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# Adapting to Challenges: K-12 Education in the time of COVID

An analysis of district-wide operational changes in response to the spread  
of COVID-19

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June 2022

## Abstract

During the first 2 years of the COVID-19 pandemic, the disruptions across society were both intense and varying along pre-existing structural and social lines of inequity, especially in the US. Research has shown that this pattern was particularly true in the context of K-12 education. To assess when, why, and how school districts and charter management organizations (CMOs) chose to adopt and execute new policies for the delivery of education during the pandemic, I review existing theories of organizational inertia and analyze four general characteristics of school districts/CMOs for their ability to predict districts' likelihood of implementing new instructional delivery methods. My findings suggest that both larger and younger school districts were more likely to adapt in response to the pandemic's disruption of education.

## External Shocks to Education During COVID

As COVID-19 spread across the US beginning in the spring of 2020, schools and districts in the US often had little stability to rely on as they rapidly transitioned to remote learning, often without sufficient access to technology: "As the [pandemic] crisis began, millions of children, particularly those in low-income communities, lacked access to the computers and connectivity that would make in-person remote learning possible, creating even greater equity gaps than those that already existed" (Darling-Hammond, 2021). Declining enrollments also meant that once-consistent funding was now much less secure, although an influx of federal funds from the CARES Act provided some balance to these funding shortages. Nonetheless, districts' concerns about future shifts in the pandemic's intensity and declining tax revenues meant that CARES money was only a temporary solution to a complex problem (Belsha, 2020). This added to the uncertainty faced by district leaders in making decisions about spending and operations.

Additionally, a May 2022 report from the Center for Education Policy Research found that "remote instruction was a primary driver of widening achievement gaps" (Goldhaber, et al., 2022: 5). This helps explain why the shift to remote learning (and especially its varying and extended duration) qualifies as an environmental shock to organized education systems, at least based on student outcomes. The authors of this report point to significant and stratified degrees of learning loss over the study's 2-year span, finding that, "On average, students who attended in-person school for nearly all of 2020-21 lost about 20 percent worth of a typical school year's math learning during the study's two-year window....But students who stayed home for most of 2020-21 fared much worse. On average, they lost the equivalent of about 50 percent of a typical school year's math learning during the study's two-year window" (Leonhardt, 2022). The report also showed that poorer students were more likely to shift to remote modalities,

and stay there longer. Taken together, these findings support the conclusion that the shift to remote learning had regressive effects, widening pre-existing gaps in educational access and outcomes.

Additionally, statistical research analysis by nature tends to be conservative in its methods, in order to avoid making claims with false confidence. As such, the reality of such divisions in student outcomes may even be more intense than the data has indicated: “The evidence to date likely understates both the average academic impacts of the pandemic and the opportunity and achievement gaps it has produced” (Dusseault, 2021: 4). I anticipate that observed gaps in learning loss may continue to grow as more time passes, enabling researchers to look at longer trends with larger amounts of nuanced data.

This CEPR report also references another study in its introduction: “Jack et al. (2021) documented declines in proficiency rates in districts that shifted to remote instruction, especially in districts serving larger shares of Black and Hispanic students and lower income students” (Goldhaber, et al., 2022: 6). While this may be a real, observed trend in certain contexts, the CEPR authors highlight this study’s inability to separate proficiency rates by school and the fact that only 12 states were included in their analysis. As such, it seems that only a rough association can be assumed rather than explicit causality.

In addition, social and emotional development was severely harmed by the extended absence of students to socialize, learn, and grow alongside their peers with consistent frequency. A report from the Brookings Institution states that “academic learning losses in reading and math are a growing concern across the U.S. and globally, especially for children living in low-resourced communities that have been disproportionately affected by the abrupt shift to remote schooling. However, many are equally concerned about the harder-to-predict developmental effects of ongoing social deprivation, both in and out of school, for children” (Bassok, et al., 2021). This demonstrates how the effects of COVID were multifaceted and unevenly distributed across society.

