

**Improving Teacher Effectiveness in Schools in Delhi through Behaviorally Informed Lesson
Planning Intervention**

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Abstract: In this paper, we propose a behaviorally informed intervention to address the 'learning crisis' plaguing government schools in Indian. The proposed intervention is aimed at encouraging government school teachers to create and employ lesson plans to increase their effectiveness and improve student learning outcomes. We use behaviorally informed tools such as enhanced active choice, defaults, anchors, and checklists. As well as behavioral insights on social norms and present-bias to inform our intervention design.

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I. Introduction

The World Development Report (WDR) (2018) published by the World Bank warned of a “learning crisis”. The Report notes that millions of children across low and middle-income countries attend schools for years without learning basic language (reading and writing) and/or arithmetic skills (World Bank, 2018). Yet, since most governments in developing countries still rely on traditional economics incentive schemes to address these issues, they have not been very successful.

In recent years, we have witnessed various behaviorally informed experimental interventions by researchers in an attempt to reform education systems to improve learning outcomes. Duflo et. al (2012) linked teachers’ attendance to their salaries & discovered that attaching the incentive to a simple behavior, resulted in a 21% increase in teacher attendance which led to higher student outcomes. A large-scale intervention to encourage “Teaching at the Right Level” by reorienting teaching to the level of the student has been showing positive results (Banerjee et al, 2016). In Uganda, World Bank is conducting research to measure effectiveness of teachers by controlling the class-size and providing guidance to teachers for improved performance along with non-financial rewards (World Bank, 2016). In a similar study in New Delhi, researchers are using the feed from the CCTV cameras installed by the Government to give “timely feedback” to public school teachers on how to improve classroom instruction (RISE India, 2015). World Bank (2017) is also involved in a RCT in India to find ways to motivate teachers without using financial incentives. An underlying principle across these interventions is that they aim to improve teacher performance. This may be because of two main reasons: teachers “account for about 30% of the variance” in student outcomes (Hattie, 2003); and in the majority of education systems, especially the Global South, teacher salary constitutes the highest recurring expenditure (UNESCO, 2016).

We note that in India, governments haven’t devised effective ways to link incentives (financial or otherwise) to the behavior of teachers to improve education systems, specially with regards to preparatory work done by teachers prior to class or “lesson planning”. Currently, the National Council of Educational Research and Training (NCERT) assists “the Central and State Governments on policies and programs for qualitative improvement in school education” wherein it “develops and disseminate innovative educational techniques and practices” (NCERT, n.d). The NCERT does make accessible a 200 page teacher’s manual to all public school teachers in India (Nandrajog et al, n.d). These Teacher’s Manuals typically have tips on “Lesson Planning & Preparation”. However, neither the Central nor the State Governments have enacted policy to ensure that teachers prepare and follow lesson plans. Further, in line with the previous studies which showed that complexity leads to low take-up of a desired policy (Bhargava & Manoli, 2015), on interviewing several education researchers, we find that not many government school teachers use the complicated manuals to make lesson plans. Hence, an intervention informed by behavioral economics principles is warranted to address this government shortcoming.

Our intervention incentivizes group lesson plan adaptations in line with best practices to improve teaching quality. We propose a pre-existing set of lesson plans to be used by teachers in India, encourage them to collaborate to improve upon it, to determine their classroom day-to-day practice. Instead of incentivizing an outcome teachers have less control over (like student test-scores), we chose to focus on an input teachers have control over: lesson plans. For an incentive to be successful, it has to be linked to a behavior individuals have control over (Vegas, 2007; Madrian, 2017). Further, it's important to establish a clear correlation between the input (quality lesson plans) and the desired output (higher student achievement) (Mizala & Romaguera, 2004). The lesson plan input we are designing prompts teachers to engage in practices that have been proven to be positively correlated with student outcomes, such as: communicating clear lesson objectives and expectations to students, variation in exercises ranging from those requiring lower to higher cognitive abilities, integrating the content with other subjects, and encouraging metacognition among students (Ko, Sammons & Bakkum, 2014). The purpose of the intervention are three folds: (1) to insure teachers have quality lesson plans for each class, (2) to improve communication between novice and experienced teachers, and (3) nudge teachers to following best classroom practices. We expect the three elements to contribute to better teacher quality, and ultimately higher student outcomes. We use four behaviorally informed tools: enhanced active choice, defaults, anchors, and checklists. We also use behavioral insights on social norms and present-bias to inform our intervention design.

