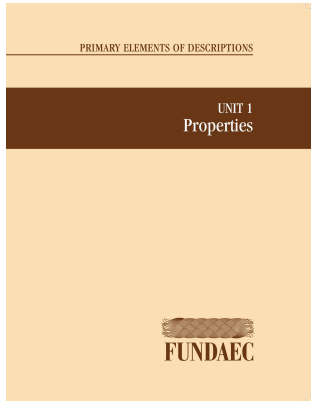


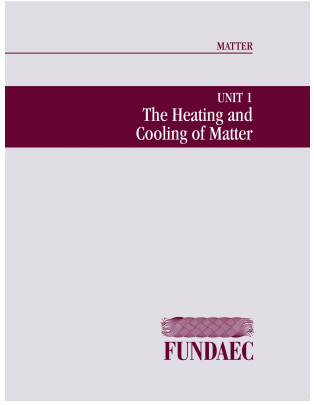
Learning to Learn Teacher Development Program

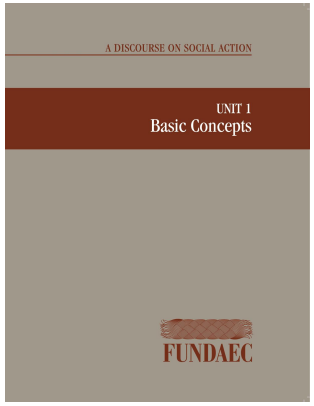
Let's watch a video of teachers and tutors.

Curriculum

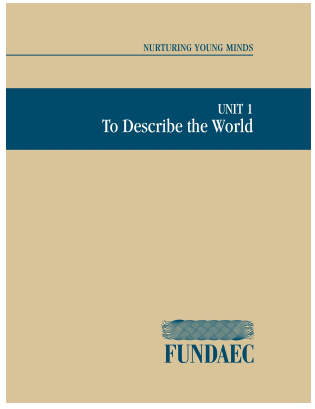
Module 1

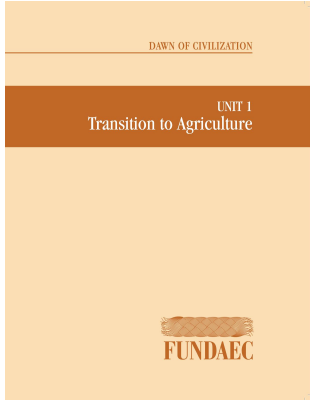


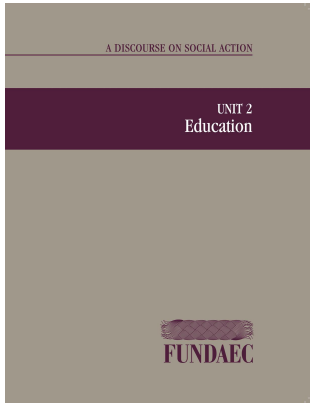




Module 2







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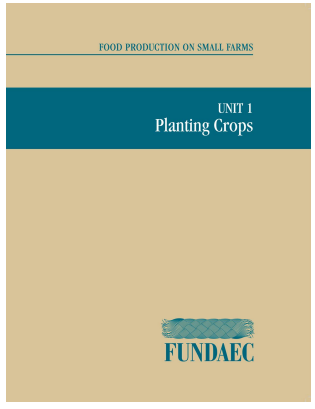

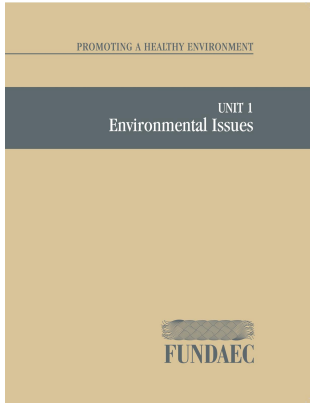

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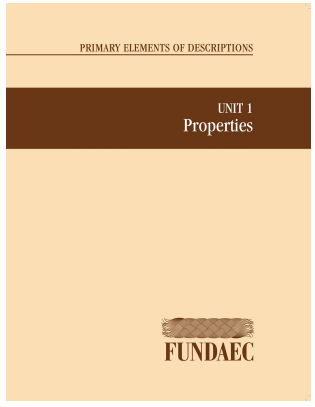

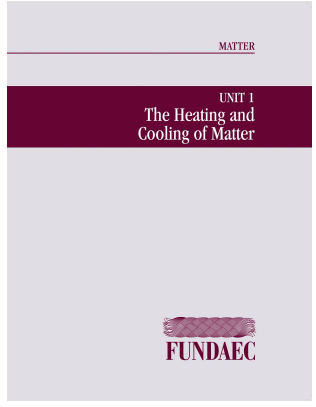

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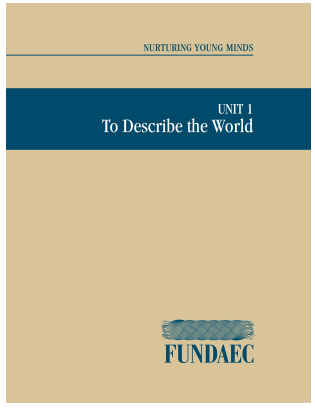

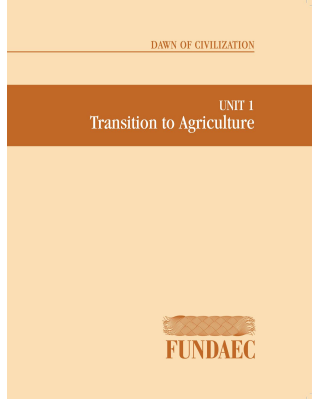

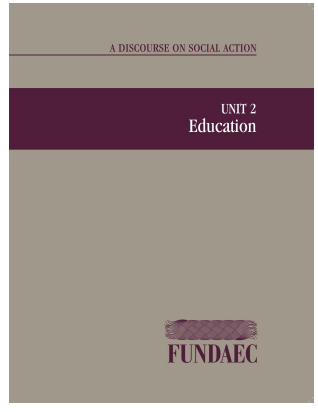

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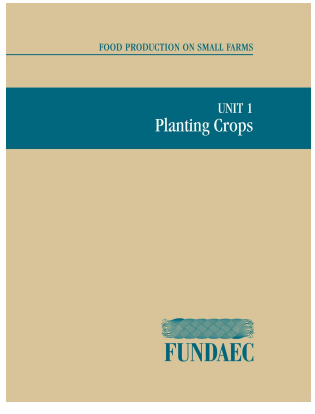

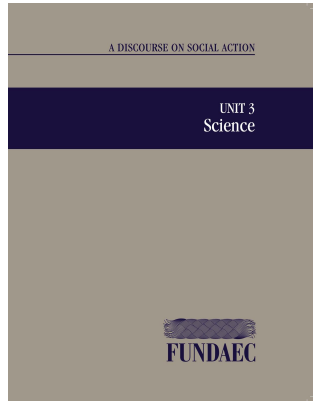

Heating and Cooling of Matter

1 What Is Science?

This is the first unit of a text dedicated to the development of some of the capabilities that enable scientists to study and understand the world around them. We will say more about these capabilities as we advance in the unit. For now, let us begin by thinking about the concept of science itself. What is science? What does it do? What methods do scientists use to study things? How does science help humanity? How can science help the inhabitants of your microregion in particular? Discuss these questions among yourselves and write down some of your ideas.

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Heating and Cooling of Matter

Science studies changes

Science helps us discover and understand the world around us, from the very small things we cannot even see to the biggest thing imaginable, the universe itself with its millions of galaxies, stars, and planets. When we think about the immensity of the universe and all that it contains, it is natural to wonder how scientists go about studying it. To explore this idea, think of what you observe as you go about your daily life. You notice colors, shapes, sizes, scents, and sounds—information about objects that reaches you through your senses. You are also aware of changes that are occurring around you all the time; you may see, for example, a person getting into a car, a cow crossing a road, a mother changing her child's clothes, someone turning on a light, the sun rising, a seed being planted, a log floating down a river, or a person performing a ceremonial dance from beginning to end. At any given time, there are innumerable instances of change taking place in this universe of ours, but you only notice a very tiny fraction of them. Think of examples of change that you have observed today and mention them below.

Heating and Cooling of Matter

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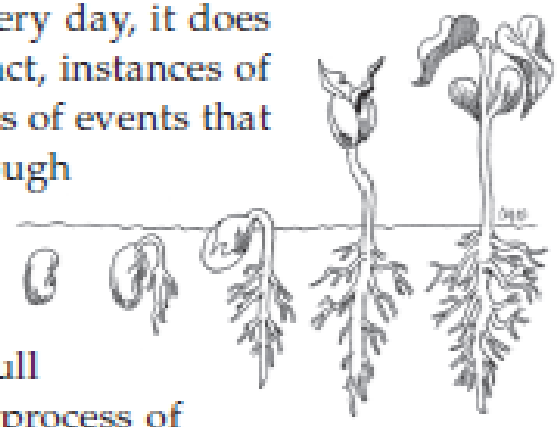
Heating and Cooling of Matter

Changes as Events and Processes



Although we observe countless small changes every day, it does not make sense to study each of them separately. In fact, instances of change do not occur in isolation, but as parts of a series of events that form a *process*. Let us explore the concept of process through an example. A seed is planted, and subsequently, a number of things happen: the seed absorbs water; the seed swells; the seed germinates; roots grow; the stem grows; leaves emerge; and the plant reaches its full height. Each of these is part of what we may call the process of the growth of a plant. Note that the changes we have mentioned are in themselves processes. For example, when the seed takes in water, small amounts of water are absorbed little by little; this continuous series of small changes over time forms a process. Now think of the stem growing. Of course, it does not grow in one instant from a small sprout to a long stem. You know that living things are made up of cells, and the stem grows because the cells that constitute it grow and then divide in two. If we call the division of one cell into two an *event*, can you imagine how many events are occurring one after the other as the stem grows?

Think of a few examples of processes, and write down two or three events that might occur in each.

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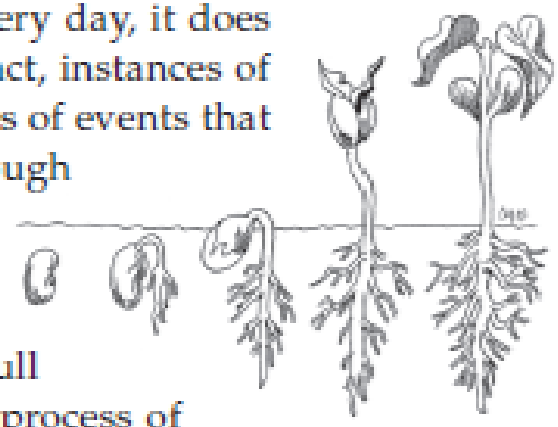
Heating and Cooling of Matter

Changes as Events and Processes



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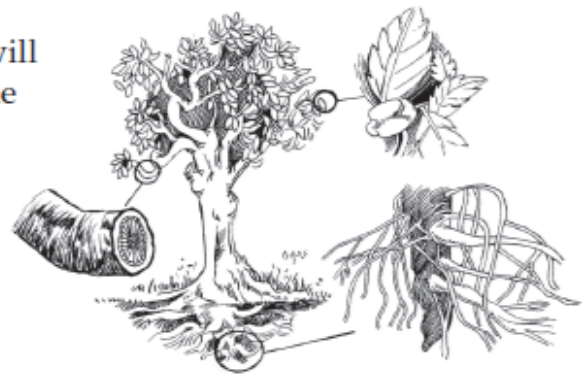
Heating and Cooling of Matter

Questions to learn about processes

When scientists become curious about a process, they begin to come up with questions. To answer some of these questions, they look around them, choose some relatively small part of the universe in which the process occurs, and observe it. We use the word *system* to describe that portion of the universe that has been selected for study. Say, for example, you want to study the process of the growth of a plant. What are some of the questions you need to ask in order to understand this process?

To find answers to your questions, you will have to choose certain systems in which the process, or some aspect of it, can be studied. Clearly, these systems will be either entire plants or a part of one—for instance, the root, the stem, or the leaf. Give a few examples of systems you would need to observe in order to answer the questions you have identified.



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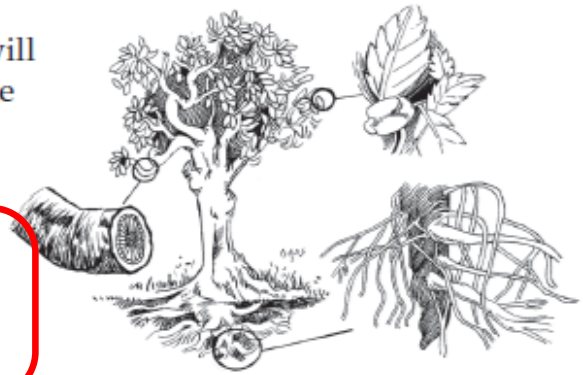

Heating and Cooling of Matter

- In the rest of the unit, participants explore basic scientific concepts as applied to a single process: The Heating and Cooling of Matter
  - Observation
  - Temperature
  - Heat
  - Force
  - Pressure
  - Variables that Determine the State of a Gas
  - Change of Phase
  - Particles
  - Models and Theories

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Heating and Cooling of Matter

Temperature

3 Temperature

The statements we made in the previous lesson were all qualitative. For example, we referred to objects as hot, cold, hotter, or colder, and tried to describe what occurs when they touch or come close to each other. If we limit ourselves to such qualitative observation statements, we will not get very far in our understanding of the process we have chosen to study. To advance, we must first define with some precision what we mean by the words *hot* and *cold*. The concept that helps us achieve this goal is *temperature*, a quantity that can be measured and used in quantitative statements about the process of the heating and cooling of matter.

We may begin our discussion of temperature by having you each perform a simple experiment. Fill three bowls with water of different temperatures—one bowl with cold water, one with warm water, and one with relatively hot water. Put one hand into the bowl of hot water and the other into the cold water, and leave them there for thirty seconds. Then transfer both hands at the same time to the third bowl. What do you observe? Does the hand that was in the hot water feel hot or cold? How does the hand from the cold water feel?

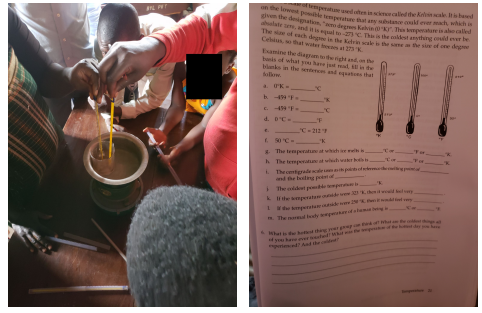
From this simple observation we can conclude that our sense of hot and cold is not that reliable. How do we really know, then, how hot something is? The answer, of course, is that we have to learn to measure temperature. Write a few words on what you know about the concept of temperature and how to measure it.

