

# TRAINING FOR PRODUCTIVITY? EXPERIMENTAL EVIDENCE FROM GHANA'S CIVIL SERVICE \*

IMRAN RASUL

DANIEL ROGGER

MARTIN J. WILLIAMS<sup>†</sup>

AUGUST 2019

## Abstract

In-service training is a channel through which civil services can endogenously improve performance and productivity. However, despite the large amount of resources governments devote to training bureaucrats, there is little rigorous evidence on its effectiveness. We partnered with the Government of Ghana to design a new productivity training module and deliver it on a randomized basis to civil servants in central government. The same training content was delivered through two treatment arms: an individual-level treatment in which the training cohort was comprised of officers of the same rank from different organizations, and a team-level treatment in which the training cohort comprised an entire team of people who work together. This working paper evaluates the short-term impacts of these trainings on civil servants' learning and awareness of good management practices. We find that the new productivity trainings led to increased knowledge of productivity concepts, and that the new training also led to significantly better awareness of good management practices. Learning gains were smaller from the team-level training. Future analysis will investigate whether there are learning interactions between the individual and team-level trainings, and which kind of training is more likely to lead what is learned to be implemented in practice.

---

\*We gratefully acknowledge funding from the International Growth Centre, Economic Development and Institutions and World Bank i2i. We thank Jane Adjabeng, Mohammed Abubakari, Julius Adu-Ntim, Temilola Akinrinade, Sandra Boatemaa, Eugene Ekyem, Paula Fiorini, Margherita Fornasari, Jacob Hagan-Mensah, Allan Kasapa, Kpadam Opuni, Owura Simprii-Duncan, and Liah Yecaló-Teclé for excellent research assistance, and Head of Civil Service Nana Agyekum-Dwamena, Mrs. Dora Dei-Tumi, Mr. Godwin Brocke, members of our project steering committee, Andrew Wyatt, and Stefan Dercon for invaluable advice and guidance. Special thanks are due to over 80 civil servants from across the service who generously and energetically led trainings, conducted interviews, collected data, and shared insights. This project received ethics approval from the Blavatnik School of Government Departmental Research Ethics Committee (SSD-CUREC1A-BSG-C1A-17-001). All errors are our own.

<sup>†</sup>Rasul: University College London and the Institute for Fiscal Studies [i.rasul@ucl.ac.uk]; Rogger: World Bank Research Department [drogger@worldbank.org]; Williams: Blavatnik School of Government, University of Oxford [martin.williams@bsg.ox.ac.uk].

# 1 Introduction

The effective functioning of government bureaucracies matters for growth and the supply of public goods. The human capital embodied in the civil service is central to this effective functioning. Governments and donors frequently use civil service training to improve the capacity of the public sector. A recent review of outstanding commitments by the World Bank indicated it had open investments of USD7.5 billion in these areas. However, despite such investments into the human capital of civil servants, there is little evidence on whether training programs effectively increase staff capacity [World Bank 2016]. This impact evaluation aims to utilize an internationally recognized training module that aims to maximize the productivity impact of standard civil service training curricula. We refer to this as ‘applied productivity training’.

Effective government bureaucracies are crucial for development, and better management practices have also been shown to be important for public service delivery [Rasul and Rogger 2016, Rasul *et al.* 2019]. A recent wave of experimental studies in low-income countries have studied the impact of selection, incentives, and management procedures on public service delivery [Banerjee *et al.* 2012, Ashraf *et al.* 2015, Khan *et al.* 2016], but these have focused largely on frontline personnel. In contrast, little is known about improving the productivity of the vital mid-level of bureaucrats who are crucial to the design and implementation of policies, and are often responsible for selecting, incentivizing and managing frontline staff [Finan *et al.* 2015]. In particular, training is one of the main levers to improve the productivity of mid-level bureaucrats, and governments and donors spend billions on training and capacity building each year. Training can influence individual knowledge and skills, but is also the main tool available for government to affect individual and group expectations, norms, and culture once individuals are in the civil service.

Yet there is remarkably little rigorous evidence of the impact of training on mid-level civil servants, although anecdotes about ineffective training programs are widespread. The only causally identified study of training impacts of which we are aware is Andersen *et al.* [2018], which randomizes Danish managers into different types of leadership training.<sup>1</sup> Our baseline study in Ghana

---

<sup>1</sup>Two other notable studies of public sector training are Jakobsen *et al.* [2019] that randomized change-oriented training with Danish public school teachers, and Williams and Yecaló-Teclé [2019] who present a qualitative study of work process innovation in Ghana conducted in parallel with this study.

found that while 89% of civil servants desired more training, only 59% thought that their existing trainings were effective [Rasul *et al.* 2019], suggesting significant room for improvement in how training is designed and delivered to civil servants.

We partner with Ghana’s Civil Service Training Centre (CSTC) and Office of the Head of Civil Service (OHCS), as well as an international consultant, to design a new productivity training program for bureaucrats: the Training for Productivity (TFP) program. This training was intended to be more applied and action-oriented than CSTC’s existing productivity curriculum. We integrated the applied productivity training developed by TFP into Ghana’s Civil Service training routine, and delivered it through two treatment arms at full scale. Our evaluation aims to provide new evidence about the impacts of Civil Service training programs on public sector management and productivity.<sup>2</sup>

This working paper presents the short-term impacts of these trainings, along two key dimensions. First, we measure civil servants’ learning about concepts, tools, and methods for improving productivity in their organizations. We also collect measures of learning gain for other important areas of knowledge for civil servants, such as procedures for handling confidential documents, which were not the direct focus of the TFP program. Second, we measure civil servants’ perceptions of good management practices using Rasul *et al.*’s [2019] adaptation of the World Management Survey methodology [Bloom and Van Reenen 2007, Bloom *et al.* 2010]. We measure these immediately before and immediately after the randomly assigned training interventions, to ask the extent to which the newly designed training content – delivered through two alternative modalities – may facilitate civil servants’ learning better than existing training content and approaches.

Our findings are as follows. First, trainees who take the existing productivity module designed by CSTC improve their knowledge of the productivity concepts taught on the course by .81 standard deviations, a substantial increase. This is among the first rigorous evidence that public sector training designed and implemented by governments can indeed be effective at transmitting conceptual knowledge. However, the existing productivity module has little impact on awareness

---

<sup>2</sup>A pre-analysis plan is available at <https://doi.org/10.1257/rct.1889-4.0>. This plan pre-specifies our intervention design and main analytical strategy, but due to the complex nature of the intervention and data we opted not to pre-specify all details of our analysis. This working paper covers the initial steps of our analysis while we await the availability of all outcome data.

of good management practices. Second, trainees who take the new, more applied TFP productivity module not only improve their knowledge on these skills (by .46 standard deviations), but also improve their knowledge of the more abstract productivity concepts from the existing course by nearly as much as the trainees who actually took the course. This is despite these concepts not being explicitly taught on the new course. This suggests that rather than practical understandings of productivity being premised on abstract knowledge, the reverse may be true. Trainees on the new TFP module not only improved their knowledge of productivity concepts but also significantly improved their awareness of good management practices, despite this not being an explicit focus of the course. These gains were concentrated on practices related to the effective use of autonomy and discretion in the civil service (as opposed to the top-down practices of incentives and monitoring).