II. Intervention Design and Behavioral Insights

Our intervention design is based on an active choice made by the teachers regarding their preferred lesson planning method, followed by a lesson plan design that prompts teachers to follow best practices. Teachers receive a package on the first day they come to work after term-break. The package includes pre-designed lesson plans and an active choice form. The pre-designed lesson plans are designed by experts in the Indian curriculum, who are familiar with public school classrooms in India, as well as in best practices. The active choice form gives teachers two options: (1) To design their own lesson plans in teams of two, or (2) to follow the pre-designed lesson plans. Teachers who choose option 2, can depend fully on the pre-designed lesson plans. A sample active choice form is in Appendix A.

Option 1 requires more time and effort from teachers, but also gives teachers access to a number of privileges. In this option, teachers are required to form a team of two, one of whom needs to be a novice teacher (has two years or less experience in teaching) and the other is an experienced teacher (has more than two years of experience)¹. The lesson plans for the first two months of classes (until midterms) need to be submitted before students resume school. As all the teachers would have access to the standard lesson plans, the teachers who have opted for Option 1 would be required to

¹ Studies have consistently found that teacher effectiveness increases non-linearly with experience during the first two years of teaching, and later tends to slows down. *See* Rockoff (2004), Chetty et al (2011), Bau & Das (2017).

submit a brief, justifying how and why their lesson plan differs from the standard lesson. Once they submit the lesson plans, they receive a bonus equivalent to ₹4000, with a card thanking them for their hard work. Teams that submitted the best lesson plans (evaluated by experts) are then invited to attend a dinner at a nice hotel with State education officials, along with having their names added to the lottery to potentially win ₹ 50,000. Teachers who choose option 1 will receive a planner as well as lesson planning forms with a checklist. The planner is can be found in Appendix B, and the lesson planning form along with the checklist can be found in Appendix C.

Teachers are required to sign and submit the active choice form in order to receive their salaries. The signature does not bind them to any repercussions if they do not follow through with the plan. It is a soft commitment (Bryan, Karlan & Nelson, 2010). This process will take place over three years, four times every year: before school starts, mid-semester one, start semester two, and mid-semester two. Below, we discuss the behavioral insights informing our design and hypothesis.

A. Enhanced Active choice and Default

In our intervention, we present teachers with an active choice between the two options. Active choice in this case is better fitting compared to a default for a number of reason. First, since designing lesson plans requires teacher effort, they need to actively choose to do so. If we default teachers in option 1, they will likely not follow-through the action required. Literature on active-choice suggests that in the long run, people are more likely to adhere to their choice than in opt-out models because they feel responsible for their choice (McKenzie, 2013). In addition, teachers know themselves better, are familiar with their students, the time they can dedicate to lesson planning and their ability, as such they are better equipped to make the choice (Sunstein, 2015).

We are employing a framing mechanism which “enhances” this active choice architecture (McKenzie, 2013). Enhanced active choice highlights the losses associated with choosing the non-preferred option (McKenzie, 2013). In our intervention, the option that we do not prefer is option 2, as such we highlight what is forgone by choosing the option: “the chance to develop my own lesson plan and get a bonus of ₹ 4000” (Appendix A). This in turn activates individuals’ loss aversion when making their choice, leading to undervaluing the benefits of the status-quo (McKenzie, 2013). Strong loss aversion is related to the prospect theory² which suggests that individuals react more strongly to losses compared to gains (Kahneman, 2011). In this case, the status-quo is to not design a lesson plan. In a study that aims to increase the number of patients getting an HIV test, they found that individuals provided with an active choice were 13% more likely to choose to take an HIV test compared to individuals who were offered an opt-in option (Montoy, Dow & Kaplan, 2016). We therefore expect the active choice mechanism to increase adoption of option 1 compared to an opt-in.

