
test
TECHNOLOGY ENHANCED SUPPLEMENTAL TUTORING

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Mission Statement

ASPEN TREE MISSION STATEMENT

'Our mission is to provide supplemental education, (i.e., individualized tutoring) employing advanced technologies, economic incentives, and parental participation for at-risk high school freshmen. Our goal is to increase on-time grade promotion, high school graduation, and college enrollment through participation in the Technology Enhanced Supplemental Tutoring (TEST) program."

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Context

CONTEXT

Zachary Frenette, our founder, was raised in Arizona by a single parent in an economically disadvantaged region of the state. Zachary overcame these and other challenges and went on to obtain an advanced degree from California State University, East Bay. However, to this day the majority of his adolescent contemporaries have never enrolled in college and many have not yet graduated high school. The disparity between these two life paths is the basis of our **T**echnology **E**nhanced **S**upplemental **T**utoring (**TEST)** program.

Unfortunately in the 1990's supplemental tutoring programs were sparse and generally the functional equivalent of evening daycare, with one unqualified parent mentoring more than twenty students. Further, teachers in his district who offered tutoring were confined to the hours in a school day and were not compensated to be available after school hours. The single company in his region that offered tutoring services charged parents a steep hourly rate that was inaccessible to his family. These for-profit programs lacked meaningful technology, purposeful incentives, and individualized attention. In response to these circumstances, **TEST** was designed to capitalize on Local Education Agencies' (LEA) resources by offering alumni mentorship to at-risk high school freshmen.

In a recent Arizona study, 37% of at-risk students and one in three youth overall report that while growing up they never had an adult mentor or tutor. Additionally, high school freshmen are at a greater risk for dropping out of school than any other grade level. The **TEST** program is designed to overcome these known barriers to success. The program's structure supports underserved freshmen by providing individualized tutoring and employing economic incentives for those students who successfully achieve the goals of the **TEST** intervention:

> There is widespread agreement that America's school system is in desperate need of reform, but many educational interventions are ineffective, expensive, or difficult to implement. Recent incentive programs, however, demonstrate that well-designed rewards to students can improve achievement at relatively low costs.[1]

The **TEST** intervention has been specifically structured to overcome known obstacles to success by offering a unique approach to supplemental learning. The program offers comprehensive services at no charge to economically disadvantaged freshmen. This program enables students who would otherwise be excluded due to their economic status. The **TEST** program capitalizes on LEA resources by pairing experienced alumni with incoming freshmen. Further, by requiring parent oversight students will benefit from an intimate and expanded support network that in turn bolsters the students' maximum learning potential. The **TEST** intervention is also flexible because individualized tutoring occurs in-home or at local community centers. The program is unique in its approach to supplemental education in that it uses learning devices and digital instruction to engage students in an innovative way, while still maintaining human connectivity and mentorship.

Based on Zachary's life experience, content analysis, and review of the literature; the **TEST** program will successfully facilitate supplementary education as well as build the relationship between students, families and the community. The goal of the **TEST** intervention is to improve the overall academic standing and grades of high school freshmen, incentivize on-time grade promotion, increase 4-year cohort graduation rates, and promote college enrollment. The **TEST** program is a concentrated effort to alleviate economic stress on families, increase high school retention rates, and bolster student support networks.

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[1] Allan, B. M., & Fryer, R. G. (2011). *The power and pitfalls of education incentives*. Brookings Institution, Hamilton Project.

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Executive Summary

Executive Summary

__T__echnology __E__nhanced __S__upplemental __T__utoring

The **TEST** program is a tailored approach to overcome specific educational barriers in Phoenix, Arizona. The **TEST** program builds a partnership between local at-risk incoming high-school freshman (i.e., apprentices) with college students (i.e., tutors) ideally graduated from the same high school. During the course of a single school year, using tablet technology with restricted Internet access, tutors will conduct weekly one-hour at-home tutoring sessions. If and when successfully completed, the apprentices' will retain the tablet style computer as a reward.

*How will **TEST** be executed and who is involved?*

Applying federal funds from a US Department of Education grant award, Aspen Tree Education will partner with a Local Education Agency (LEA) such as Roosevelt and Phoenix Union High School district, a service agency like Chicanos Por La Casa and NAACP; supplementing hard and soft assets provided by the AZ Community Foundation, and research evaluations executed by a local team to measure program impacts.

*The problems and the **TEST** solutions.*

***Problem**:*

1. Dropout rates and (lack) of on-time grade promotion among 9th grade freshmen.
2. Disparity in graduation rates of entire student body versus students who are economically disadvantaged.
3. Struggling, at-risk, and economically disadvantaged students in Phoenix.
4. Unsuccessful nature of asynchronous (online) digital tutoring.
5. Need for further research on the successes of synchronous (in-person) digital tutoring.

***Solution**:*

1. Synchronous (in-person) digital tutoring.
2. Incentivizing education with a reward-based program.
3. Accessible (in-home) tutoring and tutor mobility.
4. Individualized learning within a supplementary education service.
5. Critical Thinking and Rigorous Learning (CTRL).

***Outcome**:*

1. Increased on-time grade promotion among 9th grade TEST students moving into their sophomore year.
2. Improved Grade Point Average and academic standing among TEST students.
3. Measurable increase in four-year high school graduation rates among TEST students.
4. Demonstrable improvement in student self-efficacy, attitudes toward education and learning, as well as plans for future college enrollment.
5. Increased performance on Arizona State testing on AIMS, AzMerit, and national college entrance exams.

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Letters of Support

City of Phoenix
OFFICE OF THE CITY COUNCIL

KATE GALLEGO
COUNCILWOMAN
DISTRICT 8

602-262-7493
Fax: 602-495-0587
council.district.8@phoenix.gov

October 21, 2022

Dear Mr. Frenette,

Thank you for sharing with me your proposal to implement the Technology Enhanced Supplemental Tutoring (TEST) program. I am honored that you have chosen the Roosevelt School District as a starting place for the program as it is committed to enhancing the lives of the children and community. The hard work and dedication you put into the design of the program are evident.

There are many instances of students that simply do not have the tailored attention they need to reach their full potential. By combining traditional tutoring methods with a technology based inventive, you are creating an innovative approach that will not only support some of these students, but also gather data that can be used to further studies on the effect technology based education has on students.

I am sure that both students and the tutors involved will benefit greatly from your efforts. I wish you the best in your efforts to secure funding for this wonderful program and look forward to seeing the impact the program has on students as they transition from the Roosevelt School District to the Phoenix Union High School District.

Sincerely,

Kate Gallego

Kate Gallego
Mayor
District 8 Councilwoman

RUBEN GALLEGO
7TH DISTRICT, ARIZONA

COMMITTEES:
ARMED SERVICES
SUBCOMMITTEES:
TACTICAL AIR AND LAND FORCES
READINESS

NATURAL RESOURCES
SUBCOMMITTEES:
ENERGY AND MINERAL RESOURCES
WATER, POWER, AND OCEANS
OVERSIGHT AND INVESTIGATIONS

Congress of the United States
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Washington, DC 20515–0307

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December 5, 2019

Lynn Mahaffie
Deputy Assistant Secretary
U.S. Department of Education
Office of Post-Secondary Education
Higher Education Programs
Lyndon Baines Johnson (LBJ) Building
400 Maryland Avenue, S.W.
Washington, D.C. 20202

Dear Ms. Mahaffie:

As the Representative for Arizona's 7th Congressional District I have supported many programs that encourage youth to pursue post-secondary education. Educational attainment is fundamental to the economic success of our students and the community. Many of our students must overcome great challenges in order to matriculate at institutions of higher education, including both community colleges and universities. Programs such as Technology Enhanced Supplemental Tutoring (TEST) are intended and designed to assist students to reach their full potential.

The TEST program possesses the tools to positively impact the lives of economically disadvantaged students. They will partner with the Roosevelt Elementary School District and Phoenix Unified High School District to implement the program. I am proud to lend my support to this innovative program.

Please give the TEST program full and fair consideration for their TRIO grant application.

Sincerely,

Ruben Gallego
Member of Congress

PHOENIX UNION HIGH SCHOOL DISTRICT

Preparing Every Student for Success in College, Career and Life

CENTER FOR EDUCATIONAL EXCELLENCE
4502 North Central Avenue
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Quintin Boyce, Ed.D.
Executive Director, Teaching & Learning

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Alhambra

Bioscience

Bostrom

Trevor G. Browne

Camelback

Central

Cesar Chavez

Desiderata

Betty H. Fairfax

Franklin

Carl Hayden

Maryvale

Metro Tech

North

Phoenix Coding

South Mountain

January 24, 2020

To Whom It May Concern:

As Executive Director for Teaching and Learning in the Phoenix Union High School District, I write to express my support of Aspen Tree Education and its Technology Enhanced Supplemental Tutoring (TEST) program proposal. This would allow the use of Upward Bound funds for a tutoring program, which would greatly benefit the students of Cesar Chavez and South Mountain High Schools.

Phoenix Union is deeply committed to providing not just hope, but opportunity to every one of our students. We, therefore, strongly support the grant's goals of helping children succeed by assisting in increasing their academic skills. This initiative directly aligns with our mission of *"Preparing every student for success in college, career, and life."*

The program will serve low-income freshman students by partnering them with a college mentor who would provide them with individualized digital tutoring. The mentors would conduct one-hour weekly sessions after school with the apprentices. There will be no cost to Phoenix Union nor its students for any of the services offered.

We believe that this work has the potential to yield impressive results by helping transform our education system and our community. Please know that your support the TEST program ensures our ability to continue to dramatically impact opportunities and success for youth. In return, they make a significant contribution to society and the global economy.

Thank you in advance for consideration of the grant application as we continue to look forward to strong initiatives benefiting our students.

Respectfully,

Quintin Boyce, Ed.D.
Executive Director, Teaching & Learning

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DISTRICT 27

COMMITTEES:
EDUCATION
WAYS & MEANS

Arizona House of Representatives
Phoenix, Arizona 85007

February 2nd, 2020

Greetings Mr. Frenette,

Thank you for sharing your Technology Enhanced Supplemental Tutoring (TEST) program with my staff and I. It is apparent this education intervention has great potential for at-risk students while also bringing a huge benefit to economically disadvantaged communities in District 27. The work you have put into designing this innovative program is unmistakable, and I believe it has the capacity to positively impact the livelihood of our students.

We understand budget and time constraints make it difficult for our educators to be readily available for each student, which is why programs like TEST provide an excellent resource to our community. In addition to fulfilling the need for accessible individualized mentorship the TEST program will also build upon existing research on afterschool tutoring programs. As a State Representative I have supported similar programs which encourage our youth to pursue post-secondary education. Programs like TEST are crucial to the continued economic success of our community and students.

I look forward to seeing the positive effects this program will have on our schools and families in District 27. It is a valuable and rare resource to have a tailored academic education intervention for economically disadvantaged students. Programs like TEST have the necessary resources and tools to help students transitioning from Roosevelt School District to Phoenix Union High School District reach their maximum potential. It is with great pride that I offer my support in your efforts to have the TEST program funded in the near future.

Sincerely,

Reginald Bolding
House Democratic Whip
State Representative, LD 27

REBECCA RIOS
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DISTRICT 27

COMMITTEES:
CHILDREN & FAMILY AFFAIRS
FEDERAL & STATES' RIGHTS

JOINT LEGISLATIVE AUDIT COMMITTEE

Arizona House of Representatives
Phoenix, Arizona 85007

December 29, 2019

Dear Mr. Frenette,

After reviewing your proposal for a supplemental education program for South Phoenix's Roosevelt District and Phoenix Union High School District, I am pleased to say that you have my support!

It is clear that you have worked diligently to develop an innovative approach to technology and mentoring that will benefit economically disadvantaged students while also expanding upon current models of after school tutoring. I believe this program has the potential to change the lives of those who need it most.

My district has supported many programs in the past that encourages youth to achieve degrees which will better our community, and has been an advocate for higher education for decades. We understand that some of our students have had to overcome great challenges in their lives in order to matriculate to institutions of higher education; we have supported and encouraged programs such as your Technology Enhanced Supplemental Tutoring (TEST) program and believe they have the power to pave the way for students to reach their full potential.

The TEST program possesses the tools to manifest valuable change in the lives of economically disadvantaged students in the Roosevelt District and Phoenix Unified High School District. I am both excited and proud to lend my support as you move forward with applying for federal funds for this fascinating program. Please turn to District 27's leadership for its resources and support as you complete the final stages in actualizing this fantastic supplemental education intervention.

Sincerely,

Rebecca Rios

REBECCA RIOS
House Democratic Whip
State Representative, LD 27

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Chicanos Por La Causa, Inc.

A PROMISE OF OPPORTUNITY

Andres Contreras
Vice President

January 10th, 2020

Greetings Mr. Frenette,

I want to thank you for bringing your Technology Enhanced Supplemental Tutoring (TEST) proposal binder to Chicanos Por La Causa (CPLC) for our review. I am happy to say that you have my full support in your endeavors. The work you have done has great promise for both Roosevelt and Phoenix Unified High School District. It is clear you have developed an education resource that will enhance lives of families and enrich the future success of our students in South Phoenix.

Here at CPLC we have initiated and sustained education programs since the year 1965 and have witnessed the profound effect individualized learning has on students. We are aware that not every student has the same advantages as those coming from more affluent households. It is clear that the TEST Program will be a valuable community resource as its mentorship service is free of charge to students who are most at-risk and economically disadvantaged. We have supported many education interventions in the past and believe programs like TEST have the power to create meaningful change where it is needed most.

I am proud to lend my support as you continue your efforts to establish this innovative program. Please turn to CPLC for its leadership while you identify grants to fund this fascinating supplemental education intervention. We look forward to seeing the positive impacts the TEST Program will have in our community.

Best Regards,

Andres L. Contreras
Executive Vice President
Social Services & Education

ROOSEVELT
ELEMENTARY SCHOOL DISTRICT

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Jeanne Koba Ed. D.
Superintendent

October 10, 2019

Dear Mr. Frenette,

It was a pleasure meeting with you and learning about your Technology Enhanced Supplemental Tutoring (TEST) program. I am impressed by the work you have clearly put into this project and believe it has great promise.

As you are aware here in the Roosevelt School District we serve many children who come from economically disadvantaged homes. Our students to do not start their school careers with the same advantages that students from more affluent households have. This often results in students experiencing academic challenges.

We have found some success in the use of technology based intervention programs however your proposal to pair the use of technology with individualized support is a novel and much needed addition to what has been traditionally available for students. We find that with individualization students are more likely to achieve success however in this current era of budget cuts we are simply not able to provide the level of individualization that many students require.

It is with pleasure that I offer our support as you move forward and apply for grants to fund this very exciting project. The Roosevelt School District looks forward to working with you as you move forward.

Sincerely,

Jeanne Koba Ed.D.
Superintendent
Roosevelt School District #66

Arizona State Senate

Mr. Zachary Frenette
3243 E. Bonanza Rd.
Gilbert, AZ 85297

December 8th, 2021.

Dear Mr. Frenette:

I was very pleased to meet you and listen about the Technology Enhanced Supplemental Tutoring (TEST) program you created. Please accept my heartfelt congratulations for your efforts in developing a program that will undoubtedly enhance the lives of our children and community.

As Senator for the Arizona's 27th Legislative District, one with a large number of economically disadvantaged communities, I am well aware of the very important role that education plays in the economic success of our students and community. However, I know the disadvantages students from low-income communities face when starting their school careers. There are not only academic challenges but, sometimes, students do not have the tailored attention they need to reach their full potential and be able to matriculate at institutions of higher education.

Innovating individual mentorship programs such as "Technology Enhance Supplemental Tutoring" (TEST) that include traditional tutoring methods combined with technology based education are the best tools to help students reach their full potential.

I hereby want to express my widest my support to you and the TEST program you developed. I am convinced that both students and our communities will benefit greatly from your efforts.

I wish you the best of luck as you apply for grants to fund your very exciting program and I look forward to witnessing the impact the program has on our students.

Sincerely,

Catherine Miranda
Senator

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Business & Logic Model, Gantt Chart

BUSINESS MODEL

Aspen Tree Education is applying for a Federal Department of Education award in response to their "Upward Bound" developmental grant program. The proposed 3-5-year project will investigate and demonstrate the efficacy of a technology enhanced supplemental tutoring program for at-risk 9th grade students, designed to improve on-time grade promotion, 4-year cohort graduation rates, and academic socialization through implementation of the **T**echnology **E**nhanced **S**upplemental **T**utoring (**TEST**) program. This intervention will expand upon results from longitudinal studies that demonstrate distinct advantages for economically and academically disadvantaged students who participate in social learning programs.

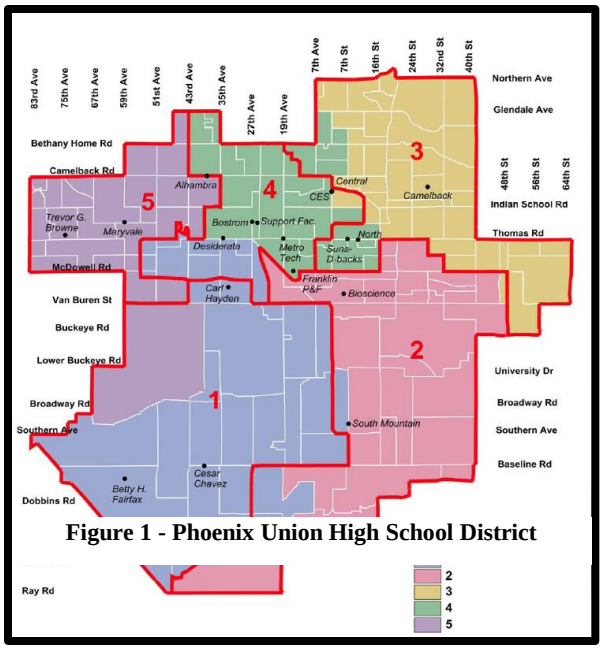

Figure 1 - Phoenix Union High School District

The project will identify at risk students originating in the Roosevelt Elementary School District who are matriculating into the Phoenix Union High School District. Then Aspen Tree, Phoenix Union High Schools (PUHS), and Chicanos Por La Causa (CPLC) and/or National Association for the Advancement of Colored People (NAACP Maricopa County) will partner to conduct an investigative study to quantify the impacts of enhanced social and technology-based integrated learning on student engagement, through the implementation of collaborative and asynchronous digital instruction (i.e., enhanced tutoring techniques). Aspen Tree will review competence in student self-efficacy and aspirations for future education enrollment; and then examine the extent to which these impacts translate into increased on-time promotion rates, decreased dropout rates, and higher 4-year cohort graduation rates.

TEST is grounded in the theories of Critical Thinking and Rigorous Learning (CTRL), which hold that improvements in student engagement and behaviors that support academic and other important school-related outcomes result from: (1) critical observation of why, how and what if questions, challenging students to push themselves intellectually, encouraging student self-efficacy; and (2) engaging students in a meaningful, interactive, evenly paced environment with an emphasis on basic core strategies and quality instruction time. The **TEST** program provides this to 9th grader students throughout their transition to high school, thereby improving school engagement, performance, and success.

Logic Model

Program: Technology Enhanced Supplemental Tutoring – Logic Model

Situation: Phoenix Unified High School District's (PUHSD) South Mountain and Cesar Chavez high school dropout rates and (lack) of on-time grade promotion among 9th grade freshmen; disparity in graduation rates among at-risk students; unsuccessful nature of asynchronous (online) digital tutoring; and need for further research.

Inputs	Outputs		Outcomes-- Impact		
	Activities	*Participation*	*Short*	*Medium*	*Long*
* Funding/ Grant *Dollars* * *Staff* * *Research Base* * *Equipment* * *Materials* * *Time* * *Volunteers* * *Community Partners* * *Aspen Tree* * *Existing Resources*	Facilitate academically good-standing college and high school mentors from the target district hired by Aspen Tree to * Deliver synchronous (in-person) digital tutoring * Carry out weekly mentor-ship sessions * Conduct community surveys on TEST Program effectiveness. * Develop relationships between college and PUHSD high schools * Improve student self-efficacy & attitude toward education * Secure Funding * Provide referrals to local agencies on an as-needed basis * Conduct pre and post testing to measure student improvement over time * Engage students in a meaningful, evenly-paced digitally interactive environment	* Public * Parents * College Students * High School Seniors * PUHSD Schools * PTA * City Council * Youth Serving Organizations *State Representatives * ASU/NAU Professors * Principals * 9th Grade Freshmen * Fair Assoc.	* Increased student engagement in class activities * Increased knowledge of curriculum being taught * Increased commitment from parents, youth, and community partners to participate in increasing access to individualized mentorship. * Increased communication b/w community, schools, and supplemental education services * Increased aspiration for future college enrollment	* Increased graduation rates (2-3 year) * Increased on-time grade promotion from 9th to the 10th grade. * Decrease in dropout rate among sophomore-level students. * Improved Grade Point Average among students enrolled in the TEST Program	* Increased performance on Arizona State test scores: AIMS, AzMerit, and national college entrance exams * Increased four-year high school graduation rates among students identified by the TEST Program * Higher level job creation and projected incomes above the average household median

Assumptions: at-risk high school freshmen will see increased four-year graduation rates through engaging in digitally synchronous mentorship; resources and funding can be secured.

External Factors: social variables including economic disadvantage; limited access to individualized mentorship; lack of teacher resources.

