A Blueprint for Scaling Tutoring Across Public Schools

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Abstract

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I. Program Vision and Principles

This paper is about an idea. Our premise is that all students could benefit from individual instruction by a tutor. Tutoring is among the most effective education interventions ever to be subjected to rigorous evaluation.[1] The *average* effect of tutoring programs on student achievement is larger than the effects found in approximately 85% of studies evaluating education interventions and equivalent to moving a student at the 35th percentile of the achievement distribution to the 50th (Kraft, 2020). The enormous demand for tutoring further attests to its efficacy. Private tutoring services now constitute a $47 billion dollar industry in the United States alone (Global Industry Analysts, 2020). Yet access to tutoring remains inherently unequal.

We seek to understand what it would take to equalize access to tutoring by integrating it into the U.S. public school system. We see tutoring not as an ancillary, compartmentalized, and temporary intervention for remediating students, but becoming a core feature of public school instruction over time. This is a long-term vision for change in the public school system, similar to the expansion of public kindergarten over a 30 year period. To accomplish this goal, we outline one possible blueprint for taking tutoring to scale nationally and highlight a range of design and implementation challenges that are inherent to such an ambitious idea. We then use the blueprint to construct credible estimates for the total cost of scaling tutoring nationally as well as for a range of more targeted approaches. Such evidence is critical for informing whether, as a society, we believe that tutoring at a national scale is a goal we can and should pursue.

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[1] For evidence from meta-analyses of causal research see Dietrichson et al. (2017), Fryer (2017), Nickow et al. (2020). The Education Endowment Foundation (2018) also summarizes a variety of research on small-group tutoring in their Teaching & Learning Toolkit.

Our blueprint is centered on ten core design principles and the expansion of existing federal organizations to support adoption, while providing for local ownership over key implementation features. High school students would tutor in elementary schools via an elective class, college students in middle schools via federal work-study, and full-time 2- and 4-year college graduates in high schools via AmeriCorps. We propose a design where students work with the same tutor either in person or online as part of a regular class. Ideally, tutoring would be part of an extended school day, rather than as part of a pull-out, in-class, afterschool, or out-of-school tutoring approach. Tutoring classes should supplement — not supplant — classroom instruction, the arts, and physical education.

We envision an incremental, demand-driven expansion process that prioritizes schools serving students most in need of individualized instruction. Our estimates illustrate that targeting funding for school-wide tutoring via a range of equity-based approaches would cost a comparable amount to existing federal education programs such as Title I, the National School Lunch Program, and Head Start. For example, a program targeting all schools in the lowest quartile of academic proficiency rates would cost approximately $10 billion annually. Expanding tutoring across K-8 Title I schools would cost approximately $15.8 billion annually. These estimates reflect the total program costs, which we envision being primarily funded by the federal government but could also include contributions from state, district, philanthropic, and private-sector partnerships.

Even an exercise in envisioning national tutoring is prime for critique. The history of education reform is littered with failed attempts to take promising ideas and evidence-based programs to scale. An initiative of this expense and magnitude would face enormous pressure to show immediate results. Lofty promises and outsized expectations that can aid in the coalition-

forming process could jeopardize its perceived success. Efforts to scale tutoring will be highly variable in their success and are unlikely to achieve the large effects found in efficacy trials of smaller to mid-sized programs often implemented under best-case circumstances. We should be clear-eyed about this reality and the need for a sustained commitment to program improvement. Tutoring is not a silver bullet, but if we can scale even reasonably good tutoring with just half the average impact found in the research literature, that would meaningfully benefit students.

There are also many reasons to be optimistic that tutoring would have benefits beyond supporting students' academic development. Positive, caring relationships with tutors might support students' social-emotional development, enhance their attachment to school, and expose students to older peers who can serve as mentors for successfully navigating the education system.[2] In fact, tutoring may also have reciprocal benefits for tutors' academic and social emotional development as well as tap into teenagers' need to contribute and feel respected.[3] Tutoring could provide valuable employment opportunities and experiences for youth, and create an expanded and more diverse pipeline of potential educators within local communities. Further, to the extent that tutoring increases educational achievement and attainment it would have economic benefits for both individual tutees as well as the nation's economy as a whole.[4] None of these benefits are guaranteed, but there are few educational interventions with such a range of potential returns.

We make several contributions to research and policy with this thought experiment. We provide the first systematic analysis of the costs associated with scaling tutoring across a range

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[2] For evidence specific to tutoring, see Bowman-Perrott et al. (2014). There also exists relevant evidence from mentorship programs, such as in Balfanz & Byrnes (2018), Christensen et al. (2020), and DuBois et al., (2011).
[3] See for example Allen et al. (1994), Allen et al. (1997), Eskreis-Winkler et al. (2019), Fuligni (2018), Yaeger et al. (2018).
[4] Gunderson & Oreopoulos (2020) Hanushek & Woessmann, (2020), Psacharopoulos & Partrinos (2018).

of grade-level and school-type combinations. We also identify a range of design and implementation challenges relevant for scaling tutoring that have remained largely unaddressed in the literature. A growing number of scholars, policymakers, and pundits have made compelling cases for a rapid, often temporary, scale-up of tutoring programs that target the students most adversely affected by the COVID-19 pandemic. While our blueprint differs in important ways, we believe it offers a range of insights that can support the success of these efforts. We also shine a light on key areas in the research literature, such as peer and virtual tutoring, where there is a clear need for further causal evidence.

Ultimately, we hope to inform efforts to reduce COVID-19 learning loss and catalyze a national dialogue about coordinating these efforts as part of a larger vision to make tutoring a permanent feature of public schooling. Imagine the ideal. What if tutoring were a regular class where students developed sustained relationships with tutors who looped with them across several grades? What if tutoring helped make college a reality for students who never thought it was possible? What if this experience motivated many more students to serve as tutors themselves, refining their skills throughout high school, college, and beyond? What if most new teachers started on day one with years of experience connecting with students and delivering individual instruction? Nothing has ever been accomplished that wasn't first imagined.