² Prospect theory predicts how people react to risks. It suggests that people’s reaction to risk depends on their reference point and that they are risk averse (Barberis, 2013).

Further, even if teachers do not make an active choice of drafting lesson plans, they are still (softly) defaulted³ into receiving a well-curated lesson plan. The likelihood of opting out of a default is low, as such, defaults tend to have a high impact (Johnson & Goldstein, 2003). In our current model, they would be required to opt-out if they do not want pre-curated lesson plans. Given that it is unlikely they will opt-out, by defaulting teachers into receiving a lesson plan, we insure they have a good guide for their day-to-day practice, which on enquiry with several researchers and Teach for India fellows, we discovered that currently, most government school teachers across India do not create and follow.

B. Inconsistent Preferences: Incentives and soft commitment

There are a number of barriers to teachers writing lesson plans, even if they believe in the benefits of lesson planning. One of which is highly discounting of future benefits (Chabris, Laibson, & Schuldt, 2010). Based on Chabris, Laibson, and Schuldt (2010), theories of intertemporal choice we can assume the discounting function of teachers is Quasi-hyperbolic (which tends to better explain individuals' behaviors). This leads to dynamically inconsistent preferences⁴ (refer to Appendix D for a detailed explanation of how Quasi-hyperbolic discounting leads to dynamically inconsistent preferences), which leads to procrastinating the act of designing a lesson plan, eventually leading to either creating it very quickly with little thought or not doing it at all.

In our intervention, we try to decrease the cost (C_t) associated with writing a lesson plan by simplifying the process. Teachers in both options receive a pre-designing standard lesson plan. This decreases the cost of designing a lesson plan for teachers who chose option 2, to almost zero, because the lesson plan is ready all they need to do is look over it and maybe adjust it a little to suit their students and teaching style. Given the vast ways teachers can approach their lesson, the numerous choices and the difficulty of aligning them may add cognitive load that leads to making no decision at all (Gourville & Soman, 2005). The standard lesson plan helps create this alignment for teachers in options by setting the standard which they can use to evaluate and guide their own design. In addition, the lesson plan forms we provide teachers in option 1 are intentionally designed to simplify the process, and help teachers think about the process in sections, decreasing the complexity and cognitive load. Studies have shown that removing complexity could have large positive effect on the take-up of the desired policy intervention (Bhargava & Manoli, 2015; Bettinger et al, 2012).

Considering that option 1 requires more work i.e. higher immediate cost than option 2, we tried to increase the immediate⁵ and future benefit of designing the lesson plans. We increase the immediate benefit by giving teachers a financial reward of ₹ 4000 in addition to a thank you note.

³ Behavior Economists define a “default” as the pre-set courses of action that take effect, unless the decision maker actively decides against it (Thaler & Sunstein, 2008).

⁴ The variation in perceiving the same act in the present and future due to highly discounting the future by a factor of β , such that an individual sees a particular act as beneficial in the future but their present self perceives it as costly in the present, is referred to as “dynamically inconsistent preferences” (Chabris, Laibson, & Schuldt, 2010).

⁵ It is immediate in relative terms compared to the delayed benefit of student outcomes, but it is not “now” as the cost is.

Expression of gratitude can be an effective way to increase effort (Grant & Gino, 2010). In a study by Grant and Gino (2010) they find that expressing thanks to an employee doubled the likelihood of the employee providing help a second time, and increased the number of calls made by more than 50%.

We also frame option 1 as a positive identity a teacher can attach to herself in order to increase the benefit of following through with option 1. In the Active Choice form, in option 1 teachers are asked if they “would like to *be a lesson plan designer*” (Appendix A). In countries where being a teacher in itself is not valued, framing the action of designing a lesson plan as not only an action a teacher takes, but an identity a teacher can attach to herself that has positive connotations may increase the benefits attached to following through with option 1 and designing a lesson plan. In a study by Bryan et al (2011) they found that by framing the act of voting as “be a voter” instead of the action “vote” increased voter turnout by 10.7%.