Gantt Chart

PHASE ONE: Milestones and Timeline (January 2017 – September 2017)			
Project Category	Key Milestone	Due Date	Responsible
Implementation	Identify 2 cohort partner schools	Feb 2017	Aspen Tree (PD)
Evaluation	Finalize evaluation design; USDOE approval	Mar 2017	Evaluations Team
Implementation	Finalize management plan; USDOE approval	Mar 2017	Aspen Tree (PD)
Implementation	Conduct at least 4 annual on-site planning meetings with school partners	Aug 2017	Aspen Tree; PUHSD
Implementation	Select faculty advisers and partner team coordination at participating district	Mar 2017	Aspen Tree; PUHSD
Implementation	Develop and implement protocols for college and district seniors to mentor new TEST students	May 2017	Aspen Tree; PUHSD; ASU
Evaluation	Obtain necessary IRB approvals	May 2017	Evaluations Team
Evaluation	Develop and finalize Outcome Questionnaire	June 2017	Evaluations Team
Implementation	Finalize continuous improvement tools	July 2017	Aspen Tree; Evaluations Team
Evaluation	Conduct initial training for project staff and prepare them to implement TEST	Aug 2017	Aspen Tree
Evaluation	Obtain parental consent for study participation	Aug 2017	Evaluations Team; Aspen Tree
Evaluation	Obtain parental consent for study participation	Aug 2017	Evaluations Team; Aspen Tree
Evaluation	Randomly assign study participants to participate in TEST evaluations or participate in a control group.	Aug 2017	Evaluations Team
Evaluation	Ensure students are scheduled into the program according to the outcome of random assignment	Aug 2017	Aspen Tree
Evaluation	Administer baseline surveys to study participants	Aug 2017	Evaluations Team
Implementation	Launch TEST with at least 80 freshmen at target partner district (minimum of 50 tutoring sessions)	Sep 2017- May 2018	Evaluations Team; Aspen Tree
PHASE ONE: PERFORMANCE TARGET	**Launch TEST in selected target district with at least 100 students; Enroll 200 students total in the study**	**September 2017**	Aspen Tree; Evaluations Team
PHASE TWO AND THREE: Milestones and Timeline (October 2017 – December 2021)			
Project Category	Key Milestone	Due Date	Responsible
Implementation	Conduct 1-day follow-up and 3-day training for project staff at partner district	Dec 2017	Aspen Tree
Evaluation	Administer post-program student surveys	May 2018/19/20	Evaluations Team
Implementation	Conduct at least 4 annual on-site planning meetings with school partners	May 2018/19/20/21	Aspen Tree; PUHSD
Implementation	Select faculty advisers and partner team coordination at participating district	Mar 2018	Aspen Tree; PUHSD
Implementation	Select 20-35 mentors at partner school and college; schedule twice a week tutoring sessions	June 2018/19/20/21	Aspen Tree; PUHSD; ASU

Implementation	Conduct initial 4-day training for project staff at partner district and prepare them to implement TEST	Aug 2018	Aspen Tree
Evaluation	Obtain parental consent for study participation	Aug 2018/19	Evaluations Team; Aspen Tree
Evaluation	Randomly assign study participants to participate in TEST evaluations or participate in a control group.	Aug 2018/19	Evaluations Team
Evaluation	Ensure students are scheduled into the program according to the outcome of random assignment	Aug 2018/19	Aspen Tree
Evaluation	Administer baseline surveys to study participants	Aug 2018/19	Evaluations Team
Implementation	Launch TEST with at least 80 freshmen at target partner district (minimum of 50 tutoring sessions)	Sep 2018 – May 2019; annually	Aspen Tree; PUHSD
Implementation	Conduct 1-day follow-up training and 3-day training for project staff at partner district	Dec 2018	Aspen Tree
Implementation	Conduct annual board meeting with district advisers	April 2018/19/20/21	Aspen Tree
Evaluation	Complete analysis of annual results	August 2018/19/20/21	Evaluations Team
Dissemination	Disseminate project lessons learned and findings through at least one professional conference and one publication	August 2018/19/20/21	Aspen Tree; Evaluations Team
PHASE TWO: PERFORMANCE TARGET	Launch TEST in selected target district with at least 200 students; Enroll 400 students total in the study	August 2018	Aspen Tree; Evaluations Team
PHASE TWO: PERFORMANCE TARGET	Launch TEST in selected target district with at least 300 students; Enroll 800 students total in the study	August 2019	Aspen Tree; Evaluations Team
PHASE TWO: ANNUAL PERFORMANCE TARGET	1. Deliver TEST to at least 100 students per school year 2. PUHSD demonstrate commitment to continue the program for the following school year 3. Freshmen report TEST is positively impacting engagement 4. PUHSD report observation of positive changes in TEST participants	August 2018/19/20/21	Aspen Tree; Evaluations Team
Project scalability	Assess TEST expansion in partner district and to additional districts in Phoenix	Dec 2020	Aspen Tree; Evaluations Team
Dissemination	Complete full evaluation & summarize lessons learned	Aug 2021	Evaluations Team
PHASE THREE: PERFORMANCE TARGET	Refine plan to sustain program beyond federal grant; expand program in partner district; and, if applicable, expand program to additional districts.	Dec 2020	Aspen Tree

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Fact Sheet & FAQ

Fact Sheet

PROBLEM:

1) Dropout rates and (lack) of on-time grade promotion among 9th grade students:

- "Furthermore, research consistently demonstrates that students are most vulnerable for dropping out of school during and immediately following their first year of high school." [i]

- "More students fail 9th grade than any other grade." [ii]

- "National public school enrollment patterns show that there is a sharp increase in the number of students enrolled in 9th grade over the last 30 years, indicating that an increasing number of students are being retained (the "9th grade bulge") and the rate at which students disappear between 9th and 10th grade has tripled over the same time period (the "10th grade dip")." [iii]

- "Promotion rates between 9th and 10th grade are much lower than rates between other grades." [iv]

2) Disparity in graduation rates of entire student body versus students who are economically disadvantaged.

- "In 38 states, 85% or more of middle- and high-income students graduate high school in four years, but only two states graduate 85% or more of their low-income students on time." [v]

- "According to the 2015 Building a Grad Nation Report, the 2012-13 estimated national 4-year adjusted cohort graduation rate (ACGR) for public high school students hit a record high of 81.4%."[vi]" While there have been promising gains among Hispanic/Latino and African-American students, these subgroups still fall

well below the national average at 75.2 and 70.7 percent, respectively."[vii]" In contrast, the ACGR for White students fell above the national average at 86.6%." [viii]

- "Low-income students, students with limited English proficiency, and students with disabilities all had 4-year ACGR rates below the national average at 73.3, 61.1, and 61.9 percent, respectively." [ix]

- "Despite historically high national graduation rates, the "silent epidemic" of dropout disproportionately affects minority, low-income, and other high-need students." [x]

- *"Dropping out of school has consistently been linked to student disengagement: "[xi]" nearly half (47%) of students who drop out report being bored and disengaged from high school, 69% said they were not motivated or inspired to work hard, and 42% spent time with people who were not interested in school." [xii]*

4) *Unsuccessful nature of the asynchronous (online) digital tutoring approach.*

- "Asynchronous instructional software houses curricular content but does not support live interaction between students and tutors. This software may house assessments, generate progress reports, and use "artificial intelligence," in other words software developed to adapt the pace and direction of tasks based on student responses." [xiii]

- "From our own and others' prior research, we know that the role of the tutor is key to instructional quality" [xiv]

- "Some digital tutoring platforms are structured where students have no interaction with a human during the tutoring session. Instead, students interact with instructional software, and may have the option of calling a helpline if they get stuck on a problem." [xv]

- "Tutor synchronicity: How immediate is the student's communication with the tutor? Asycnhronous (time-delayed)." [xvi]

- "Students attending with digital OST [sic] "Out of School Time" providers also received significantly fewer hours of tutoring (13 vs. 22 hours) on average (or 41% fewer hours)." [xvii]

5) *Need for further research on the successes of synchronous (live) digital tutoring.*

- "Research is needed to disentangle attendance patterns and program effects by subgroups, including family socioeconomic background, with specific attention to

students from low-income settings." [xviii]

- "It is also important to reiterate, however, that given the limitations of our measures of digital tutoring characteristics and the preliminary nature of this research, we see these findings as suggestive of potentially troubling patterns in access to different types of digital tutoring, rather than as definitive evidence of inequitable treatment in the provision of OST tutoring. More research is needed to confirm the associations we have found among attributes of digital tutoring offerings and measures of student achievement." [xix]

- "It is also important to emphasize one more time, however, the clear need for more research to support greater understanding of the effects of particular forms of digital tutoring on student achievement and the characteristics of the instructional setting that may contribute to or hinder positive effects." [xx]

SOLUTIONS:

1) Synchronous (in-person) digital tutoring

- "This first set of results (see Table 7) suggests that students who receive OST tutoring from digital providers in which access to the tutor is all face-to-face potentially realize significantly larger benefits in terms of their math achievement – the estimated effect is more than 3 times the size of that for students receiving tutoring digitally." [xxi]

- **"**iPad is an ideal tool to teach concepts or skills that require rote memorization of facts: teachers explained that Mathematics computation skills, such as recalling multiplication tables and addition facts and spelling skills, were well suited to the drill-and-practice apps, as the learning was disguised as fun (as summarized in Video 7)." [xxii]

- "Findings indicated that both teachers and students believed the iPads supported and enhanced student learning." [xxiii]

- "Teacher preference for content-creation apps rather than content receiving apps: The teachers suggested that the content-creation apps provided value for money as the app could be used across a range of subject areas, whereas content receiving apps were typically restricted to one subject area. Several teachers also alluded to the fact that the content-creation apps were more compatible with their pedagogical approach that was based, to some extent, on constructivism. The teachers explained that the content-creation apps enabled the students to easily create digital work that was indicative of their understanding." [xxiv]

- "It was found that 75% of apps available in the 'Education' section of the iTunes store were classified as instructive. These apps were content-receiving apps based on the drill-and-practice paradigm. It is postulated that the design of many apps has been based on entrenched philosophical views of what constitutes learning which may be affiliated with more of a behaviourist approach (Highfield & Goodwin, 2012). In addition, the linear and prescriptive design of such apps may also be easier for developers than more open-ended apps." [xxv]

- "Activities undertaken on the iPads: They were used in whole class, individual, dyads, triads and small group contexts, regardless of the ratio of iPads to students. While Hovell Public School used a one-to-one model and students predominantly had individual use of the iPads, there were still opportunities for the students to work in pairs or small groups. Interestingly, the teacher at Hovell Public School noted that despite the individual use of the iPad (one-to-one model), collaboration and student dialogue had actually increased in the classroom." [xxvi]

- "Many of the teachers were surprised to see that the students enjoyed using the game apps as much as they did. The design of game apps as a content-receiving app is aligned with behaviourist philosophies which are antithetical to the pedagogical approaches the teachers employed in the iPad trial (and often preceded the trial). Often during free time students would gravitate towards playing the game apps. This may be because the game apps were aligned to the students' gaming culture. The interviews with the students suggested that the provision of competition, instant feedback and levels were critical to the appeal of game apps. Ben explained how he created a Leader Board in his class to foster the sense of competition when using particular game apps." [xxvii]

2) Incentivizing education with a reward-based program.

- "Again, students reported excitement about receiving financial incentives for their grades. Students also reported that they attended school more, turned in more homework, and listened more in class." [xxviii]

- **"**Providing incentives for a particular activity would have spillover effects on many other activities. For instance, paying students to read books might make them equally excited about math. Or paying students for attendance and behavior—as we did in Washington, DC—might increase enthusiasm for school so much that students engage in new ways with their teachers. From our set of experiments, these effects did seem to take place. Incentives seem to change what people do, and not who they are." [xxix]

- "It is plausible that increased student effort, parental support and guidance, and high-quality schools would have been necessary and sufficient conditions for test

scores to increase during our Chicago or New York City experiments. An anecdote from our qualitative interviews illustrates the potential power of parental involvement and expectations coupled with student incentives to drive achievement." [xxx]

- "Results show that our incentive programs had little to no effect on intrinsic motivation. This suggests that the hyperconcern of some educators and social psychologists that financial incentives destroy a student's intrinsic motivation may be unwarranted in this context." [xxxi]

- "In other words, the concept of paying students in school is less Palatable than the concept of spanking students in school. Despite the public's negative opinion of financial incentives for students, reform-minded school leaders are increasingly interested because they recognize that conventional wisdom is simply not producing results." [xxxii]

- "A simple calculation shows that for every 10 percent increase in payments, students increase their effort by 8.7 percent. Compared to traditional measures of labor supply elasticities of adult males—which average about 0.32 (Chetty 2011)—this elasticity of 0.87 is relatively high, meaning that students in our incentive program are highly price sensitive and will likely respond to increased incentives." [xxxiii]

- "In Houston, for instance, students who were provided incentives mastered 125 percent more math objectives than students who were not given incentives. Paying students to read books yields large and statistically significant increases in reading comprehension." [xxxiv]

- "We have not yet discovered the best activities to provide incentives for. It is important to note that our work has barely scratched the surface of what is possible with incentive programs." [xxxv]

- "Further, larger gains were found when reward contingencies were present." [xxxvi]

3) Accessible (in-home) tutoring and tutor mobility.

- Results suggest that students can improve their accuracy on math skills through home-based peer tutoring without supplemental instruction from an expert and without highly structured procedures." [xxxvii]

4) Individualized learning within a supplementary education service.

- "Further, a peer mentoring approach may also help close the "mentoring gap," a national phenomenon uncovered in the 2014 report, The Mentoring Effect."[xxxviii] One in three young people overall and 37% of at-risk youth report they never had an adult mentor while they were growing up. Approximately 16 million youth will reach age 19 without a mentor." [xxxix]

- "These successful peer-tutoring interventions have been carried out in school settings and have typically provided supplemental practice for fundamental skills such as reading, spelling, or mathematics, but generally have not been used to replace teacher-directed instruction in its entirety during the acquisition of new skills" [xl]

- "Research on peer tutoring has demonstrated educational benefits for tutors and tutees of various ages and abilities, ranging from kindergarten to secondary school, and children with autism to average achievers" [xli]

- "This meta-analysis examined effects of peer tutoring across 26 single-case research experiments for 938 students in Grades 1–12. The TauU effect size for 195 phase contrasts was 0.75 with a confidence interval of CI95 0.71 to 0.78, indicating that moderate to large academic benefits can be attributed to peer tutoring." [xlii]

- "The finding that students with or at risk for disabilities demonstrated greater academic gains than their peers without disabilities or at-risk status may be reflective of the benefit students received from the additional support (e.g., more opportunities to respond) afforded by peer tutoring." [xliii]

5) Critical Thinking and Rigorous Learning (CTRL)

- "Employers now seek individuals who are able to **think critically** and communicate effectively in order to meet the requirements of the new knowledge economy." [xliv]

- "Academically **rigorous learning** environments create the conditions for children to learn at high levels." [xlv]

- "Skills taught in higher education are changing; less emphasis is placed on content-specific knowledge and more is placed on critical-thinking skills, such as: analytic and quantitative reasoning, problem solving, and written communication." [xlvi]

- "Critical thinking skills are longstanding desired outcomes of education -- and in modern day, they are seen as essential for accessing and analyzing the information

needed to address the complex, non-routine challenges facing workers in the 21st century." [xlvii]

- "Findings suggest that critical thinking skills can be measured using complex, authentic assessments without great concern for the potential confounding effect of content knowledge on test performance." [xlviii]

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FAQ

Frequently Asked Questions

How is TEST innovative and set apart from other supplemental education programs?

- **TEST** offers students economic incentives and supports adaptive learning in a digitally synchronous environment. Many current tutoring programs employ the use of technology as a means to an end whereas **TEST** implements technology without losing the role of *mentorship*. **TEST** also represents the first federally funded study of its kind.

  In a recent publication of *The Economist,* two Stanford professors, Sebastian Thrun and Andrew Ng, offered courses free of charge online. [1] By the time his course had begun, Thrun's "Introduction to Artificial Intelligence" had 160,000 participants from over 190 different countries. Ng's course on "Machine Learning" had 100,000 students enrolled. Both courses ran ten weeks, of the participants who enrolled Mr. Thrun's class, 23,000 people completed the course, and 13,000 completed Mr. Ng's course.

  TEST aims to address the massive disparities in online enrollment by holding students accountable and keeping them engaged with the role of a live mentor in addition to digitally synchronous tutoring.

What is the tutor recruiting plan?

- **TEST** will launch a regional outreach for qualified tutors currently enrolled in their senior year of high school or freshmen year of college, with special attention being paid to students who meet our target demographics or who have previously graduated from our target district. Utilizing multiple job recruitment platforms such as Monster, LinkedIn, Glassdoor, and Craigslist we will maximize our search for qualified personnel.

How will you ensure the tutor is qualified?

- Non-cognitive qualifications such as prior graduation from our at-risk districts or representation of our target demographics are considered equally important in a **TEST** tutor

[1] "Re-educating Rita" (2016). The Economist, 25 June. Page 10.

as cognitive qualifications for the program. As noted in Eric Digest, "a tutor need not be an excellent student, especially in the case of cross-age tutoring. A sixth grader operating at a fourth grade level can be an excellent helper of a second grader who is also operating below grade level." [2] Other general categories that will be assessed include: appeal to younger students as a mentor, interpersonal skills, character, community recommendation, and commitment to the role of a tutor.

Cognitive qualifications will be assessed by the prospective tutors' comprehension of **TEST's** written protocols, rubrics, and curriculum; mentors must also demonstrate adequate academic performance and history. [3] Aspen Tree trains prospective mentors so they are equipped to conduct weekly tutoring sessions. Over the period of five days and guided by our curriculum developer, paid tutor training will take place prior to mentors being paired with students.

What is the incentive to be a tutor?

- The **TEST** program is an intervention program which employs graduates from the same at-risk districts our students are coming from; on an emotional level we believe this will incentivize our mentors to identify with our program's purpose. **TEST** also offers economic incentives of $15.00 USD an hour with reimbursement for travel miles and paid trainings.

What if demand outpaces resources?

- The **TEST** program represents the first time this intervention program will be implemented as a developmental trial, with evaluations on effectiveness taking place. The grant period for the federal grant award is two to three years. Our current budget supports 100 students for each year the **TEST** program is in operation, serving a total of 200 to 300 students total. In the event that demand outpaces resources, **TEST** will estimate the operational costs of serving a single student and make those services available at a nominal charge.

How will you determine who gets tutoring and who does not?

- Tutoring services are offered to at-risk students in our target district in order to assess the success of the **TEST** program on factors such as economic disadvantage and demographics—this being for research purposes related to the grant funding. Students who will receive **TEST** tutoring will currently be enrolled in reduced lunch prices and show other signs of at-risk status for dropping out of high school or failing to meet on-time grade promotion. Students who will not get **TEST** tutoring will most likely be in a *control group* for the purposes of validating our research findings, but may still meet the **TEST** qualifications listed above. All

[2] "Peer and Cross-Age Tutoring." (1993). ERIC Digest 79 March. Gaustad, J. Page 3.

[3] Department of Education, Investing in Innovation. (2015). *Improving Educational Outcomes in Low-Income Rural High Schools in North Carolina through a High School Transition and Cross-age Peer Mentoring Model*. Washington, DC: Center for Supportive Schools. Page 13.

other students not included in the **TEST** program most likely did not meet the qualifications of the intervention, or applied after the program reached capacity.

How will you ensure general safety and will there be background checks for tutors?

- Live-Scan fingerprint clearance will be required of all potential employees interacting with students within the **TEST** program.

  Additionally there will be screening interviews with multiple program personnel, background checks, and references which will be verified with transcripts.

Will there be random monitoring of tutoring sessions?

- Tutoring sessions occur in-home, at public libraries, and on campus. Every tutoring session will need to be signed off by a parent or guardian.

  TEST personnel will randomly observe in person and/or record tutoring sessions to ensure compliance with TEST's goals and to ensure a consistency among the tutors and assistance received by the enrolled students. A release will need to be signed by the guardian of the enrolled student allowing them to be in promotional materials.

What is the criterion for determining success and keeping the tablet? How will you ensure the process is fair and culturally sensitive?

- Based on variants between a pre and post-test geared toward the student's learning plan we will be able to determine whether or not the student has successfully completed the curriculum.

  Cultural sensitivity can be accomplished by ensuring and encouraging diversity among TEST personnel, mentors, tutors and students. Fairness will be ensured by the above discussed monitoring as well as post-program TEST surveys by the tutors, students and parents.

What is the risk mitigation plan for getting the tablet back in the event tutoring is not successful, the student or tutor drops out, etc.? What if the student loses the computer (hocks it, sells it, trades it, loses it, etc.)?

- All tablets will be documented and etched with a code number to the correlating student enrolled in the program. Tablets will be secured with an ESN which will be traceable online. In the event a theft occurs the tablet will be traced to the owner and the authorities will be notified.

  Parents will sign an agreement on behalf of their students (minors) to be responsible for the tablet. They will be encouraged (or required) to maintain renter's insurance

that would cover the tablet in the event of theft. There must be some acknowledgment that some loss of tablets will inevitably occur and will be factored into program costs. The tablet will have software where it can be remotely locked, thereby lessening the wanting to steal or not return one of the tablets.

Where a student loses or breaks a tablet, they are provided one replacement, then if it happens again (due to something within their control), it will be up to the discretion of TEST to provide another tablet or excuse the student from the program. Selling or hocking a tablet is immediate grounds for dismissal from the program and the parent will be fully liable for the financial cost to replace the tablet.

How will we measure cause and effect?

- **TEST** is introducing two new variables—the tutor and the technology. Through program analysis we will distinguish between the impacts of both variables. By enlisting help from an evaluations team we will record detailed statistics which will document the progression of the program. (See tab 6 "Grant Application", pages 22-25)

  We will introduce both pre and post testing to measure each student's participation in the program to show results.

What data supports the need for this research?

- With over 48 citations from a sampling of research studies conducted from 2014 to the present, we are confident that this program will be beneficial to our target community while also further expanding on current research in this area. (See tab 4 "Fact Sheet", pages 1-13).

  Problems that **TEST** program acknowledges include:

  1) Dropout rates and (lack) of on-time grade promotion among 9th grade students.
  2) Disparity in graduation rates of entire student body versus students who are economically disadvantaged.
  3) Struggling, at-risk, and economically disadvantaged students in Phoenix.
  4) Unsuccessful nature of the asynchronous (online) digital tutoring approach.
  5) Need for further research on the successes of synchronous (live) digital tutoring.

  Solutions that **TEST** proposes to implement:

  1) Synchronous (in-person) digital tutoring.
  2) Incentivizing education with a reward-based program.
  3) Accessible (in-home) tutoring and tutor mobility.
  4) Individualized learning within a supplementary education service.
  5) Critical Thinking and Rigorous Learning (CTRL).

7

Economic Associates & Budget

Budget

Annual Budget

Costs for one year-- 100 student model

Development grant up to 3MIL / (AZ sales tax: 5.6%)

Office Supplies, Rent and Utilities [i] [ii] [iii]

- Annual rental for 1,376 SF office in Phoenix at $37,152 a year; for 13 months total cost is $40,248.00.

1. Electric/Central Heating— Average cost in utilities at $650.00 per month for 12 months, the total consumption cost is $7,800.00. Deposit is required; calculated as 2.5 times the average cost per month for a total of $1,625.00. The total cost for consumption and deposit is $9,425.00

2. Hot Water/Gas—Average monthly cost in utilities is $774.00. For 12 months total consumption the cost is $9,288.00. An initial deposit of $450.00 brings the yearly total to $9,738.00.

3. Maintenance/ Insurance—At a rate of $6.00 per SQ feet per year for 1,415 SQ feet, total maintenance costs equal $8,490.00

4. Property Taxes/Common Fees—The fees per month for a business is $1.75 per SF, amounting to $240.55 per month with a year total at $2,830.00.

5. Communications Equipment—A business bundle from CenturyLink is totaled at $143.98 per month with a year total of $1,727.76. Additional leased equipment for a year totals to $716.92, with a year total for communications equipment totaled at $2,444.68.

6. Water—Consumption at 1,000 gallons totals to $30.00 per month, with a year total of $360.00. A one-time deposit is $300.00, with a year total at $660.00.