This multifaceted nature of schooling disruptions caused by the pandemic reinforces the idea that constitutes a significant environmental change in the organizations that comprise education systems. But while the lack of stability created many challenges, many educators and researchers saw the moment as one of opportunity. For instance, researchers at the Center for Reinventing Public Education argued in a september 2021 report that, despite complex challenges it caused, COVID-19 offered a chance to radically imagine what a “new normal” could and should look like for education systems (Dusseault, 2021: 13). This point was echoed by an insightful op-ed in the Washington Post, titled “The Kind of Teaching Students Need Right Now” that calls for, among other

new practices, an emphasis on social emotional learning, especially after 15 months of COVID and its traumatic effects on families across all levels of society. In the article, Valerie Strauss cites the ideas of educator Larry Ferlazzo, who argues that education delivery that recognizes the traumatic experiences which many students have gone through will be crucial (Strauss). At the same time, it is still important for teachers to set boundaries with students, even though the experiences of the pandemic have been difficult for everyone. One teacher in Texas notes that “students may mistake compassionate teachers as quasi-therapists. Crossing this boundary can be harmful for both students and educators” (Bartholomay, 2021: 65). The long-term impacts of COVID, especially on mental health, has made almost every facet of professional life more difficult, especially in the classroom. Pretending that everything is “back to normal” once students are sitting in classrooms instead of sitting on a zooming call during the school day is reductive and ignores the reality of the past 2.5+ years of life in the US and abroad.

Additionally, research highlighted in report from the Learning Policy Institute has demonstrated that “personalizing” learning by putting students in front of programmed computers for machine-based instruction for long hours at a time — or piles of worksheets that offer the same decontextualized approach to learning” can lead to worse academic outcomes. Education cannot simply zoom the problem away; remote learning has to be part of a comprehensive restructuring of education delivery. What’s more, a narrow focus on learning loss will only lead educators “...down a familiar road, one paved with repetitive remediation, disengaged students, and reluctant families who are disillusioned with impersonal, inauthentic learning” (Darling-Hammond). The disparities in achievement outcomes exacerbated by the pandemic need to be dealt with using creative and evidence-based solutions.

If necessity is the mother of innovation, then the significant external shock that this pandemic had on K-12 education systems provides a fitting opportunity for educators to radically reimagine systems at the structural, policymaking, and classroom levels. In the a report from the International Commission on the Futures of Education, a structure within UNESCO, lead author Sahle-Work Zewde ends the report’s introduction by asserting that “COVID-19 has the potential to radically reshape our world, but we must not passively sit back and observe what plays out. Now is the time for public deliberation and democratic accountability. Now is the time for intelligent collective action” (International, 2020: 4). Educators can and should think about how to continue delivering quality instruction remotely, how to safely and effectively transition back to in-person or hybrid learning schedules, and what new instructional practices deserve to stick around once COVID-19 becomes an endemic, accepted part of life and ceases to upend education with the frequency and intensity that it did over the first year and a half after its onset. At the same time, it is important for educators and especially

administrators to understand that fatigue is a significant human factor that can limit effective implementation of reforms. Teachers are often tasked with using many new techniques in teaching in rapid succession, often at the same time (Eckert, 2017). This means that there is such a thing as too much innovation, but adaptability during the tumultuous period of the pandemic is still incredibly important.

## Organizational Barriers to School Reform

For this project, I chose to focus on indicators of instructional flexibility and core changes in the delivery of education, including student grouping practices and teachers' responsibilities in leading them. Changes in such features, based on the challenges of COVID, would seem to indicate that flexibility on the part of districts is at least correlated, time-wise, with an environmental change in the form of a pandemic.

Educators should understand why and how it is that school reforms of all types have all too often failed to produce any meaningful change. The education scholar Richard Elmore (1996) argues that "Much of what passes for "change" in U.S. schooling is not really about changing the core, as defined above. Innovations often embody vague intentions of changing the core through modifications that are weakly related, or not related at all, to the core" (Elmore, 1996: 3). His beliefs about what counts as the core features in educational practice include "...how teachers understand the nature of knowledge and the student's role in learning, and how these ideas about knowledge and learning are manifested in teaching and classwork. The "core" also "includes structural arrangements of schools, such as the physical layout of classrooms, student grouping practices, teachers' responsibilities for groups of students, and relations among teachers in their work with students, as well as processes for assessing student learning and communicating it to students, teachers, parents, administrators, and other interested parties" (Elmore, 1996: 2). These concepts strongly influence my variable selection to identify what core features of education were changing, which I explain later in more detail.