Heating and Cooling of Matter

Temperature

4. Find a small plot of earth and use a suitable thermometer to record the temperature of the soil at various depths. You should take readings at each depth at different times of day: some in the morning, some in the afternoon, and some in the evening. At each of these times, you should also measure the air temperature. Write down your results in the table below and then answer the questions that follow.

Depth	Time of Day	Soil Temperature Near the Surface	Air Temperature



- Does the temperature of soil increase or decrease with depth?
- At approximately what time of day is the surface temperature of the soil the greatest?
- By how much does the air temperature differ from the surface temperature of the soil in the morning? At midday?
- How does air temperature affect the temperature of the soil at, say, a depth of 20 cm?

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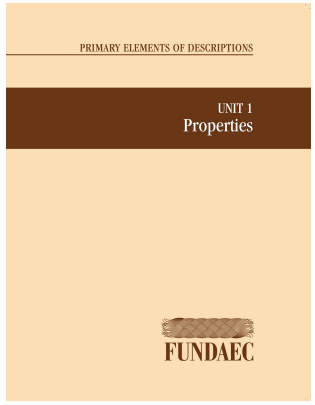
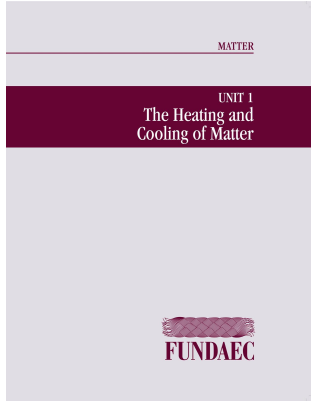
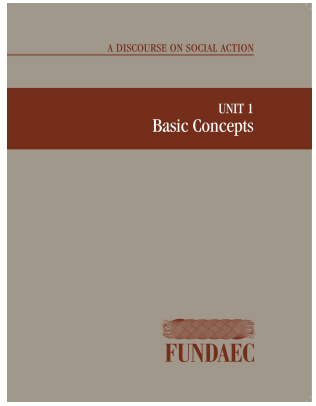
Curriculum

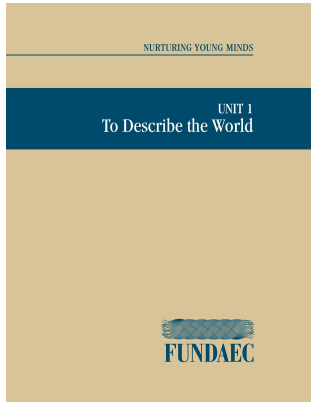
Module 1

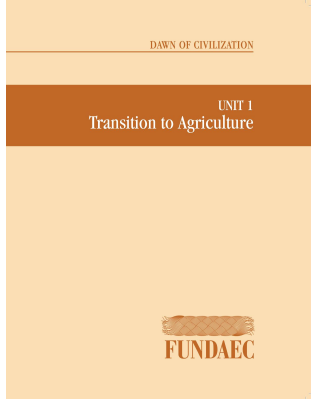


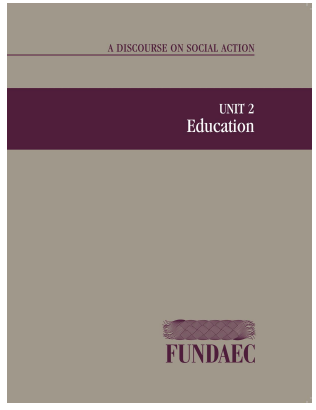




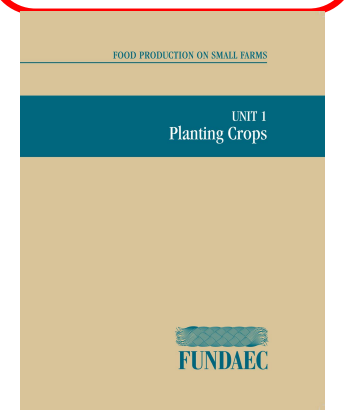
Module 2

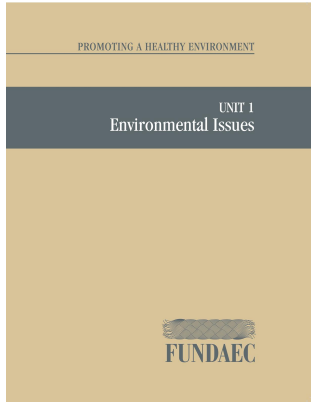






Module 3





To Describe the World

Reflections on the Condition of Children in Today's World

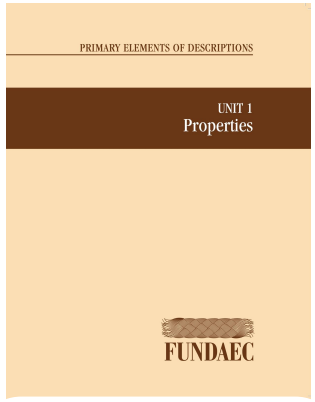
Children are the greatest treasure that society possesses; it is in them that we find the promise of the future. Why is it then that in today's world so many children face such cruel fates? Why should millions and millions of children, whether living in conditions of wealth or in poverty, find themselves alienated from their parents and their communities? How can children be recruited as soldiers, exploited as laborers, sold into virtual slavery or forced into prostitution? The picture, of course, is not so discouraging everywhere. There are also millions of children who enjoy the warmth of loving families, teachers, and friends. Yet there is no question that an increasing number of children throughout the world need to be protected from dangers that no child should have to face.

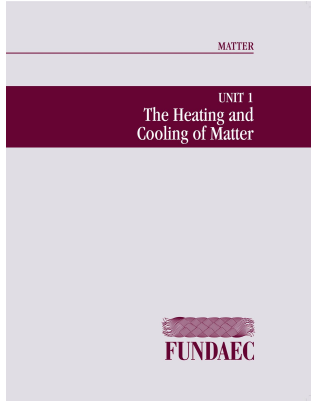
As you begin to work in an area of service that has to do with the education of children, you need to reflect a great deal on the conditions of children in your microregion, particularly those in your own communities. What does the future have in store for them? What kinds of opportunities will and will not be open to them? What are the challenges they will be required to face in their lifetime? Are they being prepared to live fruitful lives as youth and adults and to contribute to the progress of the community? What importance is given to their education? These are only a few of the questions you need to consider as you try to formulate an image of the conditions in which the children in your communities exist. Maintaining such an image in mind will assist you greatly as you think of ways to serve them throughout the years.

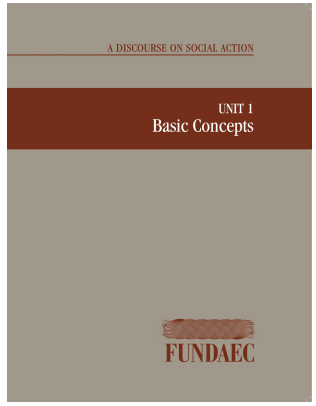
In this connection, you may find it useful on occasion to carry out certain activities based on your reflections on the conditions of children in your communities. There is a great deal of wisdom among every people as to how children should be nurtured. Unfortunately, there are also practices that cause harm to children as they grow up. As a first activity of this unit, then, you are each encouraged to identify a number of elderly members of the community who are also grandparents and ask them to share with you

Curriculum

Module 1







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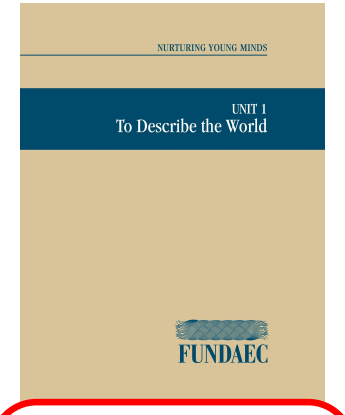

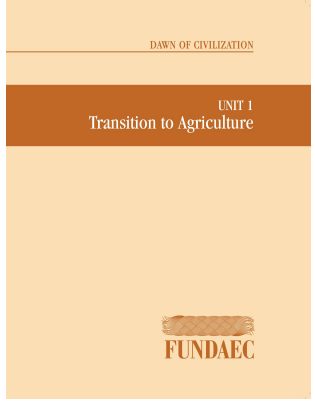

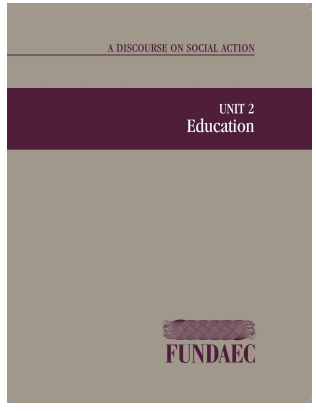

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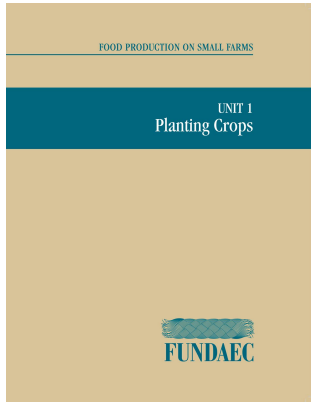
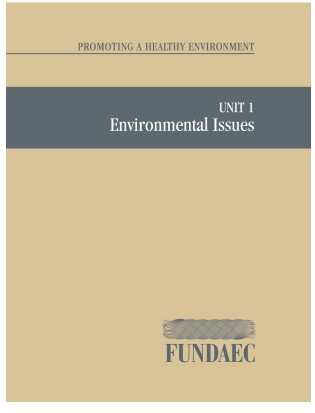




Planting Crops

2 Factors That Determine Crop Production

For Roberto there is no better place in the world than his grandmother's farm. This is where he was born and raised. When he was twelve, his family moved to a nearby town where Roberto had the opportunity to attend secondary school. He often returned during his holidays to help out on the farm. After graduating last year, he accepted his grandmother's invitation to move back to the farm and help her run it. Ever since he got back, he has been wondering why so many farmers in his area keep getting low yields from their fields. Working on the farm has created in him a desire to understand more about crop production. One day, while visiting his friend Miguel, who comes home every weekend from university, Roberto decides to raise the question of the poor harvests.

Roberto: Miguel, you are studying agriculture; I have been meaning to ask you something. You probably know that many of the farmers in our village have had bad luck again this year. Our yields were low, and some crops failed altogether. My grandmother says things seem to be getting worse. Do you have any idea why this is happening?

Miguel: You know, Roberto, some people think that the size of their harvest is a question of luck, so they don't invest much in their fields. They plant some seeds, do a few necessary chores, and hope they will be lucky. But you and I both know how hard you have to work between the planting and the harvest.

Roberto: Sure, you have to fertilize, weed, irrigate and protect your crops from harmful insects and disease.

Miguel: Right. You have to do all these things if you want to get a good yield. Living things need certain conditions in order to develop. But of course you have to start with good seed. Basically there are two kinds of factors that determine the size of the harvest: *genetic* factors and *environmental* factors.

Miguel finds a pen and paper, draws a diagram, and hands it to Roberto.

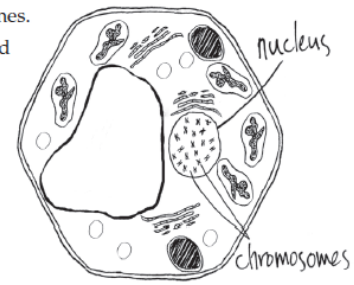
Roberto looks at the diagram: What are "genetic factors"?

Miguel: Well, let's take an example. Suppose you planted two different varieties of a bean in good soil on two halves of the same field. You provide the same care for both, but one half of the field produces a lot more than the other. Which plot would you take seed from for the next year?

Roberto: The one with the higher yield, of course. But what does that have to do with "genetic factors"?

Miguel: Well, when we talk about genetic factors we are referring to those characteristics of plants or animals that are passed from one generation to the next. The reason they are called "genetic" is because they are determined by the genes the organism inherits from its parents. You take your seed from those plants that have produced more because they have better genes.

Miguel takes up the paper and pen again and draws another diagram. As he draws he explains.



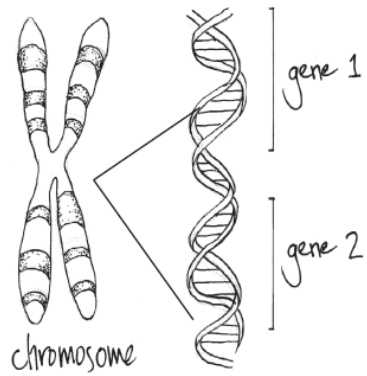
Miguel: Every living thing is made of cells. This is a plant cell. Inside the cell there is a part called the *nucleus*, and inside the nucleus there are small structures called *chromosomes*. Different plants have different numbers of chromosomes; maize has 20 and wheat has 28.

He hands the drawing to Roberto, who inspects it.

Roberto: And what do cells and chromosomes have to do with inheritance?

Miguel: Okay, let's look more closely at a chromosome.

He begins to draw again.



Miguel: If we magnify a chromosome it looks something like a funny "H". If we could get even closer, we would see that it is made up of tiny strands coiled around and around. Sections of these strands are known as *genes*.

Roberto takes the drawing and studies it while Miguel continues talking.

Miguel: The genes determine the traits that the organism will have. In plants, for example, they determine things like the number and shape of the leaves, the height of the stem and the size of the seeds. How much a certain variety will yield depends on characteristics like these.

PSA-Planting Crops

Crop: _____

Farmer's name:		
Date	**Task**	**Purpose**

Crop: _____

Farmer	Tasks	Times during the cycle in which they are performed	Reasons
1	Preparing the land		
	Planting		
	Fertilizing		
	Weeding		
	Managing pests and disease		
	Harvesting		
2			

Investigation

In small groups of three or four, you are asked to carry out some research on the practices followed by farmers in your microregion, if you live in a rural area, in relation to the crop most commonly grown there. Depending on your circumstances, this might be maize, beans, potatoes, wheat, or another crop. Each of you should talk to one farmer and discuss a few questions in order to learn what he or she does during each cycle of growth, that is, from the time of sowing to harvest. In the table on the next page, record the approximate date of each task performed and the reasons the farmer gives for doing it.

Now, if you live in a city or town, you have a few options. Your group could visit a near-by farming community and you could carry out the exercise described above. In the city you may be able to find people who use plots for growing vegetables and could interview them about their farming practices. If neither of these are possible you can always find gardeners, for example those who grow flowers and bushes around their houses, and see whether they would be willing to respond to your questions.

Next, the members of each small group should combine the information they have gathered and prepare a table such as the one on page 16. Once all of your groups have compiled the information you have gathered, analyze it together using the following questions as a guide:

1. How many of the farmers you interviewed prepare the land before planting? What are their reasons for doing so?

2. At what point(s) during the year do most of them prefer to plant? Why?

3. How many, of all the farmers you interviewed, fertilize their crops? At what time during the cycle do they do so? Why? Did the others give any reason for not doing so? What was it?

