

GUIDE 3: EXTRA TEACHER PROGRAM

How to Randomize?



This case study is based on the paper “Peer Effects and the Impact of Tracking: Evidence from a Randomized Evaluation in Kenya,” by Esther Duflo (MIT), Pascaline Dupas (UCLA), and Michael Kremer (Harvard)

J-PAL thanks the authors for allowing us to use their paper

LEARNING OBJECTIVE

To explore how an experimental design can be used to answer multiple research questions; to examine randomization strategies.

SUBJECTS COVERED

Evaluation design, randomization design

GENERAL GUIDANCE

People may get confused about how many teachers there are in each school, how many grades, etc. Tell the participants this was focused on first-grade classes. In Kenya, for each grade there was one class, and one teacher per class. Thus, sending contract teachers doubled the number of teachers available for first-grade classes. Also, tell them that the contract teachers did not serve as teachers' assistants, or teacher aids, but rather as independent teachers. When the school received the contract teacher, they split the class in two.

ADDRESSING MULTIPLE RESEARCH QUESTIONS THROUGH EXPERIMENTAL DESIGN

Discussion Topic 1

Testing the effectiveness of contract teachers (25 minutes)

1. What is the relative effectiveness of contract teachers versus regular government teachers?

Answer

For this, if the group is confused or proposing things that don't make sense, then the TA can propose different designs.

- Say we offered a contract teacher to the 120 schools, and we let the principals or government teachers choose how to divide their first grade classes into two. Then, we compared test scores of all the classes who had government teachers versus contract teachers at the end of the year—would we be able to determine the relative effectiveness of contract teachers in this way?" [No, because the division of classes may have introduced selection bias. We don't know how government teachers would divide the classes. Perhaps they'd keep all the strong or promising students for themselves.]
- Say we took a sample of 240 schools, and we sent contract teachers to 120 of those schools (randomly chosen). Could we then compare the test scores of children in schools that received contract teachers to those that didn't? [No, because the schools that received no contract teacher also have much larger student-teacher ratios (class size).]

There are two ways to do this. You can randomly split the class in half (randomly assign students to the two classes) and then give the government teacher to one class and the contract to the other. Or, if you allow non-random ways of splitting the class (i.e. principal choice, high ability-low ability, etc), then you must randomly assign the government teacher to one of the classes and the contract teacher to the other. Across all schools, you should expect that on average, the set of students assigned to contract teachers versus government teachers should look balanced (in terms of ability and all other characteristics).

Discussion Topic 2

Looking at more general approaches to improving education (35 minutes)

1. What is the effect of grouping students by ability on student performance?

Answer

Of the schools with extra teachers, randomly assign some schools to split (1st grade) classes by ability, and some schools to split classes randomly.

After doing so, you could identify the effect of tracking for the average student by pooling the low-ability and high-ability students in tracked schools and comparing them with the students in the non-tracked schools. Given enough sample size/power, you could also disaggregate this comparison. Specifically, you could compare the low-ability students in tracked schools with the low-ability students in non-tracked schools (and likewise with high-ability students).

2. What is the effect of smaller class sizes on student performance?

Answer

There are many ways of doing this. If we want to look ONLY at the effect of class size, we may want to “remove” the effect of (1) contract teachers (if they are better or worse than government teachers) and (2) the effect of tracking (which may have an independent impact). So for (1) we could compare government teachers with smaller classes (because they have contract teachers) to government teachers with larger classes (because they are in the control group). And because we are concerned about (2) we would need to ensure that classes have a similar composition of students. Therefore we should not allow tracking. In treatment schools the students should be randomly assigned to the two classes.

Now, people may be worried about “spillovers”, in that government teachers in the treatment group may now change their behavior because of the presence of a contract teacher. Therefore even though, on average, government teacher (and student) characteristics are the same in treatment and comparison groups, the treatment teachers may act differently not only because they have smaller class sizes, but perhaps because they

become more competitive now that there is a “less qualified” contract teacher at their schools...or perhaps more lazy and disillusioned. Ask participants to leave this issue aside for now, but that it is certainly worth discussing, and that you can do so at the end, and these issues will come up in the next case.

Discussion Topic 3

Addressing all questions with a single evaluation (30 minutes)

1. Could a single evaluation explore all of these issues at once?

Answer

Yes.

2. What randomization strategy could do so?

Answer

See diagram below. Sketch it out for participants and work through it step-by-step.

Legend

Comparison DT1.1	for	
Comparison DT2.1	for	
Comparison DT2.2	for	

FIGURE 1: EXTRA TEACHER PROVISION