1. Desks & Chairs-- Four desks are totaled at $633.60, with four ergonomic chairs is totaled at $633.60, with a year total at $1,267.20

2. Computers, Components & Printers -- Four computers are totaled at $612.48 with their necessary components totaled at $147.84. An all-in-one printing/scanning device is totaled at $219.65, with a year total at $979.97.

3. General Office Materials—One year supply of general office materials is totaled at $1,437.44.

TUTOR PAY RATE, (TUTOR TO STUDENT RATIO) 1:5 / 20:100 [iv]

- Cost of 20 tutors at an annual pay of $6,750.00 each (90 hrs per student x 5 students x $15.00 per hour) totals to $135,000.00.

ADMINISTRATIVE SALARIES [v] [vi] [vii] [viii] [ix] [x]

- Director—Project Director will spend 100% of his/her time and effort providing direct and qualified services for this project. This is a one (1), Full Time Equivalent (FTE) salary position with an annual salary totaled at $125,000.00.

- Assistant Director-- Assistant Director will spend 100% of his/her time and effort providing direct and qualified services for this project. This is a one (1), Full Time Equivalent (FTE) salary position with an annual salary totaled at $75,000.00

- Consultant— This is a one (1), Full Time Equivalent (FTE) salary position with an annual salary totaled at $25,000.00

- Curriculum Developer-- This is a one (1), Full Time Equivalent (FTE) salary position with an annual salary totaled at $59,628.00

- Secretary-- This is a one (1), Full Time Equivalent (FTE) salary position with an annual salary totaled $36,408.00.

- IT Personnel-- This is a one (1), Full Time Equivalent (FTE) salary position with an

annual salary totaled $36,408.00.

Employee Related Expenses (ERE)

1. The Director-- will contribute 6% of their annual salary to 401k *Retirement Benefits* each year, totaling to $7,500.00; Aspen Tree will then match 50% of their contributions annually only up to 3% of their salary, totaling to $3,750.00. Annual *Health Benefits* for the Director total to $4,260.00, with annual health and retirement benefits totaling to $8,010.00.

2. The Assistant Director-- will contribute 6% of their annual salary to 401k *Retirement Benefits* each year, totaling to $4,500.00. The agency will then match 50% of their contributions, only up to 3% of their salary, totaling to $2,250.00. Annual *Health Benefits* for the Assistant Director total to $4,260.00, with annual health and retirement benefits totaling to $6,510.00.

3. The Consultant-- will contribute 6% of their annual salary to 401k *Retirement Benefits* each year, totaling to $1,500.00. The agency will then match 50% of their contributions, only up to 3% of their salary, totaling to $750.00. Annual *Health Benefits* for the Consultant total to $4,260.00, with annual health and retirement benefits totaling to $5,010.00.

4. The Curriculum Developer-- will contribute 6% of their annual salary to 401k *Retirement Benefits* each year, totaling to $3,577.20. The agency will then match 50% of their contributions, only up to 3% of their salary, totaling to $1,788.60. Annual *Health Benefits* for the Curriculum Developer total to $4,260.00, with annual health and retirement benefits totaling to $6,048.60

5. The IT Personnel-- will contribute 6% of their annual salary to 401k *Retirement Benefits* each year, totaling to $2,184.00. The agency will then match 50% of their contributions, only up to 3% of their salary, totaling to $1,092.00. Annual *Health Benefits* for the IT Personnel total to $4,260.00, with annual health and retirement benefits totaling to $5,352.00.

Administrative Fringe Benefits

1. *Cellphones*—Phones and unlimited talk/text totals to $40.00 x 6 employees totaled at $240.00 per month. A shared $100.00 18G data plan, [- minus 8%] totals to $92.00 per month, with annual equipment totaling at $3,984.00. Individual cost to maintain devices totals to $56.00 a month (x 6 employees), with a year totaling to $8,064.00.

2. Fringe Calculation-- At a rate of 25% multiplied by the total salaries for the company ($427,134.82) the Fringe Benefits come to: $106,783.70 .

3. Administrative & Tutor Travel—Out of state travel for one year is estimated at: $20,000.00. The estimated annual cost for travel compensation of tutors is totaled at $2,500.00, (up to $10.00 per session for 250 total sessions). The annual cost of travel totals to: $22,500.00.

Equipment

1. *Company Vehicle* (with the option of 60 months at 0%) $2,000.00 down payment, the company vehicle will cost $2,160.00 every month, with an annual total of $27,920.00.

    a. *Insurance*-- totals to $439.36 every 6 months plus a one-time proaition at $100.00, totaling to $539.36. The last six months add an additional total of $439.36; for an annual total of $978.72.

    b. *Registration*-- totals to $504.00, plus an $8.00 registration fee, a $4.00 title fee, and an air quality test for $1.50 totaling to $517.50.

Promotional Activity [xi] [xii]

- Printing Services—have an estimated start-up and sustained cost totaling to $989.00.
- Advertisement & Publication-- advertisement for Aspen Tree employment has an estimated start-up and sustained total at $2,224.00. Publication of documentation of 501c3 status is totaled at an annual cost of $2,768.00; with advertisement and publication annually totaling to $4,992.00

Start-Up Costs [xiii] [xiv] [xv]

- *Articles of Incorporation Publishing*— to have the AOI published for 3 consecutive weeks (one time cost in a year) totals to $1,038.00.
- *Arizona Corporation Commission (ACC) Filing Charge*-- Articles of Incorporation

processing fee totals to: $40.00.

- *ACC Statutory Agent*-- the cost annually for a Statutory Agent totals to: $49.00.

YEAR TOTAL: $822,400.31 (DRAFT)

"Pending Addition: tablet-style computers, trainings, food; after-school snacks, monitors for computers, software costs (adobe, office, quickbooks, etc), accidental insurance, IRS filing fee, grant writer costs, etc. This budget was last reviewed by a financial analyst with Chicanos Por La Causa on February 2nd, 2017. Not for publication."

REFERENCES:

[i](3.1) Accessed 1/19/2016 at 1:56PM http://goo.gl/D6ElaV AND http://goo.gl/MJQhfi (3.2) Accessed 1/19/2016 at 2:15PM http://goo.gl/9D0ZYK (3.3) Accessed 1/19/2016 at 2:26 http://goo.gl/fbCdhz (3.4) Accessed 1/19/2016 at 2:42PM http://goo.gl/cDzefW (3.5) Accessed 1/19/2016 at 2:54PM http://goo.gl/4oZr1E (3.6) Accessed 1/20/2016 Paper Clips http://goo.gl/Dwyog2 Staples http://goo.gl/NsYvrW Stapelers http://goo.gl/nl1JLs Scissors http://goo.gl/N3TgIX Post-its http://goo.gl/24qk6l Arrow Flags http://goo.gl/OtQR1a Printer Ink http://goo.gl/jJo776 Clipboards http://goo.gl/8GiRqn Holepunch http://goo.gl/E0bYUG Mechanical Pencils http://goo.gl/YWDMVZ Highlighter http://goo.gl/4kLd0i Pens http://goo.gl/7iWWcD File Sorters http://goo.gl/fJ4hJl Manila Folders http://goo.gl/2iTI1O Copy Paper http://goo.gl/bcEmXZ Basic Envelopes http://goo.gl/mJIeBh Invoice Envelopes http://goo.gl/BAId5l Accessed 1/21/2016: Wireless Notebooks http://goo.gl/7i0EeC Weekly Planner http://goo.gl/qMsr2c Monthly Planner http://goo.gl/S6Rs1m Dry Erase Boards http://goo.gl/Fxq0Sk Power Strips http://goo.gl/DcgGXT

[ii](2.1) Called APS [928-779-6911] 12:00 noon, 1/19/2016, spoke with Sherry and was direted to https://goo.gl/5Zub4i // Spoke with Latifiah at 1:50pm on 2/4/16 for information on a deposit. (2.2) http://goo.gl/Gh3T5S accessed 1/19/2016 1:06 // Called Genia at 2:18 2/4/16 (1-877-837-4968) at Unisource (2.3) Called assistant to Dennis Kelly, Julie at 2:45 on 1/20/2016 to get an estimate on insurance and maitance charges. (2.4) Recieved an email from Julie on 1/20/2016 at 2:49 with details on rentals. // called Julie, 1/19/2016 11:20PM for an estimate on maintenance costs. (2.5) Called Century Link at 1:10PM 1/19/2016 and spoke with Billy who gave me an estimate. // Called Jasmine at Century Link 2/4/2016 at 4:30PM (celia.ortega@centurylink.com) for installation fees (2.6) at 12:10, Sabrina at the City of Phoenix quoted my costs (928-213-2231)

[iii]Spoke with assistant to Dennis Kelly at 928-226-3147 at 11:46 AM 1/18/2016 and accessed http://goo.gl/uC2LyH

[iv]Spoke with Joshua Cruz at 1:14 on 1/20/2016 (602-542-4755) and got an estimate on the limit on tutoring hours and pay rates. (4.A) Call Christina at Geico at 6:22 on 2/4/2016 to get a quote on insurance on a new Toyota Prius. (4.B)

[v]Accessed 1:57 on 1/20/2016 http://goo.gl/mTuqDD (5.1) Accessed 11:30 on 1/22/2016 http://goo.gl/9ZSV1i (5.2) Accessed 11:44 on 1/22/2016 https://goo.gl/5mXDj0 (5.3) Called Verizon [1-800-922-0204] at 11:58 on 11/22/2016 and spoke with Larry and Stacie to get an estimate. (5.4) Called Findlay Toyota (888-275-7154) in Phoenix at 1:30PM on 1/22/2016 and spoke with Benji for an estimate.

[vi]Accessed 2:36PM on 1/20/2016 http://goo.gl/Elrvsp

[vii]Accessed 2:05PM on 1/22/2016 http://goo.gl/nsZ2a2

[viii]Accessed 2:24PM on 1/22/2016 https://goo.gl/hIcrT1

[ix]Accessed 2:35 on 1/22/2016 http://goo.gl/yBV76B

[x]Accessed 2:55 on 1/22/2016 http://goo.gl/yBV76B

[xi]Called "Print Raven" (928-773-1105) and spoke with Kelsey at 1:25PM on 1/25/2016 to receive an estimate.

[xii]Spoke with Thomas on 1/25/2016 at 1:45pm at (928-556-2298) to recieve an estimate. / Spoke with Shane at 1:57pm on 1/25/2016 at (928-556-2283) to receive an estimate for a 501c3.

[xiii]Christina 602-542-3026 ext 2 (10:56 am 3/28/2016) // Spoke with Shane at 1:57pm on 1/25/2016 at (928-556-2283) to receive an estimate for a 501c3.

[xiv]Instuctions c011i (Articles of Incorporation) – Nonprofit www.azcc.gov

[xv]Spoke with Stella King with Arizona Commercial Registered Agents at 11:35am (520-422-2279) on 3/28/2016 http://www.arizonastatutoryagent.net/

ASPEN TREE BUDGET	Start Up Cost	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	TOTAL	Year Total
Office Rent **(G2)**	$3,096.00	$9,288.00	$9,288.00	$9,288.00	$9,288.00	$40,248.00	
Electric/ Central Heating **(G2)**	$1,625.00	$1,950.00	$1,950.00	$1,950.00	$1,950.00	$9,425.00	
Hot Water/ Gas **(G2)**	$450.00	$2,322.00	$2,322.00	$2,322.00	$2,322.00	$9,738.00	
Propert Tax/Common Fees **(G2)**	$0.00	$721.65	$721.65	$721.65	$721.65	$2,886.60	
Maintenance/ Insurance **(G2)**	$0.00	$2,122.50	$2,122.50	$2,122.50	$2,122.50	$8,490.00	
Internet **(G2)**	$476.80	$491.97	$491.97	$491.97	$491.97	$2,444.68	
Water **(G2)**	$300.00	$90.00	$90.00	$90.00	$90.00	$660.00	
Desks **(E1)**	$633.60	$0.00	$0.00	$0.00	$0.00	$633.60	
Computers **(E1)**	$612.48	$0.00	$0.00	$0.00	$0.00	$612.48	
Mice/ Keyboards **(E1)**	$147.84	$0.00	$0.00	$0.00	$0.00	$147.84	
Chairs **(E1)**	$633.60	$0.00	$0.00	$0.00	$0.00	$633.60	
Printer/ Scanner **(E1)**	$219.65	$0.00	$0.00	$0.00	$0.00	$219.65	
Office Materials **(E1)**	$1,437.44	$0.00	$0.00	$0.00	$0.00	$1,437.44	
							$77,576.89
Tutor Pay Rate For 60 **(F1)**	$0.00	$101,250.00	$101,250.00	$101,250.00	$101,250.00	$405,000.00	
							$405,000.00
Director Salary **(A2)**	$0.00	$31,250.00	$31,250.00	$31,250.00	$31,250.00	$125,000.00	
Director Retire Benefits **(B2)**	$0.00	$937.50	$937.50	$937.50	$937.50	$3,750.00	
Health Benefits For 6 **(B2)**	$0.00	$6,390.00	$6,390.00	$6,390.00	$6,390.00	$25,560.00	
Admin Cell & Benefits For 6 **(E1)**	$0.00	$996.00	$996.00	$996.00	$996.00	$3,984.00	
Company Vehicle **(D1)**	$2,000.00	$6,480.00	$6,480.00	$6,480.00	$6,480.00	$27,920.00	
Vehicle Insurance **(D1)**	$539.36	$0.00	$0.00	$439.36	$0.00	$978.72	
Vehicle Registration **(D1)**	$517.50	$0.00	$0.00	$0.00	$0.00	$517.50	
							$187,710.22
Asistant Director Salary **(A2)**	$0.00	$18,750.00	$18,750.00	$18,750.00	$18,750.00	$75,000.00	
Assist Retire Benefits **(B2)**	$0.00	$562.50	$562.50	$562.50	$562.50	$2,250.00	
							$77,250.00
Consultant Salary **(A2)**	$0.00	$6,252.00	$6,252.00	$6,252.00	$6,252.00	$25,008.00	
Consultant Retire Benefits **(B2)**	$0.00	$187.50	$187.50	$187.50	$187.50	$750.00	
							$25,758.00
Curric Development Salary **(A2)**	$0.00	$14,907.00	$14,907.00	$14,907.00	$14,907.00	$59,628.00	
Developer Retire Benefits **(B2)**	$0.00	$447.15	$447.15	$447.15	$447.15	$1,788.60	
							$61,416.60
Secretary Salary **(A2)**	$0.00	$9,102.00	$9,102.00	$9,102.00	$9,102.00	$36,408.00	
Secretary Retire Benefits **(B2)**	$0.00	$273.00	$273.00	$273.00	$273.00	$1,092.00	
							$37,500.00

IT Personnel Salary **(A2)**	$0.00	$9,102.00	$9,102.00	$9,102.00	$9,102.00	$36,408.00	
IT Personnel Retire Benefit **(B2)**	$0.00	$273.00	$273.00	$273.00	$273.00	$1,092.00	
							$37,500.00
Printing Service **(G1)**	$989.00	$0.00	$0.00	$0.00	$0.00	$989.00	
							$989.00
Local Advertisment **(G1)**	$0.00	$556.00	$556.00	$556.00	$556.00	$2,224.00	
Main News Paper **(G1)**	$0.00	$692.00	$692.00	$692.00	$692.00	$2,768.00	
							$4,992.00
ACC Filing Charge **(G1)**	$40.00	$0.00	$0.00	$0.00	$0.00	$40.00	
ACC Publishing Charge **(G1)**	$1,038.00	$0.00	$0.00	$0.00	$0.00	$1,038.00	
ACC Statutory Agent (1 yr) **(G1)**	$49.00	$0.00	$0.00	$0.00	$0.00	$49.00	
							$1,127.00
Fringe Benefit Calculation **(B1)**	$0.00	$26,428.97	$26,428.97	$26,428.97	$26,428.97	$105,715.86	
							$105,715.86
Travel Benefit Calculation **(C1)**	$0.00	$5,625.00	$5,625.00	$5,625.00	$5,625.00	$22,500.00	
							$22,500.00
Learning Tablet Devices **(D1)**	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
							$0.00

BUDGET SHEET REFERENCE: Salaries **(A)**: all of the combined project salaries. Fringe Benefits **(B)**: subsidized meals, health insurance, etc. Travel **(C)**: all travel costs related to the mission of the grant. Equipment **(D)**: company car, specific equipment critical to the execution of the program. Supplies **(E)**: offices supplies, program supplies, maintenance supplies, training, operational supplies, and so forth. Contractual **(F)**: money needed to hire anyone for the project who isn't a member of the staff. Construction contractor, evaluation specialist, etc. Other **(G)**: internet, janitorial services, rent, printing, security services, stipends or honorariums for speakers, telephone, utilities, vehicles, volunteers.
Direct Costs **(1):** [Activities or services that benefit specific projects.] Project Staff, Consultants, Project Supplies, Publications, Travel, etc. [Costs either charged directly or allocated indirectly] telephone charges, computer use, project clerical personnel, postage and printing, misc office supplies. Indirect Costs **(2):** [Activities or services that benefit more than one project.] utilities, rent, audit and legal, administrative staff, equipment rental. [FUTURE REF:] **For the *Indirect Cost Rate*** Federal Government guidelines don't allow a grant applicant to include the cost of contractual expenses into indirect cost rate calculation.

Year Total
$1,045,035.57

	Equip **(D)**	Other **(G)**	**TOTAL**
	$29,416.22	$81,000.28	$1,045,035.57
	Contract **(F)**	Fringe **(B)**	**DIRECT (1)**
	$405,000.00	$170,897.18	$577,408.69
	Salaries **(A)**	Travel **(C)**	**INDIRECT (2)**
	$357,452.00	$22,500.00	$467,626.88
	Supplies**(E)**		
	$7,668.61		

Aspen Tree (Grant) Budget Summary				
Line Item	**Requested**	**In-Kind**	**Cash Match**	**Total Line Item Expenses**
Salaries	$357,452.00	$0.00	$0.00	$357,452.00
Fringe Benefits	$142,548.80	$0.00	$0.00	$142,548.80
Subtotals	$500,000.80	$0.00	$0.00	$500,000.80

Line Item	**Requested**	**In-Kind**	**Cash Match**	**Total Line Item Expenses**
Travel	$22,500.00	$0.00	$0.00	$22,500.00
Subtotals	$22,500.00	$0.00	$0.00	$22,500.00

Line Item	**Requested**	**In-Kind**	**Cash Match**	**Total Line Item Expenses**
Equipment	$29,416.22	$0.00	$0.00	$29,416.22
Subtotals	$29,416.22	$0.00	$0.00	$29,416.22

Line Item	**Requested**	**In-Kind**	**Cash Match**	**Total Line Item Expenses**
Supplies	$7,668.61	$0.00	$0.00	$7,668.61
Subtotals	$7,668.61	$0.00	$0.00	$7,668.61

Line Item	**Requested**	**In-Kind**	**Cash Match**	**Total Line Item Expenses**
Contractual	$405,000.00	$0.00	$0.00	$405,000.00
Subtotals	$405,000.00	$0.00	$0.00	$405,000.00

Line Item	**Requested**	**In-Kind**	**Cash Match**	**Total Line Item Expenses**
Other	$81,517.78	$0.00	$0.00	$81,517.78
Subtotals	$81,517.78	$0.00	$0.00	$81,517.78

TOTAL BUDGET SUMMARY	**Requested**	**In-Kind**	**Cash Match**	**Total Expenses**
Direct Costs	$577,408.69	$0.00	$0.00	$577,408.69
Indirect Costs	$467,626.88	$0.00	$0.00	$467,626.88
Total Project Budget (1 yr)	**$1,045,035.57**	**$0.00**	**$0.00**	**$1,045,035.57**

BUDGET SHEET REFERENCE: Salaries (A): all of the combined project salaries. Fringe Benefits (B): subsidized meals, health insurance, etc. Travel (C): all travel costs related to the mission of the grant. Equipment (D): company car, specific equipment critical to the execution of the program. Supplies (E): offices supplies, program supplies, maintenance supplies,

training, operational supplies, and so forth. Contractual (F): money needed to hire anyone for the project who isn't a member of the staff. Construction contractor, evaluation specialist, etc. Other (G): internet, janitorial services, rent, printing, security services, stipends or honorariums for speakers, telephone, utilities, vehicles, volunteers.

Direct Costs (1): [Activities or services that benefit specific projects.] Project Staff, Consultants, Project Supplies, Publications, Travel, etc. [Costs either charged directly or allocated indirectly] telephone charges, computer use, project clerical personnel, postage and printing, misc office supplies.

Indirect Costs (2): [Activities or services that benefit more than one project.] utilities, rent, audit and legal, administrative staff, equipment rental. [FUTURE REF:] **For the *Indirect Cost Rate*** Federal Government guidelines don't allow a grant applicant to include the cost of contractual expenses into indirect cost rate calculation.

8

Fiscal Agency

DO NOT WRITE ABOVE THIS LINE; RESERVED FOR ACC USE ONLY.

ARIZONA CORPORATION COMMISSION CORPORATIONS DIVISION

COVER SHEET

USE A SEPARATE COVER SHEET FOR EACH DOCUMENT
**** ORDER COPIES USING A RECORDS REQUEST FORM ****

WHAT ARE YOU FILING?

☒ New Entity ☐ Change to existing entity ☐ Re-submission of rejected filing

ENTITY NAME - give the exact name of the corporation as currently shown in A.C.C. records:

Aspen Tree

EXPEDITED PROCESSING?

☐ YES - add $35 to the filing fee	X NO - pay only the filing fee
Document filing fees are listed on the bottom of each form or on the fee schedule on our website, http://ecorp.azcc.gov, under the FAQs.	

PAYMENT:

☒ MOD Account #: 924255300 Amount to deduct: $10.00

Cash - do not mail cash. Cash may be used only for in-person submittals.
Checks or money orders - must be made payable to "Arizona Corporation Commission," with all words spelled out and no abbreviations. Checks must be completely and properly filled out, including the amount sections. UNACCEPTABLE CHECKS include: no imprinted or preprinted name and address of the account holder; no imprinted or preprinted check number; handwritten or stamped names, addresses, or check numbers; temporary checks (new accounts).
Credit cards - may be used for in-person submittals, and for online corporation annual reports, online name reservations, or online certificates of good standing. We accept only Visa, MasterCard, and American Express.

REQUIRED - RETURN DELIVERY OPTION (PLEASE PRINT CLEARLY and select only ONE)**:**

☐ Email	Email address:	
☐ Pick up	Name:	Phone:
☒ Mail	Name: Zachary Frenette	
	Address: 3243 East Bonanza Rd.	
	City: Gilbert State: Arizona	Zip: 85297
	Phone: 928-310-8254	

DOCUMENTS WILL BE MAILED IF THEY ARE NOT PICKED UP IN A TIMELY MANNER (APPROXIMATELY ONE WEEK)

FOR ARIZONA CORPORATION COMMISSION USE ONLY

PICK-UP BY: _____ **DATE:** _____

View current processing times at: www.azcc.gov/Divisions/Corporations/document-processing-times.pdf

DO NOT WRITE ABOVE THIS LINE; RESERVED FOR ACC USE ONLY.