4. How many usually weed their fields? How many times during the cycle do they do so? What advantages do they see in this practice?

- After introducing additional factors through a grandmother character
- "Examine those tables again. Discuss among yourselves the social, economic, or cultural factors that might affect production on small farms and that influence farmers' choice."

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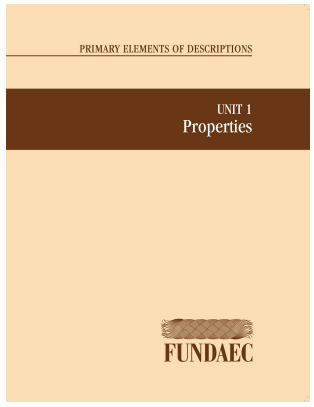
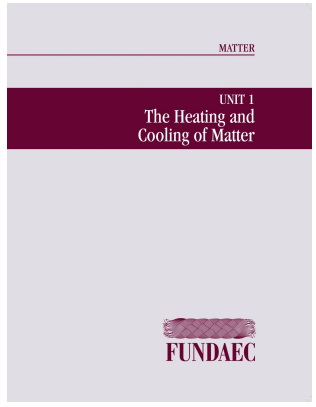
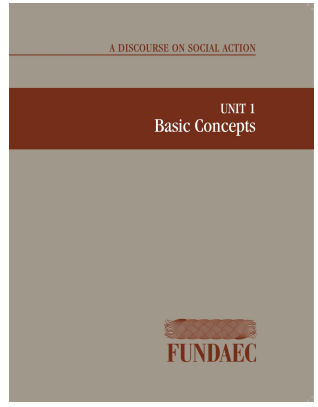
Curriculum — *DSA*

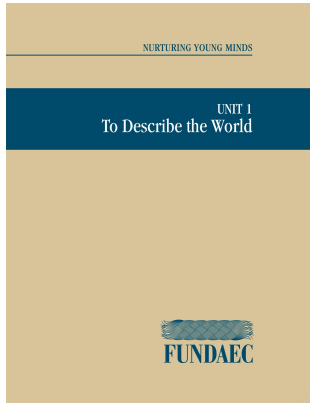
Module 1

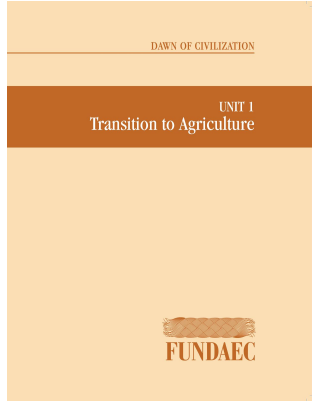


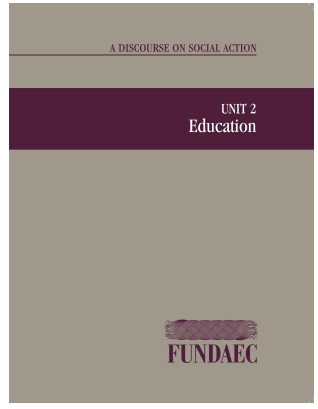




Module 2







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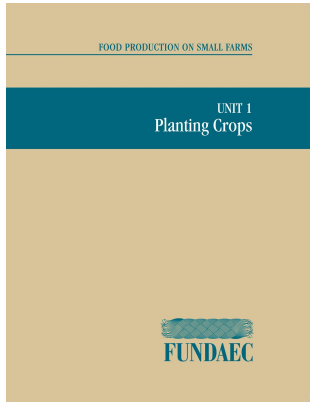

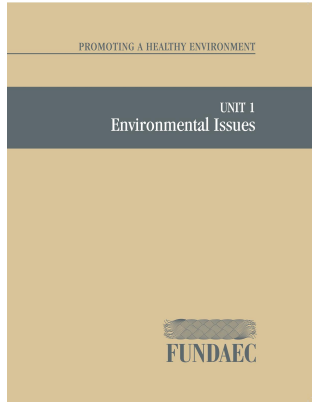

Discourse on Social Action — Education

3 Concepts and Information

The previous reading helped you think about categories of objects of understanding and their implications for the educational process you are pursuing. In doing so, you may have realized that there is a distinction between achieving understanding and assimilating information. The following reading explores this idea in some detail.

The most fundamental element of the universe of objects of understanding is a mental entity we call a *concept*. Not every object of understanding is, of course, a concept, but even those that are not have concepts closely associated with them. In physics, for example, there are numerous concepts, such as the concepts of mass, force, and gravity, which by themselves constitute objects of understanding. In ecology we deal with concepts such as ecosystem, ecological balance, and interconnectedness. Economists use concepts such as economic growth and the production function. In religious discourse one reflects on the concept of God as an unknowable Essence and the concept of Divine Revelation. These are all examples of concepts that are themselves objects of understanding. When we say we wish to understand someone's feelings, however, our object of understanding is not a concept. Yet, associated with any feeling is a corresponding concept, without which we cannot achieve the desired understanding. Desperation, for example, is a feeling. But there is also the concept of despair which we need to grasp if we are to understand the feelings of someone who is desperate.

A prevalent shortcoming of today's educational systems is that the distinction between assimilating information and understanding concepts has become blurred. This is probably one of the greatest causes of the superficiality that is afflicting education everywhere. To clarify the distinction between information and concepts let us consider an example.

Suppose you wish to help a group of friends, all secondary school students, understand Newton's law of gravitation. To begin, you would presumably make a statement such as this:

> Every particle in the universe attracts every other particle through a special force called the *gravitational force*. Newton discovered that the magnitude of this force is proportional to the mass of each particle and

Teacher Change

A Non-Linear Process Fueled by Reflection on Experience & Action

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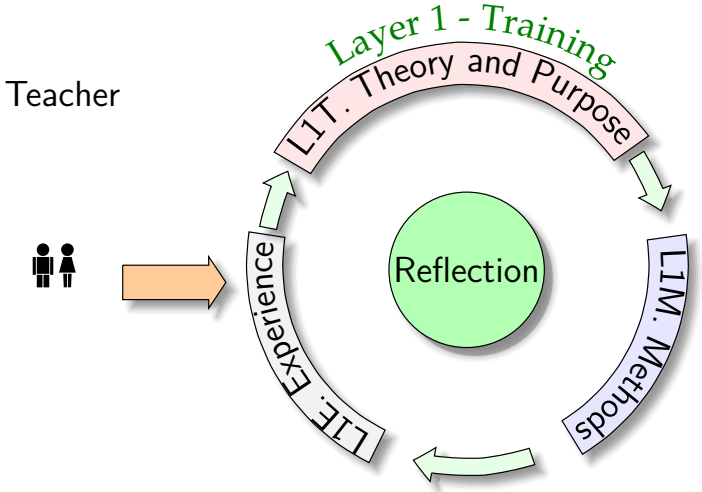
- Consistent with Darling-Hammond (2017) and Clarke & Hollingsworth (2002).



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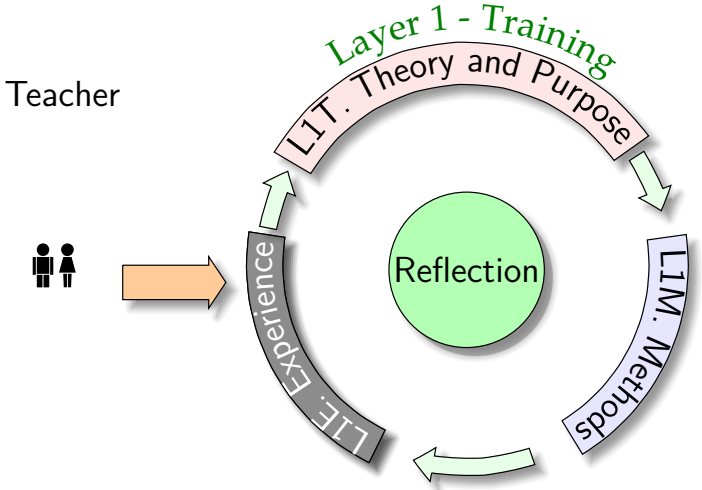

"One thing I loved about it, which my colleagues didn't like at the beginning, is, there is no direct solution. You look for your own solutions. So as you discuss, you discover, you create your own solutions."

"...They design it in such a way that they will not allow one person to monopolize the discussion, sort of academic bullying others. They organize it in such a way that each is given an opportunity... eventually by the end of the training you will have developed that confidence and comfort."

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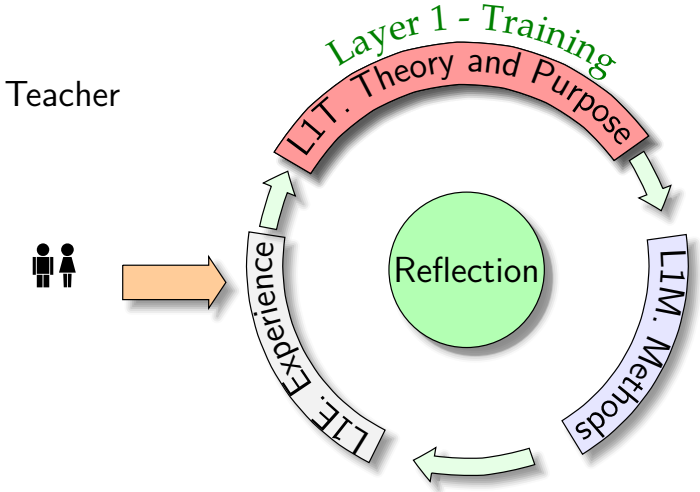

"How does this program help... think more deeply about the role that education has in their individual lives, but also the lives of the community? [W]hen I look at the purpose of the program... it really raises this quest for one to think about the way their own capacity is growing."

"I would describe it as a program which would make someone, first of all, understand the world, understand the responsibilities that he has in the world. For example, look at pollution. We are the people who are supposed to teach the learners. These people in the world, they are polluting but they don't even know what they are doing. When someone looks at this world, he thinks it is a big thing. He doesn't know that to save this world, it begins with you, and it begins with me. They think somebody else will do it. So when you go through this training, it gives you now the responsibility of, first of all, saving your life, the world and saving humanity. It puts it in your hands."

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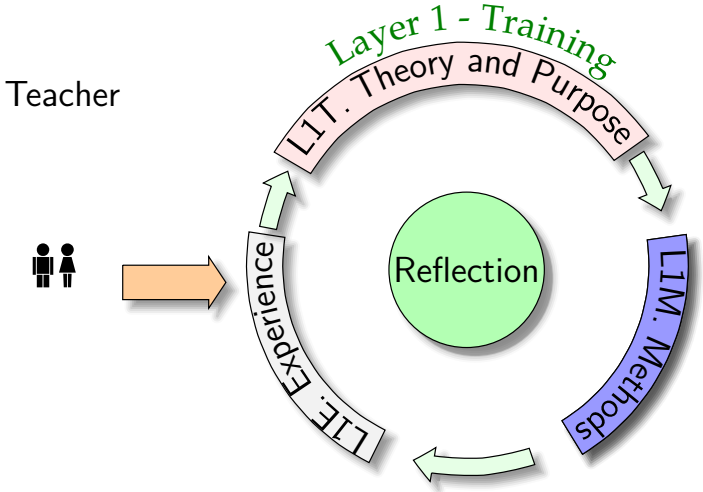

"There was no leader, there was no that, 'so and so is superior.' We were all at the same level and yearning to learn from one another. You see our teaching session this way, before, a learner looks at a teacher as the only source of knowledge. . . . But now here Kimanya-Ngeyo said, when you bring an answer then the tutor will say, 'I also don't know, what are our friends saying?' Then the other one says 'that is a good idea.' . . . So, that one paved way for everyone to be creative and generating, researching on his own, helping others also to research."

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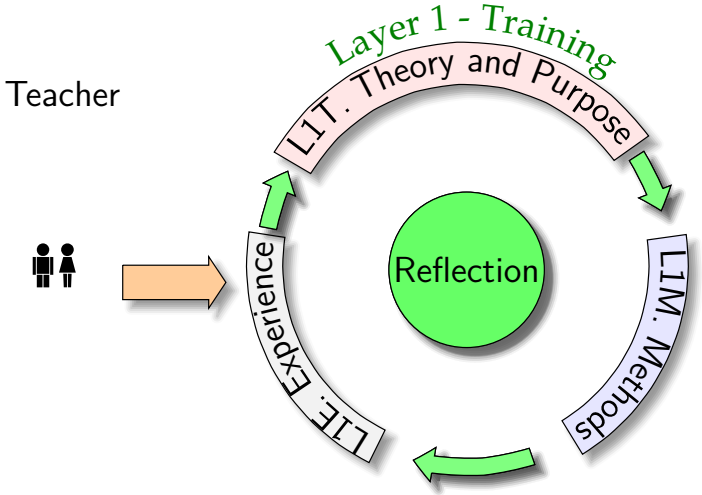

"in my class there are certain systems I learned from Kimanya-Ngeyo. One of them is the reflection part of it. That every morning, every lesson, we have to reflect on what you did in the previous lesson, before you go on to another lesson. Which helps me to evaluate my learners, to see whether they got the concepts properly or I need to re-do the lesson..."

Metacognitive Reflection: How has the learning environment facilitated your learning?

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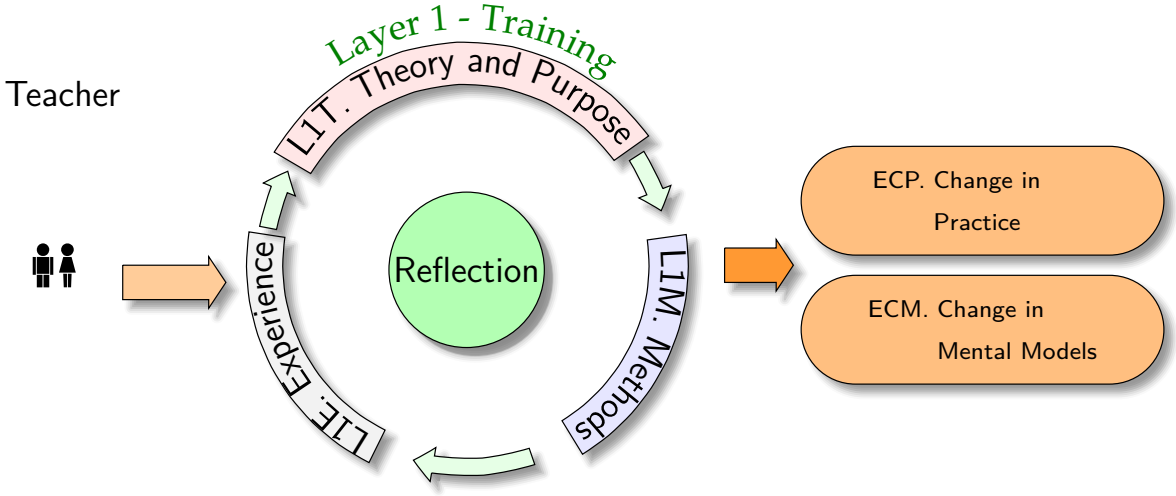

"I think this knowledge we get here is not only in class, it is also in society. It will even help me outside because it makes you develop a research minded approach to life."