I.a. The Potential and Perils of the Present Moment

Mounting evidence documents how the COVID-19 pandemic has resulted in substantial learning loss and increased educational inequity.[5] For example, in Washington D.C. Public Schools, early elementary students have experienced double digit drops in the percent of students

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[5] See for example Bacher-Hicks et al., 2020; Chetty et al., 2020; Dorn et al., 2020a; Engzell, Frey, & Verhagen, 2020; Kraft, Simon, & Lyon, 2020; Kuhfeld et al., 2020; Maldonado & De Witte (2020).

hitting early literacy targets compared to last year, with declines twice as large for Black and Latino students compared to their white peers (Stein, 2020). Analysis of the fall NWEA assessment found disproportionate attrition from testing among students of color and low-income students and a 5 to 10 percentage point drop in math achievement compared to 2019 (Kuhfeld et al., 2020). Data from the i-Ready assessment platform suggest that fall to fall achievement gains were 33% lower in math and 13% lower in reading than in previous years, with learning loss being especially acute in schools serving students of color (Dorn et al., 2020b). Educators are now facing the enormous task of helping students make up for lost instructional time while teaching classes with increasingly diverse skill levels. These broadening gaps within classrooms further strain on our traditional, group-based instructional approach to education.

At the same time, there has been a groundswell of interest in tutoring as an approach to address COVID-19 learning loss around the world. Scholars such as Robert Slavin, Simon Burgess, and Philip Oreopoulos as well as many other educators, philanthropists, journalists and policymakers have made compelling cases for major expansions to tutoring and national service programs.[6] The Annenberg Institute at Brown University, led by Susanna Loeb, has established the National Student Support Accelerator as a research, innovation, and resource hub for scaling high-impact tutoring. The state of Maryland allocated $100 million towards tutoring services this year (Salmon, 2020) and the Los Angeles United School District is paying teachers to serve as outside-of-school tutors providing individualized support to students (Blume, 2020). The Gates, Citadel, and Haslam Foundations are funding expansions of tutoring programs in New York, Chicago, Broward Country (FL), and across Tennessee (Gates, 2020; Citadel, 2020; Tamburin, 2020). Large international initiatives to expand tutoring are under way in the U.K., Netherlands,

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[6] See for example Brooks (2020), Burgess (2020), Campbell et al. (2020), Dynarski (2020), DiPerna (2020), Goldrick-Rab & Yoshikawa (2020), Kraft & Goldstein (2020), Oreopoulos (2020), Slavin (2020), and Wong (2020).

and Australia ("A Class Apart," 2020; Smith, 2020; UK Department for Education, 2020; "Victoria to employ thousands," 2020).

The pandemic has also forced us to reconsider long-held norms and practices in public education, creating a rare opening for fundamental, structural change. The sprawling, decentralized nature of the U.S. public education system has traditionally made it difficult to scale and sustain change to core educational practices (Tyack & Cuban, 1995). Amidst the pandemic, schools have had to redesign systems, redefine roles, and rearrange schedules at an unprecedented speed and scale. If ever there were an opportunity to fundamentally change the way we deliver public education, the time is now.

The immediate need, growing enthusiasm, and window of opportunity for a rapid expansion of tutoring could also imperil its potential longer-term success. We face the risk of implementing tutoring in hasty and uneven ways due to a lack of coordination and system-wide capacity. Rapid scale-up of a diffuse set of tutoring models with philanthropic backing might benefit pockets of students but could also erode support for tutoring if it is viewed as only a short-term, add-on solution and perceived as ineffectual. Attempting to scale tutoring might be more successful and sustainable if it is part of an effort to incrementally integrate tutoring within the structures of the public school system.

I.b. Lessons Learned from the Past

Taking tutoring to scale in the U.S. is not a new idea. Two prior national efforts provide important lessons on how an attractive idea can fall short. President Clinton's America Reads initiative aimed to marshal one million volunteer and college tutors to support early literacy. The accompanying legislation, however, was never funded, and the idea dissipated into a loose

network of programs with highly variable structures and goals. America Reads tutors often volunteered in classrooms and became de facto teachers' aides rather than serving as tutors.

The No Child Left Behind Act, in contrast, delivered over $2 billion annually to fund Supplemental Education Services (SES) for students in Title I schools to access private afterschool tutoring services. Although districts were required to contract with proven providers, few programs had credible evidence of their effectiveness, and states had little funding or capacity to vet providers. Tutoring via SES also suffered from low take-up and attendance given the burden it placed on parents to select and transport students to the off-campus programs, the lack of coordination with schools, and the challenge of establishing rigorous academic cultures in the afterschool settings in which they took place.

In practice, both federal initiatives placed high demands on schools and families to coordinate tutoring while providing limited funding and support. They also delivered a relatively low dosage of tutoring for far fewer students than intended (Deke, et al., 2012; Heinrich, et al., 2014; Worthy, et al., 2003; Zimmer et al., 2010). Ultimately, both programs fell well short of their lofty goals.[7]

I.c. Goals & Design Principles

We envision the primary goals of national-scale tutoring to be supporting foundational skill development and advancement in math and reading and promoting persistence and engagement in school. However, we recognize that districts are best positioned to shape program implementation to their own local contexts. Thus, we prioritize district-level flexibility that

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[7] See for example Barnhart (2011), Burch (2009), Deke et al. (2012), Edmondson (2000), Fitzgerald (2001), Fitzgerald et al. (2002), Heinrich et al. (2010), Heinrich et al. (2014), Heistad (2007), Rickles & Barnhart (2007), Springer et al. (2014), Worthy et al. (2003), Zimmer et al. (2010).

might include tutoring in other core subjects as well as social-emotional learning. We also see connecting students with older peers who can serve as mentors and role models as a primary goal of this program. Over time, we can imagine undergraduate and graduate teacher education programs collaborating with tutoring programs to develop an expanded pipeline of potential future educators from local communities.

Successfully taking education reforms to scale is a balancing act between maintaining fidelity to the core components of a program and providing flexibility for local actors to shape implementation within their contexts. Here we propose a set of ten design principles which constitute the fundamental structure of our proposed tutoring program. We intend the first seven of these principles to shape the norms and practices of tutoring. These design principles are informed by emerging research on practices of highly-effective tutoring programs (Fryer, 2017; Nickow et al., 2020; Worthy et al., 2003). The final three principles relate to program implementation, growth, and improvement and are informed by the implementation science literature (Coburn, 2003; Elmore, 1996; McLaughlin & Mitra, 2001).

I.c.1. Design Principles

Tutoring is a school-wide program. Every student can benefit from tutoring and mentorship. School-wide programs avoid the perception that tutoring is remediation and do not stigmatize tutees as low-performing students. Rather, they support a culture of collective commitment to a program.