APPLICATION TO RESERVE CORPORATION NAME

Read the Instructions C006i

1. NAME TO BE RESERVED – see Instructions C006i for name requirements for different entity types. Enter the exact name or exact fictitious name to be reserved:

Aspen Tree

2. TYPE OF ENTITY – **check only one** to indicate the type of entity that may be formed:

☐	FOR-PROFIT CORPORATION	☐	INSURANCE
☒	NONPROFIT CORPORATION	☐	SAVINGS AND LOAN ASSOCIATION
☐	PROFESSIONAL CORPORATION	☐	CREDIT UNION
☐	CLOSE CORPORATION	☐	TRUST COMPANY
☐	BUSINESS TRUST	☐	COOPERATIVE MARKETING ASSOCIATION
☐	BUSINESS DEVELOPMENT CORP.	☐	ELECTRIC COOPERATIVE NONPROFIT MEMBERSHIP ASSOCIATION
☐	CORPORATION SOLE	☐	NONPROFIT ELEC. GENERATION AND TRANSMISSION COOPERATIVE CORP.

3. APPLICANT – name and address of the individual or entity that will own the name reservation:

Zachary Frenette		
Name		
3243 East Bonanza Rd.		
Address 1		
Address 2 (optional)		
Gilbert	Arizona	85297
City	State or Province	Zip
Country: United States		

SIGNATURE: By checking the box marked "I accept" below, I acknowledge *under penalty of perjury* that this document together with any attachments is submitted in compliance with Arizona law.

☒ I ACCEPT

Signature	Printed Name	Date (mm/dd/yyyy)
Zachary Frenette	Zachary Frenette	11/14/2016

REQUIRED – check only one:

X I am the **Applicant** (I am an individual or natural person and not an entity).	☐ The **Applicant is an entity** and I am its duly authorized agent.

Filing Fee: $10.00 (regular processing) Expedited processing – add $35.00 to filing fee. All fees are nonrefundable - see Instructions.	Mail: Arizona Corporation Commission Corporate Filings Section 1300 W. Washington St., Phoenix, Arizona 85007 Fax: 602-542-4100

Please be advised that A.C.C. forms reflect only the **minimum** provisions required by statute. You should seek private legal counsel for those matters that may pertain to the individual needs of your business.
All documents filed with the Arizona Corporation Commission are **public record** and are open for public inspection.
If you have questions after reading the Instructions, please call 602-542-3026 or (within Arizona only) 800-345-5819.

DO NOT WRITE ABOVE THIS LINE; RESERVED FOR ACC USE ONLY.

ARTICLES OF INCORPORATION
NONPROFIT CORPORATION

Read the Instructions C011i

1. ENTITY NAME – see Instructions C011i for naming requirements – give the exact name of the corporation:

Aspen Tree

2. CHARACTER OF AFFAIRS - briefly describe the character of affairs the corporation initially intends to conduct in Arizona. **NOTE** that the character of affairs that the corporation ultimately conducts is not limited by the description provided.

Providing education services to economically disadvantages students.

3. MEMBERS – check one:

☐ The corporation WILL have members.

☒ The corporation WILL NOT have members.

4. ARIZONA KNOWN PLACE OF BUSINESS ADDRESS:

4.1 Is the Arizona known place of business address the same as the **street address** of the statutory agent?

☐ Yes – go to number 5 and continue

☒ No – go to number 4.2 and continue

4.2 If you answered "**No**" to number 4.1, give the **physical or street address** (not a P.O. Box) of the known place of business of the corporation in Arizona:

Zachary Frenette Attention (optional)		
3243 East Bonanza Rd. Address 1		
Address 2 (optional)		
Gilbert City	AZ State or Province	85297 Zip
Country: United States		

5. DIRECTORS - list the **name and business address** of each and every Director of the corporation. If more space is needed, check this box ☐ and complete and attach the Director Attachment form C082.

Zachary Frenette Name	Name
3243 East Bonanza Rd. Address 1	Address 1
Address 2 (optional)	Address 2 (optional)
Gilbert / AZ / 85297 City / State or Province / Zip	City / State or Province / Zip
United States Country	Country
Name	Name
Address 1	Address 1
Address 2 (optional)	Address 2 (optional)
City / State or Province / Zip	City / State or Province / Zip
Country	Country
Name	Name
Address 1	Address 1
Address 2 (optional)	Address 2 (optional)
City / State or Province / Zip	City / State or Province / Zip
Country	Country

6. STATUTORY AGENT – *see Instructions C011i*

6.1 *REQUIRED* – give the **name** (can be an individual or an entity) **and *physical or street address*** (not a P.O. Box) in Arizona of the statutory agent:	**6.2** *OPTIONAL* – mailing address in Arizona of statutory agent (can be a P.O. Box):
Statutory Agent Name (required) Registered Agents INC	
Attention (optional) 1846 E. Innovation Park Dr. STE. 100 Address 1	Attention (optional) Address 1
Address 2 (optional) City: Oro Valley / AZ / 85755 City / State / Zip	Address 2 (optional) City / State / Zip

6.3 *REQUIRED* - the *Statutory Agent Acceptance* form M002 must be submitted along with these Articles of Incorporation.

7. ***REQUIRED*** **-** you must complete and submit with the Articles a ***Certificate of Disclosure***.
The Articles will be rejected if the Certificate of Disclosure is not simultaneously submitted.

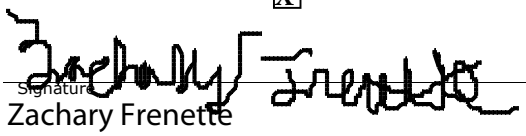
8. **INCORPORATORS -** list the **name and address,** and the **signature,** of each and every incorporator - minimum of one is required. If more space is needed, check this box ☐ and complete and attach the Incorporator Attachment form C084.

Zachary Frenette
Name
3243 East Bonanza Rd.
Address 1
Address 2 (optional)
Gilbert | AZ | 85297
City | State | Zip
United States
Country

SIGNATURE – *see Instructions C011i:*

By checking the box marked "I accept" below, I acknowledge *under penalty of perjury* that this document together with any attachments is submitted in compliance with Arizona law.

☒ I ACCEPT


Signature
Zachary Frenette 11/14/16
Printed Name Date

IF SIGNING FOR AN ENTITY, CHECK ONE, FILL IN BLANK:

☐ **Corporation as Incorporator -** I am signing as an officer or authorized agent of a corporation and its name is:

☐ **LLC as Incorporator -** I am signing as a member, manager, or authorized agent of a **limited liability company** , and its name is:

Name
Address 1
Address 2 (optional)
City | State | Zip
Country

SIGNATURE – *see Instructions C011i:*

By checking the box marked "I accept" below, I acknowledge *under penalty of perjury* that this document together with any attachments is submitted in compliance with Arizona law.

☐ I ACCEPT

Signature
Printed Name Date

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☐ **LLC as Incorporator -** I am signing as a member, manager, or authorized agent of a **limited liability company** , and its name is:

Filing Fee: $40.00 (regular processing)
Expedited processing – add $35.00 to filing fee.
All fees are nonrefundable - see Instructions.

Mail: Arizona Corporation Commission
Corporate Filings Section
1300 W. Washington St., Phoenix, Arizona 85007
Fax: 602-542-4100

Please be advised that A.C.C. forms reflect only the **minimum** provisions required by statute. You should seek private legal counsel for those matters that may pertain to the individual needs of your business.
All documents filed with the Arizona Corporation Commission are **public record** and are open for public inspection.
If you have questions after reading the Instructions, please call 602-542-3026 or (within Arizona only) 800-345-5819.

DO NOT WRITE ABOVE THIS LINE; RESERVED FOR ACC USE ONLY.

CERTIFICATE OF DISCLOSURE

Read the Instructions C003i

1. ENTITY NAME – give the exact name of the corporation in Arizona:

Aspen Tree

2. A.C.C. FILE NUMBER (if already incorporated or registered in AZ):_____

Find the A.C.C. file number on the upper corner of filed documents OR on our website at: http://www.azcc.gov/Divisions/Corporations

3. Check only one of the following to indicate the type of Certificate:

- ☒ Initial (accompanies formation or registration documents)
- ☐ Annual (credit unions and loan companies only)
- ☐ Supplemental to COD filed _____ (supplements a previously-filed Certificate of Disclosure)

4. FELONY/JUDGMENT QUESTIONS :

Has any person (a) who is currently an officer, director, trustee, or incorporator, or (b) who controls or holds over ten per cent of the issued and outstanding common shares or ten per cent of any other proprietary, beneficial or membership interest in the corporation been:

4.1	Convicted of a felony involving a transaction in securities, consumer fraud or antitrust in any state or federal jurisdiction within the seven year period immediately preceding the signing of this certificate?	☐ Yes	☒ No
4.2	Convicted of a felony, the essential elements of which consisted of fraud, misrepresentation, theft by false pretenses or restraint of trade or monopoly in any state or federal jurisdiction within the seven-year period immediately preceding the signing of this certificate?	☐ Yes	☒ No
4.3	Subject to an injunction, judgment, decree or permanent order of any state or federal court entered within the seven-year period immediately preceding the signing of this certificate, involving any of the following: a. The violation of fraud or registration provisions of the securities laws of that jurisdiction; b. The violation of the consumer fraud laws of that jurisdiction; c. The violation of the antitrust or restraint of trade laws of that jurisdiction?	☐ Yes	☒ No
4.4	If any of the answers to numbers 4.1, 4.2, or 4.3 are **YES**, you **MUST** complete and attach a Certificate of Disclosure Felony/Judgment Attachment form C004.		

5. BANKRUPTCY QUESTION:		
5.1 Has any person (a) who is currently an officer, director, trustee, incorporator, or (b) who controls or holds over twenty per cent of the issued and outstanding common shares or twenty per cent of any other proprietary, beneficial or membership interest in the corporation, served in any such capacity or held a twenty per cent interest in **any other corporation** (not the one filing this Certificate) on the bankruptcy or receivership **of the other corporation**?	☐ Yes	☒ No
5.2 If the answer to number 5.1 is **YES**, you **MUST** complete and attach a Certificate of Disclosure Bankruptcy Attachment form C005.		

IMPORTANT: If within 60 days of the delivery of this Certificate to the A.C.C. any person not included in this Certificate becomes an officer, director, trustee or person controlling or holding over ten per cent of the issued and outstanding shares or ten per cent of any other proprietary, beneficial or membership interest in the corporation, the corporation must submit a SUPPLEMENTAL Certificate providing information about that person, signed by all incorporators or by a duly elected and authorized officer.

SIGNATURE REQUIREMENTS:	
Initial Certificate of Disclosure:	This Certificate must be signed by all incorporators. If more space is needed, complete and attach an Incorporator Attachment form C084.
Foreign corporations:	This Certificate may be signed by a duly authorized officer or by the Chairman of the Board of Directors.
Credit Unions and Loan Companies:	This Certificate must be signed by any 2 officers or directors.

Zachary Frenette
Name

3243 East Bonanza Rd.
Address 1

Address 2

Gilbert | AZ | 85297
City | State | Zip

United States
Country

SIGNATURE – *see Instructions C003i:*

By typing or entering my name and checking the box marked "I accept" below, I acknowledge *under penalty of perjury* that this document together with any attachments is submitted in compliance with Arizona law.

☒ I ACCEPT

Signature

Zachary Frenette | 11/14/16
Printed Name | Date

REQUIRED – check only one:

- ☒ **Incorporator -** I am an incorporator of the corporation submitting this Certificate.
- ☐ **Officer -** I am an officer of the corporation submitting this Certificate
- ☐ **Chairman of the Board of Directors -** I am the Chairman of the Board of Directors of the corporation submitting this Certificate.
- ☐ **Director** – I am a Director of the credit union or loan company submitting this Certificate.

Name

Address 1

Address 2

City | State | Zip
Country

SIGNATURE – *see Instructions C003i:*

By typing or entering my name and checking the box marked "I accept" below, I acknowledge *under penalty of perjury* that this document together with any attachments is submitted in compliance with Arizona law.

☐ I ACCEPT

Signature

Printed Name | Date

REQUIRED – check only one:

- ☐ **Incorporator -** I am an incorporator of the corporation submitting this Certificate.
- ☐ **Officer -** I am an officer of the corporation submitting this Certificate
- ☐ **Chairman of the Board of Directors -** I am the Chairman of the Board of Directors of the corporation submitting this Certificate.
- ☐ **Director** – I am a Director of the credit union or loan company submitting this Certificate.

Filing Fee: None
All fees are nonrefundable - see Instructions.

Mail: Arizona Corporation Commission - Corporate Filings Section
1300 W. Washington St., Phoenix, Arizona 85007
Fax: 602-542-4100

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Clear Form Print Form

DO NOT WRITE ABOVE THIS LINE; RESERVED FOR ACC USE ONLY.

STATUTORY AGENT ACCEPTANCE

Please read Instructions M002i

1. **ENTITY NAME –** give the **exact** name in Arizona of the corporation or LLC that has appointed the Statutory Agent (this must match exactly the name as listed on the document appointing the statutory agent, e.g., Articles of Organization or Article of Incorporation):

Aspen Tree

2. **STATUTORY AGENT NAME –** give the exact name of the Statutory Agent appointed by the entity listed in number 1 above (this will be *either* an individual or an entity). *NOTE* - the name must match **exactly** the statutory agent name as listed in the document that appoints the statutory agent (e.g. Articles of Incorporation or Articles of Organization), including any middle initial or suffix:

REGISTERED AGENTS INC

3. **STATUTORY AGENT SIGNATURE:**

By the signature appearing below, the individual or entity named in number 2 above accepts the appointment as statutory agent for the entity named in number 1 above, and acknowledges that the appointment is effective until the appointing entity replaces the statutory agent or the statutory agent resigns, whichever occurs first.

The person signing below declares and certifies *under penalty of perjury* that the information contained within this document together with any attachments is true and correct, and is submitted in compliance with Arizona law.

Signature	Printed Name	Date
Bill Havre	Bill Havre - President	11/14/16

REQUIRED – check only one**:**

☐ **Individual as statutory agent:** I am signing on behalf of myself as the individual (natural person) named as statutory agent.	☑ **Entity as statutory agent:** I am signing on behalf of the entity named as statutory agent, and I am authorized to act for that entity.

Filing Fee: none (regular processing) Expedited processing – not applicable. All fees are nonrefundable - see Instructions.	Mail: Arizona Corporation Commission - Corporate Filings Section 1300 W. Washington St., Phoenix, Arizona 85007 Fax: 602-542-4100

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9

Grant Application

GRANT APPLICATION

*Providing Individualized Mentorship, * Employing Advanced Technologies, Economic Incentives, and Parental Participation for At-Risk High School Freshmen* * **Aspen Tree Education – Development Grant Application**

Table of Contents

A. SIGNIFICANCE. *Aspen Tree Education is applying for a Development Grant in response to Absolute Priority 1 and Absolute Priority 3. The proposed 3-5-year project will investigate the efficacy of a technology enhanced supplemental individualized mentorship program for at-risk 9th grade students, designed to improve on-time grade promotion, 4-year cohort graduation rates, and state test scores through the Technology Enhanced Supplemental Tutoring (TEST) program. This intervention seeks to expand upon the results from a longitudinal study[1] that shows distinct advantages for economically and academically disadvantaged students. The project will serve high-need freshmen attending high schools, Cesar Chavez and South Mountain in Phoenix, Arizona. Aspen Tree, Chicanos Por La Causa (CPLC), Phoenix Union High School (PUHS), and Roosevelt District will partner to conduct an investigative study to quantify the program impacts of technology integrated mentorship on student achievement, such as implementation of collaborative and asynchronous digital instruction; enhanced remediation techniques; competence in student self-efficacy; aspirations for future education enrollment; and examine the extent to which these impacts translate into increased on-time promotion rates, decreased dropout rates, and higher 4-year cohort graduation rates. In each school and in each successive cohort, incoming 9th grade students will be randomly assigned to either the TEST program or a control group. Approximately 100 students in each school and cohort will be assigned to these two study groups, resulting in a total sample of 200 students.*

1 Burch, P., Good, A., Heinrich, C. (2016 March). Improving Access to, Quality, and the Effectiveness of Digital Tutoring in K-12 Education. *Educational Evaluation and Policy Analysis.*

~~Response to AP 2: Promoting Diversity and School Climate.~~ *We will partner with Phoenix Unified High School District and two TEST bed schools in Maricopa County that are eligible for the program: Cesar Chavez and South Mountain. See Tab 6 of the TEST Proposal binder for supportive data and "Target Population" for additional information:*

~~Response to AP 4: Improving School Climate, Behavioral Supports, and Correctional Education.~~ *TEST is grounded in the theories of Critical Thinking and Rigorous Learning (CTRL), which hold that improvements in student engagement and behaviors that support academic and other important school-related outcomes result from: (1) critical observation of why, how and what if questions, challenging students to push themselves intellectually, encouraging student self-efficacy; and (2) engaging students in a meaningful, interactive, evenly paced environment with an emphasis on basic core strategies and quality instruction time. The TEST program provides this to 9th graders throughout their transition to high school, thereby improving school engagement, performance, and success.*

"Tell us how TEST helped"	*Objective to be Measured*
Caring more about graduation	*Aspirations for future*
Ability to set goals	*Goal setting skills*
Ability to ask for help	*Coping skills*

Need for Project. *The proposed project will address the profound weakness in the support systems provided to students during their transition into high school, with a specific emphasis on influencing the development of student engagement through individualized mentorship. This transition period is often marked by increases in absenteeism, truancy, and discipline problems and declines in academic achievement and school attachment.[3] By the time they*

reach high school, more than half of all students are "chronically disengaged" from school.[4] Furthermore, research consistently demonstrates that students are most vulnerable for dropping out of school during and immediately following their first year of highschool.[5] More students fail 9th grade than any other grade[6] and promotion rates between 9th and 10th grade are much lower than rates between other grades.[7] National public school enrollment patterns show that there is a sharp increase in the number of students enrolled in 9th grade over the last 30 years, indicating that an increasing number of students are being retained (the "9th grade bulge") and the rate at which students disappear between 9th and 10th grade has tripled over the same time period (the "10th grade dip").[8] Further, a mentoring approach may also help close the "mentoring gap," a national phenomenon uncovered in the 2014 report, "The Mentoring Effect."[9] One in three young people overall and 37% of at-risk youth report they never had an adult mentor while they were growing up. Approximately 16 million youth will reach age 19 without a mentor.

Existing innovative strategies. *TEST is a school-based mentoring program for 9th grade students designed to improve student engagement that support educational outcomes by immersing freshmen in safe, supportive mentorship sessions led by older peer leaders. TEST is innovative in that it capitalizes on existing resources such as staff and local college students from our target district. TEST trains local college students rather than non-school or additional school staff; taps into older local students, an underutilized resource, as peer leaders who support younger students; ensures mentors receive rigorous training through paid leadership training. In addition, intensity and duration of TEST activities are especially robust. Contact with students include weekly, 45-minute mentoring sessions. Mentors meet with the same freshmen throughout their 9th grade year.*

New strategies that build on existing strategies. *The proposed project seeks to enhance high-*

quality program implementation by implementing TEST with fidelity in high-need, urban Phoenix schools proposed for this project, providing important support as these schools try to get the program off the ground while also keeping an eye toward long-term sustainability. This proposed project represents the first time that TEST will be implemented. Therefore, we seek to couple an evidence-based program with promising new strategies for improving schools' capacity for implementation and deepening student learning process.

National significance. *Various studies spanning several decades have found that high schools across the country are failing to engage their students.[12] Dropping out of school has consistently been linked to student disengagement:[13] nearly half (47%) of students who drop out report being bored and disengaged from high school, 69% said they were not motivated or inspired to work hard, and 42% spent time with people who were not interested in school.[14] Despite historically high national graduation rates, the "silent epidemic" of dropout disproportionately affects minority, low-income, and other high-need students.[15] According to the 2015 Building a Grad Nation Report, the 2012-13 estimated national 4-year adjusted cohort graduation rate (ACGR) for public high school students hit a record high of 81.4%.[16] While there have been promising gains among Hispanic/Latino and African-American students, these subgroups still fall well below the national average at 75.2 and 70.7 percent, respectively.[17] Graduating on time is the norm for middle- and high-income students, but not for their low-income peers. Low-income students, students with limited English proficiency, and students with disabilities all had 4-year ACGR rates below the national average at 73.3, 61.1, and 61.9 percent, respectively.[20]*

Evidence of promise. *TEST seeks to augment students' engagement in and improve academic focus, career, and life outcomes and has promise of demonstrating its impact on high school*

graduation rates.

Target population. *Phoenix Union High School District is targeted as the project partner along with Roosevelt District which will help identify at-risk students matriculating into their freshmen year of highschool. Aspen Tree will partner with Cesar Chavez and South Mountain high schools.*

There is a growing body of evidence to suggest that social capital, including sense of community and neighborhood cohesion, may represent a considerable asset for urban communities. [40, 41] *TEST addresses many of the needs of urban communities (e.g., peer mentors and mentees are physically located in the same school building or at a public library; TEST offers a comprehensive curriculum including weekly activities; TEST will provide extensive, ongoing training for faculty advisors and peer mentors. TEST also capitalizes on the assets of adolescents' sense of community and cohesion and leverages them to improve social, emotional, and academic outcomes. This project may reveal TEST as a highly effective and practical strategy for high-need urban schools.*

Theoretical basis. *Critical Thinking and Rigorous Learning theory (CTRL) "teaches the skills we all need to handle ourselves, our relationships, and our work, effectively and ethically."* [42] *A mounting body of evidence clearly indicates that, compared to students who do not participate in such programs, students who practice CTRL academically outperform their peers, get better grades, and graduate at higher rates.*[43] *Critical Thinking and Rigorous Learning has been found to improve motivation, commitment, attendance, study habits, cooperative learning, grades, test scores and subject mastery.* [44] *Peer group interactions and school culture and climate have consistently been named among the most influential factors on student learning.* [45] *TEST is also grounded in social learning theory. Diverse groups of*

students from different levels of risk for dropout participate together. Lower-risk students, who demonstrate fewer overt signs of distress but may still be vulnerable to dropout, receive peer and adult support to overcome obstacles that could eventually lead to more serious problems. Youth at both high and moderate risk for dropout benefit from exposure to more motivated and academically successful students in a supportive setting.[46, 47]

Contributions to the field. *The proposed project will build strong evidence for adopting a technology based mentoring model for promoting students' skill development to ensure a successful transition from middle to high school and to improve academic achievement. While peer interventions like peer helping and counseling are common; authentic synchronous digital tutoring models like TEST are distinct in their emphasis on the development of a mutually supportive, close relationship between different-aged peers over an extended period of time.*[48] *In addition, the mentor's focus is not on interpersonal or academic deficiencies but rather on facilitating youth development in domains such as interpersonal skills, connectedness to school, prosocial bonding, social skills, and self-esteem. The prevalence of true synchronous digital tutoring is difficult to determine and empirical research on these models is extremely limited.* [49] *According to a 2009 review, no large-scale randomized studies of the effects of synchronous digital tutoring programs on mentees have been reported in the literature.*[50] *While no search can be assumed to identify all relevant studies, our search suggests that this may be the first large-scale study of its kind.*

Replicability*. The replicability of TEST will be determined. The initial investment to launch TEST is typically a one-time-only occurrence that pays for Aspen Tree training, curriculum, and technical assistance to help the program become integrated into the student's school year and sustained in perpetuity with ongoing support. TEST taps into the critical resources that communities already have in place (students and faculty). TEST's integration into the*

student's life provides a built-in mechanism for participation and retaining participants in contrast to school day models that are vulnerable to a variety of scheduling and commitment challenges. Because of this, TEST is highly replicable, scalable, and demonstrates greater likelihood than many other approaches of becoming sustained over time. We are also confident that the strategies proposed within the present project will become replicable components.