"Take for instance looking at the methods of teaching, some of us were like the way our teachers taught us, it is how maybe we should also teach the learners... but when I was there, at least I, my mindset completely changed for sure. And I was like you know, put the learners on the fore front, let them generate their own knowledge, let them experience it such that the contributions may be the ones you have to get and then you pick on and see what you what to bring in."

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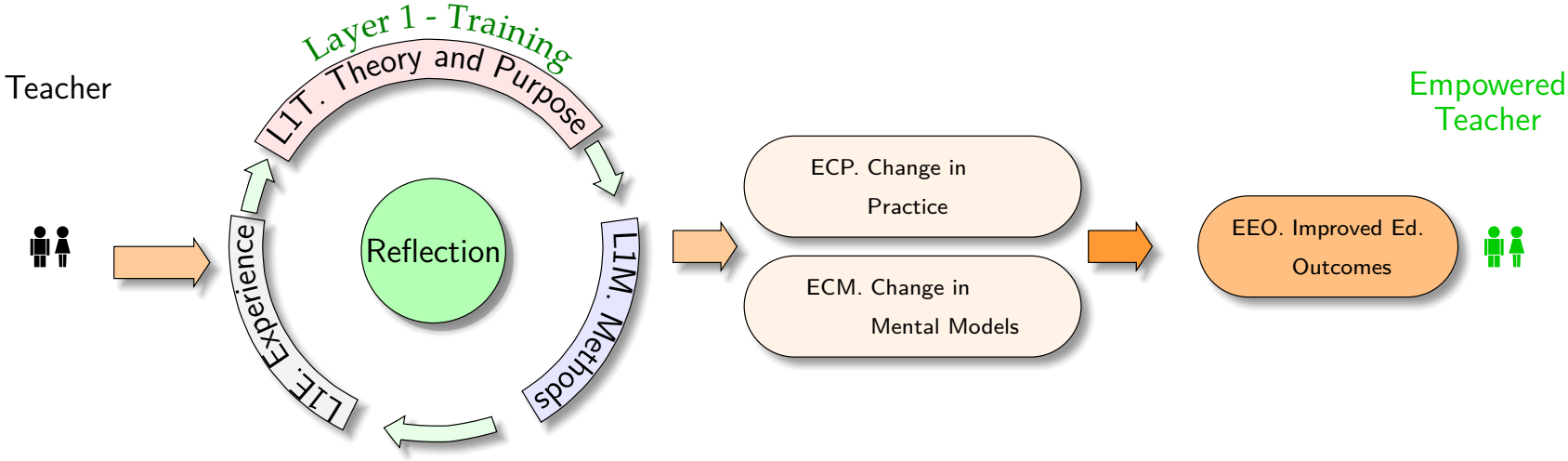


Let's go back to the Randomized Controlled Trial to see how the empowered teacher further enhances student outcomes.

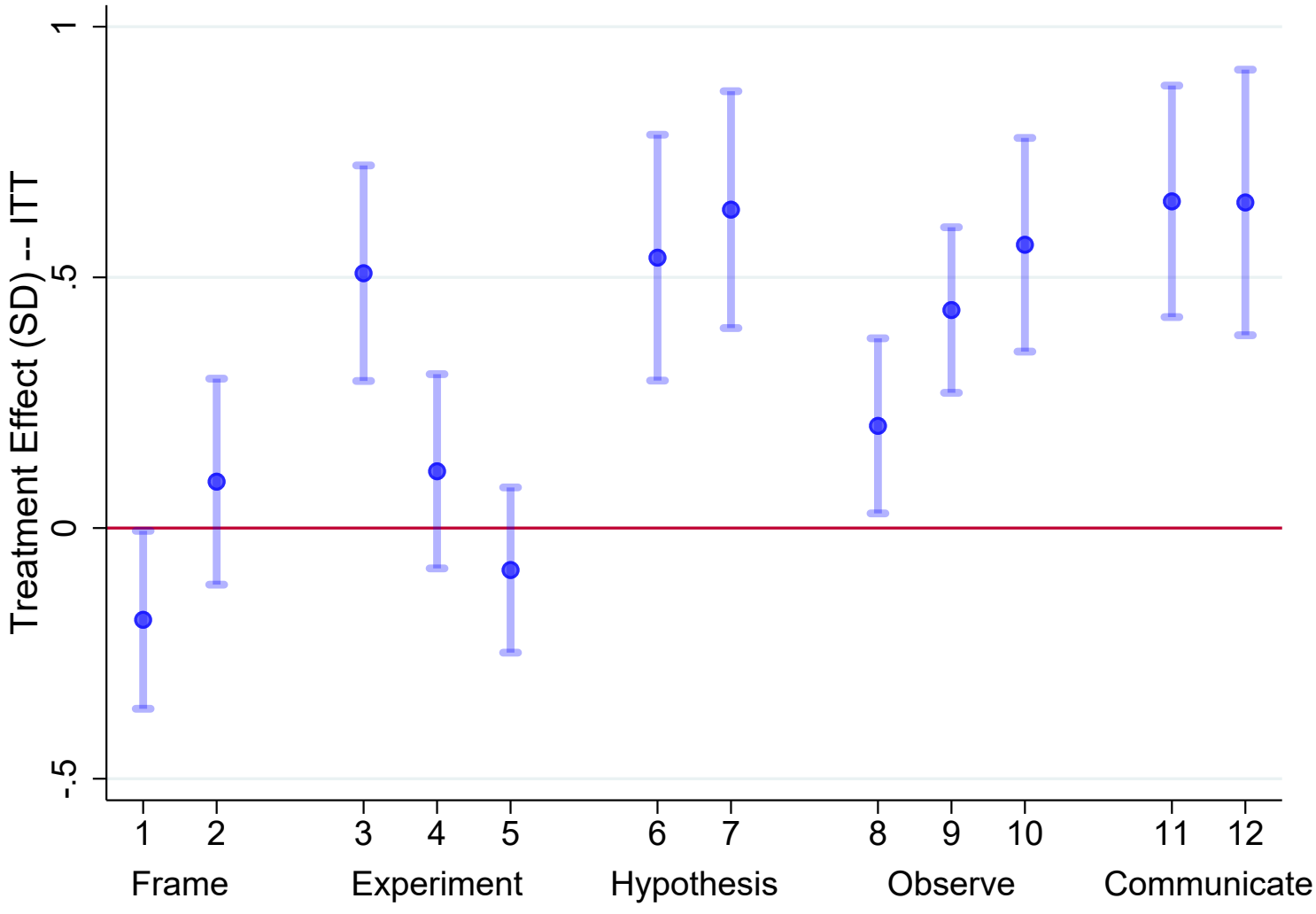
Measuring Student Scientific Competencies

Judge's Rubrik: One-to-One Map with NCDC Competencies

- National Curriculum Development Center (NCDC) P6 Competencies
- 12 Measures Across Five Categories:
    1. Framing the problem,
    2. Designing the Experiment,
    3. Articulating and Testing a Hypothesis
    4. Measuring Outcomes
    5. Articulating Independently.
- Example (Category 3): "The students had a clearly articulated hypothesis."
    1. I had no idea what hypothesis the students were testing.
    5. The students mentioned a hypothesis, but it was not clear.
    10. The students mentioned a very clear hypothesis.

Science Show Result

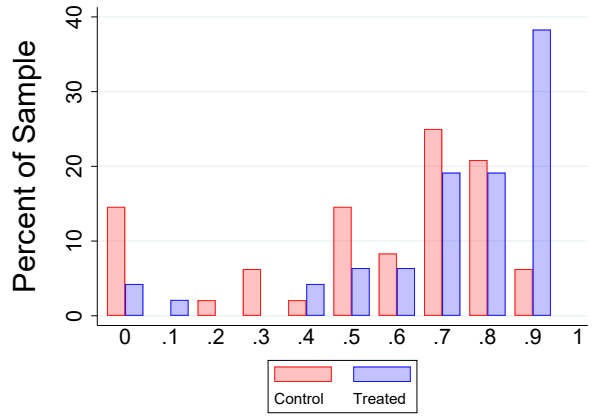
Competency Categories



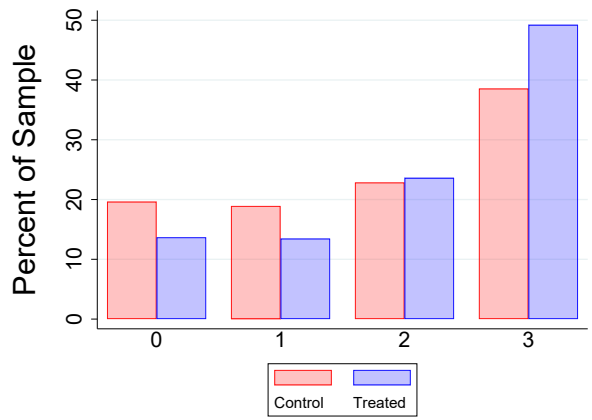
Teacher as Researcher

Results

Outcome Variable:	Knowledge of Student	Teacher Network
Treatment (*ITT*)	0.10***	0.27**
	(0.03)	(0.11)
H_0 : *ITT* = 0		
p value	[0.00]±±	[0.02]±±
RI p value	[0.06]±	[0.14]
BH Critical p value (5%)	[0.05]	[0.05]
Pair FE	Yes	Yes
Enum FE	Yes	No
Grade FE	No	No
Source of Data	Stud. + Teach. Survey	Teacher Network
Unit of Observation	P6 Teachers	Teacher Dyads
Range of Outcome Variable	[0,1]	{0,1,2,3}
Control School Mean	0.62	1.80
Clusters	29	29
Observations	95	1,466
Estimator	Tobit	OLS



Knowledge of Student



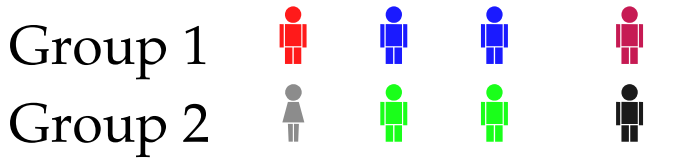
Teacher Learning Network

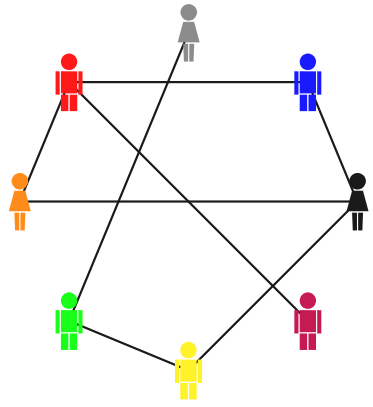
Additional Results

In Paper

- Student Learning
  - Effects on higher order learning (critical thinking, etc.)
  - Improved student inquisitiveness and engagement
  - Long-Run Improvements
    - Extensive Margin: higher enrollment in secondary
    - Intensive Margin: higher performance in secondary
    - Reduction in gender enrollment gap
- Teachers
  - Active learning pedagogy — e.g., more time spent on school garden plots and outside of school settings.
  - Teachers are more sympathetic and less adversarial
  - Teachers are more inquisitive
  - Teachers are more inclined towards attitudes of gender-equality.
  - Teachers use language more precisely.

"Learning to Learn" in Secondary Schools



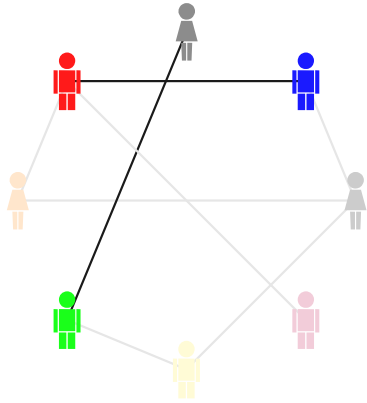


A Network of Peer Teacher Collaborators in a School

Research Question: For which **group of teachers** does the training have the largest effect?

"Learning to Learn" in Secondary Schools

	Link	No-Link
Group 1		
Group 2		



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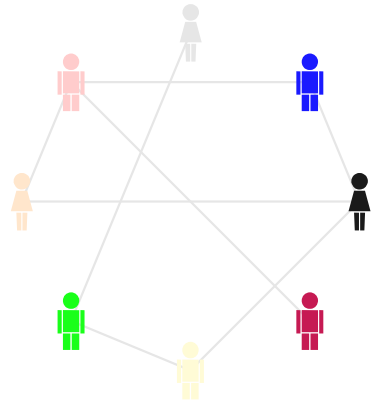

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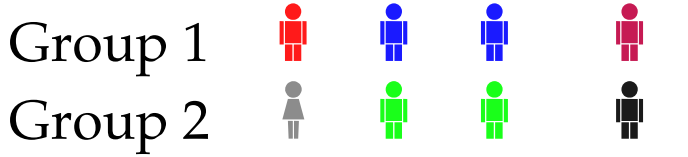