These positive results from the TFP module suggest that greater investment in improved training content and methods can further improve the effectiveness of public sector trainings.

In relation to the team-based trainings, we find that participants still have significant positive learning gains, but these are much smaller in magnitude than the gains from the individual-based training arms in the dedicated training academy, being around one-third the size. However, the main rationale for conducting these trainings with individuals' entire work teams in the office environment was to increase the likelihood that tools and methods from the training are actually put into practice. While this working paper does not shed light on that question, we anticipate being able to do so in future analysis.

The next section presents details of our research design, including the intervention, data, key outcome measures, and hypotheses. Section 3 presents our core empirical analysis. Section 4 concludes with a brief discussion of further issues and considerations.

## **2 Research Design**

### **2.1 Context**

Ghana's Civil Service operates a 'Scheme of Service' (SOS) training schedule as the core of its standard in-service training. Officers undergo compulsory training before becoming eligible for

promotion to the next grade. Since promotion is largely based on tenure, most officers go through an SOS training approximately once every three years, although the exact timing is not fixed. Trainings are conducted by the Civil Service Training Centre (CSTC), which operates under the supervision of OHCS.

SOS trainings are usually delivered at CSTC to a group of 10-40 civil servants of equivalent grade (rank), but from different organizations. Each SOS training lasts 10 days, and comprises three training sessions per day. The topics are diverse, but always include one day focused on productivity topics. Under the *status quo*, all trainings were designed and delivered by CSTC’s own trainers. SOS trainings were conducted as normal during the RCT (that our control group of individual civil servants are subject to); the only components that were varied or controlled are the content of the day of productivity training (treatment arm T1), and whether a follow-up training is delivered to trainees together with their work teams from their organization (treatment arm T2). We explain this in detail in the next sub-section.

## 2.2 Intervention

Figure 1 summarizes our randomization strategy. The first arm (T1) generates a control group that receives the *status quo* SOS productivity training and a treatment group of individual officers that instead receives the individual-level TFP training module. Within each SOS training, for the day of training that is focused on productivity, trainees are randomized into the “old” *status quo* SOS module or the “new” TFP module. The TFP productivity trainings are delivered by CSTC’s existing pool of trainers. This allows us to assess the impact of the TFP training content and style relative to the *status quo*.

At the end of the two-week SOS training, approximately 40% of trainees were randomly selected and informed that a day of productivity training would be organized for them and their entire work team of 5-20 people in the same division of their organization, including officers of *all* ranks. Crucially, this includes their director (boss). These team-based productivity trainings (T2) were conducted 3-6 weeks after the end of the SOS training, at the offices of OHCS. The training content and style was exactly the same as the TFP T1 training. The major difference between T1 and T2

is whether the TFP training is conducted with other officers of equivalent rank but from different organizations (T1) or whether the TFP training is conducted with officers of different ranks but from the same organization and division (T2). By construction, a more minor difference between the trainings is that in the T2 trainings, at least one participant had undergone the SOS training previously (with either the “old” SOS or the “new” TFP T1 productivity module).

The T2 arm generates treatment and control groups at the division level. In combination with the T1 arm, this allows us to evaluate the effect of the applied productivity training when only individual trainings are undertaken, when the whole division is subject to treatment, and when both individuals and their divisions are treated.

A “pure” control group of individuals are those who did not receive scheme of service trainings this year. The pure control can also contain officials who have recently joined the service, and so never participated in any training. Since officers attend scheme of service trainings every three years, many officials will have experienced the *status quo* training in past years, so the pure control includes those who had undergone training in previous (but not the current) year. Hence, while a pure control group who had never had any training would be desirable, such a group does not exist in Ghana’s civil service. Furthermore, the timing of selection into SOS trainings is not randomized, so that we cleanly identify the additional impact of being involved in TFP training relative to the *status quo* civil service training.

## 2.3 Data and Outcomes

We collected data both on the sub-sample of civil servants who participated in one of the trainings, and on the universe of senior-grade civil servants and their divisions. We discuss each in turn.

Our intervention sample comprises all civil servants who attended SOS trainings from March 2017 to March 2018 and whose training schedule includes one day of productivity training. This comprises professional-grade, university-educated officers between the ranks of Assistant Director IIB (and analogous grades) and Deputy Director (and analogous grades). The TFP T1 training was conducted at all SOS trainings where it was logistically feasible to do so. All individuals

eligible for randomization into T1 were also eligible for randomization into T2.<sup>3</sup>

During each TFP and SOS training session, we collected basic information about each session and attendance. We also gave pre- and post-tests to all trainees on their first and last days of the two week training, to test measures of learning gain from both the productivity and non-productivity training components. For the one-day T2 trainings, slightly shortened versions of these tests were administered at the start and end of the single day of training.

Appendix Table A1 specifies the set of questions used for each test of knowledge on various elements of our training programs (such as the use of problem-tree analysis, the development of evidence-based policymaking etc.). We split the test into sections that correspond to areas of skill development in the SOS and TFP training curricula. The SOS curriculum provides an introduction to the concept of productivity and abstract perspectives on the use of productivity as a concept for improving public sector performance. An example of a question under this topic is, "What is the definition of productivity?" TFP questions relate to more practical aspects of raising productivity within the public service. An example of a question under this topic is, "When conducting a problem-tree analysis, what should your starting point be?"

Before the intervention, in 2015, we conducted a baseline survey of the universe of professional-grade civil servants in Ghana's central government. This comprised approximately 3000 officers from 45 civil service organizations. Ghana increased the number of ministries in 2017, hence the increase in the number of organizations. Full details of our survey methodology are discussed for the baseline in Rasul *et al.* [2019]. The endline method was identical. The population was "senior" civil servants (used by Ghana's civil service to denote the professional grades of the service, not to indicate age or tenure in service) working in the headquarters of ministries and departments.

During the baseline data collection, the team worked closely with the HR departments of individual organizations to create a roster of currently employed civil servants. However, due to privacy issues, the team only partially collected respondents' names, and therefore a subset of officials could only be tracked across data collection rounds based on their primary demographic

---

<sup>3</sup>T1 could not be delivered at a small number of SOS trainings due to limited training space; this was driven purely by logistical course scheduling and room booking issues, not by anything that might feasibly be correlated with trainee characteristics.