Elmore also explains that "The problem of scale in educational innovation can be briefly stated as follows: Innovations that require large changes in the core of educational practices seldom penetrate more than a small fraction of U.S. schools and classrooms, and seldom last for very long when they do" (Elmore, 1996: 1-2). This is a sobering thought, given the heightened state of turmoil and uncertainty that education systems have been experiencing since the onset of the pandemic.

The education scholar Charles Payne (2008) has analyzed the political, economic, and social dynamics of school reforms. He assesses institutional inertia in the context of

K-12 education systems, finding that a lack of both social capital/support and material resources can be extremely detrimental in the process of implementing reforms. Specifically, in procuring the majority of educational reforms since the late 1980s and up through No Child Left Behind's passage in 2002, educators and policymakers across the political spectrum have focused excessively on finding the magic bullet of school reform, instead of understanding the stifling environments and embedded structural barriers at work in the most under-resourced schools. Payne provides illuminating perspective by saying "when even good ideas are understood out of context, when they are reduced to The Solution, they become part of the problem" (2008: 5). Often, policies that are labeled or promoted as core change do little to nothing to undo fundamental problems. Context is key to understanding the variety of problems which hinder schools that try to adapt.

In his book *110 Livingston Street*, David Rogers highlights several key features of the New York City Board of Education and school system, which, in addition to dysfunctional politics at the inter-organizational level, stand in the way of progress. Among them are overcentralization and an "upward orientation of anxious subordinates"; vertical and horizontal fragmentation, which leads to poor coordination between units within systems; informal pressure between personnel which can work against wider goals; insulation from clients due to internal politics and individual career goals; and committee structures which splinter authority (quoted by Payne, 2008: 123). Unfortunately, this frequently results in "a situation in which people can administer failure constantly and, again, not feel like failures, protected both by the complexity of the organizational structure and by ideologies of 'professionalism'" (Payne, 2008: 124). Ironically, some of these features are the result of standardization and bottom-line accountability taken too far.

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## Building a conceptual framework using theories of organizational inertia and change

Why do organizations across a range of sectors and types seldom make significant operational changes, even in the face of significant outside pressure? The concept of routinization and inertia in organizational environments has long been a subject of focus for social research. In an essay published in 1968, Max Weber argued that "bureaucracy...was so efficient and powerful a means of controlling men and women that, once established, the momentum of bureaucratization was irreversible" (Weber, quoted in DiMaggio & Powell, 1983: 147). With all due respect to Weber, this seems like an overly deterministic view of structured organizations' unwillingness to change.

Organizations today are highly structured entities, but changes can still occur. Whether such changes are permanent, significant, and legitimate depends on the context of the different times, places, and the environments in which changes are to be implemented.

Nonetheless, research has shown how greater stability is highly valued in organizational contexts, which often leads to less capacity to adapt in the face of new challenges. According to Hannan and Freeman's (1984) work, while "...institutionalization and standardization offer the advantage of reproducibility, they generate strong pressures against change because organization members seek to maintain the status quo that protects their interest. Thus, the very characteristics that give an organization stability also generate resistance to change" (Kelly & Amburgey, 1991: 593). From a rational self-interested perspective, it makes sense that organizations, particularly larger ones with more employees and anxious shareholders, would want to minimize uncertainty in the foreseeable future and maximize predictability. Other researchers have contended that "highly structured organizational fields provide a context in which individual efforts to deal rationally with uncertainty and constraint often lead, in the aggregate, to homogeneity in structure, culture, and output" (DiMaggio & Powell, 1983: 147). Across a range of organizational types, passionate and driven individuals often find themselves blocked from making meaningful progress due to rigid and stubborn structural environments. Destler (2014) describes the persistent gaps between formal policy and informal practice: "Prior research on organizational change (e.g., Sandfort, 1999) highlights the difficulty of changing deeply ingrained practices. Even if individuals within an organization support a reform or perceive a need for change, inertial forces can impede substantive change" (Destler, 2014, quoting Hannan & Freeman, 1984, on p. 204). School districts often experience this problem for a variety of different reasons, but often the schools and districts with greatest need for reform have the least human capacity and material resources to effectively do so (Payne, 2008).