B. PROJECT DESIGN AND MANAGEMENT PLAN. ***Goals, objectives, and outcomes.*** *The proposed project has five goals: 1) Increased on-time grade promotion among 9th grade TEST students moving into their sophomore year; 2)Improved Grade Point Average and academic standing among TEST students; 3)Measurable increase in four-year high school graduation rates among TEST students; 4) Demonstrable improvement in student self-efficacy, attitudes toward education and learning, as well as plans for future college enrollment; and 5)Increased performance on Arizona State testing on AIMS, AZMerit, and national college entrance exams. The TEST Program will then prepare for scale. Specific objectives and outcomes are listed in the Executive Summary of the TEST Proposal binder located on Tab 5.*

Project design and intervention components. *TEST trains select college and high school students and seniors respectively to engage younger at-risk freshmen in mentorship. TESTS's launch begins with the assembly of a stakeholder team of administrators and local college students who receive the training, tools, and resources necessary to implement TEST, troubleshoot obstacles, and ensure TEST's long-term sustainability. We will serve PUHSD high schools, Cesar Chavez and South Mountain and will work closely with district leadership in each of the LEAs to ensure greater impact of this initiative than could be*

expected by solely working with individual schools. Mentors are carefully selected by Aspen Tree to serve as tutors. Aspen Tree provides the mentors with written protocols which include resources for assessing qualifications and fit. Mentors should be a recent graduate or high school senior who consistently demonstrate leadership and excellence among their peers. Prospective mentors are assessed for criteria within general categories such as attitude, character, interpersonal skills, communication skills, and experience. Specifically, mentors must demonstrate evidence of: enthusiasm for the TEST program and peer mentoring; commitment to positive youth development; demonstrated ability to follow through on commitments; openness to professional development; creativity and energy; and general program management skills. Mentors participate in a intensive course prior to being introduced to the TEST Program to learn how to mentor according to state and Aspen Tree standards.

Local college freshmen are carefully selected by faculty advisors to become peer leaders and serve as mentors for 9th graders. TEST provides the mentors with guidance and written protocols to select students, including a rubric for assessing qualifications and fit. Prospective mentors are assessed for criteria within general categories such as attitude, character, interpersonal skills, communication skills, and experience. Prospective peer leaders complete a written application, participate in a group interview, and provide community recommendations. Specific criteria for selection includes a clear commitment to the role of mentor; ability to work collaboratively; friendliness; appeal to younger students as a role-model; demonstrated leadership; ability to communicate clearly; willingness to participate and share opinions in a group setting; ability to offer encouragement; and self-confidence. Mentors must also demonstrate adequate academic performance, strong

attendance, and no serious discipline infractions. Aspen Tree supports a diverse group of peer leaders that accurately reflects the racial/ethnic composition of the school community, neighborhood affiliation, socio-economic status, known cliques, and an equal number of girls and boys. Mentors are trained and conduct weekly tutoring sessions. This helps mentors prepare to lead their students each week and debrief following each session, sharing successes, challenges, and suggestions for handling issues. TEST provides a built-in mechanism for retaining participants in contrast to other extracurricular models. Aspen Tree works closely with faculty advisors to assign students to appropriate mentors. Within each partner school Aspen Tree will assign 9th grade students to mentors, with stratification by gender, race/ethnicity, and at-risk status. Aspen Tree works closely with mentors and students to coordinate scheduling. Incoming freshmen spend the duration of their freshmen year engaged in activities designed to help students focus on skill development through experiential learning activities. As noted above, the proposed project represents the first time that TEST will be implemented. Phoenix Unified School District (PUHSD) serves a low-income community with children from families below the poverty line and a large body receiving free or reduced lunch.[56] *Additionally, a substantial percentage of students in PUHSD are Hispanic/Latino or African American representing the two racial groups with the lowest graduation rates.*[57]

The proposed project represents the first time TEST will be implemented as an essential program component designed to support meaningful, synchronous digital tutoring. Individualized mentorship has demonstrated significant positive effects on students' academic performance, values, self-efficacy, leadership, and interpersonal skills.[60]

Management plan; Roles and responsibilities of partners. *Aspen Tree will oversee all*

aspects of the project, and will: recruit, confirm, and retain LEA and school partners; provide mentor development at each school; train tutors; provide technical assistance and coaching; fidelity monitoring; continuous improvement; implementation-related performance measures; and work closely with our evaluator, Dr. Marianne Arini. Dr. Arini will conduct the independent, RCT evaluation and will obtain IRB approvals and parent consent; conduct random assignment procedures; finalize and administer the student survey; obtain student record data; analyze all data; submit progress reports; and collaborate with Aspen Tree to develop articles and conference presentations to disseminate study results.(See Tab 5, Gantt Chart). School staff at each program site will introduce TEST, providing all requested data per the evaluation requirements. Through the guidance of Aspen Tree, PUHSD will help identify mentors at both target LEAs as they launch TEST. PUHSD will participate in a continuous improvement process along with the LEAs to assist Aspen Tree in making program enhancements and any necessary course corrections. ***The _____ Foundation has already committed the required ____ matching grant of $000,000.***

Project staff*. Aspen Tree and our evaluations specialist will each have a designated lead. Dr. Mich Lyon, VP of Operations and Evaluation at Aspen Tree, will serve as Project Director (PD).*

Marianne Arini, Ph.D, Lead Evaluator, TEST, has previously participated in research projects relating to the evaluation and study of regional, state and federal social, education and economic welfare programs. Dr. Arini is the Principal Investigator (PI) and has been involved with Development grants, and several other ongoing RCTs, quasi-experimental, and observational studies in the field of education. Additionally, Dr. Arini served as a peer

reviewer for Education Journals in both Arizona and New York, and is working on receiving her What Works Clearinghouse Certification for group design standards. Aspen Tree will seek evaluation specialists that have successful track records working with the target population on similar interventions and conducting similar types of evaluation projects. Please see Evaluation Chart as well as the Management Plan, and project timelines and milestones included with the TEST Proposal binder on Tab 5.

***Ensuring feedback and continuous improvement**. To understand variations in how TEST works in practice, collect and evaluate data to assess progress against interim and longer-term goals, make mid-course corrections, interpret the efficacy of the intervention, and identify features and conditions necessary for sustainability and effective replication, the evaluation design will include comprehensive fidelity of implementation (FOI) measures. Measures include program dosage, regular observations by trained observers of the intervention in action, fidelity monitoring logs, faculty advisor and student feedback forms and focus groups, and assessments of relationship quality completed by freshmen about their peer leaders. The below table outlines strategies to ensure active communication, accountability, and continuous improvement:*

Project Team Meetings (Monthly)	*Project team reviews project progress toward milestones and goals at each partner site and identifies and problem-solve challenges.*
Site-based Team Meetings (Monthly)	*Held at each implementation school. Include the Aspen Tree project manager, principal, district-level represenative, stakeholder team coordinator, and other site-based stakeholder team members to prepare for launch and evaluation of TEST, ensure program operations are running smoothly, the program is well resourced, and school staff is well supported.*
Advisor Team Check-ins, Observations, & Fidelity Monitoring (Every Other Week)	*Aspen Tree project manager will check in with Dr. Arini and the evaluations team regarding progress on TEST implementation and to troubleshoot obstacles. Check-ins will include a reveiw of program attendance tracking, observations of the peer leadership training, and the weekly outreach to freshmen, feedback to advisors, and fidelity monitoring logs as described in greater detail in the Project Evaluation Plan (Section D).*
District and School Leadership Check Ins (Quarterly)	*Aspen Tree PD will meet with district and school leadership to review progress toward major milestones, assess any areas that require modification, and, if neccessary, develop an action plan for modification. This meeting will include at least one check-in to reveiw student survey forms to see if students are reporting changes in key non-cognitive ablities and level of engagement at school.*

Implementation Feedback (Ongoing)	*Gathered from administrators, other stakeholders, faculty advisors, peer leaders and freshmen at each LEA, including quarterly feedback forms and annual focus groups regarding the perception of the intervention's value and impact.*
Annual Advisory	*Offered annually for faculty advisors/stakeholders across sites to reveiw the previous academic year's program, share successes and challenges, receive mentorship from other successful implementation sites, reveiw data, prepare for integration of any program enhanchments, prioritize areas of improvement for the following school year.*

Dissemination. *We will publish manuscripts about the project in peer-reviewed journals, present at least one regional or national conference, and share results with stakeholders and prospective school partners. Dr. Arini will take the lead on writing articles for journal publication in close collaboration with Aspen Tree. Aspen Tree and our evaluations specialists will submit proposals to present at professional conferences. We will also provide a report of lessons learned and evaluation results to administrators and stakeholders at PUHSD and will host information sessions and webinars for schools throughout the state to learn more about the project. Study results will be disseminated through popular media so that parents and public can learn about the impact of TEST. Research results will be posted on the Aspen Tree website.*

C. EVALUATION PLAN. Overview. *Aspen Tree has engaged Dr. Arini as the independent evaluator (see Tab 12 of the TEST Proposal binder). The logic model on Tab 5 of the TEST Proposal hypothesizes how a year-long, digital synchronous mentorship model grounded in theories put forth by Technology Enhanced Supplemental Tutoring (TEST) will promote and improve 9th grade students' success through peer support; competence in peer relationships; competence in goal-setting, decision-making, and coping skills; intentions/aspirations for future education; valuing education) and school engagement, thereby improving their educational outcomes, as demonstrated by on-time grade promotion and decreased dropout (i.e. persistence in school). These expectations are based on evidence of promise. The evaluation will test these hypotheses by: 1) an individual-level randomized controlled trial*

(RCT) to draw causal inferences about the effects (impact) of TEST on student engagement, and educational outcomes; and 2) an implementation evaluation to understand how TEST works in practice, interpret its efficacy, provide feedback for program improvement, and identify features and conditions necessary for sustainability and replication. The impact evaluation investigates whether TEST impacts specific participant-reported educational outcomes.

Research questions. *We are proposing to answer two primary research questions: 18 months after the end of treatment, what is the impact of TEST (treatment) relative to the control condition on participants': 1) on-time grade promotion, and 2) persistence in school. In addition, we may investigate the following exploratory (secondary) research questions: What are the short-term (immediate post- program) impacts of TEST (treatment) relative to the control condition on participants' reported: 1) perceived peer support, 2) competence in peer relationships, 3) school engagement, 4) perceived value of education, 5) intentions/aspirations for future education, and 6) competence in goal-setting, decision-making, and coping skills. And, finally: 7) To what extent do components of fidelity of implementation (i.e., adherence, quality, experiences of control group, and context) impact the effect of TEST on students' outcomes, and how might this inform replication efforts.*

Methods for impact study. *The impact study design and methods will meet What Works Clearinghouse (WWC) evidence standards 'without reservations'. For the impact study, the primary educational outcomes of interest are on-time grade promotion and persistence in school. Evaluating TEST's impact on longer-term outcomes identified in the logic model on Tab 5 (e.g.on-time high school graduation, college enrollment/completion) is not feasible in the grant time frame with sample identification/selection, sample size, and minimal*

detectable effect size. The target population are all students who enroll in 9th grade at the two partner schools during the 2017-18 and 2018-19. In each school, students will be recruited and individually randomized into study conditions each year for two successive years. Total annual 9th grade enrollment across all six schools is approximately 1,000 students (See Tab 5). We estimate a 75% consent rate, resulting in a total sample of 1,500 total. As prior research does not provide estimates, we will use an effect size of .25 as a benchmark, which WWC identifies as the point at which impacts become substantively important. The evaluation as currently proposed (1,500 students randomly assigned to treatment and control conditions) will be adequately powered to detect an effect of this size. Based on a number of standard assumptions and reasonable expectations this study should yield a Minimal Detectable Effect Size (MDES) of approximately .23 after two years of data collection.[2] In fact, because we propose to estimate impacts while controlling for theoretically relevant covariates, we expect that we should have even more precision and statistical power. Aspen Tree staff will be responsible for implementing and monitoring all random assignment procedures. In August of each study school year, Aspen Tree will: 1) obtain final student rosters of all 9th grade students enrolled and attending each partner school; 2) identify all students eligible for the study (those who have attended one week, provided parent consent/youth assent for the evaluation, and not previously participated in TEST); and 3) randomly assign eligible youths at the individual level to either the treatment (TEST) or control condition. Aspen Tree project managers will then work with schools to ensure that treatment condition-assigned students' schedules are adjusted to reflect their participation in their weekly TEST mentorship sessions. Assignment procedures will occur prior to the

2 . Effect size estimates are calculated with Optimal Design and reflect the following expectations: power (B) = .80, significance (a) =.05 and a two-tailed significance test, with a random effects model.

provision of any programming or collection of baseline data. Joiners will not be a concern because the evaluators will randomly assign new students to treatment on control conditions on a rolling basis for the next two weeks, after which point new students will be excluded from the study.

***Outcome measures and data collection**. To measure the impact of the intervention, TEST will collect outcome data from two sources: 1) student-level school record data from partner schools for the primary research questions and 2) an Outcome Questionnaire to collect self-reported data directly from students for the exploratory research questions. The Outcome Questionnaire will collect background characteristics and outcome data on participant-reported perceived peer support, competence in peer relationships, valuing education; school engagement; intentions/aspirations for future education; and competence in goal setting, decision-making, and coping skills. All items and scales used for outcome measurement will be composed of measures that have been used and validated in peer reviewed research (See Tab11 of the TEST Proposal binder & includes possible scales for outcome measurement). The same questionnaire will be administered by Aspen Tree staff at baseline and at the end of the school year. Data collection procedures will be identical for both treatment and comparison conditions. Attrition will be closely monitored and analyzed routinely; TEST will execute a comprehensive follow-up plan to retain participants in the study based on the evidence-based Engagement, Verification, Maintenance, and Confirmation Model.[61] While interaction between individuals in the intervention and control groups does present the potential for diffusion of intervention effects, this is not expected to be substantial, given that the intervention itself is relationship-based and not information-based. Educational outcome data (on-time grade promotion, persistence in school, graduation) will be requested by TEST from all partner schools in the fall of grant years three, four, and five (for previous year's*

data); data-sharing agreements with all schools will be formalized. We summarize data sources, collection methods, timelines, and analytic approaches by research question in Tab 5 of the TEST Proposal binder.

Analytic approach. *For primary research questions, the analytic approach will be to regress outcome measures on a treatment/comparison indicator, blocking indicators, and relevant individual-level covariates, including baseline measure of outcome variables using a multi-level model. While a comparison of means should produce un-biased estimate of impact, we propose a multi-level modeling approach to increase the precision of impact estimates, and to account for blocking procedures. Statistical significance will be inferred at* $p < .05$*, using a two-tailed test.*

Methods for implementation study. *TEST will design and conduct an implementation evaluation to understand variation in how TEST works, interpret the efficacy of the intervention, provide feedback for program improvement, identify conditions necessary for sustainability and replication. The implementation evaluation will assess and report on: 1) adherence, 2) quality, 3) control group experiences, and 4) contextual factors. Implementation data will be analyzed and reported to the Aspen Tree team semi-annually as formative feedback and to encourage modifications to improve program effectiveness. Annual thresholds will be set for each key component depicted in the logic model. Fidelity measures will include: program dosage, observations by trained observers of the intervention, fidelity monitoring logs, faculty advisor and student feedback forms and focus groups, and assessments of relationship quality completed by freshmen about their peer leaders. We describe each implementation element, data used to assess each element, frequency of data collection, and responsible party in the Implementation Evaluation Summary on Tab 3 of the TEST Proposal binder. Quantitative data, such as dosage data and close-ended questions*

from the survey, will be analyzed descriptively. To analyze qualitative data gathered in interviews and open-ended survey questions, the evaluators will use a grounded theory approach. Aspen Tree and school partners will complete Implementation Summary Forms to report the input and output data such as training and planning activities.

Sufficient resources. *The budget allocates sufficient resources for an evaluation that includes an RCT with 100 students per year.*

Qualifications of independent evaluator. *The evaluator, Dr. Arini is well-qualified to conduct the evaluation, having led federally-funded evaluations in the past, many of which included extensive RCTs. The principal investigator (PI), Dr. Marianne Arini, has worked with multiple projects and other i3 Development grants, as well as several other ongoing RCTs, quasi-experimental, and observational studies. Dr. Arini has valuable experience in supervising rigorous evaluations and authoring evaluation reports, and she serves as a peer reviewer for educational review boards in both Arizona and in New York. She will be assisted by an evaluations team. (See Tab 12 for Aspen Tree résumés).*

10

Curriculum

Curriculum

“Freshmen curriculum for TEST will be introduced and integrated into the program after Phoenix Unified High School District state revisions are completed for South Mountain and Cesar Chavez high schools. Completion projected May 25th, 2017.”

PUHSD Office of Teaching & Learning

602-764-1324

11

Research Articles

THE HAMILTON PROJECT

POLICY PROPOSAL 2016-02 | MARCH 2016

Improving Academic Outcomes for Disadvantaged Students: Scaling Up Individualized Tutorials

Roseanna Ander, Jonathan Guryan, and Jens Ludwig

MISSION STATEMENT

The Hamilton Project seeks to advance America's promise of opportunity, prosperity, and growth.

We believe that today's increasingly competitive global economy demands public policy ideas commensurate with the challenges of the 21st Century. The Project's economic strategy reflects a judgment that long-term prosperity is best achieved by fostering economic growth and broad participation in that growth, by enhancing individual economic security, and by embracing a role for effective government in making needed public investments.

Our strategy calls for combining public investment, a secure social safety net, and fiscal discipline. In that framework, the Project puts forward innovative proposals from leading economic thinkers — based on credible evidence and experience, not ideology or doctrine — to introduce new and effective policy options into the national debate.

The Project is named after Alexander Hamilton, the nation's first Treasury Secretary, who laid the foundation for the modern American economy. Hamilton stood for sound fiscal policy, believed that broad-based opportunity for advancement would drive American economic growth, and recognized that "prudent aids and encouragements on the part of government" are necessary to enhance and guide market forces. The guiding principles of the Project remain consistent with these views.

THE HAMILTON PROJECT

THE HAMILTON PROJECT

Improving Academic Outcomes for Disadvantaged Students: Scaling Up Individualized Tutorials

Roseanna Ander
University of Chicago

Jonathan Guryan
Northwestern University and the National Bureau of Economic Research

Jens Ludwig
University of Chicago and the National Bureau of Economic Research

MARCH 2016

BROOKINGS

Abstract

Improving the educational outcomes of economically disadvantaged children is a policy priority in the United States, and yet relatively little progress has been made in recent decades. Education reforms that aim to help economically disadvantaged students often focus on improving the quality with which grade-level material is taught, or the incentives that students have to learn it. Yet such efforts may not adequately account for important differences within a classroom of students—differences in knowledge, in learning styles, or the rate at which students learn. As a result, in spite of these efforts, students who fall behind grade-level material tend to stay behind. When these students miss developing crucial foundational skills, they can have major difficulties in subsequent learning tasks, which worsens the gap between them and their grade-level peers as they move from one grade to the next. This persistent mismatch between the learning needs of students and what classroom instruction delivers can seriously undermine students' chances of success in the workforce and beyond. We propose scaling up a daily, individualized tutorial program that would allow students who have fallen behind grade level in math to reengage with regular classroom instruction, likely increasing their chances of graduating high school and achieving the many long-term economic benefits that go along with academic success.

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Chapter 1. Introduction

What if there were a way to help economically disadvantaged children attending under-resourced schools do better in math, narrow the black–white test score gap, reduce the achievement gap between poor and rich children, improve high school graduation rates in the country's most disadvantaged neighborhoods, and reduce income inequality? And what if it were possible to do all of this without any additional government spending? It sounds too good to be true, but that skeptical reaction probably reflects the narrow view that many of us have adopted about how best to organize schools. By breaking out of our implicit assumptions about the optimal organization of schools, we can help children left behind by the traditional school model to learn and thrive.

Consider the way that schools are organized for instruction: students are assigned to a grade level based on their age, and teachers are assigned some portion of these students as their class. Classrooms and grades are not well set up to handle differences among students—differences in knowledge at a point in time, differences in learning styles, or differences in the rate at which kids learn. These differences make it difficult to individualize instruction in a classroom setting where students have widely varying skills, knowledge, and educational needs. When these challenges are combined with the high levels of disadvantage that so many children in American cities face, it is perhaps not surprising that many struggle to keep up in school, although there is substantial variation in the degree to which children fall behind.

Most education reforms focus on either improving the quality with which grade-level material is taught or the incentives students have to learn it. Yet such efforts may have little effect on students who are far behind grade level—"saying it louder" will not help these students. Despite the $590 billion the United States spends each year on public K–12 schooling, most urban school systems lack adequate safety nets to intensively help those who have fallen behind, which remains a key systemic challenge.

To see why this type of mismatch can make learning in a regular classroom seem close to impossible, imagine that someone transported you right now into a doctorate-level class on advanced aspects of molecular engineering. You sit down at your desk, eager to learn, and determined to do your best to follow along. Then the professor begins to lecture, talking about "evolutionary optimization of directed self-assembly of triblock copolymers on chemically patterned substrates," before transitioning to a discussion of "chirality-selected phase behavior in ionic polypeptide complexes," and then closes with an extended discussion of the finer points of "orientational anisotropy in simulated vapor-deposited molecular glasses." Who (aside from the five people on the planet who actually understand molecular engineering) would not become frustrated? Would you receive any benefit from sitting through such a class without adequate prior knowledge?