(gender, age, and educational background) and work characteristics (organization, division, position, and tenure). Between data collection rounds, there was a natural process of entry and exit into the civil service (sometimes into the public service, and other times into the private sector).

At the division level, the Ghanaian Civil Service has changed its structure between 2015 and 2017/18, with new organizations being created, and existing organizations changing their internal structures. Overall, the internal structures have become more concentrated. Documenting which officials belong to which division is also complicated by the fact that informal nomenclatures do not always map directly on to *de jure* division names. Civil servants' perceptions of what makes a division is not always a real division, but instead work teams that are functionally important within an organization's activities. Therefore, we disaggregated the formal divisions in 2017/18 and 2015 to ensure a coherent match of their functions over time.

We hypothesize that T1 and T2 will have a positive effect on the post-test learning gain, relative to SOS training alone. We are agnostic on whether T1 or T2 will have a stronger effect for these individual learning outcomes. We might find positive complementarities between T1 and T2, or there could be substitution between the two. For the management practice outcomes, we expect to find positive effects on the autonomy/discretion indices, and null or weak effects on the incentives/monitoring indices.

### **3 Empirical Analysis**

#### **3.1 Raw Learning Gains from Scheme of Service Trainings**

To assess the extent to which the public officials we study increased their knowledge in the SOS and complementary T1 training sessions, we compare test scores before the training (entry) and after (exit) at the individual level, for those individuals in our sample that undertook both entry and exit tests. Table 1 provides descriptive statistics relating to the proportion of officials who took an entry, an exit, or both tests. Whilst 90% of our core sample that focuses on senior civil servants take at least one of the tests, only 65% take both.

To alleviate concerns that these 65% of individuals on which we focus our analysis are a

selected sub-group, Table 2 shows balancing tables. These compares entry and exit scores for our core sample and a series of other comparison groups. In the last panel, we compare our core sample to those individuals who filled either an entry or exit survey but not both. We see that across the four sets of modules that make up the test, differences are generally small. There is a difference between our core sample and all other officials in terms of their scores on the modules related to management, significant at the 10% level. The only demographic information we have from the tests is gender, which shows no imbalance. Where we do see a difference is in the proportion of sessions that the official attended. Those who only took one of the entry or exit tests attended a lower proportion of sessions overall, with a natural consequence that they were more likely to miss one of the tests. However, participation was generally very high, with on average, 84% sessions being attended.

To assess the raw learning gains trainees achieved in the SOS and TFP tracks, we estimate the following OLS specification,

$$y_{i,t} = \alpha_0 + \alpha_1 Exit_t + \epsilon_{i,t} \quad (1)$$

where the unit of observation is a set of test scores for individual  $i$  at time  $t$ , where  $t = 0$  refers to an entry test score and  $t = 1$  refers to an exit test score,  $y_{i,t}$  is the relevant test score for bureaucrat  $i$  at time  $t$  (entry or exit),  $Exit_t$  is a binary indicator for whether the test scores relate to the exit survey or otherwise, and  $\epsilon_{i,j}$  is an error term.

Table 3 presents our results for raw learning gains in the SOS and TFP trainings separately. Each Column presents the difference in entry and exit scores for different topic areas of the training. Robust standard errors are reported.

We see that civil service training increases the level of knowledge of public officials in both the standard and TFP arms. This is some of the first rigorous evidence on the impact of civil service training on learning, and the results are positive.

Standard SOS training increases participants knowledge of productivity in the abstract terms focused on by SOS, but not in the practical methods taught by the TFP module. SOS training increases participants raw test scores by approximately three-quarters of a standard deviation. The message here is that civil service training is providing participants with new knowledge. However,

it is constrained to the more abstract concepts typically taught in these standard courses. We see limited impact of the SOS training on any other margin of practical management skills.

Turning to the results on learning in the TFP, we see substantial increases in knowledge in TFP related modules of roughly a half of a standard deviation in the underlying test scores. Interestingly, this does not come at the cost of knowledge of the more abstract principles of understanding productivity, with TFP participants scoring almost as highly on SOS-related modules as SOS participants. A natural interpretation of this result is that practical knowledge of productivity is premised on a more abstract understanding, but the reverse is not true. As might be expected, TFP and SOS participants do not score differently in areas of training unrelated to productivity (Column 3), since TFP training focussed on productivity only.

Columns 4 though 7 explore the extent to which TFP training improves the quality of participants understanding of successful management techniques. Overall, TFP participants increase their test scores on management questions by around a third of a standard deviation. This result is driven almost completely by a fuller understanding of the use of autonomy in the public sector rather than incentives.

### 3.2 Relative Learning Gains from Scheme of Service Trainings

To better understand the comparison between the two forms of training, Table 4 presents results from an OLS specification of the form,

$$y_i = \alpha_0 + \alpha_1 TFP_i + \gamma \mathbf{X}_i + \delta \mathbf{Z}_i + \epsilon_i \quad (2)$$

where  $y_i$  is the difference between the pre- and post-training tests for bureaucrat  $i$ ,  $TFP_i$  is an indicator for individual  $i$ 's participation in the TFP training session,  $\mathbf{X}_i$  is a vector of individual characteristics,  $\mathbf{Z}_i$  is a binary indicator denoting the set of tests taken by individual  $i$ , and  $\epsilon_{i,j}$  is an error term.

Coherent with the results in Table 3, we see from Table 4 that TFP training increases participants knowledge of practical management skills and their knowledge of successful management

strategies relative to standardized public service training. Overall, combining the management and TFP questions, we see an improvement in test scores on these topics in Column 7 of roughly a third of a standard deviation. Thus, novel approaches to in-service training can improve participants practical knowledge of how to manage for improved public service productivity.

Appendix Table A2 provides a battery of checks on our baseline estimates. These show the results to be robust to alternative samples, estimation methods, and fixed effects specifications. Appendix Table A2 further shows the results to be robust to clustering standard errors by session.

### 3.3 Raw Learning Gains from Team Trainings

As a complement to improved productivity sessions in the standard scheme of service training, we now turn to our analysis of the whole team training sessions (T2). To assess the impact of these training sessions, we return to a specification similar to (1). Our assumed counterfactual is zero learning gains for officials who are not trained under T2. The sample of officials over which we estimate are all members of a division in which we held a training session.

Table 5 shows the results. We once again see significant learning gains in both broad concepts of management (SOS) and their practical application (TFP). However, the effects are smaller than those in T1, and we actually see a reduction in average scores in incentives/monitoring. The total gain in raw scores when we aggregate questions relating to TFP and management is .11 (roughly 10% of a standard deviation), which is significant at the 10% level. Comparing this to the comparable figure in Column 5 of Table A2, we see that the coefficient is substantially smaller (.11 relative to .27). This would imply that gains in knowledge are more likely to arise as part of a structured curriculum at a structured training centre than within an office setting.