Tutoring is individualized instruction. Effective tutoring programs maintain low student-to-tutor ratios — no higher than 4:1, and preferably 2:1 — to preserve the ability for tutors to personalize instruction. Student-to-tutor ratios pose a tradeoff between individualization and cost-effectiveness (Fryer & Howard-Noveck, 2020). As ratios increase, tutoring becomes more

affordable but requires tutors to increasingly divide their focus across multiple students and teach

to the middle of the skill distribution. Larger student-to-tutor ratios require that tutors have a

much broader set of pedagogical skills than those necessary for individualized instruction.

Tutoring is a high-dosage intervention. Tutoring programs that meet more frequently are

more effective. The most successful tutoring programs typically meet three to five times a week

for at least thirty minutes per session (Nickow et al., 2020).

Tutoring is with the same tutor all year. Relationships are at the heart of tutoring.

Effective programs ensure continuity in tutor-student pairings to support the development of

these relationships and allow tutors to learn about individual students' strengths and areas of

instructional need (Balfanz & Byrnes, 2020). Such an approach may also support the

development of positive, caring relationships between tutors and students (Hill & Jones, 2008).

Tutoring is a part of the school day. Incorporating tutoring into the school day promotes

regular attendance, better coordination with teachers, and a stronger academic culture (Cook et

al., 2015; Fryer, 2014). Rather than delivering tutoring by pulling students out of their core

classes or displacing enrichment classes, we envision tutoring as a supplemental class

incorporated into an extended school day. Importantly, some extended day designs would not

necessarily require extending the workday for teachers, such as staggering teacher start and end

times to accommodate an additional period.

Tutors receive intensive, ongoing training. Tutors are more effective when supported by

adequate training and ongoing coaching (Hänze et al., 2018; Jacob et al., 2015; Kraft, 2015).

Prioritizing tutor development through a combination of ongoing professional development, peer

learning communities, and on-the-job feedback with support continued improvement among

tutors.

Tutoring is curriculum-based. Tutors use proven curricular materials and scaffolded tutoring models for individualized instruction that are selected by states/districts to support students' mastery of core classroom content. The success of cross-age peer tutoring depends critically on high-quality instructional resources to guide tutors' efforts and align tutoring with class content.

I.c.2. Implementation Principles

District adoption is voluntary. Successfully scaling tutoring should follow a ground-up process of voluntary local adoption rather than a top-down federally mandated or incentivized expansion. Our blueprint is predicated on an organic, demand-driven growth process. There is little reason to hope that schools that lack parent and teacher support or that are not committed to integrate tutoring into their core structures would succeed in implementing tutoring in a way that benefits students.

Districts shape program implementation. Districts would be supported to implement the design principals of the program with fidelity, but also have the flexibility to determine a range of program characteristics. Local school administrators will have the best expertise in how the program can suit their schools' needs.

District experiences should inform ongoing revisions to the blueprint. The blueprint we provide is only an initial framework. It should be revised and amended based on lessons learned from pilot implementation districts and results from ongoing program evaluations. This will require a systematic approach to improvement by experimenting with different implementation models, testing practice-based evidence, and building a networked system for sharing best practices (Bryk et al., 2015).

II. The Blueprint

On average, U.S. students spend about 1,200 hours in school each year.[8] We propose

delivering tutoring by extending the K-12 school year for students by approximately 100 hours,

or 30 minutes a day, and using this additional time to reinforce and accelerate the development

of students' core literacy and numeracy skills. In order to make this possible at scale, we propose

a tiered structure of cross-age peer tutors: high school students tutor elementary school students

as an elective course, college students tutor middle school students as a federal work-study job,

and recent college graduates tutor high school students as full-time tutors. Tutors at each level

would voluntarily choose to participate in the program and be compensated with elective course

credit, Federal Work-Study wages, or living stipends analogous to AmeriCorps members, at each

respective level. Tutoring would take place virtually or in person with one to four tutees per

tutor.

Our program is dependent on support for school and district implementation and

operation. We expect the federal government would need to fund the program and support

districts via a new office in the Department of Education (ED), which we will refer to as the

National Tutoring Institute (NTI). The NTI could serve three main purposes: support

implementation and operation in districts, coordinate full-time Tutor Corps opportunities, and

lead efforts to improve the program over time. These functions could also be instituted as a part

of Title I or at the state level, but we believe that a national office within ED would provide

clarity of mission and a center of coordination.

Participation in this program would be completely voluntary for districts. The tiered

system of tutors across grade levels creates a modular framework allowing districts to roll out

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[8] Authors' calculations based on the 2014-15 National Teacher and Principal Survey.

tutoring in stages. Federal support, both financial and technical, is intended to minimize the cost

and burden to districts and colleges for establishing and operating programs. K-12 teachers

would be encouraged, but not required, to serve as tutoring homeroom teachers for additional

pay, overseeing students during tutoring, and coordinating efforts between teachers and tutors.

We hope that teachers view this program as a tool for supporting their instructional efforts. We

propose additional, fully funded positions to administer the program, support tutors, and oversee

operations, including peer leadership, school site managers, and district coordinators. Districts

would have autonomy over whether to adapt or adopt alternative curricular materials and shape a

range of implementation decision. We propose rolling out the program in equity-based phases

where we first target Title I schools or schools in the bottom quartile of academic proficiency

rates given potential limitations to federal funding and tutor supply.

II.a. Cross-age Peer Tutors

Tutoring at a national scale is a human resource challenge. How can we recruit and

support enough effective tutors for millions of students? Research demonstrates that younger,

less-experienced tutors can be effective with strong oversight, ongoing training, and structured

curricula (Allor & Mccathren, 2004; Hänze et al., 2018; Juel, 1996; Lindo et al., 2018;

Markovitz, et al., 2019; Moore-Hart & Karabenick, 2009). Our idea is to match cross-age peer

tutors from a range of school-age populations with tutee grades according to the increasing

difficulty of subject content. While peer tutoring has a long history in practice,[9] we want to

highlight the need for more research on its effectiveness, in part because it is a logical solution

for scaling tutoring. In Table 1, we provide estimates of the total students reached and tutors

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[9] See for example Cloward (1967), Cohen et al. (1982), and Delquadri et al. (1986). Evidence on Peer-Assisted
Learning Strategies is summarized for math and literacy in What Works Clearinghouse (2012, 2013).

needed for each module across all public schools as well as more targeted approaches focusing on Title I and low-proficiency schools.[10] At any scale, a huge number of tutors are necessary to implement our program design. We expect that tutor supply will constrain program scale initially but would expand over time.