In thinking about what factors lead organizations to break with such powerful forces of inertia of core practices, my understanding of institutional inertia is rooted in Hannan and Freeman's (1984) theory of structural inertia. In their research, core organizational features are defined as the following:

- 1) Stated Goals, the "basis on which resources are mobilized"
- 2) Forms of Authority within an organization
- 3) Core technology, especially investments in infrastructure and human capital/capacities
- 4) Marketing strategy, the kinds of clients/customers "to which the organization orients its production and the ways in which it attracts resources from the environment"

Changes in any of these fundamental aspects of an organization therefore represent some meaningful degree of core change.

In their research on organizational inertia, Kelly & Amburgey (1991) argue that older organizations are less likely to change because, once organizations become more established, they are more likely to become set in their ways: "...old organizations have had time to formalize relationships and standardize routines (Stinchcombe, 1965), structural stability increases monotonically with age. The other side of this increasing stability is increasing resistance to change: inertia also increases monotonically age (Hannan & Freeman, 1984:157)" (Kelly & Amburgey, 1991: 594). This pattern is significant across a variety of organizational types in the private and public sector.

Other scholars have confirmed this pattern of the greater age of organizations creating rigidity: "Organizations may change their goals or develop new practices, and new organizations enter the field. But, in the long run, organizational actors making rational decisions construct around themselves an environment that constrains their ability to change further in later years" (DiMaggio & Powell, 1983: 148). Over time, organizational inertia builds up and decreases the potential of any core changes in operation.

This argument will help illustrate why the distinction I make between older public school districts and newer charter management organizations in my analysis of schools' likelihood of changing core practices is sensible and meaningful. If CMOs (which are newer organizational forms that only came into practice starting in the 1990s) are vastly more equipped, for whatever reason, to adopt and implement changes compared to public school systems, it would be unwise to pretend as though these two forms have no meaningful differences when it comes to flexibility and implementing new practices. This leads to my first hypothesis:

H1: Since school districts are older than CMOs, school districts are less likely to initiate changes in their core practices.

Other foundational research has highlighted the importance of organizational size and inertia: "Size is also associated with resistance to change (Hannan & Freeman, 1984: 158). As organizations increase in size, they emphasize predictability, formalized roles, and control systems (Downs, 1967: 158). Organizational behavior becomes predictable, rigid, and inflexible" (Kelly & Amburgey, 594). This understanding of size as a known factor in determining a lack of flexibility leads to my second hypothesis:

H2: Larger districts will exhibit greater inertia, and are thus less likely to initiate changes in their core practices.

Existing research contains mixed findings on the potential for external shocks that significantly change the environment in which an organization operates to motivate change in core organizational features. For instance, Singh, Tucker, and Meinhard's (1988) study of almost 400 Toronto-area voluntary organizations, from 1970 to 1982, found that an environmental shock, defined as distinguishing two distinct legislative periods, "was associated with an increase in the probability of core feature change" (Kelly & Amburgey, p 595). On the other hand, Baum's (1990) study of over 750 Toronto-area daycare centers over a span of 18 years found that "...environmental change, as measured by increases in the cost of capital to small businesses, was associated with a decrease in the probability of core feature change" (Kelly & Amburgey, 595). While school districts are certainly different kinds of organizations, this pattern still provides helpful context. Because of these mixed results, I decided to test a similar theory in a different and more current context, which leads to my third hypothesis:

H3: A district/CMO's likelihood of initiating changes in core practices is positively associated with a longer period of time spent in exclusively remote learning modalities, which is due to the significant environmental shock to education posed by the pandemic