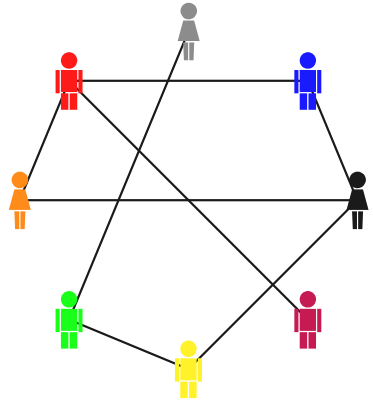

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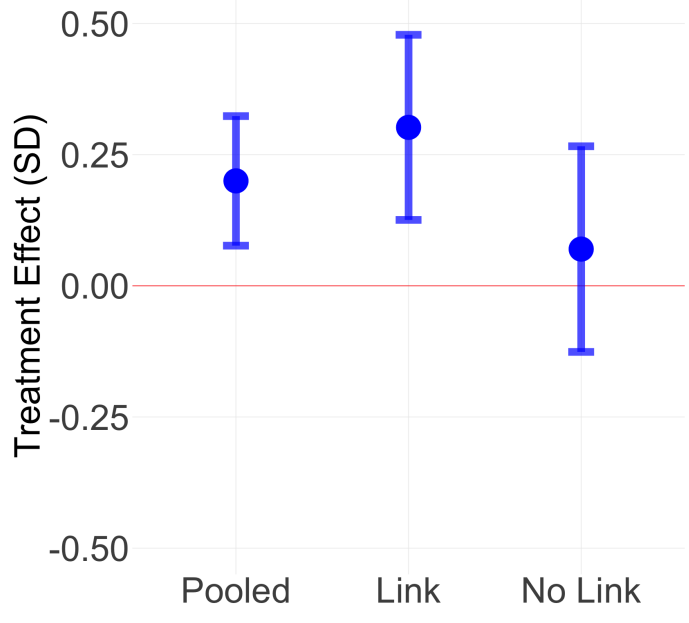
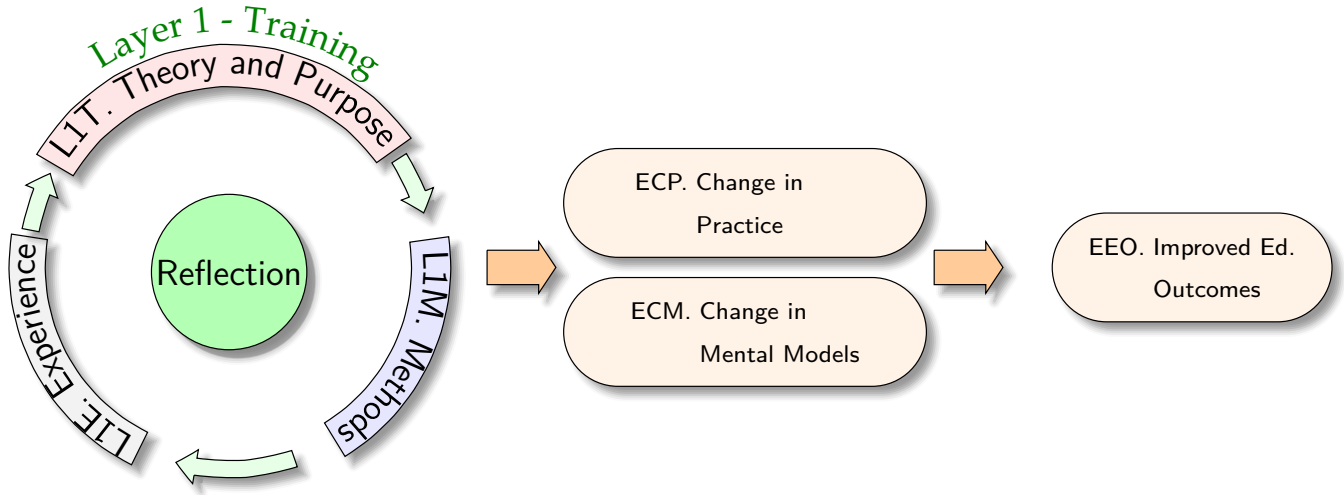


The Problem of Scale

- Can we devise arrangements that produce "empowered teachers" at scale?
- Consider existing programs that scale successfully →
- Replication and adoption of successful **techniques**
  - TARL: technique placing students in groups.
  - "Structured Pedagogy" extreme: tell teachers what to say.



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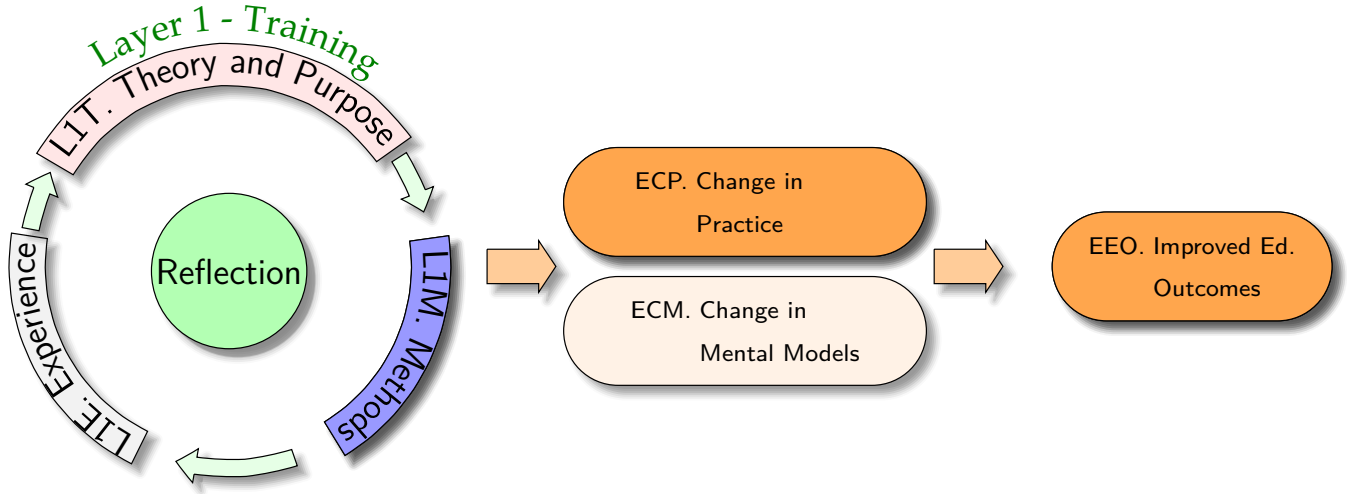
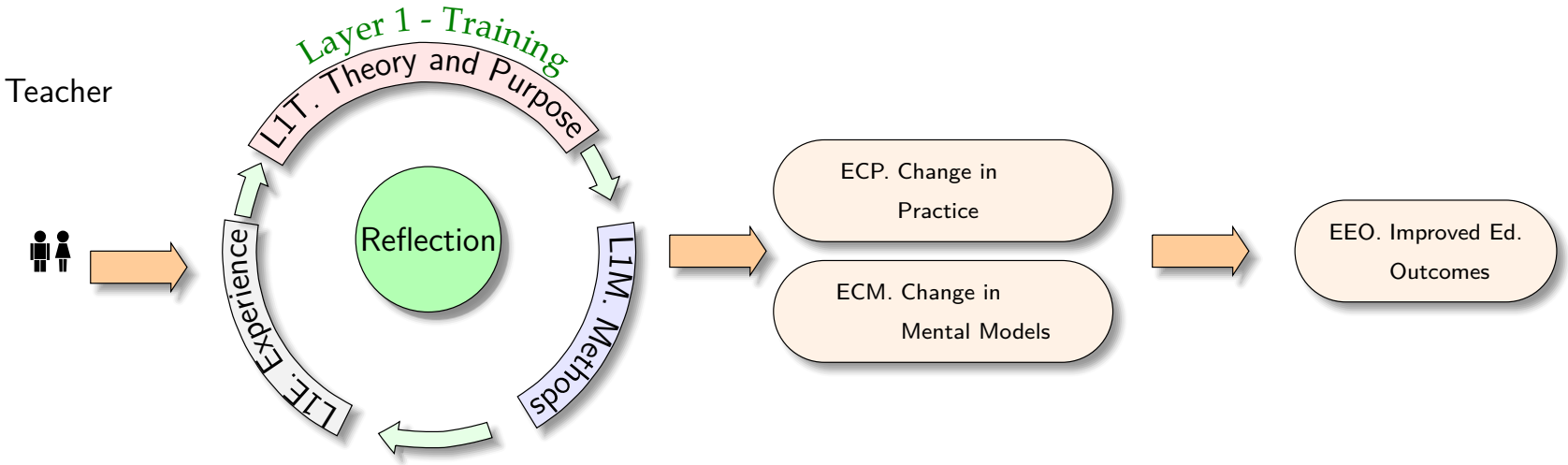


Step 1: Action-Research Learning

From Change in Technique to Sustainable Continuous Professional Development



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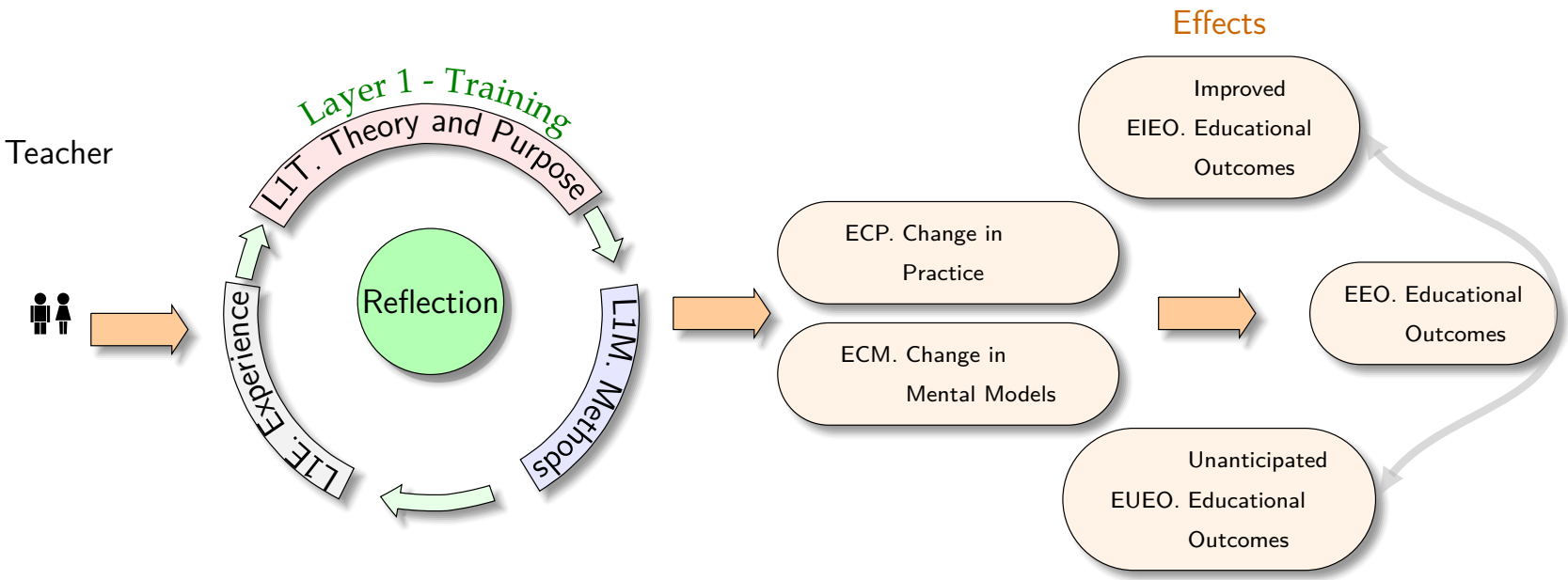

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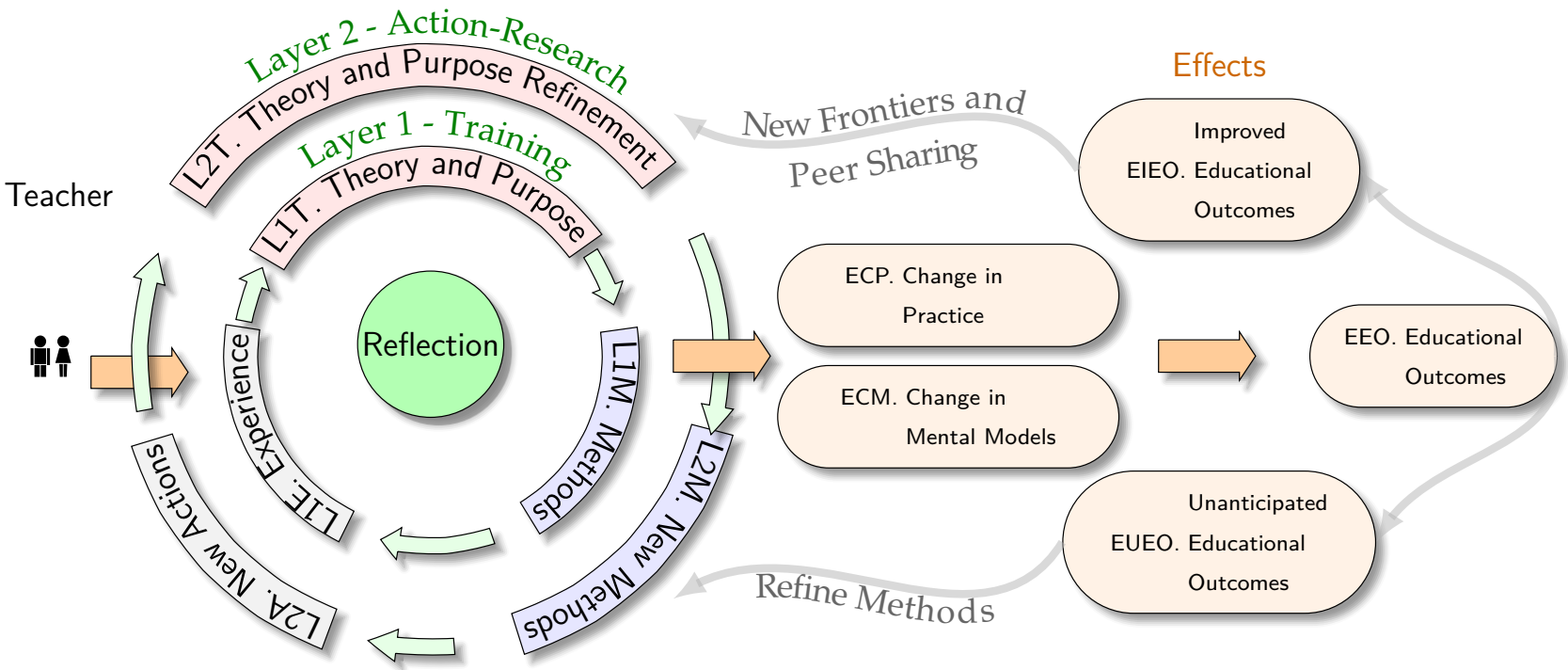
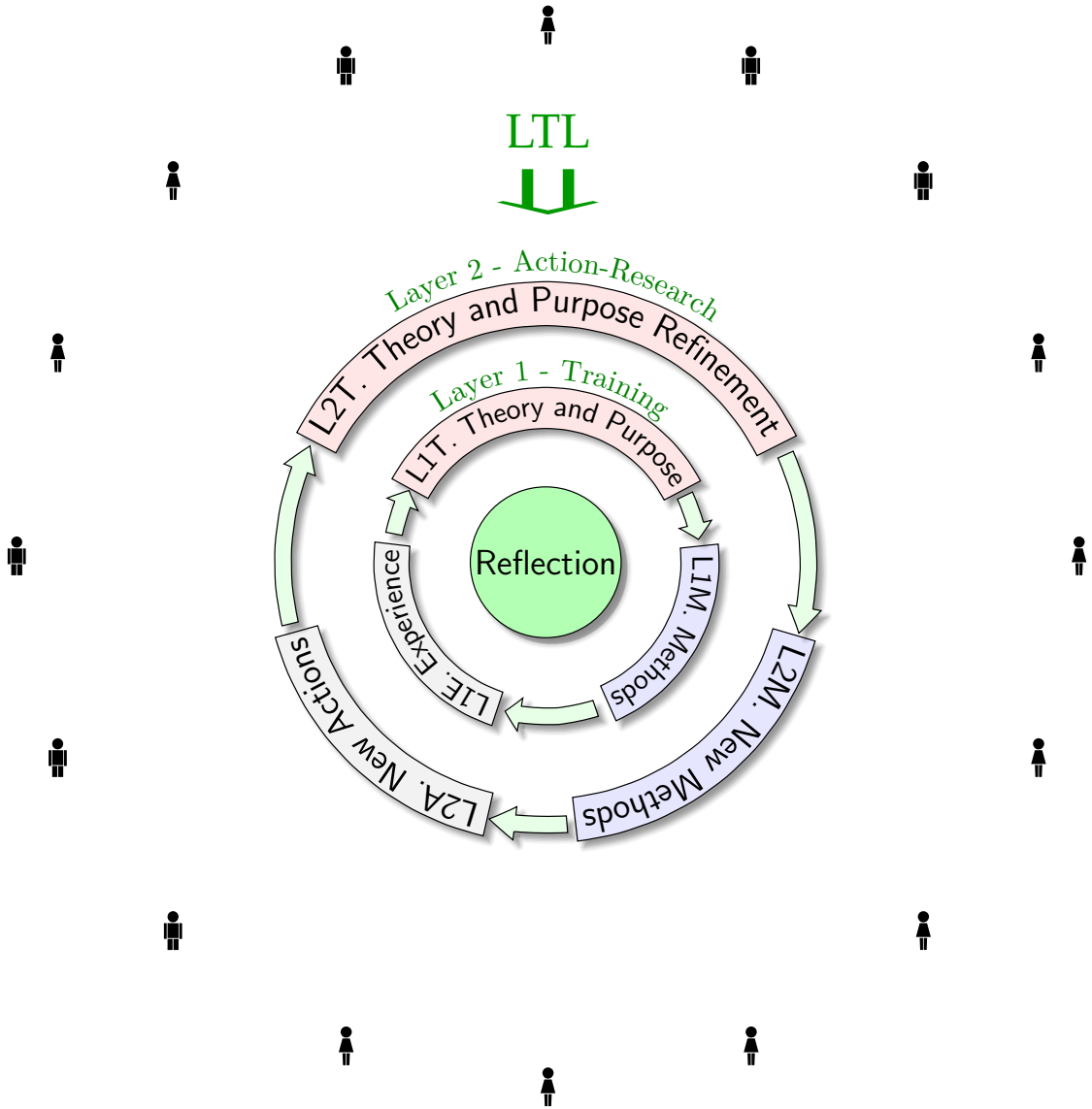