Table A3 shows robustness checks on the result in Column 7 of Table 5 along the same lines as those in Table A2. It is robust to the inclusion of a range of demographic and session controls, but vulnerable to the sample used for estimation and the nature of clustering. Overall, it is a less robust result. Though there are positive gains from training within the office environment, they are not as large as at a structured training academy.

## 4 Conclusion and Next Steps

We partnered with Ghana’s Office of the Head of Civil Service and Civil Service Training Centre to conduct an evaluation of a full-scale randomized training intervention. We found that the short-run effects of these trainings on trainees’ learning are positive and substantial, but that the new productivity module led to a broader range of learning and also improved awareness of good management practices. We also found that delivering trainings in a dedicated learning academy rather than an office environment improved short-term conceptual learning, although we do not yet have evidence about whether concepts learned in this format are more likely to be put into practice. Overall, this indicates that appropriate curriculum and teaching methods can improve the potential effectiveness of training in the public sector, despite widespread skepticism in Ghana and elsewhere.

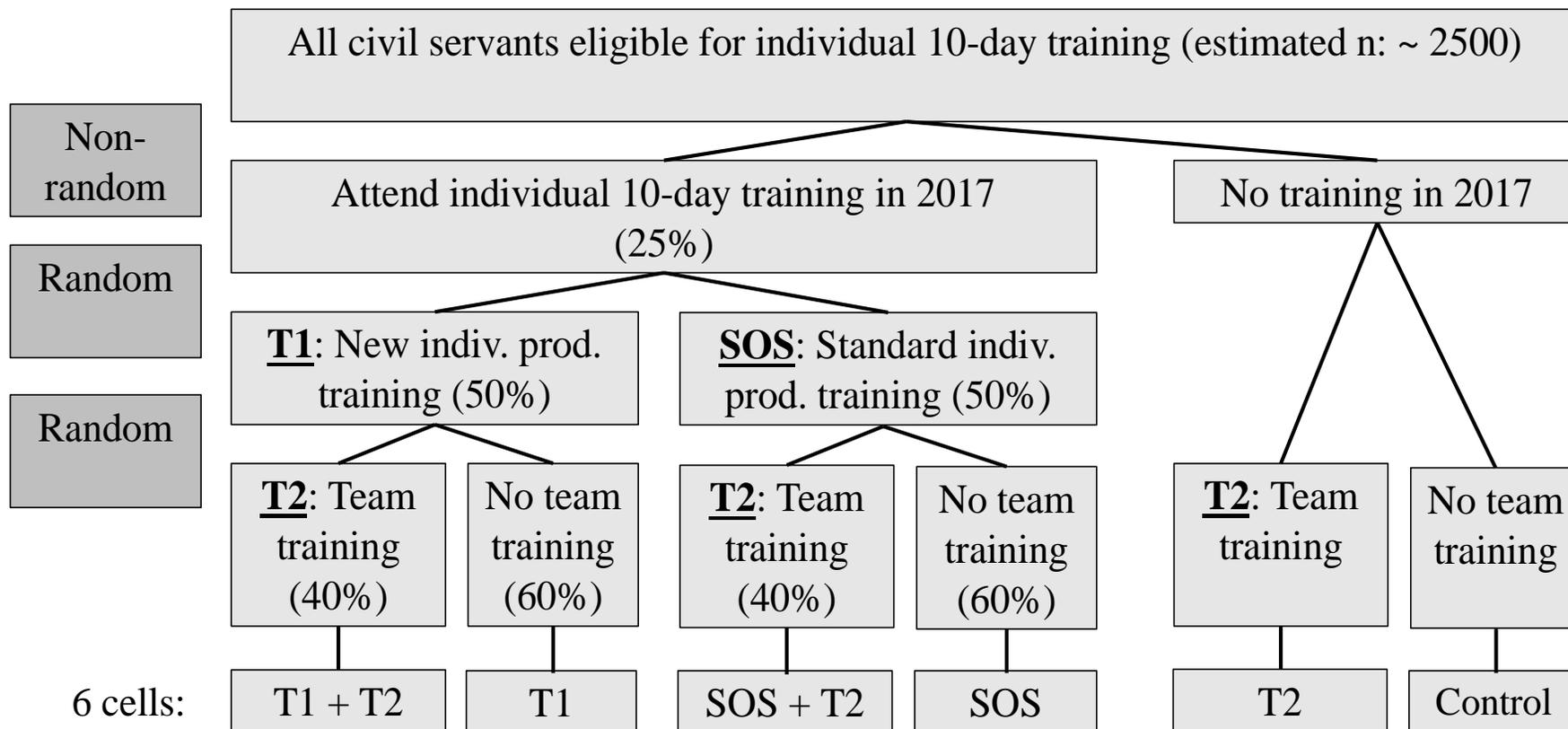
While this paper has focused on the immediate impacts of these trainings, in future work we will also be able to evaluate how the trainings affected intermediate and longer-term outcomes, as discussed in our pre-analysis plan. In addition to the data collection during the intervention itself, we also conducted a full endline survey in 2018 and digitized and coded a range of administrative data held by OHCS. The most important of these are quarterly and annual progress reports generated by each organization that detail their achievement of outputs against their plans for each period. This will enable us to assess the extent to which the promising initial impacts of these trainings on short-term learning and knowledge translate into meaningful improvements in management and public service delivery.

## References

- [1] ANDERSEN.L.B, B.BJORNHOLT, L.LADEGAARD BRO AND C.HOLM-PETERSEN (2018) “Achieving High Quality Through Transformational Leadership: A Qualitative Multilevel Analysis of Transformational Leadership and Perceived Professional Quality,” *Public Personnel Management* 47(1): 51-72.