While learning loss has been given enough, perhaps even too much, focus in the research on the pandemic's effect on students, I also include a fourth hypothesis to test the following:

H4: A district/CMOs likelihood of initiating changes in core practices is positively associated with a greater level of learning loss

## Process of Inquiry

This paper analyzes data from the American Educator Panel surveys conducted by the RAND corporation in 2020 and 2021. There are three nationally-representative groups of educators that RAND conducts periodic surveys on: the American Teacher Panel, the American School Leader Panel, and the American School District Panel (RAND, 2020). I focus on the ASDP surveys, making districts and charter management organizations the unit of analysis. There were 4 rounds of surveys sent to superintendents and leaders of charter management organizations during the first 2 years of the pandemic:

wave 1 was conducted in October 2020, wave 2 in April 2021, wave 3 in June 2021, and wave 4 in October 2021. I primarily draw from responses to the first and second waves of this survey to test my theories of instructional change in response to COVID.

At first, I wanted to focus exclusively on lost learning as a possible driver of implementing new practices at the district level. Learning loss has been a subject of focus in educational research for some time, but some see the present connotation of the concept as somewhat reductive and stifling: “While many of us resist the deficit orientation of learning loss language, these concerns are certainly legitimate...It is critically important that we address these concerns based not on outdated notions about remediation, but on what we now know about how people learn effectively” (Brookings). There has been a massive decrease in the amount of opportunities for learning during the first 1.5 years of COVID, but returning to the same old techniques of remediation, the authors argue, will improve nothing.

District policy and strategy is a meaningful case with which to examine theories of change in structured organizations. There’s clear evidence of an external shock to education based on student outcomes, based on findings from the CEPR report that students lost between 20-50% of a year’s worth of math learning between fall 2019 and fall 2021, and that “schools with large numbers of poor students were more likely to go remote” (Leonhardt, 2022). This, combined with the lack of adequate technology for remote learning experienced by students in poor families, created a double-challenge for poor families in trying to minimize learning loss.

To identify what areas of education leaders were most concerned about at the start of the first pandemic school year, I started by looking at the distributions of responses to all 7 questions in the first wave of ASDP. The distribution of responses indicated several common concerns of district leaders, such as lost learning and social/emotional development, staffing and funding shortages, access to technology, and the mental health of students and teachers. I wanted to know if all these heightened challenges might lead to more flexibility on the part of educators, to come up with creative solutions to the unique problems caused by the pandemic.

Eventually, with guidance, I started thinking about how other features of districts/CMOs might influence the likelihood of enacting and implementing core changes that have a direct impact on students’ learning experiences, which lead to the formulation of my aforementioned hypotheses.

## Data and Methods

For context, there is clear evidence that district and CMO leaders were concerned about the immediate and long-term challenges to education posed by COVID at the beginning of the 2020-2021 school year. By fall 2020, more than 3 out of every 4 districts were already planning to retain a covid-driven change in their jurisdiction's policies/practices (RAND, 2020). Additionally, over half (53%) of respondents on the first wave of surveys sent to district leaders indicated that "addressing disparities in students' opportunities to learn that result from differences in supplemental supports provided by families" was a "significant concern" for their districts. This suggested that, even during the first few months of school shutdowns necessitated by the public health impact COVID, superintendents and CMO leaders were already concerned about students' unequal levels of access to and support for meaningful remote learning.

What's more, over half (51.4%) of district leaders indicated that they were planning to adopt "flexible staffing models in which teachers provide instruction to students other than the ones who would be assigned to them if instruction were in-person (for instance, helping other teachers with small-group instruction or teaching larger groups of students than would be feasible in an in-person modality)". Over half (50.8%) of district leaders also said they were planning to adjust policies regarding instructional time. These responses seem to indicate that a significant portion of districts were at least willing to adopt significant changes in operational policy, which indicates a base level of willingness to adopt core feature changes.