Towards a Culture of Learning

1. Action-Reflection



Towards a Culture of Learning

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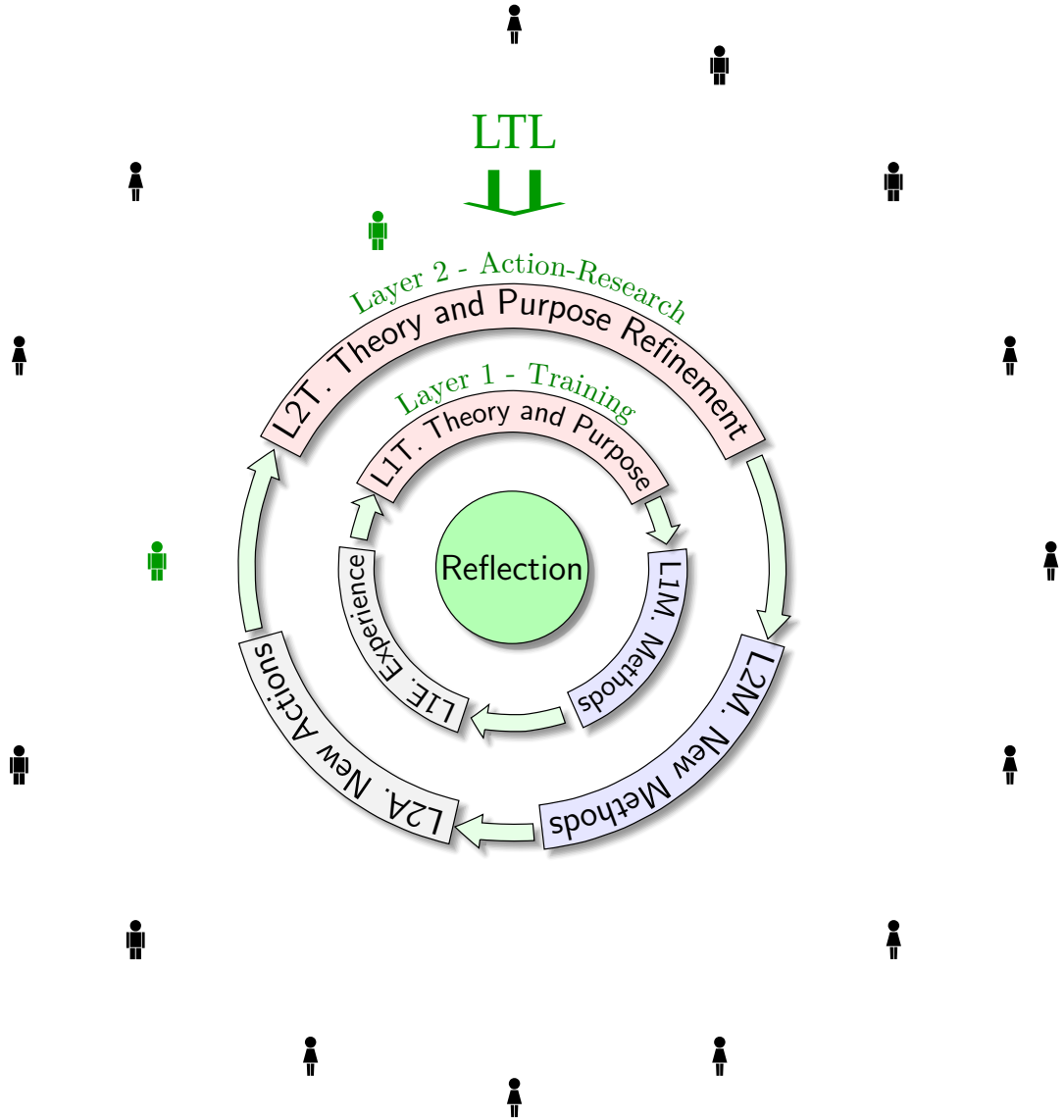

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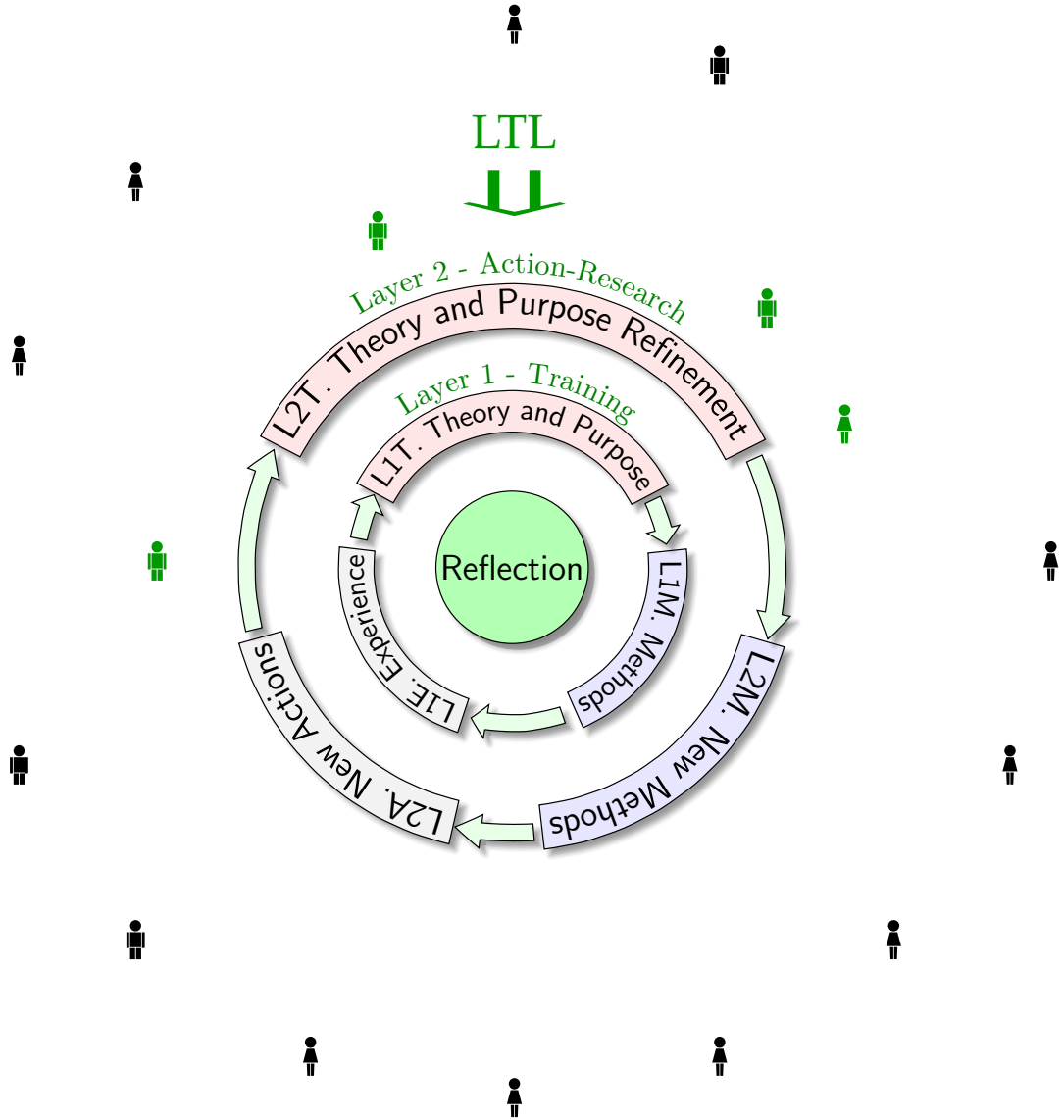

Towards a Culture of Learning

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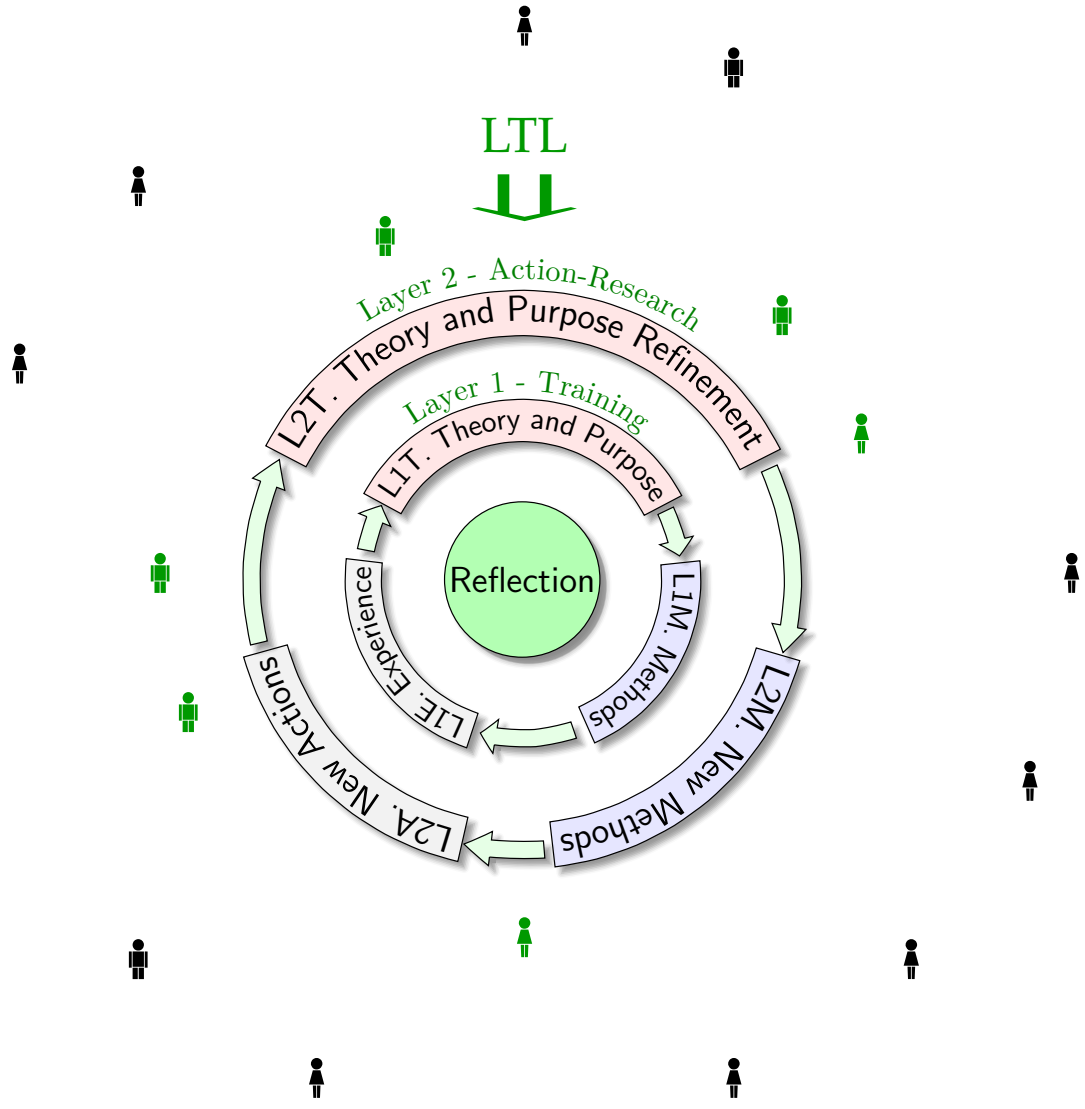
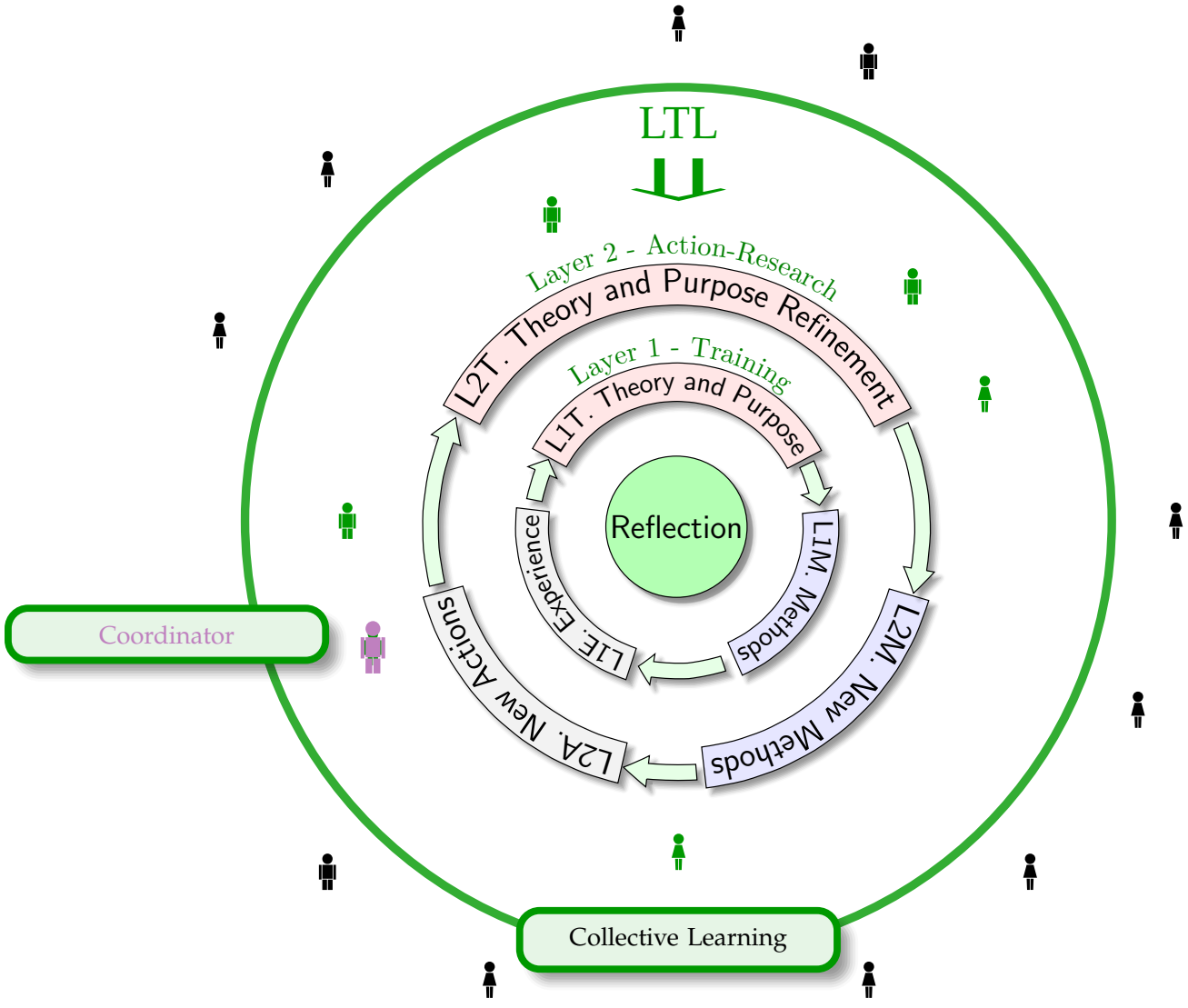