- [2] ASHRAF.N, O.BANDIERA AND K.JACK (2014) “No Margin, No Mission? A Field Experiment on Incentives for Pro-social Tasks,” *Journal of Public Economics* 120: 1-17.
- [3] BANERJEE.A, R.CHATTOPADHYAY, E.DUFLO, D.KENISTON AND N.SINGH (2014) Improving Police Performance in Rajasthan, India: Experimental Evidence on Incentives, Managerial Autonomy and Training, NBER Working Paper 17912.
- [4] BLOOM.N AND J.VAN REENEN (2007) “Measuring and Explaining Management Practices Across Firms and Countries,” *Quarterly Journal of Economics* 122: 1351-408.
- [5] BLOOM.N, R.SADUN AND J.VAN REENEN (2012) “The Organization of Firms Across Countries,” *Quarterly Journal of Economics* 127: 1663-705.
- [6] FINAN.F, B.A.OLKEN, AND R.PANDE (2017) “The Personnel Economics of the State,” in A.V.Banerjee and E.(eds.) *Handbook of Field Experiments*, Elsevier.
- [7] M.JAKOBSEN C.BØTCHER JACOBSEN, AND S.SERRITZLEW (2019) “Managing the Behavior of Public Frontline Employees through Change-Oriented Training: Evidence from a Randomized Field Experiment, ” *Journal of Public Administration Research and Theory*: 1-16.
- [8] KHAN.A.Q, A.I.KHWAJA AND B.OLKEN (2015) “Tax Farming Redux: Experimental Evidence on Performance Pay for Tax Collectors,” *Quarterly Journal of Economics* 131: 219-71.
- [9] RASUL.I, D.ROGGER AND M.J.WILLIAMS (2019) Management and Bureaucratic Effectiveness: Evidence from the Ghanaian Civil Service, mimeo UCL.
- [10] WORLD BANK (2016) Towards a New Approach to Capacity Building in Africa, mimeo, World Bank.

**Figure 1: Randomization Strategy for Treatments**



**Table 1: Tests take-up Rate Amongst Trainees**

	Senior Civil Servants			All Officials			Senior Civil Servants	All Officials
	Total	New Productivity Curriculum (TFP)	Standard Productivity Curriculum (SOS)	Total	New Productivity Curriculum (TFP)	Standard Productivity Curriculum (SOS)	Team Training	Team Training
<b>Participation</b>								
Proportion Of Individuals Who Took At Least One Of The Tests	0.90	0.93	0.88	0.89	0.94	0.87	0.96	0.96
Proportion Of Individuals Who Took An Entry Test	0.77	0.81	0.75	0.76	0.80	0.74	0.89	0.89
Proportion Of Individuals Who Took An Exit Test	0.78	0.85	0.75	0.77	0.85	0.73	0.90	0.90
Proportion Of Individuals Who Took An Entry And Exit Test	0.65	0.73	0.61	0.64	0.72	0.60	0.83	0.82
<b>Observations</b>	447	146	301	527	165	362	733	860
<b>Type of Survey</b>								
Proportion Of Officials Who Took Either A (G) or B (H)	0.65	0.71	0.62	0.64	0.74	0.59	0.48	0.48
Proportion Of Officials Who Took Either C (E) or D (F)	0.35	0.29	0.38	0.36	0.26	0.41	0.52	0.52
Proportion Of Officials Who Took A (G) and B (H)	0.49	0.56	0.45	0.48	0.57	0.43	0.41	0.40
Proportion Of Officials Who Took C (E) and D (F)	0.24	0.22	0.25	0.24	0.19	0.26	0.45	0.45
<b>Observations</b>	402	136	266	470	154	316	705	829

**Notes:** From Column 1 to 3, the statistics reported refer to the core sample, focusing on senior officials coming from MDAs that we worked with. Column 4-6 report statistics for all the civil servants who showed up for the 10 days training in 2017. Column 7 and 8 present the same statistics for those officials who were selected for the team training.

**Summary:** In 2017, 527 civil servants coming from 47 organizations showed up for the SoS training at the CSTC training center in Accra. Among them, 31 officials were junior, and 49 came from organizations that were not part of the TFP research study. Therefore, 447 senior civil servants showed up to training days. 146 were assigned to the new productivity curriculum (tfp- first treatment arm), and 301 were assigned to the standard productivity curriculum (sos - control group). Trainees were asked to take a test before the beginning and after the end of the 10 days training sessions. The take-up rate, i.e., the proportion of trainees who took at least one of the tests, is 90% (Column 1). Looking among the two treatment arms, 0.93% of the officials randomly assigned to the new training curriculum did at least one of the tests, while 0.88% of trainees assigned to the standard curriculum completed at least one of the two exams. The second panel of the table presents statistics for the type of survey administered. The tests were not randomly allocated to each session, but alternated within the session. The approach aimed to avoid any 'spillovers' in terms of answers. During the training period, 6 TFP training could not be held because of logistics issues. Therefore, we do not have a balanced distribution of the type of tests. Hence, 65% of the trainees did the pair A-B, while 35% did the pair C-D. The second table presents the same statistics calculated on the entire sample of civil servants (from junior to mid-level managers) that showed up for the SoS training at the CSTC training center in Accra. The third table presents the same statistics calculated on the entire sample of civil servants (from junior to mid-level managers) showed up for the 10 days training, on the senior officials that showed up for the T2 training (Column 7) and on all trainees that participated to the team trainings (Column 8).

**Table 2: Balance Checks**

	Comparing SOS to TFP on Entry			Comparing Core Sample to Only Entry			Comparing Core Sample to Only Exit			Comparing Core Sample to Only Entry or Exit		
	Standard Productivity Curriculum (SOS)	New Productivity Curriculum (TFP)	Diff	Core Sample	Only Entry	Diff	Core Sample	Only Exit	Diff	Core Sample	Exit or Entry	Diff
<b>Panel A: Productivity Session Characteristics</b>												
Gender [Female == 1]	0.54	0.46	0.08	0.50	0.47	-0.03	0.50	0.53	0.04	0.50	0.51	0.01
Proportion of Day attended	0.83	0.84	-0.01	0.87	0.85	-0.02	0.87	0.74	-0.13***	0.87	0.79	-0.08***
Observations	301	146	447	291	53	344	291	58	349	674	133	693
<b>Panel B: Entry/Exit Scores</b>												
TFP Modules	1.34	1.25	0.09	1.31	1.28	-0.03	1.55	1.55	0.01	1.43	1.42	-0.01
SOS Modules	0.88	0.78	0.10	0.83	0.94	0.12	1.61	1.55	-0.05	1.26	1.22	0.05
Other Modules	2.22	2.25	-0.03	2.21	2.36	0.15	2.43	2.45	0.02	2.32	2.41	0.08
Management Modules	2.23	2.02	0.21	2.09	2.53	0.44**	2.38	2.28	0.04	2.16	2.40	0.24*
Observations	226	118	344	291	53	344	291	58	349	582	111	693

**Notes:** Standard deviations are in parentheses. The value displayed for t-tests are the differences in the means across the groups. \*\*\*, \*\*, and \* indicate significance at the 1, 5, and 10 percent critical level. The sample is based on senior officials coming from Civil Service MDAs surveyed at midline.