To increase teachers’ effort at producing high quality lesson plans, we provide additional social and monetary incentives for teachers who produce the ‘best’ lesson plans. Teachers, like other individuals, care about how their action is perceived by others (Madrian, 2017). Therefore, teachers who produce the ‘best’ lesson plans will have their lesson plans shared with the teaching community and invited to an event that celebrates them. Publicizing individual’s actions was found to have a positive effect on individuals’ actions, increasing likelihood of voting and decreasing energy consumption (Gerber et al 2004; Alcott & Rogers, 2014). That said, those studies publicized negative behavior as well. In our study we will be publicizing positive behavior only. The impact of such interventions depends on how pro-social norms are defined. If teachers do not perceive producing lesson plans as a positive thing, this may have a negative impact on participation. In a study on savings, publicizing savings was found to decrease savings rates (Beshears et al, 2015). Similarly, sharing peer information on energy consumption among conservatives had two to three times less of an impact on their energy consumption compared to that on liberals (Costa & Kahn, 2013). In our intervention, we seek to make great lesson planning a pro-social norm by attaching the creation of great lesson plans to a prestigious social event where prestige is signaled by the location of the event (in Leela Palace, a 5-star hotel) and inviting top officials in the community.

We also provide a lottery incentive for teachers to produce great lesson plans which increases the delayed benefit of lesson planning. According to the prospect theory, individuals overweight low probabilities of gain (Kahneman, 2011). As such, teachers are likely to expect higher delayed benefits from writing a great lesson plan that would include their name in the lottery.

In order to increase the impact of delayed benefits in this intervention we try to decrease how much teachers discount the future by adding a picture of a teacher who won the lottery in the previous cycle (Appendix A). We expect that by helping teachers imagine themselves winning the lottery, we can decrease the discount rate of future benefit. In a study that aims to increase retirement savings, helping individuals connect the decisions they make to their future self by showing an age progressed image of themselves was found to increase retirement saving rates by 1.8%-1.6% (Hershfield, 2011).

C. Planning & Soft Commitment

Planning and soft commitments both help bridge the gap between the intention of writing a lesson plan and actually writing one. Since those who chose option 1, chose it on their own accord, we can assume that they want to complete working on their lesson plans on time, in this case we need to help them follow-through this intention. In a number of studies, planning was found to increase the likelihood of following through on good intentions such voting (by 4.1%), and vaccination (by 8%) (Nickerson & Rogers, 2010; Milkman et al, 2011)

Effective planning prompts encourage individuals to think of how, when and where the act will be completed, as well as what the tasks are exactly (Rogers et al, 2015). Our prompt encourages teachers to describe the tasks they need to undertake to complete one lesson plan, how much time each task will take, what time and day will they work on the tasks, and when will they complete it (Refer to Appendix B for planner template). Plans are also more effective when shared with others (Rogers et al, 2015). Since the lesson planning will take place in teams the teachers can be accountable to one another.

We also intentionally designed the active choice form to sound like a soft commitment.⁶ That said, we do have a reward for teachers who follow through on option 1, though there is no financial penalty associated with not following through. Commitment devices can help individuals who face dynamically inconsistent preferences (discussed in the previous section) by having them commit their future self to an action (Bryan, Karlan & Nelson, 2010). In a study, they found that asking individuals to decide what their future self will watch increases the number of ‘virtuous’ movies chosen compared to individuals who decided what they will watch sequentially, day-by-day (Read, Loewenstein & Kalyanaraman, 1999). Similar, providing students with the option to set and commit to their own deadlines, improved their performance (as cited by Bryan, Karlan & Nelson, 2010). Therefore, we expect that by having teachers sign at the end of the active choice form following “I commit ...” statement, they will be more likely to follow through with their chosen option, especially in option 1 where there is a reward associated with following through.

D. Anchoring in best practices

By defaulting teachers into receiving standard lesson plans, we anchor⁷ teachers in high quality lesson plans. Anchors have a strong impact on people’s estimates. In a study, one group was asked if the tallest redwood is “more or less than 1,200 feet?” (Kahneman, 2011, p.123), while another group was asked if it was more or less than 180 feet. The average estimate of the first group was 844 feet, approximately four times more than that of the second group with an average of 282 feet (Kahneman, 2011). By providing teachers with a lesson plan we are anchoring teachers in what a

⁶ A soft commitment is a commitment that does not entail financial reward or penalty, but only entails psychological costs such as regret (Bryan, Karlan & Nelson, 2010).