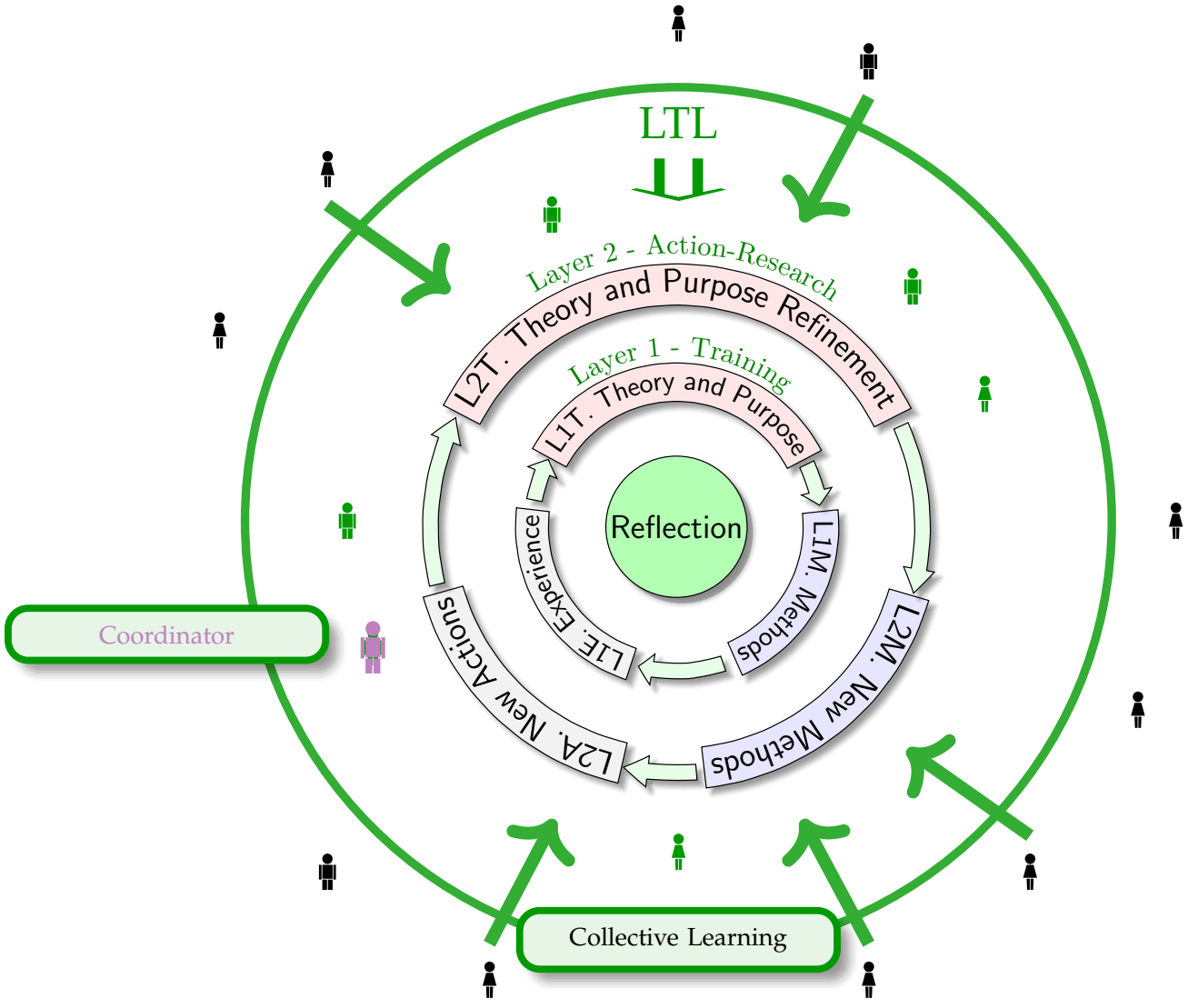
Towards a Culture of Learning

1. Action-Reflection → 2. Collective Learning



Towards a Culture of Learning

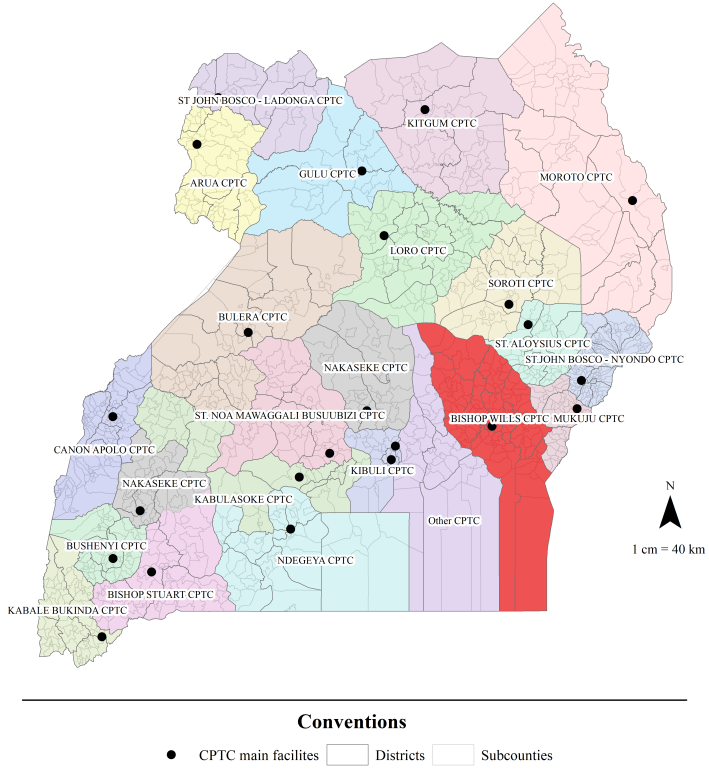
1. Action-Reflection → 2. Collective Learning → 3. Culture of Learning



Towards a Culture of Learning

Core Primary Teacher Colleges (CPTC)

Uganda's National Institute for Teacher Education (UNITE) oversees teacher development through CPTCs.



- Red Region (Bishop Wills) serves 1m children, 2,269 schools.
- 34 tutors who offer in-service professional development.

Working with UNITE/TETD

Adapting Training for Core PTC — Tutor Training

2022	Workshop in August to introduce more stakeholders to the approach
2022	Interviewing CPTCs to understand points of integration
2023-25	Adapting Training
2025	Coordinating Study Design with Stakeholders
2025-26	Piloting Training in one CPTC
2025-26	Collecting baseline data.
2025-2030	Studying Adapted Training's Impact.

Research Focus

- Can we devise arrangements that produce "empowered teachers" at scale?
  - Especially through a change in culture of professional development.
- I.e., Do the characteristics of empowered teachers become the new norm?
  - Focus on analyzing spillovers.
  - What density of trainees is needed to shift the culture?
- Are newly trained (pre-service) teachers more encouraged to experiment with new approaches in placement schools where the culture has changed?

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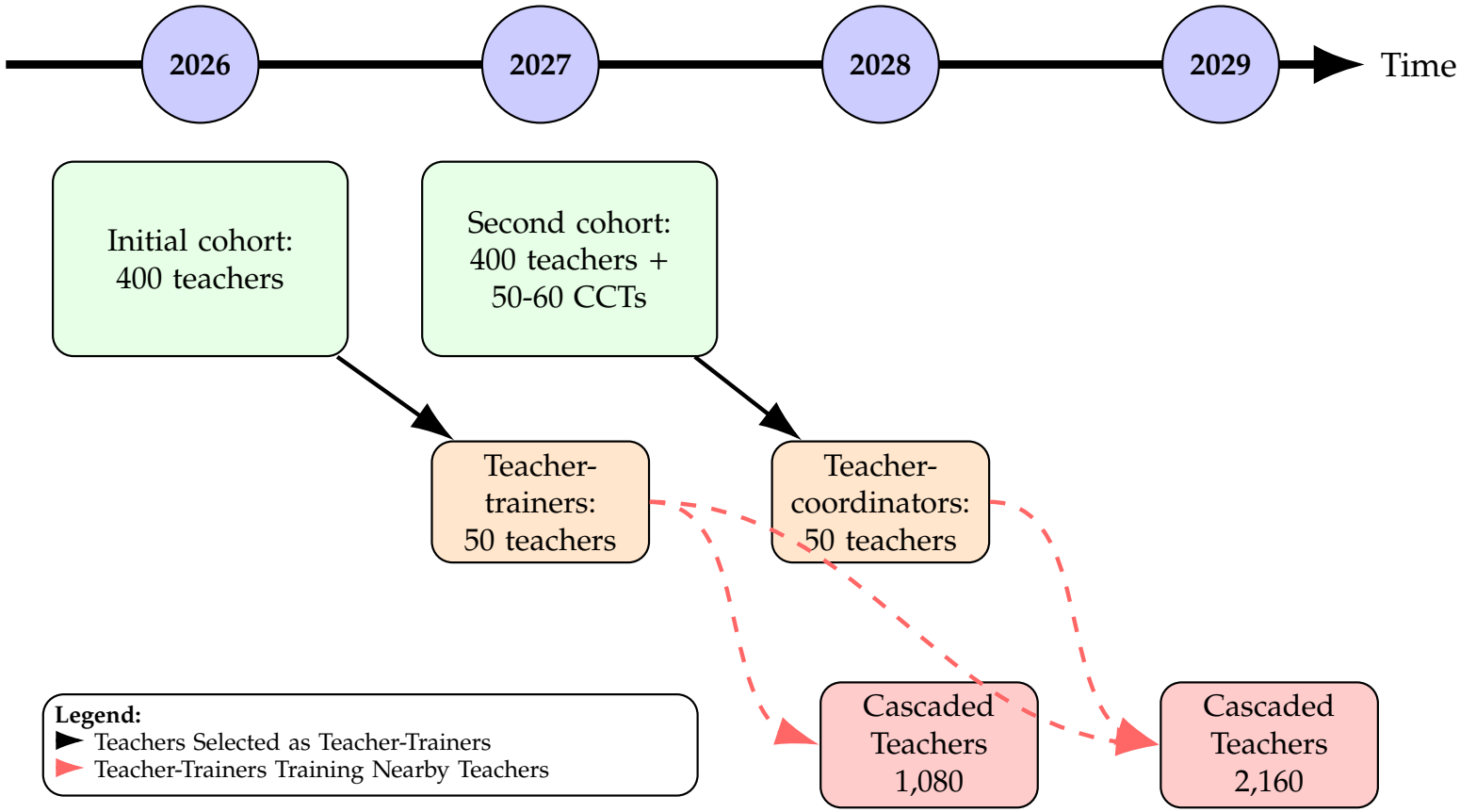
Scale-Up Implementation Across Time



Conclusions

Staking a claim for "general-skills" professional development

- Evidence that thorough general-skills professional development very effective in developing contexts.
  - Contrasts with focus on structured pedagogy.

  (e.g. Banerjee et al., 2010; Banerjee et al., 2007; Loyalka et al., 2019; Piper et al., 2014; Muralidharan et al., 2019; Bando et al., 2019)
- Narrowing the knowledge and practice gap, esp. in developing contexts.
  - Consistent with literature on effective teacher professional development (Villegas-Reimers, 2003; Darling-Hammond et al., 2017)
- Use of RCT and qualitative data allows rich understanding of mechanism
- Propose an actionable framework for radical and large-scale systems change.

Conclusion

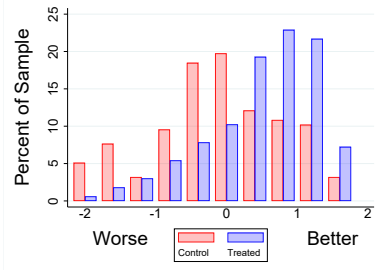
Towards a Re-thinking of Education

"Again, I will say, the main concern we have been putting across all along, this is just a drop of the change we can make. The community, the society, is bigger than where we come from. Our whole country can be our society. If we say we are satisfied with where we are, it means we've left the bigger part outside. Our own society is a country and more than a country... If we can extend it to other regions, to the whole country — the whole world — it would be much better. We are hungry for achieving more and more.