### Table 3: Raw Learning Gains - Standard and Training for Productivity

Dependent Variable: Total Raw Scores for: TFP-Related Modules Only (Column 1); SOS-Related Modules Only (Column 2); Other Modules Only (Column 3); Management Modules Only (Column 4); Incentives-Related Management Modules Only (Column 5); Autonomy-Related Management Modules Only (Column 6); TFP and Management Modules (Column 7)

OLS Estimates

Robust Standard Errors

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Total Scores (TFP Modules)	Total Scores (SOS Modules)	Total Scores (Other Modules)	Total Scores (Management)	Total Scores (Incentives)	Total Scores (Autonomy)	Total Scores (Management and TFP)
<b>Standard Productivity Module</b>	0.11 (0.10)	0.81*** (0.11)	0.23* (0.13)	0.00 (0.13)	-0.13 (0.08)	0.13* (0.08)	0.11 (0.20)
<b>Standard Deviation of Outcome</b>	0.97	1.15	1.26	1.27	0.78	0.76	1.94
<b>Adjusted R-Squared</b>	0.00	0.12	0.01	0.00	0.00	0.00	0.00
<b>Observations</b>	370	370	370	370	370	370	370
<b>New Productivity Curriculum</b>	0.46*** (0.14)	0.73*** (0.13)	0.21 (0.18)	0.42*** (0.17)	0.08 (0.10)	0.33*** (0.10)	0.88*** (0.27)
<b>Standard Deviation of Outcome</b>	1.03	1.03	1.30	1.24	0.74	0.75	2.03
<b>Adjusted R-Squared</b>	0.05	0.12	0.00	0.02	0.00	0.04	0.04
<b>Observations</b>	212	212	212	212	212	212	212

**Notes:** \*\*\* denotes significance at 1%, \*\* at 5%, and \* at 10% level. Robust standard errors are in parentheses. All columns report OLS estimates. The sample refers to those senior officials who attended the productivity training, completing both the entry and exit tests (N=291). In all the Columns, the dependent variable is the total scores, aggregated following the 'Score Definition' sheet. The New Productivity Curriculum refers to those officials assigned to the new productivity session (N= 106), while the Standard Productivity Training refers to the control session (N=185). Figures are rounded to two decimal places.

**Summary:** Table 3 presents the raw learning goals obtained by officials that attended the new productivity and the standard productivity training. Trainees who participated in the new productivity training (TFP) scored significantly positive in the questions related to the topic discussed during the session, both in terms of productivity (TFP and SOS Modules) and management. Similarly, trainees who attended the regular training scored significantly positive in the topics related to the standard productivity module and autonomy.

## Table 4: Relative Learning Gains - Standard vs Training for Productivity

Dependent Variable: Difference in Exit and Entry Raw Scores for: TFP-Related Modules Only (Column 1); SOS-Related Modules Only (Column 2); Other Modules Only (Column 3); Management Modules Only (Column 4); Incentives-Related Management Modules Only (Column 5); Autonomy-Related Management Modules Only (Column 6); TFP and Management Modules (Column 7)

OLS Estimates

Robust Standard Errors

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Diff in Ex-En Scores (TFP Modules)	Diff in Ex-En Scores (SOS Modules)	Diff in Ex-En Scores (Other Modules)	Diff in Ex-En Scores (Management)	Diff in Ex-En Scores (Incentives)	Diff in Ex-En Scores (Autonomy)	Diff in Ex-En Scores (Management and TFP)
<b>New Productivity Curriculum</b>	0.32** (0.13)	-0.17 (0.15)	-0.09 (0.20)	0.34** (0.16)	0.21* (0.11)	0.13 (0.10)	0.66*** (0.23)
<b>Standard Deviation Of Outcome</b>	1.13	1.34	1.67	1.45	0.94	0.99	2.11
<b>Test Pair Fixed Effect</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Adjusted R-Squared</b>	0.07	0.19	0.07	0.14	0.01	0.25	0.16
<b>Observations</b>	291	291	291	291	291	291	291

**Notes:** \*\*\* denotes significance at 1%, \*\* at 5%, and \* at 10% level. Robust standard errors are in parentheses. All columns report OLS estimates. The sample refers to those senior officials who attended the productivity training, completing both the entry and exit tests (N=291). In all the Columns, the dependent variable is the raw difference between entry and exit scores, aggregated following the 'Score Definition' sheet. The independent variable (New Productivity Curriculum) is a dummy that takes 1 if the trainees attended the new productivity training and 0 otherwise. Pair test control relates to which pair of entry and exit tests the officials took. Figures are rounded to two decimal places.

**Summary:** Table 4 presents the relative learning goals obtained by officials that attended the new productivity training versus the standard productivity training. Trainees who participated in the new productivity training (TFP) scored significantly better in the questions related to the topic discussed during the session, both in terms of productivity (TFP Modules) and management. Similarly, trainees who attended the regular training scored better in the topics related to the standard productivity module, but estimates are not significant at any level.

## Table 5: Raw Learning Gains - Team Training

Dependent Variable: Raw Total Scores for: TFP-Related Modules Only (Column 1); SOS-Related Modules Only (Column 2); Other Modules Only (Column 3); Management Modules Only (Column 4); Incentives-Related Management Modules Only (Column 5); Autonomy-Related Management Modules Only (Column 6); TFP and Management Modules (Column 7)

OLS Estimates

Robust Standard Errors

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Total Scores (TFP Modules)	Total Scores (SOS Modules)	Total Scores (Other Modules)	Total Scores (Management)	Total Scores (Incentives)	Total Scores (Autonomy)	Total Scores (Management and TFP)
<b>Team Curriculum</b>	0.14*** (0.04)	0.26*** (0.04)	-0.02 (0.03)	-0.04 (0.04)	-0.06** (0.03)	0.02 (0.03)	0.11* (0.06)
<b>Standard deviation of outcome</b>	0.65	0.73	0.48	0.66	0.49	0.50	0.96
<b>Adjusted R-squared</b>	0.01	0.03	0.00	0.00	0.00	0.00	0.00
<b>Observations</b>	1,212	1,212	1,212	1,212	1,212	1,212	1,212

**Notes:** \*\*\* denotes significance at 1%, \*\* at 5%, and \* at 10% level. Robust standard errors are in parentheses. All columns report OLS estimates. The sample refers to those senior officials who attended the team training, completing both the entry and exit tests (N=1212). In all the Columns, the dependent variable is the raw total scores, aggregated following the 'Score Definition' sheet. Team Curriculum refers to the learning gains obtained by trainees. Figures are rounded to two decimal places.

**Summary:** Table 3 presents the learning goals obtained by officials that attended the team training. Trainees scored significantly better in the questions related to productivity (TFP and SOS Modules) and management. However, trainees scored significantly worst in the question related to incentives.