Elementary School Students and High School Tutors: We propose that high school students tutor local kindergarten through fifth grade students in pairs as part of an optional high school elective. Programs such as Reading Buddies and Peer Assisted Learning Strategies that incorporate elements of peer tutoring have been used in schools for decades (Fuchs et al., 2002; McMaster et al., 2005; Stein et al., 2008). Available evidence suggests cross-age tutoring can be effective at raising achievement and developing mentorship relationships across a range of age differences (Dennis, 2013; Sprinthall & Scott, 1989; Topping, et al., 2003, 2011, 2012). However, much of the existing research is limited by small samples, weak research designs, and use of self-reported proximal outcomes. Training appears to be a critical feature of effective cross-age peer tutoring programs (Alegre-Ansuátegui, et al., 2018; Hänze et al., 2018).

Middle School Students and College Work-Study Tutors: We propose that college students tutor middle school students in groups of three as part of Federal Work-Study (FWS) programs. There is ample evidence that college students can be effective tutors, particularly when they follow highly structured curricula (Astin & Sax, 1998; Courtney et al., 2008; Denton et al., 2004; Fitzgerald, 2001; Lachney, 2002; Spear-Swerling, 2009; Young et al., 2018; Allor & McCathren, 2004; Juel, 1996; Lindo et al., 2018; Moore-Hart & Karabenick, 2009).

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[10] We define low-proficiency as schools in the bottom quartile of student proficiency rates on state assessments, according to public achievement data from the Department of Education. We average proficiency rates on math and English language arts assessments and sort schools based on the indexed score.

High School Students and Full-Time Tutors: We propose expanding AmeriCorps to fund grants for 2- and 4-year college graduates to serve as tutors for high school students through local, state, and national non-profit partners in groups of four. A key distinction from existing AmeriCorps programs like City Year is that Tutor Corps positions would focus exclusively on tutoring during the school day rather than working as teachers' aides in core classes or staffing afterschool programs. Evaluations of AmeriCorps tutoring initiatives and other full-time tutoring interventions have shown this can be an effective delivery method for individualized instruction and that tutor development is a central component of successful programs (Cook et al., 2012; Fryer, 2014; Jacob, et al., 2015; Kraft, 2015; Markovitz, et al., 2014; Markovitz, et al., 2018; Markovitz, et al., 2019; Parker, et al., 2019).

Students with Disabilities and Paraprofessionals: A greater level of skill and individualization is necessary to work with students with substantial learning differences. Of the 6.6 million students currently receiving special education services, 1.1 million spend less than 40% of their time in regular classroom instruction. We budget for paraprofessionals to work one-on-one with this high-need population of students with disabilities, but would expect school-based teams that manage students' Individual Education Plans to decide whether a student should instead be in the school-wide cross-age peer tutoring classes. Placing paraprofessional in tutoring roles might not be possible in some districts without changes to existing collective bargaining agreements and would certainly require targeted training and support.

II.b. The Organizational Structure

Here we propose an organizational infrastructure where a federal office administers funding and provide resources to districts, colleges, and service organizations which in turn

assume primary responsibility for staffing, training, supporting, and overseeing tutors. We

include a visual of this organizational structure in Figure 1. Our organizational blueprint is

intended to project the personnel and infrastructure necessary to minimize the burden on existing

K-12 and college resources. We expect district and school-level staff would be locally hired but

federally funded.[11] It remains an open question whether this degree of bureaucracy and

managerial support is the optimal or most cost-effective organizational model.

*National Tutoring Institute***:** Critical to our blueprint is a new institute within ED that

administers funding, provides infrastructure, and supports tutoring operations nationally. We

envision that the NTI would need to be established in the earliest stages of this program. The

NTI could be responsible for (1) coordinating and marketing National Tutor Corps positions, in

partnership with state AmeriCorps offices and local organizations employing full-time tutors

funded via AmeriCorps, (2) facilitating local partnerships between districts, colleges, and

National Tutor Corps affiliates, (3) processing district and university applications for program

funding, (4) creating and maintaining a repository of learning tools, assessments, and tutoring

guides for districts opting to use centralized resources, (5) providing playbooks, training, and

voluntary guidance to local program staff about best operational practices, (6) collecting

implementation data about program operations and expansion, (7) providing targeted technical

support for high-needs districts to establish program partnerships and submit funding

applications, and (8) commissioning external evaluations and collecting internal feedback to

inform program improvement efforts over time.

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[11] We include district- and school-level staff in this structure, despite their employment by those local entities, to account for the multi-level coordination needed, but acknowledge that in practice their time may be coopted to manage other district or school programming.

District Coordinators: Coordinators would be district employees responsible for defining the goals of the tutoring program, managing partnerships with local colleges and National Tutor Corps affiliates, and coordinating schedules across schools to facilitate tutoring between elementary and high school students. They would assume primary responsibility for managing the selection process for high school tutors interested in tutoring younger students for elective credit and would oversee program operations. Coordinators would also identify curricular materials for tutors to use.

Work-Study Directors: Directors at participating colleges would lead newly expanded Federal Work-Study programs with a focus on service and program improvement as well as tutoring placements with local districts. Their responsibilities would include coordinating with district partners, overseeing the tutor selection process, selecting and managing tutor peer leadership, and supporting peer leaders in tutor development efforts.

School Site Manager: Managers would be full-time administrators that oversee school-based program operations. All tutors and tutor homeroom teachers would report directly to these managers. Their responsibilities would include matching students and tutors, training tutors on the schools' curriculum and standards, observing and providing feedback to tutors, overseeing peer leaders, and communicating with families. We see this role as critical to the success of any program. Effective managers would lead on-the-ground efforts to solve ongoing implementation challenges and promote continuous improvement efforts. They would also have to be proactive about protecting their time from being coopted by administrative tasks unrelated to tutoring.

Tutor Homeroom Teachers: We envision employing a group of teachers in each school to work an extra 30 minutes a day for additional pay to oversee tutoring for a homeroom of students. The primary responsibility of this position will be to help coordinate communication

and align instructional efforts between tutors and teachers. It is also necessary to have an adult presence in each classroom where tutoring occurs given tutoring may take place online and many tutors will be only teenagers.