⁷ Anchoring is the impact of considering a certain value before estimating the value of the unknown, as a result the estimated values tends to be closely linked to the value initially considered (Kahneman, 2011).

good quality, good practice looks like.⁸ As such, when they deviate they more likely than not will not deviate significantly. In addition, if teachers are assuming that those who wrote the lesson plans are experts, the standard lesson plans may result in an endorsement effect. Defaults tend to be effective because they are perceived as an endorsement of a certain course of action (Beshears, Choi, Laibson & Madrian, 2009).

We also utilize a checklist that is on the first page of both the standard lesson plans (to all teachers) and the blank lesson plan forms (to option 1 teachers) to help them move away from their usual lecture-based method of teaching – the status quo (refer to Appendix C). Individuals tend to make their decisions first, and then come up with reasons to justify it (Shafir, Simonsonb & Tverskyb, 1993). Checklists can help teachers think of reasons they otherwise would have not considered when making a certain choice (Johnson et al, 2016). In a study looking at the influence of preference checklists on individual's choice to claim retirement savings, they found by listing reasons to claim late before reasons to claim early, individuals, on average, chose to claim their retirement saving 18 months later (Johnson et al, 2016). Teachers who are used to a certain way of teaching have available reasons for why their method is the right one. By having a checklist of reasons for why they may want to consider another method of teaching, we are making available and salient what was previously unavailable, encouraging teachers to change their method of teaching. On the checklist, we have reasons why teachers should endorse student-centered learning methods, before reasons why they should endorse lecture-based teaching. The order of reasons and choices matters; individuals put more weight on what comes first (Johnson et al, 2016; Ho & Imai, 2008).

III. Potential Impact of Implementation

We note that similar interventions have not been implemented earlier so it is difficult to accurately predict the effect size. However, since our policy proposals are layered with behavioral insights, we anticipate it working on different aspects of teacher performance which impacts learning outcomes. Further, these proposals will also impact other aspects of education system potentially leading to a large positive effect on the overall system. When implemented, we would measure the impact of the proposal on student learning outcomes, teacher subject knowledge & teacher attendance.

Defaulting teachers to get well curated detailed lesson plans will lead to better classroom teaching by teachers, leading to higher student outcomes. Studies have shown that online access to the pre-made lessons with supports for teachers increased student's math test score by about 0.08 standard deviation (which is considered between small-medium effect size by industry standards (Lipsey et al, 2012) (Jackson & Makarin, 2016). Since our proposal does more than making a pre-designed lesson plan accessible online, and since defaulting will result in high take up rate (Beshears et al, 2008), we expect a medium-big effect (by industry standards (Lipsey et al, 2012)) on student outcomes.

⁸ The standard lesson plan we will provide, as well as the lesson plan form are inspired by best practices and India's vision for teacher effectiveness (Ko, Sammons & Bakkum, 2014; Nandrajog et al, n.d.)

For teachers who choose option 1 we expect higher impact on student outcomes and teacher attendance. Teachers who chose to collaborate to draft their own lesson plans (option 1) would benefit from working together (sharing knowledge, tips, etc). They are also more likely to spend relatively more time and thought on how to most effectively teach their class. This should lead to a bigger effect size on student learning outcomes when compared to option 2, as well as higher teacher subject knowledge. Lesson planning might also have a small effect on improving teacher attendance. Planning in advance could lead to a more invested teacher who is more likely to not skip an event for which she/he has prepared for (due to sunk cost). This is in line with the behavioral insight that people have irrational need to complete set of things (Carmen, 2017).