**Table A1: Test Questions**

QUESTION MODULE	TOPIC	SOS/T1 AND T2	A-D, E-H	B-C, F-G
<b>STANDARD PRODUCTIVITY (SOS)</b>	Productivity Movement	SOS/T1 AND T2	Which of the following is <u>NOT</u> a stage in the productivity movement?  (‘Ownership Stage’, ‘Action Stage’, ‘Improvement Stage’, ‘Awareness Stage’)	Which of the following is <u>NOT</u> part of the Awareness Stage of the productivity movement?  (‘Soliciting buy-in for the new direction’, ‘Creating a mirror picture of success’, ‘Setting the objective for change’, ‘Mobilizing funding’)
	Productivity Improvement	SOS/T1	What is the “Kaizen” approach to management?  (‘Improving adherence to protocols’, ‘Encouraging staff to work harder with incentives’, ‘Implementing best practices across all aspects of the organization’, ‘Making gradual, continuous changes in workplace practices’)	Which of the following is <u>NOT</u> a principle of Total Quality Management?  (‘Hierarchy’, ‘System approach to management’, ‘Continuous improvement’, ‘Mutually beneficial stakeholder relationships’)
	Introduction to Productivity	SOS/T1 AND T2	Which one of the following is <u>NOT</u> a dimension of productivity?  (‘Professional’, ‘Organizational’, ‘Individual’, ‘National’)	What is the definition of productivity?  (‘Increasing production at the expense of quality’, ‘Working harder and putting in overtime in order to achieve results’, ‘Output/Input’, ‘Input/Output’)
<b>NEW PRODUCTIVITY (T)</b>	Problem-Tree Analysis	SOS/T1	When conducting a problem-tree analysis, what should your starting point be?  (‘The problem’, ‘The desired solution’, ‘The effects of the problem’, ‘The causes of the problem’)	How does a force-field analysis try to solve problems?  (‘By isolating the resisting forces and the driving forces preventing you from moving from an undesired to a desired state’, ‘By focusing on immovable barriers to moving from an undesired to a desired state’, ‘By considering problems in a static context’, ‘By creating a problem tree diagram to help solve the problem’)
	Effective Teams	SOS/T1 AND T2	Which of the following is <u>NOT</u> a characteristic of an effective team?  (‘There is a focus on both the tasks (what do we need to do?) and the process (how do we achieve this?)’, ‘There is a lot of discussion in which everyone participates – listens, speaks, and is heard’, ‘There is a range of individuals who contribute in different ways’, ‘There is no space for disagreements, since these could cause disharmony’)	Which of the following is <u>NOT</u> a component of competency?  (‘Intellect’, ‘Drive/motivation’, ‘Personality/style’, ‘Rank’)
	Brainstorming Sessions	SOS/T1 AND T2	Which of the following is <u>NOT</u> a key principle for conducting a successful brainstorm session?  (‘Spontaneity’, ‘Suspension of judgment’, ‘Serendipity’, ‘Speed’)	Which of the following is <u>NOT</u> an important part of a brainstorming session?  (‘Having a solution in mind when you start’, ‘Having a facilitator to encourage and prompt thinking’, ‘Having a scribe keep all ideas visible by writing them on a flipchart or on papers’, ‘Encouraging silent participants to come out and speak’)
<b>OTHER TOPIC</b>	Evidence-Based Policymaking	SOS/T1	Suppose that your division has been tasked with creating a new policy on some topic within your area of competence. What should be your first step?	Which is <u>NOT</u> a step in the policy development cycle?
	Org Safety and Security	SOS/T1 AND T2	Which of the following is <u>NOT</u> an example of an official security classification?	Which of the following is <u>NOT</u> part of the record life cycle?
	Administrative Writing	SOS/T1	Which one of these should always be included in handing-over notes?	Which of the following is a type of administrative writing?
	Civil Service Admin Principles	SOS/T1	Which of the following is <u>NOT</u> necessarily a member of a Disciplinary Committee constituted under the Civil Service Code?	Who has the responsibility for initiating recruitment in the Civil Service?
Work Ethic and Work Standards	SOS/T1	What are the three essential characteristics of a written work standard for a task?	Which of these is <u>NOT</u> a reason why written work standards are important?	

	Human Relations	SOS/T1	Which of the following is <u>NOT</u> an example of an individual working style?	Which of the following is an example of a type of bias in perceptions we can have <u>about other people</u> ?
AUTONOMY		SOS/T1 AND T2	<p>Within a public sector organization, how much discretion should senior officers be given to carry out their assignments?</p> <p>('Officers should have some independence about how they go about their work', 'Officers should do what their Director tells them to do and not deviate from those instructions', 'Officers should have a lot of independence to decide how best to complete their tasks')</p>	<p>What kind of contributions should staff be able to make to the process of policy formulation and implementation?</p> <p>('Only top management should make substantive contributions to organisational policies and their implementation', 'All officers should make substantive contributions to organisational policies and their implementation', 'All officers should make substantive contributions in staff meetings, but otherwise it should be left for top management')</p>
		SOS/T1	<p>How much should civil servants make efforts to adjust to the specific needs and peculiarities of different communities, clients, or other stakeholders?</p> <p>('Civil servants should use the same procedures in all cases, regardless of the particularities of who they are serving', 'Civil servants should adjust their procedures as much as possible, within regulations, to respond to the needs of particular communities/ clients', 'Civil servants should only make minor adjustments to procedures based on who they are serving')</p>	<p>How flexible should divisions or directorates be in terms of responding to new and improved work practices?</p> <p>('There is no need to make a deliberate effort to identify new ideas or practices into daily work', 'Seeking out and adopting improved work practices is an integral part of every division's work', 'New ideas or practices can be adopted when they arise, but it's not necessary to seek them out')</p>
INCENTIVES		SOS/T1 AND T2	<p>How should each division/ directorate in an organization track how well it is delivering services?</p> <p>('A division should have as many performance indicators specified as possible, and should rely exclusively on formal indicators of performance', 'A division should track performance continuously with selected indicators that are directly relevant to the division's objectives, using both formal indicators and other less formal assessments of performance', 'A division should rely mainly on less formal ways of tracking performance, based on the knowledge of the division's Director')</p>	<p>How should officers be disciplined for breaking the rule of the Civil Service?</p> <p>('Occasional violations do not need to be punished every time, but officers that break the rules regularly should be disciplined', 'In general, breaking the rules should not be punished', 'Any violation of the rules should always be punished')</p>
		SOS/T1	<p>Should public sector organizations use performance targets, or other indicators for tracking and rewarding (financially or non-financially) the performance of their officers?</p> <p>('Performance should be closely monitored, with significant rewards or punishments for those who overperform or underperform based on those indicators', 'Officers' performance should not be compared', 'Good or bad performance should be rewarded or punished, but the criteria for this should be up to management rather than based on formal indicators')</p>	<p>How should under-performance be dealt with in the Civil Service?</p> <p>('Repeated poor performance should be systematically addressed, starting with targeted intermediate interventions', 'Poor performance should be addressed on an ad hoc basis, depending on the individual's superior', 'There is no need to address poor performance or impose consequences on under-performing staff')</p>

**Table A2: Relative Learning Gain - SOS vs TFP**

Dependent Variable: Difference in Exit and Entry for Management and TFP Modules in Columns 1 through 12; Exit Score Only in Columns 13 and 14.