Peer Leaders: Similar to existing AmeriCorps programs, experienced tutors at all levels could apply for peer-leadership roles and be compensated with an additional stipend. Peer leaders would take primary responsibility for observing and providing frequent feedback to tutors to help them improve their practice. Tutors at all levels would meet as a group with peer leaders weekly during a regularly-scheduled block, likely on the non-tutoring day of the week.

II.c. Applying, Adapting, and Implementing

We imagine a process where districts choose to apply to the NTI for federal funds to support a tutoring program. A streamlined application would require districts to identify: (1) what school level(s) they will target for tutoring, (2) the high school, college and/or service organization(s) they will partner with, (3) the schedule they will use to offer tutoring as part of the school day, (4) the curriculum they intend to use, and (5) evidence of sufficient interest among teachers to serve as tutoring homeroom teachers. All districts that have submitted these plans would be approved according to funding capacity, target school priorities, and tutor supply. Districts would then be responsible for determining how to take the core design principles of the tutoring program and adopt them to their context. We expect local implementation decisions will include:

Online vs. In Person: Districts determine if tutoring will take place in person or remotely. Virtual sessions have the benefit of reducing time costs and logistical obstacles associated with commuting to schools. When feasible, we recommend in-person tutoring. The

tradeoffs with each option highlight the need for research examining how the mode of tutoring affects its efficacy. The nascent literature on virtual tutoring programs is encouraging, but mostly focuses on one-to-one tutoring rather than with multiple students (Burch et al., 2016; U.S. Department of Education, 2010; Roschelle et al., 2020).

Scheduling: Districts will have two key scheduling decisions to make: whether to extend the school day, and whether to offer tutoring to all students simultaneously during a single period or integrate tutoring classes throughout the school day. As shown in Table 2, these choices will determine three key features of tutoring: (1) whether tutoring supplements or supplants existing classes, (2) whether schools will need to extend teachers' workday, and (3) how many tutors are required and how much they can work. We recommend extending the school day by 30 minutes across all K-12 schools, with tutoring taking place for 30 minutes a day Monday through Thursday and Fridays being an early release for K-8 students. We see extending the day for high school students as essential given that our blueprint requires many of them to serve as tutors for 30 minutes in addition to being tutored.

A critical but underappreciated challenge with extending the school day is whether this would require union approval through collective bargaining and fair compensation for teachers' additional time. Our proposed model of extending the school day would not rely on extending teachers' workday. For this to be feasible, tutoring has to happen at the same time for all students either during the first period or last period to allow some teachers to start their days after tutoring or end before tutoring. The tradeoff here is that simultaneous tutoring sessions require more tutors than if districts integrate tutoring across the full school day. Extending the teacher workday would allow tutoring to be integrated throughout the school day and for tutors to work across multiple classes, requiring fewer overall tutors.

The large supply of high school students to serve as tutors means that it is likely easier to offer tutoring during a single period in elementary schools. Limiting tutoring to a single period in middle school is possible but more challenging given the more limited supply of college students. It would also limit Federal Work-Study students to tutoring only two hours a week which may be optimal for some but less so for others. Full-time Tutor Corps members would need to work with high school students in classes integrated throughout the school day. For high schools, we can imagine creating a schedule with an extended day where tutoring and core classes take place during the traditional school day and then electives, including tutoring elementary school students, happen during an additional period added as part of an extended day. This might allow schools to stagger the workdays of core-subject teachers and elective teachers to avoid extending the teacher workday. Regardless of the grade level, scheduling options may be constrained by local tutor supply.

Tutor Training: We envision training as an integral aspect of the tutor experience, with an emphasis on ongoing observation and coaching via peer and school leadership. The NTI would provide initial training guides that districts could opt to use and adapt. We expect that institutional leadership (i.e., high school site managers and college work-study coordinators) would administer initial training sessions. We imagine training would include topics such as relationship-building strategies, how to set appropriate boundaries, questioning techniques, student learning differences, local curriculum and content standards, diversity training, and responsible community engagement (especially for tutors not from the local community). Peer leaders would also need additional training to provide ongoing feedback and coaching to their fellow tutors.

Tutoring Content: Districts would determine the core goals and associated curriculum for tutoring. The NTI would make a range of evidence-based content for math and reading available that districts would be able to use or adapt. Districts could also choose to focus on other core subjects and blend elements of formal mentoring or social-emotional learning into the tutoring curriculum. Regardless of the focus, district coordinators should ensure tutoring content is vetted for evidence of effectiveness and alignment with state-level standards.

Tutor Selection: Tutor selection would be managed locally by districts, colleges, and National Tutor Corps affiliated organizations. The NTI would provide resources for tutor selection and make suggestions for considering different qualifications such as ability to connect with students, content knowledge, and a minimum GPA, but ultimately the selection criteria would be left to local discretion.

Student Grouping and Tutor-Student Matching/Ratios: Districts would determine the process for grouping students and matching tutors as well as exact student-to-tutor ratios with a ceiling of 4:1. We imagine students would be grouped based on common learning needs and can envision a range of different matching priorities related to a tutor's experience level, fluency in students' home language, individual background, and subject-specific interests.

III. Costs and Funding

We provide broad estimates of total program costs and outline a range of possible funding mechanisms at the federal level. We assume the program would need to be primarily funded at the federal level to be feasible, but recognize there are a number of possibilities for distributing costs across federal, state, and local levels. Requiring districts to cover some fraction, perhaps 10%, of program expenses would lower costs from the federal perspective and

possibly enhance local commitment to the program's success.[12] We hesitate to recommend states

or districts take on a large share of costs given the longstanding racial and socio-economic gaps

in per-pupil funding both across states and within states across districts (Corcoran & Evans,

2015; Knight, 2017)

III.a. Program Cost Projections

In Table 3, we break down total and per-pupil cost estimates across three different target

populations and within each grade range. This breakdown helps to illustrate that the total costs of

a more targeted tutoring model would be on par with many current federally funded education

initiatives such as Title I programs ($16 billion), the National School Lunch Program ($14

billion), and Head Start ($9 billion). We estimate that a national program to tutor the 6.4 million

elementary and middle school students in schools in the bottom quartile of student proficiency

rates would cost $4.7 billion annually. Alternatively, targeting all 22.3 million public elementary

school students would cost $14.4 billion. Tutoring the 28 million K-12 students attending Title I

schools would cost $25.5 billion. At the highest end, tutoring every public-school student in the

U.S. would cost $49.1 billion.