To measure organizational willingness and ability to adopt innovative instructional practices as the dependent variable, I constructed a factor component variable using district leaders' responses to roughly a dozen questions that represent varying degrees and types of operational flexibility. I used Hannan and Freeman's (1984) ideas of core organizational features to select questions that related, either explicitly or implicitly, to changes in district policy that relate to the core of educational delivery. The following table lists the selected questions I used to construct the factor analysis, which are also described in the variable appendix:

|  | Communalities |            |
|--|---------------|------------|
|  | Initial       | Extraction |
| Cut some non-core courses to focus on core academic courses (i.e., math, ELA, sc | 1.000         | .651       |
| Adopted new online-accessible curriculum or instructional materials              | 1.000         | .333       |
| Delayed the use of planned new curriculum or instructional materials             | 1.000         | .534       |
| Adopted a new learning management system   | 1.000         | .803       |
| Added software, courses, or coursework (whether online or in-person) to review p | 1.000         | .406       |
| Added or increased social and emotional learning programming or minutes          | 1.000         | .481       |
| Grouped students by ability level  | 1.000         | .320       |
| Offered online course credit recovery  | 1.000         | .457       |
| Offered one-on-one or small group tutoring (whether virtual or in-person)        | 1.000         | .418       |
| Provided professional development to teachers about how to remediate learning re | 1.000         | .480       |
| Reduced number of elective courses to increase staff or resources for core acad  | 1.000         | .568       |
| Changed grading policy to assign students incompletes rather than failing grades | 1.000         | .507       |

Extraction Method: Principal Component Analysis.

|  | Component 1 |
|--|-------------|
|  | 1           |
| Cut some non-core courses to focus on core academic courses (i.e., math, ELA, sc | .418        |
| Adopted new online-accessible curriculum or instructional materials              | .512        |
| Delayed the use of planned new curriculum or instructional materials             | .410        |
| Adopted a new learning management system   | .276        |
| Added software, courses, or coursework (whether online or in-person) to review p | .563        |
| Added or increased social and emotional learning programming or minutes          | .584        |
| Grouped students by ability level  | .273        |
| Offered online course credit recovery  | .390        |
| Offered one-on-one or small group tutoring (whether virtual or in-person)        | .558        |
| Provided professional development to teachers about how to remediate learning re | .492        |
| Reduced number of elective courses to increase staff or resources for core acad  | .365        |
| Changed grading policy to assign students incompletes rather than failing grades | .420        |

Extraction Method: Principal Component Analysis.  
a. 4 components extracted.

While these survey questions are neither perfect nor comprehensive indicators of core changes in education, this combination of questions and answers provide strong representations of core changes in the delivery of education. The **Eigenvalue** of the strongest component analysis, which measures the consistency of responses to all of these questions, is **2.429**, which is high enough above 1.0 to assume a real-world

underlying rationale for why these answers hang together. I contend that this rationale is the desire of district leaders to creatively imagine and enact new policies in response to the challenges posed by COVID.

For my first hypothesis, the independent variable I use to indicate organizational age is whether each district is a public school district or a private CMO, with the understanding that CMOs are overall newer forms of school systems than public districts.

For my second hypothesis, the independent variable I use to indicate organizational size is the number of students per district, broken up into 3 ordered categories: Tiny districts are those with 0 to 700 students; small districts are those with 701 to 2250 students, and medium/large districts are those with 2251 or more students.

For my third hypothesis, the independent variable I use to indicate the degree of disruption to schooling as an external shock caused by the pandemic is whether students were learning in-person or remotely by winter 2021.

For my fourth hypothesis, the independent variable I use to indicate different amounts of students' learning loss are district leaders' assessments of how far behind their students were in math and reading skills in fall 2020 compared to fall 2019.

For my analysis, I start by creating bivariate regression models for each hypothesis, using the factor component as the dependent variable each time. I also control for demographic variation within districts in these models, due to the crucial context provided by different student-body characteristics in an analysis of districts' ability and willingness to adopt new practices. The variable representing such differences is a target/non-target classification of district, which is a dummy variable that indicates whether a district has at least 50% of students who are black and/or latino or at least 50% of students qualifying for Free or Reduced-Price Lunch based on family income.

Finally, I create a multivariate regression model using all 4 independent variables, still controlling for the target/non-target classification of districts.