The way that schools are typically organized creates the same problem. Imagine being a teacher tasked with teaching math to a classroom of 30 ninth-grade students. Some of those students have math skills and knowledge at the ninth- and tenth-grade levels, but others have math skills at only a fourth-grade level. How do you teach without either causing the advanced students to become bored or leaving the struggling students behind?

We propose addressing this problem by expanding a tutorial program that pairs two students who have fallen behind in math with a single tutor for daily instruction. The tutorials take place during the school day, and are in addition to a student's regular math class. The small student-to-tutor ratio means that a tutor can individualize instruction to the level of each student's knowledge. A student who has not yet mastered multiplying two-digit numbers can start there, while another student in the same room who is comfortable with basic algebra can work on more-advanced topics. The two-to-one ratio also allows the tutor to develop a relationship with each student, provide instruction to help get past stumbling blocks, and offer encouragement to keep moving forward after successes.

The challenge of this approach is not one of *pedagogy* but rather one of *economics*. Many public school systems, especially those in big cities, struggle to balance their books running systems that have 20 or 30 students, or even more, per class. Given these fiscal constraints, how can we provide the benefits of individualized tutorials at prices that are realistic for urban public schools?

The key insight behind our proposal is that intensive, personalized tutorial instruction can be delivered at a manageable cost by recognizing that tutoring is a task that is *fundamentally different from regular classroom teaching.* To become a licensed and expert classroom teacher in a traditional public school requires extensive formal training or specialized degrees, demonstrations of content knowledge on standardized exams, as well as several years of on-the-job learning. But many of the tasks associated with successful classroom teaching—such as classroom management—are not relevant for teaching just one or two children at a time. Tutors must be knowledgeable in the subject they teach, they must be good at explaining things, and they must have a positive attitude about every child's potential to learn. An intervention built around small-group instruction need not depend on expert regular-classroom teachers and can tolerate high levels of instructor turnover because on-the-job experience is not as critical as it is for classroom teachers.

This insight led Boston's Match Education (Match), and now SAGA Innovations (SAGA), to develop a model in which talented people—such as recent college graduates or others interested in public service—work as math tutors for one year as a public service for a stipend of about $19,000 for a 10 ½-month contract covering the school year and preservice training. This low cost enabled Match, and now SAGA, to provide students who have fallen behind in math with a substantial dose of individualized instruction in a tutorial setting in one 50-minute class period each school day, with two students at a time per instructor. This program is different from many tutoring programs in that it is delivered during the school day as a credit-bearing elective course with a structured curriculum.

We evaluated this tutorial program using a randomized controlled trial involving more than 2,700 students attending 12 Chicago Public Schools (CPS) high schools. Because we used a fair lottery to determine which students to invite to participate, we were able to measure the effect of the tutorial program (hereafter "Match/SAGA" tutorials) on test scores and grades holding constant any outside factors that might have affected kids' school performance. This evaluation was done essentially the same way that the medical field tests the effectiveness of new drugs and therapies.

Data from our large-scale randomized controlled trial shows that by the end of one school year the students who were randomly assigned to have a chance to participate in the Match/SAGA tutorials had significantly higher test scores, math grades, and grades in their other classes, as well as fewer course failures. The effects were large: we estimate that the tutorials helped students learn one to two additional years of math in a single school year above and beyond what kids typically learn in a year. The tutorials effectively narrowed the black–white test score gap by almost a third in just one year.

In what follows we outline a proposal to begin scaling up this type of intervention in school systems all across the country for students who are substantially behind grade level. Eventually, we envision the possibility that school districts around the country might have tutorials integrated into the regular school day on a wide scale. Tutorials might serve as a safety net for students who fall behind grade level at any age. By bringing students to the point where they can engage with grade-level material, tutorials could help to make classrooms and classroom teachers more effective, and could narrow achievement gaps to the point where they become the exception, not the rule.

Chapter 2. The Challenge

Improving the schooling outcomes of economically disadvantaged children is a policy priority in the United States, and has been for decades, and yet too little progress has been made. While the black–white test score gap narrowed during the 1980s, in the past decade white students scored, on average, about 0.8 standard deviations higher than black students on the National Assessment of Educational Progress, also known as the "Nation's Report Card" (Chay, Guryan, and Mazumder 2009; Loveless 2012).[1] This test score gap is similar to what the typical American teenager learns from eighth grade through the end of high school (Reardon 2011, 97). Such patterns are not limited to test scores: black and Hispanic youth are about 60 percent more likely to drop out of high school than are their white counterparts (Murnane 2013). Another way to think about the size of this test score gap is in terms of its impact on future labor market outcomes: a change in test scores of 0.8 standard deviations would be expected to translate into a difference in annual earnings of 22 percent (Hanushek et al. 2013). The achievement gap between rich and poor students has increased substantially since the 1940s and now exceeds the black–white gap (Reardon 2011).

Some have come to believe that the effects of poverty are too powerful for teachers and schools to substantially improve the academic outcomes of disadvantaged children. This pessimism stems partly from the limited number of educational interventions that have been shown to improve children's learning. While evaluations of a number of early childhood programs show that interventions can improve outcomes, there are fewer success stories for interventions that work with disadvantaged children of school age, particularly adolescents.

It is possible, though, that these interventions have failed to target a key part of the problem. As they currently operate, schools are not structured properly to help many disadvantaged children master foundational concepts that subsequent grades build on. The underlying challenge is nicely illustrated by the observation of Sal Khan, the founder of Khan Academy, in his book *The One World Schoolhouse* (2012):

> Let's consider a few things about that inevitable test. What constitutes a passing grade? In most classrooms in most schools, students pass with 75 or 80 percent. This is customary. But if you think about it even for a moment, it's unacceptable if not disastrous. Concepts build on one another. Algebra requires arithmetic. Trigonometry flows from geometry. Calculus and physics call for all of the above. A shaky understanding early on will lead to complete bewilderment later. And yet we blithely give out passing grades for test scores of 75 or 80. For many teachers, it may seem like a kindness or perhaps merely administrative necessity to pass these marginal students. In effect, though, it is a disservice and a lie. We are telling students they've learned something that they really *haven't* learned. We wish them well and nudge them ahead to the next, more difficult unit, for which they have not been properly prepared. We are setting them up to fail. (Khan 2012, 83–84; emphasis in original)

One way this plays out in practice is that the differences across students in what students can do academically—and what they need to learn—grow each year as children progress in school (Cascio and Staiger 2012). As a result, students who miss developing crucial foundational skills can have major difficulties understanding subsequent learning tasks. One consequence is that by high school many students in distressed communities can be many years behind grade level, especially in math. In the 2011 National Assessment of Educational Progress, for example, 40 percent of Chicago eighth graders were below basic level in math. The challenge may be particularly pronounced in urban areas where many students come from very economically disadvantaged backgrounds. Youth in Chicago who were at highest risk for school failure and crime (i.e., those who had been arrested and sent to the Cook County Jail) were on average four—and up to ten—years behind grade level in math (Keeley 2011). Teaching an entire classroom of students with such varying needs is an extraordinarily complicated task. The shift in the focus of policy toward accountability reforms places increasing pressure on teachers to demonstrate that students are mastering grade-level content, which in turn tends to drive curriculum decisions, yet time and resource constraints make it difficult within a typical classroom setting to individualize instruction. The result for many students is a mismatch between what regular classroom instruction delivers and what they need to succeed. A major structural challenge is that few urban school systems have adequate capacity to provide a safety net to students as they fall farther and farther behind.

Chapter 3. The Proposal

For decades, education researchers have understood that small-group tutoring generates "the best learning conditions we can devise," in part by individualizing instruction (Bloom 1984, 4). Compared to regular classroom instruction, tutoring also increases time on task (90+ percent versus 65 percent) and improves student attitudes and interest. Tutoring has been shown to increase the amount of feedback and correction between student and instructor, a key characteristic of effective teaching, and also ensures that students—including those who are struggling in school—receive the kind of individual attention they need. The key challenge for the field has been implementing tutoring in a cost-effective way; small-group tutoring by regular teachers has been widely viewed as "too costly for most societies to bear on a large scale" (Bloom 1984, 4).

We provide results from a randomized controlled trial in which low-cost, individualized math tutorials were offered to CPS high school students, many of whom were behind grade level in math. Based on these promising results, we outline a proposal to scale up the program to serve more students in a cost-effective manner.

THE MATCH/SAGA TUTORIALS

Match Education originally developed this tutorial model at its high school in 2004, implementing it at all of its charter schools in Boston, for all grade levels. In 2014 executives from Match spun off to form SAGA Innovations, the enterprise that would expand this model into traditional public school systems across the country. SAGA provides two-to-one individualized instruction with substantial contact time—one class period of about 50 minutes each day. In the CPS system, with 180 school days, that means a student receives individualized math tutorials for as many as 150 hours per year.

Students are assigned to participate in a tutorial session as part of their regular class schedule. Each tutor is assigned to work with two students at a time during each session. Part of the tutorial session is focused on remediating students' skill deficits, for which Match/SAGA has its own skill-building curriculum. Tutors tailor instruction to students' current skill level; often their work begins with teaching basic math skills. Students begin their work at the lowest math skill level they have yet to master, and as they progress they work on more-advanced coursework. The bulk of each session is also tethered to what students are working on in their math classrooms or what they will face in state or national math exams at the end of the year.

The Match/SAGA tutorial approach uses frequent internal formative and summative assessments of student progress to continuously individualize instruction and benchmark achievement. The daily "tickets to leave" exercises are one-to three-question mini-assessments of the day's lesson that allow the tutor to revise the next day's lesson. SAGA also divides the year into seven to ten course units, each with a pre-test and post-test; these tests help tutors determine how much review time is needed before the next unit. Quarterly proficiency assessments consist of 50 questions of basic math skills, administered at the beginning of the school year and up to four other times during the year. These tests assist tutors in targeting specific areas the student has not yet mastered that will be taught in the next quarter. These numerous assessments allow tutors to constantly and consistently measure student progress and tailor curricula to meet their students' needs.[2]

The key insight of the Match/SAGA tutorial model was about the basic economic barrier to personalizing education within big-city public school systems: per-pupil costs. Under the Match/SAGA tutorial model, youth receive intensive, individualized instruction at costs that are feasible at large-scale—around $3,800 per student in the Chicago Match/SAGA program—and are predicted to fall to $2,500 per student when carried out at large scale in a district. The per-pupil cost is low because the program selects tutors who can succeed in teaching two students at a time, but who typically do not have the extensive training and experience required to successfully teach classrooms of students. Because less preservice training is required, the Match/SAGA tutorials can hire instructors who commit to this work for a single school year as a public service and in exchange for a modest stipend. Tutors teach for six or seven periods of an eight-period school day. At each school they are overseen by a full-time site director who handles behavioral issues in the tutorial room and communication with school staff, and who offers daily feedback and professional development to tutors. Match/SAGA has also refined the model and figured out ways to implement the program at moderate scale in multiple locations in a way

that is consistent with how it was intended to be implemented. In principle, nothing about this educational strategy would preclude any other well-run nonprofit organization from delivering it.

RESULTS FROM A RANDOMIZED CONTROLLED TRIAL IN CHICAGO

The study we describe here builds on prior work by a member of our larger research team who found Match tutorials to be highly effective in a set of Houston public high schools that implemented a whole set of school reforms (Fryer 2014). Results from our work in Chicago have shown that at moderate scale, intensive, individualized instruction as delivered under the Match/SAGA tutorial model can generate very large gains in academic outcomes in a short period of time, even among students many years behind grade level (Cook et al. 2015). The large gains in academic outcomes for disadvantaged youth stand against a backdrop of few prior success stories in improving academic outcomes, particularly achievement test scores, for similarly disadvantaged adolescents. The impacts on academic achievement per dollar spent are sizable compared to even the most successful early childhood programs.

For our study of Match/SAGA tutorials, our research team worked with CPS and Match Education to conduct a large-scale randomized controlled trial of this approach in the 2013–14 academic year in 12 disadvantaged high schools on the high-crime and low-income south and west sides of Chicago. Randomized controlled trials represent the gold standard for research in areas like medicine, but remain far too rare in social policy research. We continued this study in the 2014–15 academic year, expanding to youth across 15 CPS high schools; we are currently analyzing results from the full two-year study.

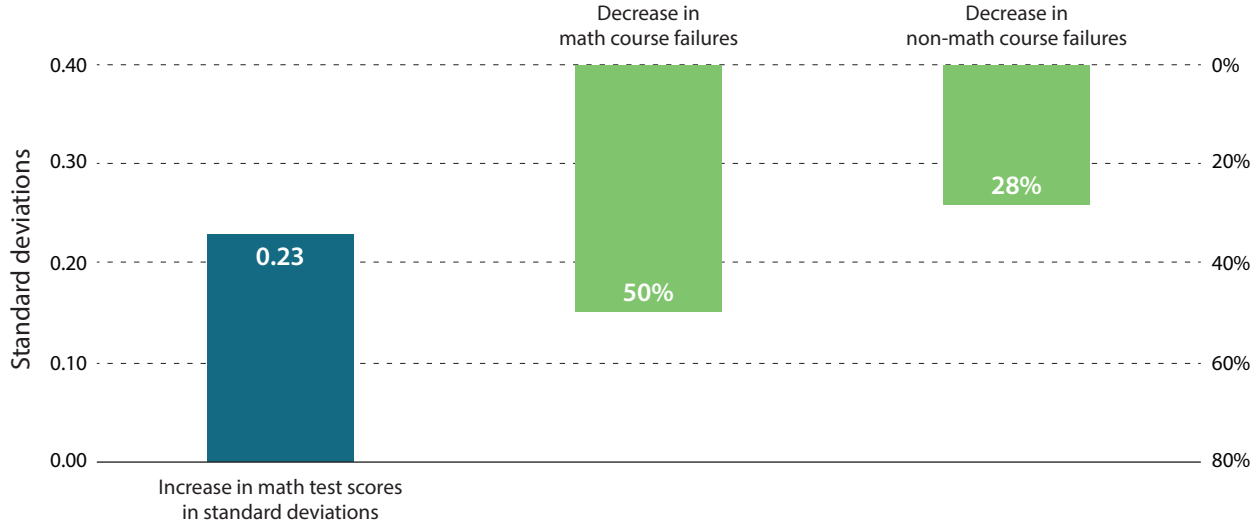
During the summer of 2013, we worked with CPS to identify 2,718 male incoming ninth- and tenth-grade students who were estimated to be at elevated risk of dropout, but not at such high risk that truancy would prevent them from benefitting from a school-based program. We randomized these students either to receive the Match/SAGA tutorial intervention or to be in a control group receiving status quo CPS services.

We focused on math skills partly because failure to complete required core math classes is one of the key drivers of high school dropout in Chicago (Hacker 2012), and because of growing evidence showing the importance of math specifically for short- and medium-term success in school, and also for long-term economic outcomes like employment and earnings (Duncan et al. 2007). We focused on male youth partly because their graduation rates and test scores lag behind those of female youth.

Of the youth in the study, 95 percent were either black or Hispanic, 90 percent were eligible for free or reduced-price lunch, and 49 percent had failed at least one course the year before they were randomized. In the school year prior to randomization, the students had an average GPA of 2.2 on a 4-point scale and had missed about a month of school. Around one in five had been arrested prior to the start of the study.

FIGURE 1.

Impacts of Match/SAGA Tutorials on Math Test Scores and Course Failures



Approximately 600 students were randomly assigned to receive the Match/SAGA tutorial intervention. As shown in figure 1, the impacts were strong: students assigned to the tutorials had substantial gains in math test scores relative to the control group. In fact, we found that Match/SAGA tutorials helped students to learn between one and two *extra* years of math, over and above what the typical American high school student learns in one year.

There are a number of ways to measure test score gains, and every way we checked, the gains experienced by the students who participated in the Match/SAGA tutorials were large. One way to compare test scores is using national percentile ranks. We found that Match/SAGA tutorials moved kids on average from about the 34th to about the 42nd percentile in the national distribution—in other words, the program closed about half the gap between participants' math scores prior to the tutorials and the national average. In terms of "effect size" units, or standard deviations, we found that Match/SAGA tutorials improved students' scores by 0.19 to 0.30 standard deviations, depending on the exact test and norming that we examined. As one way to assess the magnitude of these effects, 0.27 standard deviations is equal to about one-third of the black–white test score gap in math in the National Assessment of Educational Progress among 13-year-olds. This, of course, does not mean that providing this intervention universally would cut the black–white test score gap by this much each year, since the effects could be different for different populations; in particular we do not now know how cohorts of primarily white youth would benefit from the program if they were enrolled.

These impacts are measured on the ACT's Explore and Plan tests, which CPS administers to ninth and tenth graders, respectively. In addition, the impacts are measured on in-person math achievement tests administered to a randomly selected subsample (separate from the focal high-stakes test administered by CPS). We found similarly sized impacts on this additional math achievement test. The similarity in the effects of the tutorial program on both tests is one indication that the results of the Explore and Plan tests do not reflect a narrow "teaching to the test" by the Match/SAGA tutors.

A similar conclusion is suggested by the fact that math grades improved: CPS math teachers themselves saw sizable gains in math performance among the students who participated in Match/SAGA tutorials. The tutorials improved math grades by 0.58 points on a 1–4 point scale, a sizable gain compared to the average math GPA among the control group of 1.77 (or essentially a C minus average). We also found that the tutorials cut in half the chance that students failed their math course.

Even though the tutorials focused specifically on math, the students in the program improved their performance in other subjects—reducing the chances of failing non-math courses by about one-quarter. We do not know the mechanism underlying this improvement, for example whether the spillover occurred primarily in other subjects that reward math skills, such as science, or if having success at math helped to change the students' motivation, feelings of self-efficacy, or institutional attachment. There are three findings from our research that may suggest why the individualized Match/SAGA tutorials are effective. First, we found that the students who received the math tutorials were more likely to report that they liked math, but no more likely to say that they liked reading. Second, they were more likely to say they were "good at math," but no more likely to say they were "good at reading." Third, the students in the math tutorials were more likely to report that their friends "did not study enough." It is unlikely that friends of students receiving the tutorials reduced their study habits; instead, the tutorials appear to have changed the participants' mindset around school and math and how much studying is "enough."

The combination of working on math problems appropriate for a student's skill level along with individualized support from tutors likely helped the tutorial participants perceive themselves as capable. And once they saw that they could do some simple math problems, it became easier to do more-complex problems. It is possible that they then saw that their friends were missing out on this satisfying process—learning—by not studying enough.

The degree to which these mechanisms could be replicated in a version of the tutorials that changes the group size slightly or supplements the tutor's time with the use of technology remain critical questions to investigate as part of the scale-up process.

This study highlights a systemic challenge for so many urban school districts: the need for a more-robust safety net to help students who fall behind and wind up experiencing a mismatch between what they need and what regular classrooms deliver. Many have thought that improving academic outcomes was infeasible for male ninth- and tenth-grade minority students living in economically disadvantaged, distressed, and dangerous communities; our study suggests otherwise. Students who are four to six years behind grade level—unfortunately not an uncommon occurrence in distressed urban areas—have been getting very little or virtually nothing out of regular classroom instruction for years. A few years of the Match/SAGA tutorials intervention could bring almost all students up to grade level—at which point they could begin to successfully reengage with and benefit from the grade-level material taught in regular classrooms.

Because of the low ratio of students to tutors required under the tutorial model, the costs are relatively high at $3,800 per student per year. We estimate that the cost could be reduced to around $2,500 per student if the tutorials were delivered at a large scale. One way to think about the scalability and

sustainability of these results is to compare the costs to the expected long-term benefits. Our calculations suggest that these costs are more than offset by the benefits of the program, as measured by the predicted gains in future lifetime earnings among students who participate in the tutorials.

Estimating the long-term benefits of a recently implemented program clearly requires making assumptions about the future, but doing so can indicate whether the program would generate sufficient benefits to make the necessary expenditures a worthy investment. To estimate the long-term benefits implied by the increased math test scores, we relied on a study of the long-term effects of kindergarten classroom characteristics by Chetty et al. (2011). In that study, Chetty et al. estimate that each one-percentile increase in test scores in elementary and middle school is associated with $100 to $150 in additional annual earnings. In our research, we found that participation in the Match/SAGA tutorial program increased the average student's test score by approximately seven percentile points. Combining these two findings implies that the tutorials are expected to increase participants' adult earnings by between $700 and $1,050 each year. Discounting these gains back to age fifteen, and comparing them with estimates of per-student costs that range between $2,500 and $3,800 per year, we estimate that the benefits would be roughly five to eleven times larger than the costs—suggesting that the current investment in tutorials is economically worthwhile. We also calculated benefit-cost ratios under the extreme assumption that it would be necessary to deliver four years of tutorials to a student to maintain the test score impact we found. Even in this extreme case we estimate that the benefits would be between 1.3 and 2.9 times as large as the costs. These calculations suggest that this type of tutorial program is a cost-effective way to improve learning and could lead to long-term benefits that significantly outweigh the costs.

SCALING UP THE PROGRAM

Based on the results described above, we propose that schools serving economically disadvantaged students set up an educational safety net by delivering individualized math tutorials during the school day. Specifically, we propose that all school districts receiving schoolwide Title I funds provide individualized daily tutorials to all third through tenth grade students who are at least two grades behind grade level in math. In the tutorials, one tutor would work with two students for a full class period every day. Since we find in our Chicago data that the Match/SAGA tutorial program doubles or triples the amount of math students learn over the course of a year, the expectation would be that most students would need a year or two of this intensive safety-net intervention to catch back up to grade level, at which point they would begin to benefit from regular classroom instruction. Put differently, we view our proposal as a complement to and acknowledgment of, but not a substitute for, ongoing policy discussions about strengthening regular classroom instruction and other common targets of school reform.

Under our proposal, all students in the third through tenth grades would be assessed either at the beginning of the school year or at the end of the previous school year to determine which students are two grades or more behind grade level in math. These students would be assigned to receive individualized Match/SAGA tutorials each day of the school year, with each tutorial taking place during a full class period of about 50 minutes. Where appropriate (e.g., in middle and high school grades), the tutorials would be treated as a required course: students would receive a grade and it would be credit-bearing. Students would be enrolled in these math tutorials in addition to their regular math class. If the student progresses to grade level, the tutorials could be discontinued. Students who remain behind grade level could continue in the math tutorials for multiple years.

The tutorials could be administered by organizations like SAGA Innovations, which is currently delivering individualized math tutorials of the sort we propose in Chicago, New York City, and elsewhere. We believe SAGA could deliver tutorial services at a significantly larger scale. But because the tutorial framework is highly replicable, in principle nothing bars any other well-run nonprofit organization from implementing a model with a similar curriculum and framework. Put another way, a key question about the possibility of replicating the tutorials is whether the recipe for combining the necessary inputs into a successful program is written down in sufficient detail for others to pick up the plan and carry it out themselves. We argue that it is, because the Match/SAGA tutorial program has the advantage of being fairly well reverse-engineered. The program developers have a good sense of what key program elements make it successful—smart, enthusiastic tutors who will work for one year for a modest stipend, who are selectively screened and intensively supervised. The tutoring task itself is well articulated. Having exported the model to several cities now, the organization has a fairly well-developed set of instructions to offer new providers or franchisees in other cities.

