Advantages and Drawbacks of Grade Band Assignment: Early Observations from a Work in Progress RCT testing the Impact of Teacher PD

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Overview: This poster will present lessons learned regarding the benefits and drawbacks of an RCT design wherein elementary schools are assigned to use either a new professional development (PD) intervention, or engage in business-as-usual (BAU) instruction, in one of two specified grade bands. That is, each participating school provides both a treatment and control group grade band. This design helped to facilitate recruitment because all schools will receive the PD. Our lessons learned are based on an RCT in progress; as of this writing a first cohort of schools has been recruited, assignment for this cohort is complete, and baseline data are being collected.

Intervention: The intervention being investigated is an in-service teacher PD. The PD has been previously investigated and there is some evidence of its efficacy (citations not provided to allow for a blinded review).

Design: This impact study will work with two cohorts of participants. Schools are randomly assigned to participate in the PD either in grades K–2 or in grades 3–5. The treatment window is two school years. As shown in Exhibit 1, schools that are assigned to have their Grades K–2 teachers receive the PD will be compared to schools where Grades K–2 teachers follow BAU routines (and where Grades 3–5 teachers are assigned to receive the PD). Conversely, schools that are assigned to have their Grades 3–5 teachers receive the PD will be compared to schools where Grades 3–5 teachers follow BAU routines (and where Grades K–2 teachers are assigned to receive the PD). Confirmatory research questions focus on various teacher and student outcomes.

Design Benefits. Schools are being recruited with the message that it is not a matter of whether it will be exposed to treatment, but at what grades. Other advantages include: (a) fewer schools need to be recruited to achieve the same statistical power as designs that assign whole schools to study conditions; (b) loss of a school would entail minimal differential attrition; and (c) it is logistically easier to maintain communication with members of the control group.

Challenges:

- Since the treatment window is two years we expect that new students and staff will join a grade band after assignment. This concern will be addressed by conducting intent-to-treat (ITT) impact analyses with sample members who are present at random assignment. This will apply to both student and teacher contrasts (student achievement outcomes will only focus on 3-5 grade band). Analyses with any other sample composition will be relegated to exploratory and sensitivity analyses.

- Schools are dynamic systems and students and teachers routinely change (or are assigned to) different classrooms, roles, and so on. This complicates matters for cluster RCTs and will be exacerbated with a two-year treatment window. We plan to address this concern with the aforementioned ITT approach.

- Schools will be assigned to the PD in either grades K–2 or grades 3–5. Hence, instructional teams that actively work together cannot be formed around grades 2–3 because this will promote treatment contamination. We are therefore recruiting schools that do not have team teaching across grades 2–3.

- The treatment will be present in the same schools as the control condition. If the PD and resultant teaching is thought to be efficacious or otherwise desirable across a school, it is possible that comparison teachers will seek to gain access to PD knowledge and deploy it in their classrooms. However, the PD principles are not easily transmitted via casual conversation. Contamination will be further mitigated by educating the sample about the concern and study staff will be present in control settings so contamination can be detected early on.

- Compensatory Rivalry and Resentful Demoralization (Shadish, Cook, & Campbell, 2002). Teachers in a grade band who do not initially receive the treatment might perceive a competition and work harder at mathematics instruction than they normally would in an attempt to provide proof that their approaches to teaching are superior. This might arise in private behavior (e.g., thinking more about how to teach) or public exertion (e.g., increasing instructional time in mathematics at the expense of other subjects), or both. Conversely, demoralization could occur when control teachers feel that they have been passed over. For this design, we are trying to address this issue by engaging in clear messaging about the importance of the BAU condition and so far this appears to be a minimal concern. The poster will offer related details.

Lessons learned so far. One complexity that has emerged is that smaller districts often operate "attendance centers" where, for example, all K-2 students are enrolled in one school, and all grades 3-5 students are enrolled in another. In the cases where the lower and upper grade bands are housed at different schools, we are treating the K-2 school and the grade 3-5 school as independent units, each of which will be randomized into one of the two study conditions. A related complication arises if a district is able to offer only one elementary school, because the district is small or if only one school is willing to join the study. We have found however that flexibility in blocking has addressed the scenarios we have encountered so far. The poster will present a few examples of a coordinated blocking scheme.

Despite efforts to establish clear and repeated communication about assignment of grade bands, school staff have often struggled with the idea that they cannot choose which grade band will experience the PD, and there have been concerns about the need to maintain teacher assignment within a band after randomization. This might be complicated by the two-year treatment window required by the intervention. The poster will offer lessons learned and talking points being used to address this matter. Since this is a work in progress, details around successes and challenges pertaining to the use of this design that emerge between this writing and later presentation will be offered.

References

Shadish, W.R., Cook, T.D., & Campbell, D.T. (2002). *Experimental and quasi-experimental designs for generalized causal inference.* Boston, MA: Houghton Mifflin.

Exhibit 1. Study Design and Estimated Numbers of Participants by Cohort, by Project Year

Study Conditions (60–80 schools total, over the course of the entire project)		**RCT Contrasts**
30–40 schools where PD is provided to Grades K–2 teachers	**30–40 schools where PD is provided to Grades 3–5 teachers**	
Grades K–2 teachers who receive PD PD over two school years	Grades K–2 BAU teachers	PD impact in Grades K–2
Grades 3–5 BAU teachers	Grades 3–5 teachers who receive PD PD over two school years	PD impact in Grades 3–5

Cohort 1 (2019 – 2021)	**Summer 2019**	**2019 – 2020 School Year**	**2020 – 2021 School Year**
	Two Facilitator Institutes (40 facilitators, 20 teams)	~36 schools ~432 teachers (216 T; 216 C) ~8,640 students (4,320 T; 4,320 C)	~36 schools ~432 teachers (216 T; 216 C) ~8,640 students (4,320 T; 4,320 C)
Cohort 2 (2021 – 2023)	**Summer 2021**	**2021 – 2022 School Year**	**2022 – 2023 School Year**
	Two Facilitator Institutes (40 facilitators, 20 teams)	~36 schools ~432 teachers (216 T; 216 C) ~8,640 students (4,320 T; 4,320 C)	~36 schools ~432 teachers (216 T; 216 C) ~8,640 students (4,320 T; 4,320 C)