In all of the variables I selected, I erased the non-response data, which were coded as either -999 or -888 in the survey codebooks, for answers left blank and for legitimate skips of the question based on previous answers given by each respondent. This was to ensure that any results would not be skewed by these placeholder values, and instead be solely based on answer options that respondents were usually asked to rank on a scale of 1-4 or a similar range of options.

## Findings

|                         | <b>Age, indicated by CMO/public district status (H1)</b> | <b>Tiny district size (H2)</b> | <b>Small district size (H2)</b> | <b>Large district size (H2)</b> | <b>Elementary modality as of winter 2021 (H3)</b> | <b>Secondary modality as of winter 2021 (H3)</b> |
|-------------------------|--|--------------------------------|---------------------------------|---------------------------------|---|--|
| Adjusted R <sup>2</sup> | 0.036  | -0.015                         | -0.015                          | -0.015                          | -0.008  | -0.013   |
| Slope                   | 0.642  | -0.362                         | 0.119                           | 0.155                           | -0.177  | -0.153   |
| p-value                 | 0.043 **   | 0.397                          | 0.741                           | 0.502                           | 0.507   | 0.564  |
| Standard deviation      | 0.313  | 0.425                          | 0.358                           | 0.230                           | 0.266   | 0.263  |

|                         | <b>Learning loss in math (H4)</b> | <b>Learning loss in reading (H4)</b> | <b>Multiple Regression</b> |
|-------------------------|-----------------------------------|--------------------------------------|----------------------------|
| Adjusted R <sup>2</sup> | -0.160                            | -0.160                               | -1.20                      |
| Slope                   | 0.511                             | -1.273                               |                            |
| p-value                 | 0.661                             | 0.463                                |                            |
| Standard deviation      | 1.127                             | 1.658                                |                            |

The results of my regression analyses show that only district type (public or CMO) is a statistically significant predictor of adopting innovative practices. All other hypotheses fail to meet the threshold for statistical significance (alpha = 0.05).

However, I also created another regression model earlier in my process of analysis that uses only 1 survey question as the dependent variable. This question, at the end of the first wave of surveys, asked district leaders whether they had adopted any innovative practices by fall 2020 in response to COVID that they planned to continue after the

pandemic. In a regression model controlling for demographic difference, ordinal district size (1 for tiny, 2 for small, 3 for medium/large) is a significant predictor of this indicator of innovation in educational delivery ( $p < 0.001$ ), with a slope of 0.292 and standard error of 0.055. In this model, the target/non-target variable has a p-value (0.884) nowhere near the requisite 0.05 or below. Therefore, I suggest that district size may be a meaningful predictor for the adoption of innovative practices in the context of education.

## Discussion/Conclusion

The fact that charter schools are positively associated with the likelihood of adopting innovative practices supports my first hypothesis that younger organizations are better equipped to change core features. Furthermore, the results of my regression model that uses district size to predict the isolated indicator of adopting innovative practices refutes my second hypothesis that larger districts will be less likely to change core features. With a small but positive slope, it appears that larger districts are in fact more likely to adopt innovative practices.

These findings can inform how current and future reforms in K-12 education can be most successful in different environments. If public school districts and smaller school districts are significantly less likely to adapt, there must be a keen awareness of the policy features and resources needed to ensure effective implementation in these educational contexts.

Limitations of this study include a relatively small sample size for all of my hypotheses. Additionally, the measure of students' learning loss for H4 was not based on student assessment data, which would have been a stronger indicator than district leaders' understanding of their students' outcomes. Finally, the fact that I only used the first two waves of ASDP surveys limits the ability of these findings to describe broader changes over time in the likelihood of districts to adapt.

Further research may find it worthwhile to test similar theories of district-level change, especially in regards to duration of remote learning and degrees of learning loss, which were both insignificant in my findings.