Another question about scale-up is whether there are binding limits on the supply of effective tutors willing to do the job for the modest stipend currently offered. Match and SAGA have been operating their tutorial program with thousands of students in several cities across the country, and usually receive something on the order of five to twenty applications from potential tutors per opening. That suggests at least some room to grow, although whether big leaps are possible in the ability to recruit high-quality tutors and supervisors (and whether increases in the stipends paid would be required to do that in a way that does not compromise staff quality) is uncertain.

COSTS AND FUNDING

In 2014 about $14 billion of Title I funding was allocated to districts across the country. Large districts, including Chicago and New York City, receive hundreds of millions of dollars of Title I funding each year. In an era of budget shortfalls and crises, CPS received a waiver under the then-prevailing No Child Left Behind Act of 2001 (NCLB) that allowed them to direct Title I resources to fund the Match/SAGA tutorial program, with roughly $400,000 in the 2014–15 academic year and $2.5 million in the 2015–16 academic year. In conversations with lawyers and representatives of the U.S. Department of Education, it became clear that this use of Title I funding in Chicago was particularly exciting to many policymakers, because the Match (now SAGA) tutorial program specifically targets high-school-age youth, a population that has historically been under-served in the allocation of Title I funds.

Such use of Title I funds is permissible without a waiver in the latest reauthorization of the Elementary and Secondary Education Act of 1965 (ESEA) as the Every Student Succeeds Act of 2015 (ESSA) in December 2015. The ESSA allows for best practices in school organization and student-centered learning, emphasizing the role that tutoring has in both. In the bill language, high-quality tutoring is highlighted as an effective pedagogical approach that raises student achievement and as an organizational strategy akin to other school day activities that benefit particular students, such as offering Advanced Placement courses. Due to changes in the statutory language around the "supplement, not supplant" provisions for the use of Title I funds that tie "supplement" more tightly to fiscal accounting practices rather than programmatic decisions, schools will be able to more readily adopt pedagogical and organizational strategies like tutoring with the use of Title I funding.

In a sense, our proposal to expand math tutorials comes full circle on the reform strategies promoted and paid for through Title I since its inception through ESSA authorization. In the early years of Title I, one of the simplest choices a school could make to account for supplemental services to targeted students was to pull these students out of their regular classrooms for remedial work. Though the research at the time suggested that pullouts seemed to offer some of the same features as the Match/SAGA tutorials described here—low student-to-teacher ratios, less classroom management, and more time on task—some argued that it was not the most effective approach for Title I (Hill 2006). Concerns over the quality of instructors and instruction, lack of coordination with classroom teachers, stigma and racial segregation of the students, and organizational incoherence at the school level led some to argue for using Title I for schoolwide programs rather than pullouts (Cohen and Moffitt 2009). While schools were never forbidden from adopting pullouts as a strategy through Title I, similar tutoring programs were often paid for through budget lines set aside for supplemental educational services (SES) and were therefore limited to out-of-school time under the NCLB regime. Our pilot evaluations in Chicago were paid for with Title I SES funding, which was allowed because Illinois received an NCLB waiver permitting SES funds to be used to pay for the Match/SAGA tutorials during the school day.

With the historical stigma around pullouts and the funding stream silo for tutoring, it is not surprising that school day tutorial programs like the one evaluated in this proposal are novel. Though our study did not look at stigma directly, students who participated in the tutorials reported that they liked and were good at math. Integrating tutoring into a schoolwide plan and organizational routine might alleviate some of the residual concerns around pullouts while allowing students to benefit from intensive, personal, high-quality instruction under ESSA.

While schools are free to adopt tutorial programs as part of the schoolwide strategies, ESSA also established a grant program that allows state education agencies to reserve up to 3 percent of funding for direct student services programs such as tutoring. Along with other in-school programs, including Advanced Placement courses, credit recovery, or early college high school pipelines, the provision would apply to "components of a personalized learning approach, which may include high-quality academic tutoring" (Sec. 1003A(c)(3)(D)). School districts that apply for an award under this section must demonstrate how services to the lowest-achieving students would be prioritized. This may be another source of funding to finance Match/SAGA tutorials in Title I schools.

Chapter 4. Questions

Should students who are not in economically disadvantaged schools receive these tutorials?

Tutorials of this sort would likely be effective for students who have fallen behind grade level, no matter what type of schools they attend. We suspect that many school districts with the resources to do so already incorporate individualized instruction into their curriculums. While we have not studied the impacts of the tutorials in a high-income school district, we suspect they would be effective and we encourage well-funded districts to consider adopting the program as well.

Should students who are not behind grade level receive these tutorials?

While individualized tutorials may also be effective for students who are at or even above grade level, this proposal focuses on using tutorials to remediate skills among students who are behind grade level so that subsequent classroom instruction can be more effective for them. By reducing the range of educational needs that students have, the tutorials will allow classroom teachers to focus on delivering grade-level material in an effective way.

What other types of students would benefit from Match/SAGA tutorials?

While our study in Chicago demonstrated the effectiveness of the Match/SAGA tutorials for ninth- and tenth-grade boys, we see no reason why the tutorial approach would not be just as effective for girls or for younger students. The curriculum is designed to teach a mix of basic skills and grade-level material and is already designed to cover third- through tenth-grade math topics. Extending coverage back to first grade seems feasible. And while Match/SAGA has a well-developed tutorial model for math, federal research dollars would be well spent to support the development of a similar model for other subjects and for earlier grades.

If a school cannot implement the tutorials at the full scale described in the proposal, how should it allocate seats?

We propose that large school districts around the country might devote some of their Title I funding to support individualized Match/SAGA tutorials. For districts that do not devote enough funding to serve all of their third through tenth grade students who are scoring two grades behind grade level in math, we propose that they select which students to enroll in the program by lottery. This will allow districts to learn how effective the tutorials were in their district, and will help other districts to learn about how different ways of implementing a tutoring program like this can make it more or less effective.

Why do the tutorials need to be in-school rather than after-school?

Based on our observations, it appears that a key reason the Match/SAGA tutorials are effective is that students spend a large amount of time focused on doing math, and do it every day. We would be concerned that attendance rates would be lower in after-school tutorials, and students would be less focused and engaged with the work.

How important is the face-to-face format of the tutorials relative to an online format? What about using technology to do the tutorials?

It is natural to wonder whether technology can be used to deliver the individualization of instruction that is a key ingredient to the Match/SAGA tutorial model. We need additional research to answer this question. While it is possible that technology could be used to reduce the cost of the tutorials, a crucial question will be whether this will also harm the effectiveness of the program—potentially so much that the cost savings are not worth it. What we know right now is that the face-to-face model works at medium scale across different urban school systems. What we do not yet know, but would be important to learn, is the degree to which incorporating technology would change both costs and the effectiveness of the intervention.

Can we try larger tutorials of three or four students instead of two students?

Since the cost of the tutors is the key expense for the program, increasing the number of students per tutor would substantially lower the cost of the program, and is worth investigating further. It is also possible that experimenting with larger tutorial sizes during the scale-up stage could lead to potentially even lower-cost (and perhaps even more-cost-effective) possibilities. At this point, the evidence shows that tutorials with one tutor and two students are cost-effective.

How quickly can students progress through the tutorials?

Students are allowed, and even encouraged, to move at their own pace. Students can be reshuffled easily across tutorial groups so that they are paired with another student working at a similar level. The program has many of the benefits of what has historically been called "tracking" in education circles, but without the major downside. Whereas a student placed in a low "track" in school has a hard time making the discrete jump to a middle or upper track, a student who begins the tutorials at a fourth-grade level can move with his tutor to fifth-, sixth-, or eventually seventh-grade math as quickly as he is able to master the material.

Should students participate in tutorials in reading or other subjects besides math?

To begin, we are only proposing that the tutorials be offered in math. There is research showing that some individualized reading tutorial programs are effective, though these can be more expensive. We hope that tutorial programs can be developed for reading and other subjects—like science, writing, and history—that can be delivered at scale at reasonable cost in the future.

How many tutors would be needed each year to deliver tutorials on the scale you propose?

To offer tutorials to one-quarter of all third- through tenth-grade students at the 100 largest public school districts in the United States, we estimate it would require about 140,000 tutors each year. This is clearly a large number, and a scale far beyond what we—or any other researchers—have studied. It may be the case that it would simply not be possible to recruit that many effective tutors each year without offering a stipend that would make the tutorial program cost-prohibitive. We are currently developing methods to study exactly this question. An alternative may be to offer the tutorials only to students who are significantly farther behind grade level. For example, it would require fewer than 50,000 tutors to serve 10 percent of all third- through tenth-grade students at the 100 largest school districts. This is also a large number, but may be more feasible. Another possibility would be to limit tutoring to ninth and tenth graders, where we have directly tested its effectiveness. It would require about 35,000 tutors nationwide to serve one-quarter of all ninth and tenth graders at the 100 largest school districts, and 14,000 to serve 10 percent of all ninth and tenth graders in those districts. As a point of comparison, each year about 75,000 people participate in AmeriCorps, about 5,000 work as Teach For America corps members, and about 3,000 participate in City Year.

Chapter 5 . Conclusion

We are eager to continue to learn about how the Match/SAGA tutorial intervention can be scaled up most effectively. If it is possible to achieve at large scale the impacts we demonstrated in Chicago, we believe this individualized tutorial program has the potential to be a transformative strategy in public education, helping our most at-risk youth catch back up to grade level, reengage with regular classroom instruction, and gain real hope for a diploma and all the long-term economic benefits that go along with that.

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Endnotes

1. The exact magnitude of the black–white gap depends on the study sample examined, the age at which the gap is measured, the achievement assessment that is used, and the academic subject being examined; most studies report the gap among adolescents to be in the range from 0.5 to 0.9 standard deviations, with gaps that tend to be larger for math than for reading (Clotfelter, Ladd, and Vigdor 2009; Fryer 2014; Jencks and Phillips 1998; Reardon 2011).
2. Each site director has some combination of experience including math teaching or tutoring, mentoring, program direction, nonprofit management, public speaking, and training of adults, and is trained specifically in the Match/SAGA model. Tutors complete a daily report to the site director, where they note each student's progress and communicate any issues.

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Highlights

Economically disadvantaged students who fall behind grade level and miss developing crucial foundational skills can have major difficulties in subsequent grades and later in the workforce. Roseanna Ander of the University of Chicago, Jonathan Guryan of Northwestern University, and Jens Ludwig of the University of Chicago propose scaling up a tutorial program that would allow students who have fallen behind grade level to reengage with regular classroom instruction, likely improving their chances of graduating high school and achieving the many long-term economic benefits that go along with academic success.

The Proposal

Individualized Tutorials. School districts would deliver daily, individualized, in-school tutorials to all students in the third through tenth grades who are at least two grades behind grade level in math. A single tutor would be paired with two students for a full-period tutorial session during each school day. The content of the tutorial would be customized to the students' level of knowledge and learning style, allowing students to work back up to grade level and begin benefitting again from regular classroom instruction.

Funding the Tutorials. To finance the tutorial program, school districts would use Title I funds made available through the December 2015 reauthorization of the Elementary and Secondary Education Act as the Every Student Succeeds Act (ESSA), including the grant program established in ESSA that allows state education agencies to reserve up to 3 percent of funding for direct student services programs such as the tutorials that the authors propose here.

Benefits

The need for a more robust safety net for students who fall behind grade level is a key systemic challenge for many urban school districts. The authors' proposals would meet this need by bringing students back up to grade level so that they can reengage with regular classroom instruction. The program on which the proposal is based—tutorials offered to predominately minority students in some of Chicago's most disadvantaged public high schools—substantially increased students' standardized test scores and school performance. In one year, participants learned between one and two extra years of math above what the typical American high school student learns in that period. The program's tutors are talented people interested in dedicating a year to public service in exchange for a modest stipend. With the program's relatively low labor costs, the authors calculate that the costs of the tutorials would be more than offset by their benefits, as measured by the predicted gains in future lifetime earnings among the participants.

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Improving Access to, Quality, and the Effectiveness of Digital Tutoring in K–12 Education

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There is considerable variation in how providers of digital education describe what they do, their services, how students access services, and what is delivered, complicating efforts to accurately assess its impact. We examine program characteristics of digital tutoring providers using rich, longitudinal observational and interview data and then analyze student attendance patterns and effects of digital tutoring on low-income students' reading and mathematics achievement. We find significant associations between formats, curriculum drivers, tutor locations, and other characteristics of digital providers and their effectiveness in increasing student achievement, as well as differential access by student characteristics, that warrant further investigation as digital providers' roles in K–12 instruction continue to expand.

Keywords: *digital instruction, tutoring, student achievement*

DIGITAL instruction—using a digital platform (such as computer, netbook, or handheld device) as an integral and consistent part of an instructional delivery strategy—is rapidly becoming a commonplace component of K–12 classroom and supplemental instruction. Estimates place the current value of the U.S. market for K–12 education software and digital content anywhere in the range of US$8 billion (Molnar & Cavanaugh, 2014) to US$21 billion per year (Burch & Good, 2014). In the last decade, private-sector investment in K–12 education technology companies has nearly tripled, from US$146 million to US$420 million (Burch & Good, 2014). As of 2011, 63% of districts with enrollments higher than 10,000 students contracted with an outside organization to provide online courses (Queen, Lewis, & Coopersmith, 2011). Advances in technology have allowed digital tools to compete with features of face-to-face instruction with the promise of low-cost, broad access (Richards & Struminger, 2013).

In this research, we focus on digital providers' role in out-of-school time (OST) tutoring programs, which has continued to expand, even as waivers from No Child Left Behind (NCLB) have released many districts from the requirement to offer federally funded supplemental education services. In a mixed-method, longitudinal study of OST tutoring conducted in five urban sites over 4 school years, we observed online tutoring companies reaching a student "market share" as high as 88% in one district; in another district, we observed a single digital provider

delivering tutoring to more than 10,000 students. NCLB mandated unfettered parental choice in tutoring providers and accordingly gave providers the flexibility to try varied formats for tutoring. However, the implementation and effects of the wide range of approaches and formats that are emerging in digital tutoring are especially difficult for school districts to monitor and assess.

Moreover, there is considerable variation in how digital tutoring providers describe what they do, the actual services they offer, how students access these services, what is delivered, and the degree of alignment to state standards and district needs, which complicates efforts to accurately assess the effects of digital tutoring on students' academic achievement. Drawing on our 4-year mixed-methods study of federally funded OST tutoring programs, we examine key program characteristics of digital providers, as described in provider applications for state approval, recorded in district administrative data and enacted and observed in rich, longitudinal observational data. Specifically, we ask what are the key characteristics of different program models in digital tutoring (curriculum, instructional driver, the role of the tutor, use of data, etc.), as reflected in program descriptions in state applications, in district administrative data, and in observational data of instructional settings. We identify critical variables that define the format and content of digital tutoring, as well as access points for students enrolled in digital tutoring (e.g., location of tutor and curriculum). We then conduct exploratory analyses of student attendance patterns and the relationship of different digital provider characteristics, tutoring forms, and access points to the educational outcomes (reading and math achievement) of students from low-income families.

Our findings raise concerns about which students have access to the types or forms of digital tutoring that the results suggest may be relatively more effective. We find that English-language learners and students with disabilities were significantly less likely to receive OST tutoring in formats that value-added models suggested may be more effective in increasing student math achievement. Based on these findings, we consider priority directions for research that aims to improve digital tutoring models, and the policy tools available to state and local educational agencies to ensure greater transparency and continuous improvement of the quality of digital tutoring and its accessibility (Miron & Urschel, 2012).

Prior Research

There is a growing demand for more and more rigorous evidence to understand whether and how "digital" and "tutoring" practices in K–12 systems are linked to student achievement outcomes (Cavanaugh, Barbour, & Clark, 2009). The few studies examining the effects of different kinds of digital instruction on student outcomes show mixed results (Bingham, in press; Burch & Good, 2014), and they seldom focus on the K–12 student population in the United States (London, Pastor, & Rosner, 2008; Price, Richardson, & Jelfs, 2007; Slattery, 2003). In addition, while recent studies have started to build a knowledge base on the characteristics of quality digital instruction (more generally), to date, equity issues have received less attention in the literature. This is concerning given the implicit suggestion in some studies that online instruction has distinct advantages for students who are economically and academically disadvantaged (Rose & Blomeyer, 2007). In this section, we review what is known about the types of digital instruction associated with quality instruction and student achievement gains. Next, we motivate the importance of greater treatment of equity issues in research on instructional technology and, in doing so, set the context for subsequent discussion of digital instruction in federally funded OST programs in this study.

The existing research on digital education and student learning is limited, particularly in the context of increasing calls for expanding education technology in public schools. (Bingham, in press; Means, Bakia, & Murphy, 2014). A handful of studies have found positive effects linked to specific online formats. For example, Bakia, Shear, Toyama, and Lasseter (2012) found that blended (both online and in-person) instruction can lead to positive effects on student achievement, especially when it is collaborative and promotes self-reflection in students. Arroyo, Tai, Muldner, Woolf, and Park (2013) found digital mathematics instruction to be particularly beneficial to female students' mathematics knowledge

and problem-solving ability. Other studies emphasize the importance of live interaction between teachers and students for improving educational outcomes (Zhao, Lei, Yan, Tan, & Lai, 2005), as well as real-time data feedback for teachers and consistent access to the technology for all students, regardless of need (Brush & Hew, 2006).

Alternatively, some researchers have found no effect or negative effects of blended learning models on student achievement (Cole, Kemple, & Segeritz, 2012; Margolin, Kieldon, Williams, & Schmidt, 2011). A study of School of One's Math-Only blended learning program based in New York City examined achievement gains of School of One students, comparing them with the achievement gains of School of One students prior to the blended learning intervention. The School of One study controlled for prior achievement, student demographics, and city and statewide factors. On average, researchers found that the School of One blended model did not improve sixth graders' math achievement. The lack of effect was explained in terms of a "gap dip," where students were filling in gaps in their knowledge instead of working on grade-level skills. Similarly, a study of the Enhancing Education Through Technology Program in Vermont drew on survey data, interviews, and site visits to evaluate the program's implementation, technology integration, sustainability, and perceived effects on student outcomes (Margolin et al., 2011). Findings from this study identified classroom organization as a major challenge for teachers implementing the program. The program was organized to enable students to work at their own pace; however, some students had difficulty working independently and teachers lacked capacity to effectively organize the classrooms in ways that supported independent learning. Reviewing the literature on virtual schools, Barbour and Reeves (2009) found a mix of both benefits to student learning (e.g., higher levels of student choice and motivation) and challenges (e.g., retention and a lack of access associated with the "digital divide").

A critical but relatively overlooked issue underlying the extant research on digital learning concerns the extent to which digital instruction addresses long-standing inequities and achievement gaps. This is a pressing concern, as districts and states are increasingly requiring some form of online instruction as a condition of graduation (Burch & Good, 2014). For example, among the students eligible for OST tutoring in our study, anywhere from two thirds to 100% are free-lunch eligible, 90% to 98% are students of color, and up to 36% are English language learners. Historically, these students are some of the most vulnerable in terms of achievement gaps, and there is growing evidence that students in poverty still face considerable barriers to accessing products and services offered under the banner of digital education (Goslee & Conte, 1998; Zickuhr & Smith, 2012). That is, as the use of technology in public education expands, access to this technology is lower for students attending schools with a higher percentage of families living in poverty (Burch & Good, 2014; Snyder & Dillow, 2013).

Clearly, more rigorous research on the effects of digital tutoring in K–12 settings is needed. At the same time, if this research is to inform the rapidly expanding policy and program agendas that are encouraging online instruction, there also needs to be more specific attention to understanding the attributes of digital tutoring that work for students with varying levels and types of instructional needs, as well as the capacity required of large, urban school districts for managing the use of educational technology.

Our mixed-methods study of the implementation and effects of digital providers in federally funded OST tutoring is intended to contribute to the knowledge base on digital programs and practices in OST settings. In light of the limited evidence on online tutoring, we leverage the larger research base identifying factors that contribute to high-quality OST tutoring in traditional bricks-and-mortar settings to inform our work. These studies suggest that a high-quality OST curriculum is content rich, differentiated to student needs, and connected to students' school day (Beckett et al., 2009; Stevens, 2012; Vandell, Reisner, & Pierce, 2007). Effective instruction is organized into small grouping patterns (ideally 3:1 or less), and instructional time is consistent and sustained. Instructional strategies are varied, active, focused, sequenced, and explicit (Beckett et al., 2009; Elbaum, Vaughn, Hughes, & Moody, 2000; Farkas & Durham, 2006; Lauer et al., 2006; Little, Wimer, & Weiss, 2008, Lou et al.,

1996; Vandell et al., 2007). And beyond elements specific to curriculum and instruction, quality OST programs not only hire and retain tutors with both content and pedagogical knowledge but also provide instructional staff with continuous support and feedback (Little et al., 2008; Vandell et al., 2007). Research also suggests the importance of actively supporting positive relationships among tutors and students (Durlak & Weissberg, 2007; Durlak, Weissberg, & Pachen, 2010; Vandell et al., 2007), as well as between programs and the surrounding community (Little et al., 2008).

We argue that there is a need for more research on how these best practices in OST tutoring hold or diverge in digital OST settings. The research and findings we present below link information on digital instruction formats and other program attributes and their implementation in OST settings with data on student achievement to explore the effects of digital OST on student achievement, including for subgroups targeted by NCLB.

Research Samples, Methods, and Data

This investigation builds on a longitudinal, mixed-method study of OST tutoring, including an in-depth, qualitative examination of instructional practice in different program models and settings and a rigorous, quasi-experimental analysis of OST tutoring program effects. The study sample includes students eligible for OST tutoring under NCLB[1] in five urban school districts—Chicago, Milwaukee, and Minneapolis Public Schools; Dallas Independent School District (Dallas ISD); and Los Angeles Unified School District—that ranged in size from approximately 80,000 to 650,000 students over the study period, 2009 to 2013 (see Table 1). Student demographics in these districts are generally representative of the larger national population that is eligible for OST tutoring, that is, high concentrations of students from low-income, urban settings, including subgroups with higher levels of academic need/disadvantage (e.g., students with limited English proficiency and disabilities). Our study data also include information on approximately 180 providers of OST tutoring in these districts, about a quarter of which are digital providers.