OLS Estimates

Robust Standard Errors in Columns 1 through 10 and Columns 14 and 15; Uncorrected in Column 11; Clustered at Session Level in Column 12; Wild Bootstrap in Column 13

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	Baseline Result	All Public Servants	Attended T2 Before T1	Z-Scores	Using Questions Asked in T2	Using Questions Asked in T2 With Controls	Without Test Pair Controls	Demographic Control	Session Controls	Attendance Controls	Standard Errors Without Correction	Clustered at Session Level	Wild Bootstrap	Exit Scores Only	Exit Scores Only With Controls
<b>New Productivity Curriculum</b>	0.66*** (0.23)	0.59*** (0.22)	0.71*** (0.24)	0.37*** (0.12)	0.27* (0.16)	0.32** (0.16)	0.77*** (0.24)	0.66*** (0.23)	0.75*** (0.22)	0.76*** (0.22)	0.66*** (0.24)	0.66* (0.38)	0.66* (0.38)	0.21 (0.24)	0.37* (0.20)
<b>Demographic Control</b>	No	No	No	No	No	Yes	No	Yes	Yes	Yes	No	No	No	No	Yes
<b>Session Controls</b>	No	No	No	No	No	Yes	No	No	Yes	Yes	No	No	No	No	Yes
<b>Attendance Controls</b>	No	No	No	No	No	Yes	No	No	No	Yes	No	No	No	No	Yes
<b>Standard Deviation Of Outcome</b>	2.11	1.12	2.09	1.04	1.51	1.51	2.11	2.11	2.11	2.11	2.11	2.11	2.11	2.10	2.10
<b>Test Pair Controls</b>	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Adjusted R-Squared</b>	0.16	0.14	0.16	0.02	0.22	0.28	0.03	0.16	0.27	0.27	0.16	0.10	-	0.02	0.02
<b>Observations</b>	291	337	262	291	291	291	291	291	291	291	291	291 [28]	291	349	349

**Notes:** \*\*\* denotes significance at 1%, \*\* at 5%, and \* at 10% level. Robust standard errors are in parentheses, but Columns 11-12-13 report normal standard errors (Column 11), cluster standard errors at session level (Column 12), and wild bootstrap standard errors (Column 13). All columns report OLS estimates. In Column 2, the sample refers to all officials (junior and mid-level) who attended the productivity training, completing both the entry and exit tests (N=337). In Column 3, the sample refers to those senior officials who attended the productivity training, completing both the entry and exit tests (N=262) after attending team training. In all the other Columns, the sample refers to those senior officials who attended the productivity training, completing both the entry and exit tests (N=291). In Columns 13 and 14, the dependent variable is the raw score of the exit scores for the management and tfp modules, aggregated following the 'Score Definition' sheet. In Columns 5 and 6, the scores are aggregated using a sub-sets of questions that were asked before and after the team training. The session controls refer to the number of trainees in the session, standardized within the treatment, and a set of quality controls for the productivity sessions. The quality controls refer to the following questions related to a 5 point scale, where 1 refers to the lower level and 5 to the higher level: (i) How engaged were the students in training, on a scale of 1-5?; (ii) How practical would you say the training was, on a scale from 1-5?; (iii) How well did the training go, on a scale of 1-5?; (iv) Trainer-Trainees interaction, on scale of 1-5; (v) Trainer's responses to questions, on the scale of 1-5; (vi) Class control, on scale of 1-5. The questions were standardized within the treatment arms. The attendance control captures the effect of the proportion of day attended during the first week of training. Pair test control relates to whether the officials did the pair test A-B or C-D. Figures are rounded to two decimal places.

### Table A3: Learning Gain - Team Training

Dependent Variable: Total Raw Score for Management and TFP Modules in Columns 1 through 10; Exit Score Only in Column 11 and 12

OLS Estimates

Robust Standard Errors in Columns 1 through 5 and in Columns 11 and 12; Uncorrected in Column 8; Clustered at Session Level in Column 9; Wild Bootstrap in Column 10

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Baseline Result	All Civil Servants	Attended T1 Before T2	Z-Scores	Without Test Pair Controls	Demographic Control	Session Controls	Standard Errors Without Correction	Clustered at Session Level	Wild Bootstrap	Exit Scores Only	Exit Scores Only
<b>Team Curriculum</b>	0.11* (0.06)	0.07 (0.05)	0.10* (0.06)	-0.02 (0.06)	0.11* (0.06)	0.11* (0.06)	0.11* (0.06)	0.11* (0.06)	0.11 (0.09)	0.11 (0.09)	2.01*** (0.05)	1.94*** (0.66)
<b>Demographic Control</b>	No	No	No	No	No	Yes	Yes	No	No	No	No	Yes
<b>Session Controls</b>	No	No	No	No	No	No	Yes	No	No	No	No	Yes
<b>Standard Deviation of Outcome</b>	0.96	0.97	0.97	1.00	0.96	0.96	0.96	0.96	0.96	0.96	1.05	1.05
<b>Test Pair Controls</b>	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Adjusted R-squared</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	-	0.07	0.08
<b>Observations</b>	1,212	1,408	1,134	1,212	1,212	1,212	1,212	1,212	1,212 [86]	1,212	657	657

**Notes:** \*\*\* denotes significance at 1%, \*\* at 5%, and \* at 10% level. Robust standard errors are in parentheses, but Column 8-9-10 report normal standard errors (Column 8), cluster standard errors at session level (Column 9), and wild bootstrap standard errors (Column 10). All columns report OLS estimates. In all Column 2, the sample refers to all officials (junior and mid-level) who attended the team training, completing both the entry and exit tests (N=1,408). In Column 3, the sample refers to all senior civil servants attending t2 after t1 (N=1,134). In all the other Columns, the sample refers to all senior civil servants who showed up for the team training (N=1,212). In all the Columns, the dependent variable is the total score for only TFP modules. The session controls refer to a set of quality controls for the productivity sessions. The quality controls refer to the following questions related to a 5 point scale, where 1 refers to the lower level and 5 to the higher level: (i) How engaged were the students in training, on a scale of 1-5?; (ii) How practical would you say the training was, on a scale from 1-5?; (iii) How well did the training go, on a scale of 1-5?; (iv) Trainer-Trainees interaction, on scale of 1-5; (v) Trainer's responses to questions, on the scale of 1-5; (vi) Class control, on scale of 1-5. Figures are rounded to two decimal places.