We also expect the impact of the intervention to persist with time. Running our intervention for an appropriate time period could lead to long-term adherence. Current studies show promise of long term adherence (persistence effect) to behaviorally informed interventions which are run for longer time period (Alcott and Rogers 2012). We believe our proposed intervention could lead to such positive effect, since it changes the way people think and prompts an investment in the future that would lead to habit creation and persistence (Frey & Rogers, 2014). Teachers would see how lesson planning makes them more effective, potentially reducing stress before the class. In addition, teachers would have a stock of lesson plans that they can use, making their work on lesson planning easier in the future (investing in the future). This could lead to a habit formation with teachers continuing to make and use lesson plans without any financial incentives, but the effect size might be small due to long-term decay of effect (Frey & Rogers, 2014). Additionally, since repeated cycles of lesson planning would lead to small further improvement and refinement of lesson plans and this exercise could also be used to tune up the overall curriculum the States have adopted. Curriculum reforms are a lengthy and expensive process. A detailed account of what teachers are teaching, how they are teaching it, and how much time on average are they spending on specific lessons would be very helpful and informative, while reducing costs, in process of curriculum reforms. In the long run, we expect our proposals to have a medium positive effect on the education system overall.

IV. Practical implications, potential evaluation and limitations:

Our policy proposal requires significant up-front investment (of resources and time) for large scale implementation. At scale, our proposal would require standard lesson plans to be made for each subject from grade 1 to grade 12. Further, to incentivize large number of teachers to actively engage in collaboration and draft their own lesson plans four times (two each term) a year, the rewards (cash award, lottery, social recognition etc) could add up into a considerable amount.

That said, the intervention we are proposing is scalable and is politically feasible. The proposed policy interventions are not contingent on technology and would be able to function by using well established and functioning Indian Postal Network. However, with increased access to computer and internet, the proposed intervention can become easier to implement. The proposed

intervention is also politically viable, since all the stakeholders stand to gain from its implementation. It does not impose any obligation on the teachers. Further, both the Central and State Governments are investing heavily to improve learning outcomes, with the help of World Bank and other such players. Given the current high investment and interest in education reform, the costs we propose are small considering the potential long-term impact.

To evaluate its impact, we envisage running randomized controlled trials for fewer grades at a smaller scale and/or collaborating with organization currently running RCTs in the field of education such as the World Bank and RISE. We could measure the effect size by comparing the student learning outcomes, teacher subject knowledge and attendance on the class/school where the intervention was applied to the class/school which was in the control group. We acknowledge that any long term impact of our proposed intervention would be difficult to measure. However, we could measure long term adherence, by evaluating for persistence effect 5-10 years after the removal of the incentive model (for creation of lesson plans) from our proposed intervention.

Recent studies have found that in developing countries, well performing teachers have high levels of intrinsic motivation (Kurniasih & Izati, 2017). Studies have shown that rewards may have an adverse effect on intrinsic motivation (Jovanovic & Matejevic, 2014). There is a possibility that our incentive model might drive out the intrinsic motivation that teachers might have to collaborate/make lesson plans and they might constantly need to be rewarded to carry on this process. While the effectiveness of using “default” has been documented in various studies, some research indicates that “active choice” can lead to lower take-up compared to an opt-in (Kessler & Roth, 2014). This is the reason; we have opted from “enhanced active choice”, which has been found to be more acceptable and ethical (Keller et al, 2011). That said, we do run the risk of low take-up of option 1.

V. Conclusion

Despite massive investment, Indian Public Education System continues to underperform due, inter alia, to ineffective government policies based on traditional economic models. By utilizing insights and tools from behavioral economics we hope to improve learning outcomes by increasing teacher effectiveness in India. We use four behaviorally informed tools: enhanced active choice, defaults, anchors, and checklists; along with behavioral insights on social norms and present-bias to inform our intervention design. Our intervention encourages adoption of best practices by providing lesson plans that anchor teachers in effective teaching methods, while incentivizing them to make their own adaptations by increasing immediate and delayed benefits, and decreasing immediate costs associated with lesson planning. We believe that such policy intervention could have a medium-big effect on student learning outcomes and a significant positive impact on the education system, considering the comparatively low cost.