We make several assumptions when calculating these estimates that suggest they might

be on the high end of the cost range. We assume a model that is fully funded by new rather than

a reallocation of existing funds. We also assume every district in a given target population would

choose to opt into the program and two thirds would need additional technical resources to

support remote tutoring. We derive our estimates by pricing the primary inputs of the tutoring

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[12] Cohen & Dupas (2010), argue against cost-sharing when the benefits of free provision are large. Chandra et al. (2012) find cost-sharing through copays does not have regressive effects for low-income individuals' consumption of health care similarly to high-income individuals.

model and provide the details of input costs, model assumptions, and data sources in Appendix A. Personnel expenses comprise 83 percent of our estimated costs, which is consistent with prior literature on intervention costs (Hollands et al., 2016) as well as evidence from IRS filings of non-profit tutoring organizations.[13] Per-pupil costs vary by grade ranges ($643 elementary; $907 middle; $1,462 high) primarily because of the differential costs associated with high school, college, and post-college aged tutors.

Costs for tutoring high school students are also higher because we estimate the all-in costs of Tutor Corps members, which are shared across federal and community stakeholders in the current AmeriCorps model. We budget for an average Tutor Corps stipend of $30,000 annually, just above the AmeriCorps maximum, to attract a larger and more diverse supply of potential tutors and to make participation more practical for recent college graduates from low-income backgrounds. If Tutor Corps stipends were $22,340 per service year (the recommended minimum stipend in the CORPS Act), our program would cost $46 billion to reach all students in all schools, and high school costs would drop to $1,256 per-pupil.

III.b. Potential Funding Channels

Our blueprint would require four main funding channels. The federal government could take a number of avenues to distribute program funding, including an initial stimulus bill. Here, we focus on reauthorizing and amending existing funding mechanisms to cover program costs.

National Investments: The National Tutoring Institute might be funded by increasing the ED budget by $111 million annually, a 0.15% increase.[14] This would need to be established and

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[13] Tax-exempt organizations with gross annual receipts greater than $50,000 publicly file the IRS 990 form. We reviewed the proportions of reported costs attributable to personnel, operations, facilities, etc., for a range of tutoring organizations that file the 990. The average share of total costs for personnel was 69%.
[14] This is roughly the budget of the National Center for Education Statistics

funded through an act of Congress similar to the Education Sciences Reform Act of 2002, which established the Institute for Education Sciences.

AmeriCorps Funding: Tutoring for high school students would require a National Tutor Corps of up to 307,000 members. This would be a massive expansion of the existing AmeriCorps program, which currently funds 75,000 members, but a bipartisan bill has already been introduced to the Senate proposing a similar expansion over the next three years.[15]

District Funding: K-12 districts will need funding for district and school managerial positions, additional pay for teacher supervision, stipends for peer leadership, IT investments, and all management roles. Currently, most federal funding to K-12 districts is through Title I of the Elementary and Secondary Education Act (ESEA).

Higher-Education Funding: Colleges involved in the program will need support for expanded Federal Work-Study programs and coordinator roles. About 731,000 college students receive FWS grants each year. Increasing FWS would improve college affordability and also likely increase diversity in the pool of tutors.[16] This expansion fits with initiatives to improve college affordability and accessibility with the reauthorization of the Higher Education Act and proposed service-learning credit for AmeriCorps service (Goldrick-Rab & Yoshikawa, 2020).

IV. The Challenges of Scale

The success of any effort to take tutoring to scale will depend critically on a clear-eyed understanding of the many ways that implementation challenges can scuttle even the most

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[15] Senator Christopher Coons and a collection of Democrat senators initially drafted the *Pandemic Response and Opportunity Through National Service Act* which proposed a tenfold increase of AmeriCorps positions to 750,000 each year for three years. The CORPS Act, a bipartisan bill championed by Sen. Coons, was introduced in the Senate on June 16, 2020, and proposes a more modest increase of 250,000 total positions each year for three years.
[16] Diversity of tutors likely matters for "role model effects" as found for teachers by Gershenson et al. (2019).

promising education reforms. Successfully scaling education initiatives requires navigating a complex and decentralized organizational environment where shifting political priorities, competing demands, and high rates of administrative turnover serve to reinforce the status quo. Districts are often risk-averse organizations that are wary of partnering with outside programs. We have intentionally designed the blueprint so that the actors and organizations that are required to implement tutoring at scale all stand to benefit in some way including direct compensation, new administrative positions, increased funding, instructional support, mentoring relationships, and job experience.

Too often, education reformers focus on scale as a narrow numerical expansion of a program. Scaling successfully requires attending to the depth as well as the breadth of consequential change, the spread of practices across actors within organizations, and the sustainable transfer of ownership to local actors (Coburn, 2003). Other efforts have failed due to an excessive focus on superficial features of program adherence (Spillane et al., 2002). Sustainability requires a balance between empowering implementers to adapt programs to their local contexts and ensuring successful knowledge transfer of core design principles to avoid "lethal mutations" (McLaughlin & Mitra, 2001).

The blueprint we propose is predicated on a fundamental shift in our collective understanding and norms about what schools do. We see individual instruction complementing group-instruction as part of an integrated strategy to support the learning of all students. For this to happen, administrators, teachers, students, and parents would need to view tutoring as a core part of students' schooling experience. Maximizing the potential of tutoring would also mean moving away from the egg-crate structure and norms of schooling, where teachers work in

isolation, towards a more collective approach where teachers and tutors coordinate their efforts to support students' learning.

Our proposed blueprint would also require substantial structural changes to education systems and ongoing skill development for young adults. Schools will need to make major, coordinated changes to their schedules across grade levels and in partnership with local colleges to align the timing of tutoring with the schedules of high-school and college students. Scaling tutoring is highly dependent on the will of young adults to serve as tutors and the skill required of them to succeed. Ongoing on-the-job training is critical for program success.

We have attempted with this blueprint to create a structure that recognizes these challenges. Our aim is to provide a foundational architecture for supporting schools' efforts to integrate tutoring during the school day as a core class, while providing for local ownership over key implementation features. The modular nature of the blueprint is intended to provide flexibility in program design while still maintaining a "family resemblance" across programs (Elmore, 1996). Research suggest that scaling tutoring successful will likely require a scaffolded sequence of implementation support and capacity building (Quinn & Kim, 2017; Durlack & DuPre, 2008).