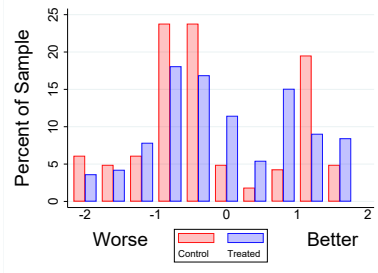
Higher Order Learning & Creativity

Results

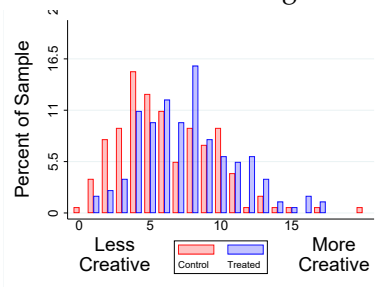
Hypotheses:	**Higher Order Learning**		**Creativity**
Outcome Variables	Apply/Understand	Critical Thinking	Index
Treatment (*ITT*)	0.73***	0.45**	0.44**
	(0.14)	(0.16)	(0.20)
H_0 : *ITT* = 0			
p value	[0.00]‡‡	[0.01]‡‡	[0.03]‡‡
RI p value	[0.00]‡‡	[0.02]‡‡	[0.35]
BH Critical p value (5%)	[0.03]	[0.05]	[0.05]
Pair FE	Yes	Yes	Yes
Enum FE	Yes	Yes	Yes
Source of Data	Student Assessment	Student Assessment	Student Survey
Unit of Observation	P6 Student	P6 Student	P6 Student
Standardized Variable	Yes	Yes	No
Range of Outcome Variable	[-2.00, 1.68]	[-1.75, 1.95]	[0, 20]
Control School Mean	0.00	0.00	6.21
Clusters	29	29	29
Observations	329	329	329
Estimator	OLS	OLS	Tobit



Apply/Understand



Critical Thinking



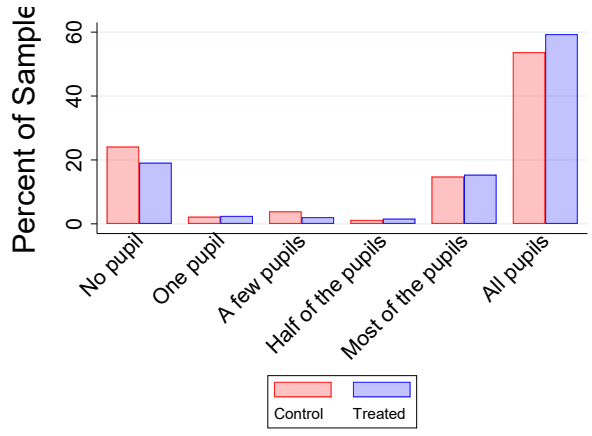
Creativity

Student Engagement in Class

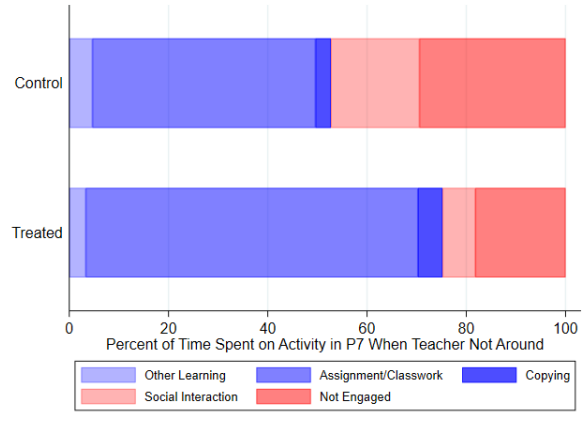
Results

Details of Classroom Observations

Hypothesis:	**Pedagogy**
Outcome Variable:	Share of Engaged Pupils
Treatment (*ITT*)	0.39***
	(0.15)
H_0 : *ITT* = 0	
p value	[0.01]±±
RI p value	[0.01]±±
BH Critical p value (5%)	[0.02]
Pair FE	Yes
Enum FE	Yes
Grade FE	Yes
Source of Data	Classroom Observations
Unit of Observation	Classroom Snapshots
Range of Outcome Variable	{1,2,. . . ,6}
Control School Mean	4.41
Clusters	29
Observations	2,380
Estimator	Ologit



Student Engagement

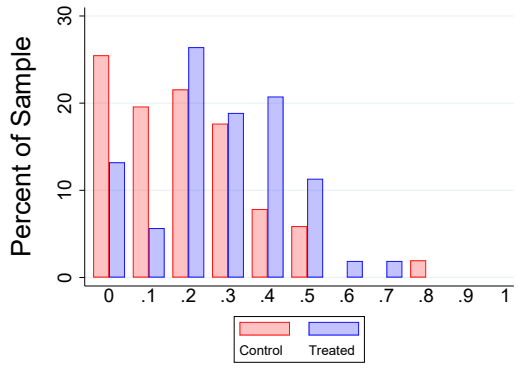


P7 Student Activities (Teacher Not Present)

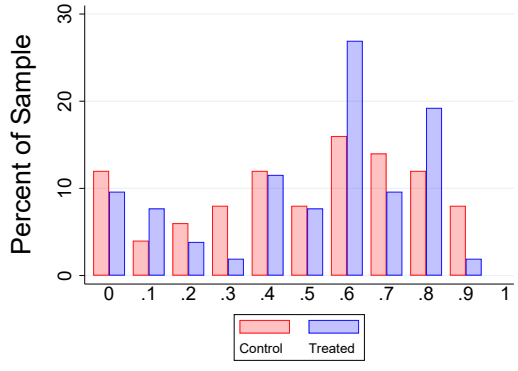
Asking Questions and Corporal Punishment

Results

Hypothesis:	**Pedagogy**	
Outcome Variable:	Student Inquisitiveness	Corporal Punishment
Treatment (*ITT*)	0.06**	−0.01
	(0.03)	(0.04)
H_0 : *ITT* = 0		
p value	[0.02]±±	[0.81]
RI p value	[0.28]	[0.94]
BH Critical p value (5%)	[0.03]	[0.05]
Pair FE	Yes	Yes
Enum FE	Yes	Yes
Source of Data	Student Survey	Student Survey
Unit of Observation	P6 Teachers	P6 Teachers
Range of Outcome Variable	[0,1]	[0,1]
Control School Mean	0.22	0.53
Clusters	29	29
Observations	95	95
Estimator	Tobit	Tobit



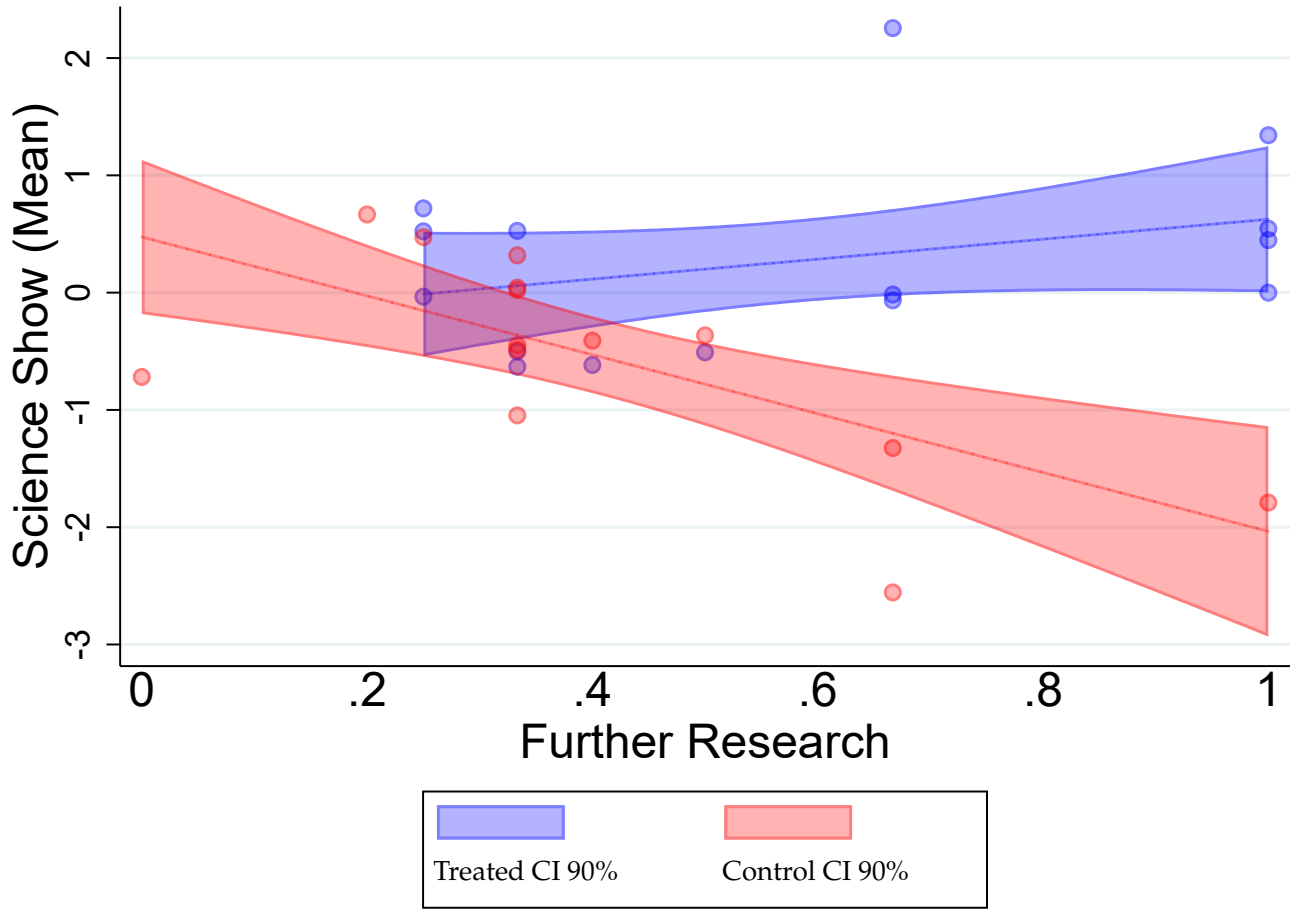
Student Inquisitiveness



Corporal Punishment

Teachers are More Inquisitive

Inquisitiveness interacts with science show outcomes in treated schools



Towards a Culture of Learning

The Existing Approaches to Professional Development in Uganda

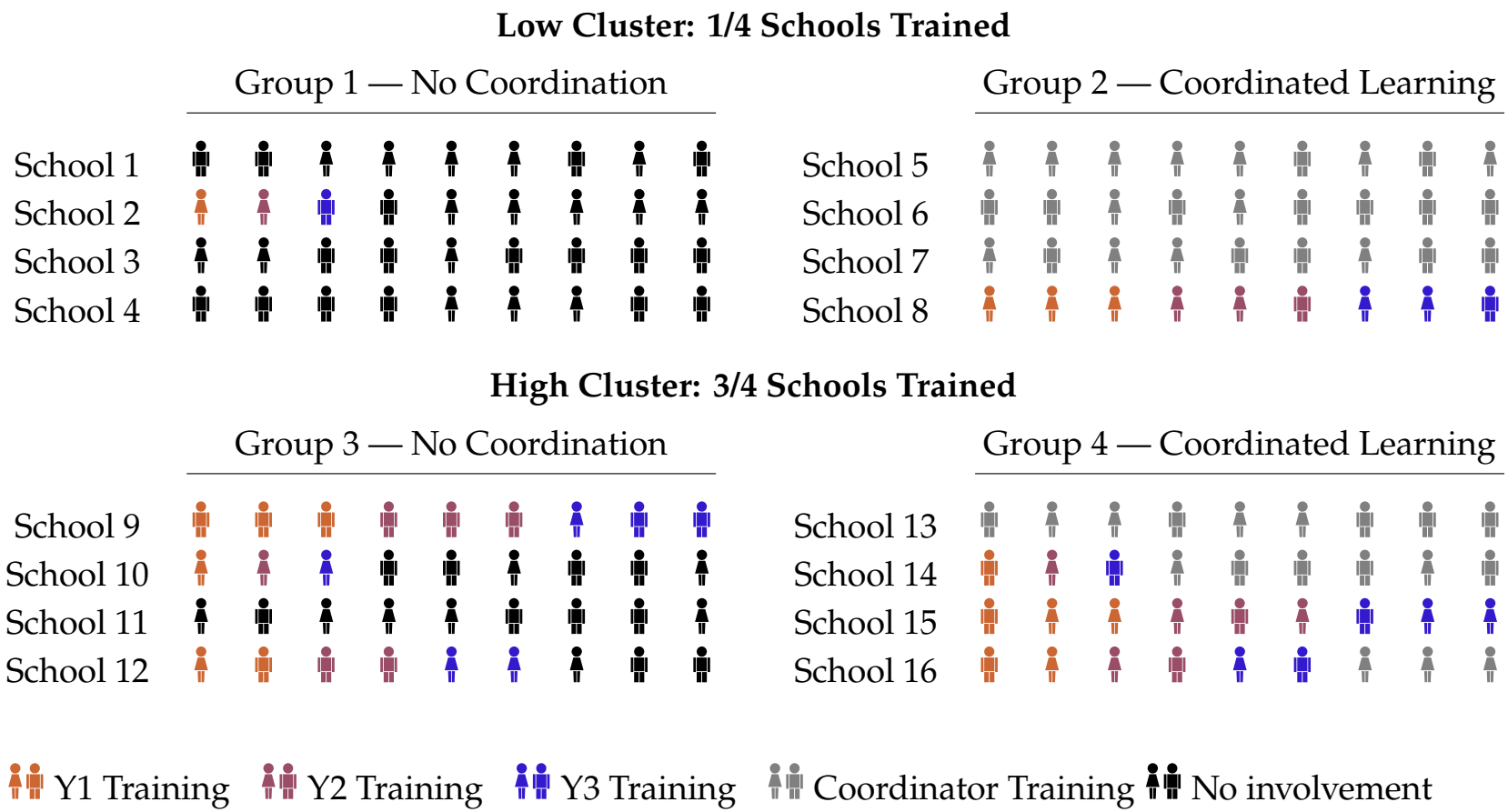
I would summarize it to be too dictatorial because, I remember when I was there, I think I had not realized myself well. Someone tells you, just giving orders, "Don't do this, do this," just learning from mistakes. There is even a time I wrote a scheme but from nowhere somebody crossed it out.

When you try to bring in the idea of. . . practical work, sometimes [higher ups in the education system] say "Wastage of time, use shortcut." Now, when you get to the way they want us to do it, at the end of the day, we leave learners going without benefiting.

Where the problem comes in now is . . . the administration you find on the ground. Is it caring enough?. . . Do they try to see what is happening in the classroom? This is where now we get issues from. . . People now go to class and they begin doing their own things.

Towards a Culture of Learning

Testing the Emergence of a Culture of Learning



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