VI. References

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VII. Appendix

Appendix A: Sample Active Choice Form for Teachers

Dear [Teacher name],

In order to receive your salary, you need to check the lesson plan option you would like to be enrolled in for the next 2 months, and submit the form to the principal no later than **1/9/2018**. Check the box on the left of the option you would like to enroll in:

- Option 1:** I would like to be a lesson plan designer and work in a team of two, using the standard lesson plan provided as a guide.
- I recognize that by choosing this option, one of the team members needs to have less than 3 years of teaching experience, and another, more than 3 years of teaching experience.
 - If I enroll in this option, I will have to complete and submit all my lesson plans for the next 2 months before students start classes on **12/9/2018**.
 - If I enroll in this option, I will receive the following privileges:
 - I will receive a bonus of 4000 Rs. I will receive this amount immediately after submitting the new lesson plans.
 - If my lesson plan is chosen as one of the best lesson plans by a team of expert teachers:
 - My lesson plan will proudly be shared with other teachers in my school and across India.
 - I will be invited to attend a mid-semester dinner in a Leela Palace with education officials.
 - I will get the chance to win ₹ 50 000 in a lottery that includes the names of the teams that designed the best lesson plans.



- Option 2:** I will follow the pre-designed standard lesson plans I received, forgoing the chance to develop my own lesson plan and get a bonus of ₹ 4000.

I, [teacher name] commit to the option I have chosen above.

Teacher's Signature and date

Principal's Signature and date

If you wish to opt-out of receiving the standard lesson plans, please check the box below and submit this document to the principal no later than 12/9/2018.

- I would like to opt-out of receiving standard lesson plans for this year.

*Note that the image used here is only to represent how it would look like in the second round of the active choice form. Instead of it we would have the picture of the lottery winners. The image was taken from the following link: <http://www.pgtfindia.com/?view=photos&page=157&sname=>

Appendix B: Planner for teachers who chose option 1

Dear [teacher name],

Thank you for choosing to enroll in option 1, to help in the process, please use the space below to plan your submission with your teammate. Remember that you will have to submit the lesson plans for the first two months of classes by **12/9/2018**.

The first row is filled in as an example.

Lesson Plan	Steps that need to be taken and time each will take	Time and day to work on each	Completion deadline
Adding Decimals (first period)	<ol style="list-style-type: none"> 1. Go over lesson content and think of potential lesson design (1.5 h) 2. Decide lesson objectives and activities together (2 h) 3. Divide responsibilities among team members (30 mins) 4. Write up the lesson plan (2 h) 5. Review draft lesson plan and incorporate feedback (2 h) 	Time for tasks: (1) 8:00-9:30 (2) 9:30-11:30 (3) 11:30-12:00 (4) 12:00-2:00 (5) 2:00-4:00 <i>On Monday, 30/8/2018</i>	Tuesday, 31/8/2018, 10:00 am

Appendix C: Lesson Plan Template & Checklist *

Unit Title:	Date: / /	Teachers' names:									
Lesson objectives (I will communicate the objective to the students) By the end of the class the student will be able to <table style="width: 100%; border: none;"> <tr> <td style="width: 33%; border: none;">•</td> <td style="width: 33%; border: none;">•</td> <td style="width: 33%; border: none;">•</td> </tr> <tr> <td style="border: none;">•</td> <td style="border: none;">•</td> <td style="border: none;">•</td> </tr> <tr> <td style="border: none;">•</td> <td style="border: none;">•</td> <td style="border: none;">•</td> </tr> </table>			•	•	•	•	•	•	•	•	•
•	•	•									
•	•	•									
•	•	•									
Methods of assessment: I will check student understanding during the class time by <table style="width: 100%; border: none;"> <tr><td style="width: 33%; border: none;">(1)</td><td style="border: none;"></td></tr> <tr><td style="border: none;">(2)</td><td style="border: none;"></td></tr> <tr><td style="border: none;">(3)</td><td style="border: none;"></td></tr> </table>	(1)		(2)		(3)		Students' understanding of their thought process (metacognition) I will develop students' meta-cognitive skills by <ul style="list-style-type: none"> <input type="checkbox"/> Asking them to voice their thoughts <input type="checkbox"/> Going through the thinking process together as a class <input type="checkbox"/> Having them showcase their thoughts on paper <input type="checkbox"/> Other: 				
(1)											
(2)											
(3)											
Differentiation I will cater to lower than average students' needs by ...	I will cater to higher than average students' needs by ...										
Co-operation I will encourage cooperation between students by ...	Student motivation I will motivate students to learn by <ul style="list-style-type: none"> <input type="checkbox"/> Relating content to student life <input type="checkbox"/> Having students discover the answer on their own (with guidance) <input type="checkbox"/> Other: 										
Constructive feedback I will provide students with constructive, positive, feedback <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;">(1) When they do well, I will ...</td> <td style="width: 50%; border: none;">(2) when they do not perform well, I will ...</td> </tr> </table>		(1) When they do well, I will ...	(2) when they do not perform well, I will ...								
(1) When they do well, I will ...	(2) when they do not perform well, I will ...										