V. Conclusion

There are often large gaps between what we know about effective education interventions and what we can successfully implement at scale. This paper attempts to bridge this gap for tutoring. We view individualized instruction as a promising intervention not only for supporting struggling students and addressing COVID-19 learning loss, but also as pedagogical practice that should become a core part of all students' educational experiences in school. Accomplishing this

goal will take a substantial federal commitment and a shift in the norms and structures of schooling. It will also require patience and persistence in the face of implementation challenges. We hope our blueprint helps to pave the way forward.

Tables

Table 1: Paired Grade Ranges and Tutors Needed for Schools

Panel A: All Schools

	Students	Tutors Needed	
		#	% of Population
Grades K-5: HS Students	22,337,730	10,950,129	74.40
Grades 6-8: College Students	11,528,775	3,754,007	43.42
Grades 9-12: Tutor Corps	15,155,056	306,615	52.68
Total	**49,021,561**	**15,010,751**	

Panel B: Title I Schools

	Students		Tutors Needed	
	#	%	#	% of Population
Grades K-5: HS Students	16,137,188	32.82	7,911,256	53.75
Grades 6-8: College Students	6,215,935	12.68	2,024,116	23.41
Grades 9-12: Tutor Corps	5,600.405	11.42	113,268	19.46
Total	**27,953,528**	57.02	**10,048,640**	

Panel C: Low Proficiency Schools

	Students		Tutors Needed	
	#	%	#	% of Population
Grades K-5: HS Students	3,892,061	7.94	1,908,083	12.96
Grades 6-8: College Students	2,497,233	5.09	813,182	9.41
Grades 9-12: Tutor Corps	2,958,745	6.04	59,841	14.84
Total	**9,348,039**	19.07	**2,781,106**	

Notes: Percent of population gives the share of potential tutors who would be needed to serve the respective number of students. The college population is based on the total number of full-time students at four-year colleges. The Tutor Corps population is based on the reported total applications to AmeriCorps in 2012. Low proficiency schools are in the bottom quartile by school-level student proficiency rates on state assessments, indexed across math and English language arts achievement reported by the Department of Education (2020).

Table 2: Tutoring Scheduling Decisions and Implications

	Regular School Day	Extended School Day
Single Period	- Supplant a class - Regular teacher workday - More tutors/fewer hours	- Supplement classes - Regular teacher workday - More tutors/fewer hours
Integrated Throughout	- Supplant a class - Regular teacher workday - Fewer tutors/more possible hours	- Supplement classes - Extended teacher workday* - Fewer tutors/more possible hours

*It is possible that a creative staggered start for different teachers would make it possible to avoid extending the workday for teachers with this schedule

Table 3: Estimated Total and Per Pupil Funds by School Level

	All Schools		Title I Schools		Low Proficiency Schools	
	Total Cost ($ billions)	Per Pupil Cost	Total Cost ($ billions)	Per Pupil Cost	Total Cost ($ billions)	Per Pupil Cost
Elementary	14.37	$643	10.28	$637	2.53	$651
Middle	10.45	$907	5.47	$880	2.17	$869
High School	22.16	$1,462	8.24	$1,472	4.57	$1,545
Program Total	**49.11**	**$1,002**	**25.51**	**$913**	**10.04**	**$1,062**

Notes: Low proficiency schools are in the bottom quartile by school-level student proficiency rates on state assessments, indexed across math and English language arts achievement reported by the Department of Education (2020). Program Totals includes costs that are not attributable to specific grade ranges such as district and federal expenses.

Figures

Figure 1: Sample Organizational Chart
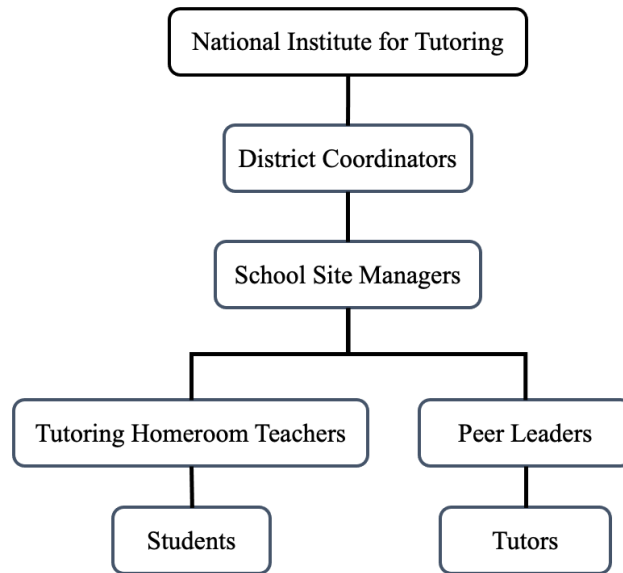
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Table A.1: Populations and Program Cost Inputs

	Grades K-5	**Grades 6-8**	**Grades 9-12**	**Program Totals**
Total students	22,337,730	11,528,775	15,155,056	49,021,561
# students (excl. sped)	21,900,258	11,262,021	14,717,517	47,879,796
# special education	437,472	266,754	437,539	1,141,765
Tutors needed	10,950,129	3,754,007	306,615	15,010,751
students reached per tutor	2:1	4:1	48:1	3.19
tutor type	HS students	College FWS	Tutor Corps	
% of tutor population	74.40%	43.42%	52.68%	
Paraprofessionals needed	437,472	266,754	437,539	1,141,765
Hours tutors work per week	2	2.5	30	
# weeks	36	36	36	
Average class size	26.2	25.5	24.2	
Classroom supervisors	835,888	452,290	631,653	1,919,831
% of teachers to supervise				54.16%
School coordinators	61,091	15,780	21,287	100,986