## Variable Appendix

| Independent, dependent, or control) and which hypotheses it corresponds to | Wave # | Survey question selected (question#_row# or other externally coded name)                      | Original phrasing of question (and subquestion, if applicable)   |
|--|--------|---|--|
| Dependent (H2)   | 1      | 07  | <p>“Q07: “Did your district adopt any innovative practices in response to COVID-19 that you anticipate continuing in future years, even after the pandemic has passed?”</p> <p>Possible answers: 1 = yes; 0 = no</p> |
| Independent (H1)   | n/a    | District type   | Possible options: Charter Management organization or Public school district (I created a dummy variable CMO = 1; public = 0  |
| Independent (H2)   | 4      | wv4_district_size   | Possible options: 0-700 students, 701-2250 students, and 2251+ students (I re-coded these options into a dummy variable as 1, 2, and 3, respectively)  |
| Control (demographic)  | 1      | Target/Non-Target   | At least 50% black or latino student population, or at least 50% of students qualifying for FRPL   |
| Dependent (H3)   | 2      | d_att_schedule<br><br>“Which of the following changes to the school schedule or calendar have | Row 10: “cut some non-core courses to focus on core academic courses (i.e., math, ELA, science, social studies)”   |

|                |   |   |  |
|----------------|---|---|--|
|                |   | any one or more of your schools adopted for this school year (2020-2021)?"  |  |
| Dependent (H3) | 2 | d_ins_change<br><br>"Which of the following changes to instructional programming have any one or more of your schools adopted for the 2020-2021 school year?" | <p>Row 01: "Adopted new online-accessible curriculum or instructional materials"</p> <p>Row 03: "Adopted a new learning management system" <b>core #?</b></p> <p>Row 04: "Added software, courses, or coursework (whether online or in-person) to review previously taught content or catch students up to grade level"</p> <p>Row 05: "Added or increased social and emotional learning programming or minutes"</p> <p>Row 08: "Grouped students by ability level"</p> <p>Row 09: "Offered online course credit recovery"</p> <p>Row 10: "Offered one-on-one or small group tutoring (whether virtual or in-person)"</p> <p>Row 11: "Provided professional development to teachers about how to remediate learning required for students to perform grade-level work"</p> |

|                  |   |   |  |
|------------------|---|---|--|
|                  |   |   | <p>Row 12: “Reduced number of elective courses to increase staff or resources for core academic courses”</p> <p>Row 13: “Changed grading policy to assign students incompletes rather than failing grades to avoid students having to retake the entire course”</p>  |
| Dependent (H3)   | 2 | D_bud_services<br>“Which of the following changes to partnerships and services have any one or more of your schools adopted for 2020-2021?” | <p>(respondents were instructed to select all rows/options that apply)</p> <p>Row 03: “Partnered with one or more online providers to provide virtual instruction (e.g., tutoring or leading full-size classrooms”</p> <p>Row 04: “Partnered with before- or after-school providers to provide in-person homework or other academic support”</p> |
| Dependent (H3)   | 2 | d_staff_change<br>“Which of the following changes to school staffing have any one or more of your schools adopted for 2020-2021?”           | <p>Row 10: “Hired additional specialist to offer push-in or pull-out instruction”</p>  |
| Dependent (H3)   | 2 | d_stf_centoff_teach   | <p>“Has your district/CMO re-assigned central office staff to classrooms to cover teacher shortages in 2020-2021?”</p> <p>0 = No, 1 = Yes</p>  |
| Independent (H3) | 2 | d_ins_mode_elementary   | <p>“Which of the following most closely reflects how instruction is offered to the majority of your elementary school-age</p>  |

|                  |   |                |  |
|------------------|---|----------------|--|
|                  |   |                | <p>students <i>as of the date you are taking this survey?</i>" (emphasis in original)</p> <p>1 = Fully remote instruction, where a large majority or all students are offered at least one synchronous class 4-5 days per week</p> <p>2 = Fully remote instruction, where a large majority or all students are offered less than one synchronous class each school day (i.e., instruction might be distributed via paper workbooks or asynchronous videos)</p> |
| Independent (H3) | 2 | d_ins_mode_sec | <p>"Which of the following most closely reflects how instruction is offered to the majority of your secondary school-age students <i>as of the date you are taking this survey?</i>" (emphasis in original)</p> <p>See above cells for description of answer options 1 and 2 that I focus on</p>   |

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