Student-centered learning approach places the student at the center of the learning process, giving them the opportunity to “lead learning activities, participate more actively in discussions, design their own learning projects, explore topics that interest them, and generally contribute to the design of their own course of study.”¹

Reasons to adhere to student-centered teaching style:²

- Students are more motivated and engaged to learn
- Students are better able to retain the information
- Students' scores are slightly better on exams
- Students develop better life skills such as presentation and team work
- Allows for teacher creativity, breaking the school routine for both teachers and students.

Lecture-based learning approach depends on the teacher conveying information and the student listening and taking notes. The student is a passive learner in this case.

Reasons to adhere to student-centered teaching style:

- Easier to manage students' behavior
- Easier for teacher to plan for

¹The Glossary for Education Reform: Student Centered learning, Retrieved from <http://edglossary.org/student-centered-learning/>

² In reference to Armbruster, Patel, Johnson, & Weiss (2009), Antepohl & Herzig (1999), and Wijna, Loyens & Derous (2010)

*The lesson plan design was inspired by Ko, Sammons & Bakkum (2014) on *Effective Teaching*, as well as Nandrajog et al (n.d.) lesson planning guide for teachers in India.

Class time	Teacher instructions - In class I will ...	Student role - In class the student will ...

¹The Glossary for Education Reform: Student Centered learning, Retrieved from <http://edglossary.org/student-centered-learning/>

² In reference to Armbruster, Patel, Johnson, & Weiss (2009), Antepohl & Herzig (1999), and Wijna, Loyens & Derous (2010)

*The lesson plan design was inspired by Ko, Sammons & Bakkum (2014) on *Effective Teaching*, as well as Nandrajog et al (n.d.) lesson planning guide for teachers in India.

Appendix D: Quasi-hyperbolic discounting and procrastinating lesson planning

Based on Chabris, Laibson, and Schuldt (2010), theories of intertemporal choice we can assume the discounting function of teachers is Quasi-hyperbolic (which tends to better explain individuals' behaviors). This leads to dynamically inconsistent preferences. Teachers will discount the future benefit of lesson planning by an additional factor of β , such that the benefit of writing a lesson plan in the future is βB_{t+1} where t denotes now, such that $t+1$ denotes a period that is after now by "1" time frame. When the benefit of lesson planning is experienced in the future in the form of positive student outcomes, the cost (C) of writing a lesson plan is experienced in the present C_t . Evaluated at the present, writing a lesson plan results in a higher cost than benefit, assuming $B_t=0$, as shown in the equation below.⁹

$$C_t > B_t + \beta B_{t+1}$$

At the same time, thinking about the future, teachers see more benefit than cost to writing a lesson plan as shown in the equation below.

$$\beta C_{t+1} < \beta B_{t+1} + \beta B_{t+2}$$

The variation in perceiving the same act in the present and future is referred to as "dynamically inconsistent preferences" (Chabris, Laibson, & Schuldt, 2010). This leads to procrastinating the act of designing a lesson plan, eventually leading to either doing it very quickly with little thought or not doing it at all.

⁹ Note that for the purpose of this exercise we assumed that $\alpha = 1$ where α is the exponential discounting of benefits and costs, such that both benefits and costs are multiplied by a factor of α^t