Table A.2: Detailed Personnel & Materials Costs

Personnel Costs	Grades K-5			Grades 6-8			Grades 9-12			Total
	Hours	Wage	Cost	Hours	Wage	Cost	Hours	Wage	Cost	**Total**
Peer-training	72	$10	$394,204,644	72	$12.5	$168,930,315		$2,000	$30,661,494	$593,796453
Tutor Pay				90	$12.5	$4,223,257,875		$46,000	$14,104,287,125	$18,327,545,000
Paraprofessionals	90	$20	$787,449,600	90	$20	$480,157,200	90	$20	$787,570,200	$2,055,177,000
Teacher supervision	72	$56	$3,366,860,166	72	$56	$1,822,780,390	72	$58	$2,622,840,197	$7,812,480,753
School Site Managers		$94,580	$5,777,986,780		$94,580	$1,492,472,400		$94,580	$2,013,324,460	$9,551,255,880
District Coordinators										$1,732,800,180
Programming Subtotal			$10,326,501,190			$8,817,598,180			$19,558,683,476	$40,073,055,266
Network & System Admin	100	$40	$244,364,000	100	$40	$63,120,000	100	$40	$85,148,000	$392,632,000
Network & Comp Support	180	$30	$329,891,400	180	$30	$85,212,000	180	$30	$114,949,800	$530,053,200
IT Support Subtotal			$574,255,400			$148,332,000			$200,097,800	$922,685,200
Personnel Total			$10,900,756,590			$8,335,930,180			$19,758,781,276	**$40,995,740,466**

Materials Costs	Units	Price	Cost	Units	Price	Cost	Units	Price	Cost	**Total**
Chromebooks	14,891,820	$229	$3,410,226,780	9,187,453	$229	$2,103,926,691	10,409,986	$229	$2,383,886,703	$7,898,040,175
Laptops for Coordinators	61,091	$599	$36,593,509	15,780	$599	$9,452,220	21,287	$599	$12,750,913	$71,464,893
Internet Access / Support	40,727	$50	$18,327,300	10,520	$50	$4,734,000	14,191	$50	$6,386,100	$29,447,400
Material Total			$3,465,147,589			$2,118,112,911			$2,403,023,716	$7,998,952,468

	Grades K-5	Grades 6-8	Grades 9-12	Total
Personnel + Materials Costs	$14,365,904,179	$10,454,043,091	$22,161,804,992	**$48,994,692,933**
% of item subtotal	28.91%	21.48%	45.13%	
Per Pupil Cost	$643	$907	$1,462	
Variable + Federal Support Organization Cost				**$49,718,422,808**
% of total education spending				7.60%
Total Per Pupil Cost				$1,002

Personnel Cost Assumptions:
For all estimates of personnel costs based on hourly wages, we assume the program runs for 36 weeks each year and that each student receives two hours of tutoring each week. Total wage estimates for part-time personnel follow this formula:

*Total wage = weekly hours * 36 weeks * hourly wage * number of tutors needed*

Federal Work-Study Tutors: We assume college FWS tutors would work with one group of three middle school students each day, for a total of two paid hours each week. Additionally, tutors would be compensated for the 30-minute meetings with peer leaders every Friday. FWS hourly pay is usually determined by the type of work, required skills, and college policies, but must be at least minimum wage. We assume FWS tutors are paid $12.50 an hour.

Paraprofessionals: We assume that paraprofessionals work one-on-one with all special education students who spend less than 40% of their time in regular classroom instruction. We add an additional 30 minutes each week to budgeted hours to account for an hour-long staff meeting every two weeks or other form of training. We assume hourly pay for paraprofessionals is $20.

Peer leadership pay: We include compensation for two hours each week for peer leadership to prepare and run development sessions with other tutors. We assume one in twenty tutors at the each level will take on a peer leader role. For pay, we assume high school students earn $10 an hour, college students earn $12.50, and Tutor Corps earn an additional $200 each month – the same as in current AmeriCorps VISTA leader roles.

Teacher pay for classroom supervision: Teachers would be compensated at their regular rate, including benefits, for the two total hours each week that they could opt to supervise classrooms for tutoring. We approximate these total costs with hourly rates by grade level, as estimated by the Bureau of Labor Statistics and reported by Career Trend (Mancini, 2017). Hourly rates including benefits are $56 for elementary and middle and $58 for high school teachers. We estimate the number of teachers needed to supervise classrooms by dividing the total students being tutored by the average class size for each school level: 26.2, 24.3, and 23.3 students at the elementary, middle, and high-school levels, respectively (National Center for Education Statistics, 2018)

Computer & network support: We appropriate funds for each school for 100 hours of system administrator labor and 180 hours for network support specialists. The Bureau of Labor Statistics estimates the hourly rates for these positions are $40 and $30, respectively (U.S. BLS 2019b, 2019c). This is a possible overestimate of the support needed, as many schools already have technological infrastructure and support.

Full-time Tutor Corps salaries: We estimate Tutor Corps salaries will cost $46,000 per tutor based on an average gross pay of $30,000, a Segal Education Award of $6,000, and the assumption that benefits will increase salary costs by 33%, which is an approximation method for total teacher compensation costs (Costrell & Podgursky, 2009). This estimate represents the all-in cost of supporting a Tutor Corps member, rather than estimating the costs to just the federal government in the current dollar-for-dollar matching structure leveraged between

AmeriCorps and grantee partners. Note that this base pay is slightly above the maximum allowable stipend of about $28,000, which we chose intentionally to make the program accessible to a more diverse pool of applicants. As we note above, a lower stipend of $22,340 would decrease our total program cost to $46 billion.

District coordinator, school site manager, and university coordinator salaries: We budget for each of these full-time positions to earn a total compensation of $94,580, including benefits. Using the approximation that benefits are roughly 33% of total pay, these positions would earn roughly $71,000 in gross pay. This salary is from the Bureau of Labor Statistics estimated salary for education administrators for educational support services from June, 2018 (U.S. BLS, 2019a).

Materials Cost Assumptions:

Tutoring content and resources: We assume that the National Tutoring Institute would make available adequate resources and tutoring content for districts that choose to select that option. Those costs are assumed under our umbrella budget for the NTI of $111 million.

Technology: We assume the government would need to fund purchases of a Chromebook or similar device (valued at $229) for two thirds of public-school students. This is operating under the assumption that one third of students either have access to a personal device, are in a district or school with an adequate device, or are participating in in-person tutoring. We additionally include funds to provide Chromebooks for two-fifths of college tutors, assuming the remaining tutors either have a personal device or access to a computer lab or library through their school. For all program coordinators at districts, schools, and colleges, we include funds for a $599 laptop. Finally, we approximate costs for internet which may go to either providing Wi-Fi, strengthening connections, or other network needs. We assume half of schools have adequate internet, and for the remainder we budget $50 for 9 months of internet costs. Given that 88% of schools reportedly had Wi-Fi in 2017 (Harold, 2017), we believe this is a reasonable assumption.