Although we draw on both quantitative and qualitative data collected in this study for the 2009–2010 to 2012–2013 school years, we describe the research we present here as primarily an exploratory effort to dig deeper into the "black box" of digital instruction in the OST context. A key aim of this work is to examine the characteristics of digital OST instruction (and its management and implementation by providers and districts) and to develop a conceptual framework that links them to improvements in student learning and achievement. Our qualitative investigation draws on data collected within and across the study districts described above to identify key program attributes and practices of digital OST tutoring, while our quantitative analyses of digital instruction focus on a single school district (Dallas ISD) for which detailed coding of digital provider characteristics was undertaken (and linked to information on students served by these providers). Dallas ISD provided scans of the applications that OST tutoring providers submitted to the state of Texas to obtain approval for offering OST tutoring in the district, as well as administrative data that included information about the instructional settings, tutor location, tutoring format (e.g., individual, small group, etc.), tutoring subject, student–teacher ratios, and digital access points. These data were combined and analyzed to construct the detailed measures of digital OST program features that we use in our empirical analysis of tutoring effects on student achievement. Table 2 presents descriptive statistics on the students eligible, registered for and, attending OST tutoring in Dallas ISD in 2011–2012 (the year for which we have detailed data on digital OST providers), as well as these same statistics for the students among these who were matched with digital OST providers.

We have also conducted in-depth, qualitative observations and collected other data on 32 OST tutoring providers in our multisite study, including seven digital tutoring providers. The sample of seven digital providers is illustrative of the key subcategories of digital program formats that we further discuss below, including: synchronous (live), asynchronous (not live), entirely digital, and blended (digital and in-person), as well as both national and locally based providers. Four of these seven digital providers serve a market share of 14% or higher in at least one of our study districts. For the purposes of analysis, a "digital" provider is one that uses a digital

TABLE 1
Characteristics of Students Eligible for OST Tutoring in Study Districts

Characteristics	Chicago public schools				Dallas independent school district				Los Angeles unified school district		Milwaukee public schools				Minneapolis public schools			
Year	2008–2009	2009–2010	2010–2011	2011–2012	2008–2009	2009–2010	2010–2011	2011–2012	2010–2011	2011–2012	2008–2009	2009–2010	2010–2011	2011–2012	2008–2009	2009–2010	2010–2011	2011–2012
Number of students	88,353	87,542	101,930	245,616	35,612	30,774	35,026	39,091	344,323	364,837	11,992	26,798	16,439	20,905	10,963	15,769	16,444	15,906
Asian (%)	1	2	2	2	1	1	1	1	2	3	5	4	4	4	11	9	9	9
Black (%)	53	49	42	43	34	31	30	31	8	8	68	69	68	68	48	47	46	45
Hispanic (%)	44	47	53	51	62	64	65	62	85	82	17	20	20	20	28	29	28	26
White (%)	2	2	2	3	3	4	4	3	3	5	8	5	8	6	6	8	9	12
Other race (%)	0	0	1	1	0	0	0	1	2	3	3	3	0	0	6	7	7	8
% female	49	49	49	50	48	48	48	48	49	49	48	47	46	46	51	50	50	49
% ELL	12	12	16	18	21	19	16	20	31	28	6	10	12	10	34	36	33	36
% free lunch	100	100	100	99	67	79	74	60	100	100	83	87	88	90	99	100	100	98
% with disabilities	14	13	12	13	12	12	11	11	10	10	21	22	22	24	17	18	18	18
Attended SES last year (%)	26	42	8	13	16	15	37	28	10	11	11	6	14	8	13	7	16	16
% absent last year	6	4	5	5	7	9	7	6	5	4	16	15	16	13	8	8	7	4
Retained this year (%)	4	2	2	2	0	7	8	8	4	4	13	11	12	12	2	6	2	5

Note. OST = out-of-school; ELL = English language learners; SES = Supplemental Educational Services.

TABLE 2
Characteristics of Students Eligible, Registered for and Attending OST Tutoring in Dallas Independent School District and Matched With Digital Providers

	Dallas independent school district, 2011–2012 school year					
	District eligible sample			Students matched with digital providers		
Number of students and characteristics	Eligible	Registered	Attended	Eligible	Registered	Attended
	39,091	10,862	7,941	11,111	7,610	5,651
Asian (%)	1	0	1	1	1	1
Black (%)	31	33	33	30	29	28
Hispanic (%)	62	64	64	65	68	68
White (%)	3	2	2	3	2	2
Other race (%)	1	1	1	1	0	1
% female	48	49	49	49	49	49
% ELL	20	23	24	23	25	26
% free lunch	60	84	84	74	84	84
% with disabilities	11	12	13	12	11	12
Attended SES last year (%)	28	37	39	40	40	41
% absent last year	6	5	5	6	4	4
Retained this year (%)	8	5	4	6	5	5
Middle school (%)	30	30	31	28	30	31
High school (%)	67	69	68	70	69	68

Note. OST = out-of-school time; ELL = English language learners; SES = Supplemental Educational Services.

platform (software or live tutor via technological platform such as computer, netbook, or handheld device) as an intentional, integral, and consistent part of its instructional strategy in delivering tutoring to eligible students in at least one of the five districts in our study. Students served by these providers consistently used digital instructional tools for at least half of their tutoring experience.

In undertaking the qualitative work, we used a standardized observation instrument in both nondigital and digital tutoring settings (Burch & Good, 2013). Because digital and nondigital settings can differ in a number of ways, this instrument includes indicators that specifically accommodate digital settings without a live tutor (e.g., instructional software that adapts to students' instructional needs), as well as measures that describe how technology is used to improve instruction (e.g., to use higher order thinking skills) and to address issues of access (e.g., reliability and accessibility to all students). Over 4 years, we observed 185 full tutoring sessions (46 across the seven digital providers in our study sample). Other elements of the qualitative data collection in the larger study include 79 personal interviews with provider administrators about the structure of instructional programs, choice of curricula and assessments, challenges in implementation, and choices in staffing; 109 personal interviews with tutoring staff about instructional formats, curriculum, adaptations for students' learning differences, staff professional background, and training; 47 personal interviews with district and state administrators involved in program implementation; focus groups with 221 parents/guardians of students who were eligible to receive OST tutoring, and document analysis of formal curriculum materials from providers; diagnostic, formative, or final assessments used; and informal "in-use" curriculum collected during instructional sessions and policy documents on federal, state, or district policies concerning program implementation.

In the quantitative analysis, our empirical measures of the key treatment variables—hours of OST program participation, types of digital and nondigital tutoring, and hours/types of combinations—are constructed using district administrative data and the qualitative data collected and coded to describe digital tutoring features and formats. The administrative data from the school districts allow for the construction of dosage measures of tutoring with specific providers. Specifically, the tutoring providers were required to invoice school districts for each hour of tutoring provided to the students, and thus, tutoring "dosages" are measured in invoiced hours of tutoring (per student). Other data made available by the districts included the rate per hour charged by the providers, the total of invoices paid out, and, in some cases, the balance of unspent funds (from dollars allocated per student for tutoring). The data from the digital provider applications and other components of the qualitative research investigation aided in developing empirical measures of variables such as tutoring formats/types and forms of digital tutoring.

We also obtained student-level demographic, attendance, and test score data from the school districts. These data include controls for gender, race/ethnicity, free and reduced-price lunch eligibility, English proficiency, students with disabilities, grade retention, prior year achievement test scores, number of absences from the prior school year, grade year, school attended, and prior OST tutoring program attendance (see the descriptive statistics in Table 1). These are standard, student-level control variables (in an education production function model). In addition, student outcomes—specifically, student test scores on state standardized tests—are measured as effect sizes, that is, the level of student achievement relative to the district average score on state standardized tests. These achievement measures are derived from student test scores on the Texas Assessment of Knowledge and Skills (TAKS) state standardized test, which was used in determining adequate yearly progress (AYP) under NCLB.

Qualitative Analysis

Data analysis in the qualitative component of this study occurred both concurrent to and after the data collection process, using a constant comparative method to explore and explain provider instructional practices. Analytic codes were developed from patterns in initial data collection and in response to the research questions, and then reapplied to interview, observation, and archival data to establish findings. Coding trees and data were inputted into a qualitative coding system where researchers collaborate on common project tasks through remote access to a common server. The base and examples of associated subcodes applied to qualitative fieldwork include "enrollment" (e.g., process, strategies, challenges), "instructional core" (e.g., amount of instructional time, differentiation, curriculum structure and/or source, varied instruction, classroom-level interaction, tutor capacity), "alignment" (e.g., individualized learning plans, instructional practice, challenges), and "students with special needs" (e.g., areas of confusion, curriculum, instruction, format, challenges). The research team then developed additional subcodes specific to digital provider analyses, which included "technology–instructional format," "technology–curriculum," "technology–assessment," "technology–access," "technology–administrative uses," and "technology–free" to capture relevant data on technology outside of those subcodes. For purposes of analysis, all audiotapes of focus groups and interviews were transcribed verbatim and then transformed into integrated text for analysis.

In addition to coding the text recorded in observations, ratings of indicators were analyzed by categorizing indicators into clusters, organized by areas of OST tutoring best practice (e.g., varied, active, rigorous, targeted, differentiated, high levels of student engagement). This clustering of qualitative indicators allowed us to see which best practices are predominant in observations and which were rare or missing. For example, in assessing whether a session was "active," we would focus on indicators such as whether students had to participate in structured discussions, demonstrate understanding of concepts, or help determine the direction of an instructional task. Levels of differentiation were examined in terms of indicators such as accommodations made for students with disabilities or English language learners, or whether a software program or tutor adapted the instructional pace or

content based on student needs. In assessing the rigor of a tutoring session, we would include indicators that focused on the extent to which instructional tasks required by curriculum software and/or the tutor demanded the application of students' higher order thinking skills, or if students were asked "why," "how," or "what if" questions as part of the session. Although the observation instrument ratings used a numeric rating system, the process was fully qualitative in terms of clustering the indicators under each best practice area.

Quantitative Analysis

In the larger study of OST tutoring on which we build this work, we have used multiple strategies for quasi-experimental estimation of OST tutoring impacts, including value-added modeling, fixed-effects models (student fixed effects and student plus school fixed effects), and propensity score matching methods. We have found a high degree of consistency in the estimates produced by these models (Heinrich & Nisar, 2013), and therefore have primarily used a value-added modeling approach that controls for school fixed effects.

In estimating the relative effectiveness of different features/formats of digital tutoring, our sample for estimation consists of all students receiving digital tutoring, and we adjust for selection into different types of digital providers. For each estimation, we make the assumption that after adjusting for all available measured characteristics and prior test scores, program participation (i.e., receipt of a particular type of digital tutoring) is independent of the student outcomes that would occur in the absence of participation (in a particular type of digital tutoring). We also recognize, however, that there could be factors (for which we do not have measures and do not control for in our models) that could explain both participation in specific types of digital programs and student outcomes, leading to possible bias in our estimates of digital provider effectiveness. For example, we do not have complete information on the extent to which tutoring providers may have influenced student enrollment in their programs with promises of access to digital devices (or particular types of devices), and whether this type of information may have encouraged selective enrollment among students with differing levels of access to or experience with digital tools in school and/or home settings, which might in turn have affected the extent to which students made academic progress through use of digital tools. In the absence of concrete information on how selection may have worked in this regard—for example, how students with less experience versus more experience with digital tools differentially chose among the digital provider options, or how important of a factor was this in their decisions—it is difficult to speculate on the direction of any potential omitted variable bias.

The particular value-added model (with school fixed effects) that we use allows us to control for other classroom and school interventions which are fixed over time. For example, if there is a reading intervention at a school and those students also receive tutoring in that program, failing to control for the intervention (school fixed effect, π_s) would bias the results. We estimate

$$A_{jst} = \alpha DigCharac_{jt} + \beta X_{jt-1} + A_{jst-1} + \pi_s + \mu_{gt} + \varepsilon_{jst}, \quad (1)$$

where A_{jst} is the achievement of student j attending school s in year t; $DigCharac_{jt}$ is an indicator function if the student j attended tutoring with a digital provider with a given characteristic in year t; X_{jt-1} are student characteristics which include student demographics, percent absent in prior year, retained in prior year, and attended tutoring in the prior year; A_{jst-1} is the prior year test score; π_s is school fixed effect; μ_{gt} are grade by year fixed effects; and ε_{jst} is the random error term. Identification in this specification comes from average student achievement after controlling for student characteristics and school and grade year effects. In these models, we include one or more indicators of digital program characteristics, as all students in these analyses will have received tutoring from a digital provider. The outcome measure is the level of student (math or reading) achievement, adjusting (on the right-hand side) for the possibility that students with similar characteristics might enter OST tutoring with different underlying achievement trajectories (as reflected in their prior test scores).

Because our value-added modeling strategy includes school-level fixed effects, we are utilizing the within-school variation in attributes of the OST program offerings to identify any effects of digital program characteristics on student achievement. Our data analysis confirms that there is substantial within-school variation in the distribution of the OST program characteristics (described in greater detail below), specifically, variation in the presence of (and combinations of) characteristics that include the location of the tutor, instruction drivers, curriculum location, and tutor synchronicity. The exhaustive descriptive analysis (available from the authors) showed that only one characteristic—having a "tutor-structured curriculum driver"—was not present among the providers delivering OST tutoring to students in 3 of the 26 schools.

Our quantitative analysis is tightly linked with the qualitative research in defining measures, specifying the empirical models and analyzing the factors that influence the outcomes of digital OST tutoring. For example, as detailed below, interviews and observations from the qualitative fieldwork revealed important differences within digital tutoring formats, critical information that was then applied in refining our measures and interpretation of empirical results. We also optimized our sample through this integrated mixed-methods approach by using quantitative data to identify the parameters (e.g., student market share, cross-site enrollment, etc.) that guided the selection of tutoring providers observed in the field research. We think that this tightly integrated, mixed-methods approach strengthens the validity of the inferences from this exploratory work.

Research Findings

Indicators of Instructional Quality

In addressing the quality of digital OST tutoring and constructing our measures of quality, we drew upon two sources of observation data: average ratings on select indictors and narrative description of tutoring sessions, both captured on the standardized observation instrument. In addition to observation data, we also drew from interviews in identifying key elements of the digital OST settings.

TABLE 3
Comparison of Observation Ratings for Select Indictors of Instructional Quality (2009–2013)

Indicator	Digital	Nondigital
Ask students why, how, or what if questions	.24	.52
Challenge students to push themselves intellectually	.30	.50
Students push themselves intellectually	.29	.51

Table 3 offers rating averages of three primary indicators of instructional rigor. Although indicators on the instrument are rated from 0 to 2 (with a 2 meaning that it was observed consistently throughout the observation point with most students), the averages here are recorded from 0 to 1, where a "1" would indicate that an indicator received a rating score of "2" in every observable instance. Comparing the average rating of digital and nondigital tutoring sessions across 4 years (2009–2013), the digital tutoring sessions were rated low overall as well as in comparison with nondigital settings.[2] More specifically, these average indicators suggest that digital OST sessions lacked important elements of high-quality instruction, such as intellectual rigor and the application of higher order thinking skills. Average ratings across at least 50 observation points indicate that digital sessions were even less effective at encouraging these elements than the already low ratings for nondigital sessions.

In addition, we added three pilot indicators in the last year of data collection (2012–2013), specific to the digital setting. Table 4 presents data from 25 observations across five of the digital providers in four of our study districts. Again, the averages below are recorded from 0 to 1, where a "1" would indicate that an indicator received a rating score of "2" in every observable instance.

The juxtaposition of additional narrative elements from observations of instructional settings with these ratings offers a further perspective on the quality of digital OST tutoring. For example, as shown in Table 4, technology was generally reliable and accessible to students participating in the settings we observed. When we did see difficulties with accessing the instructional material, it

TABLE 4
Observation Ratings for Digital-Specific Indicators (2012–2013)

Pilot indicator	Average rating
Technology used is reliable and accessible to all students	.78
Instructional software adapts to students' needs	.30
Use technology to employ higher order thinking skills	.16

related to either problems initially logging in or with audio equipment associated with synchronous (live) tutoring. To mitigate technical problems, one provider in our qualitative sample held training sessions with parents and students before the commencement of services. This involved a 2-hour session to introduce the curriculum, what instruction was going to look like, and how to use the laptops for instruction.

Two of the providers used a program where students moved independently through preloaded or Internet-accessed curriculum software without a live tutor present. This presented a challenge to students who might get stuck on a problem. However, where providers (four in our sample) combined face-to-face tutoring with online software, tutors had the capacity to differentiate the instruction and reword some of the existing problems. Alternatively, for those providers using a live tutor, we observed few instances where the instructor changed a full problem. The tutors sometimes asked students to draw representations of the problem on a digital whiteboard during math instruction, but only to help explain the problem or as a way for the instructor to see a student's work. In three of the four synchronous providers, instructors rarely provided any follow-up questions or any differentiation aimed at simplifying a question or increasing the level of difficulty. In three of the providers where tutors worked with multiple students at once via the online platform, students had to wait for the instructor to give them the next problem. Students who finished early had to wait about 2 to 3 minutes to move ahead, while the tutor was helping other students in the virtual classroom.

As the data in Table 4 also indicate, there was little evidence of the use of technology to use higher order thinking skills. Often, the questions presented to students were simply "digitized worksheets" that did not require students to actually use technology to apply, evaluate, or create concepts. In general, our preliminary analysis of tutoring practices across different digital providers suggests that digital tutoring, not surprisingly, does not always add value to instructional quality, even when the technology is working well and is accessible on-site.[3]

As part of our ongoing, mixed-methods efforts to better understand the quality of digital OST tutoring, we have identified three elements of digital tutoring that offer a critical vantage point on the levers for improving the quality of instruction in the digital setting. These include (a) the nature of curriculum and what drives it, (b) what drives the instruction and the role of the tutor, and (c) the nature and role of assessments and data in digital tutoring programs.

Digital Curriculum

Due to regulations under NCLB, the general content focus of many digital providers in the OST context is either language arts or math. However, providers, whether under the law or operating in states with waivers from NCLB, are given considerable discretion in how they enact the curriculum, contributing to considerable variation in terms of curricular format, curricular access, and curricular software. Curricular formats range from highly structured and completely dependent upon software to "homegrown" curriculum that is more fluid and dependent on the discretion of a live tutor. For example, one provider uses software that is essentially an online whiteboard through which the tutor and student interact by writing with the track pad/mouse, typing, and speaking through headsets. The tutor can upload curriculum materials and prompts as needed. In terms of source, curriculum used by digital providers comes from a variety of sources (purchased/leased from an outside source to curriculum developed in house and used only by tutors, and some combination of above). A number of providers develop their own, proprietary curriculum used only by their tutors. We find that digital curriculum used in tutoring is often delivered outside of the traditional classroom and school context, so that

teachers and principals are unable to do a "walk through" to observe curriculum and instruction. For that and other reasons, it is much harder to "see" and analyze particular types of curricula and, in particular, the enacted curriculum.

In addition, students access the curriculum in a variety of ways. In our qualitative sample of seven providers, we have seen one provider lend students used desktop computers, another provides a handheld device, two provide netbooks, and the remaining three providers send students laptop computers. Each of these providers had either software preloaded onto the hardware or dedicated websites through which students would access the program. All but two of these providers used Internet-based programs.

In a digital tutoring setting, software is a key element of the instructional setting. Drawing on both our qualitative investigation of the digital tutoring setting and common terms used in the field of digital education (iNACOL, 2011), we identify three types of software used to facilitate instructional interactions between students, tutors, and curriculum in our qualitative study sample:

- *Synchronous instructional software* facilitates live instructional interaction between students and tutors through chat functions, audio capabilities, and/or a "whiteboard" function. This type of software houses the curricular content itself and in principle is intended to generate progress reports.
- *Synchronous course management system* (CMS) facilitates live instructional interaction between students and tutors, for example, through a "whiteboard" platform combined with an Internet-based voice call service (e.g., Skype). This type of software facilitates digital interaction between the student and the tutor, but the tutor generates or delivers "homegrown" curricular content.
- *Asynchronous instructional software* houses curricular content but does not support live interaction between students and tutors. This software may house assessments, generate progress reports, and use "artificial intelligence," in other words software developed to adapt the pace and direction of tasks based on student responses.

Instructional Driver and the Role of the Tutor

From our own and others' prior research, we know that the role of the tutor is key to instructional quality (Good, Burch, Stewart, Acosta, & Heinrich, 2014; Hock, Pulvers, Deshler, & Schumaker, 2001). The context of digital tutoring challenges traditional conceptions of a "tutor." Instead of falling into the models typical of in-person, nondigital tutoring contexts where the tutor is the primary guide or delivery system of the curriculum, our observations of tutoring sessions and interviews with provider staff indicate and illustrate a spectrum of enacted roles. For this analysis, we define "tutor" as the provider staff most directly responsible for the instruction of an individual student; in other words, the closest adult to the point of instructional delivery. We categorize digital OST tutors into the following:

- *No tutor:* Some digital tutoring platforms are structured where students have no interaction with a human during the tutoring session. Instead, students interact with instructional software, and may have the option of calling a helpline if they get stuck on a problem. Students also might interact with a provider staff member on occasions to upload progress reports or deal with technical needs (see below).
- *Technician:* Some tutoring platforms use personnel only for technical assistance, which could include a technical helpline or delivering/retrieving hardware from students' homes. We also observed sessions where students brought netbooks into a central location to have a provider personnel upload their progress in working through preloaded software.
- *Monitor/guide:* Tutor and "monitor" are beyond a technician, but not quite a full, interactive instructor. We characterize the "monitor" role as when tutors respond to students if they need help on a specific question related to academic content, call families to discuss progress and encourage students, or answer questions via email.
- *Instructor:* We identify a tutor as an instructor if the tutor interacts with a

student constantly throughout the session, and the curriculum could not progress without the tutor. The instructor category differs from that of the monitor/guide in that the tutor is an integral part of instructional platform and curriculum delivery.

Although these roles are distinct, in practice, tutors often occupy multiple categories, sometimes simultaneously. For example, we observed a synchronous tutoring session where the tutor was working through a math problem with a student when the audio connection with the student was lost. The tutor then had to use the chat function in the software program to explain how to reconnect the headset, so that they could resume instruction. In addition to tutors, there may be staff farther from the point of instructional delivery, but who interact with a student's instructional process. These include case managers, teacher leaders/monitors, curriculum managers, and so on: for example, counselors or case managers who contact parents and the school district if there are issues or questions about students' progress, or "prescription monitors" who periodically review student files, adjust the sequence or pace of the learning program, and continually train tutors. There are also provider staff involved in instructional delivery, but who do not interact with students or their files. These include, for example, curriculum teams that continue to develop and revise the curriculum, or quality assurance testers that test the curriculum once it is inserted into the software platform.

Use of Data and Assessments

Assessment and the data it generates are just as important of a consideration in digital tutoring as curriculum and instruction, and just as complex. The distinctions between curriculum, instruction, and assessment often blur, especially for those programs where the software drives the assessment, which drives aspects of the curriculum, which in turn drives instruction. Under NCLB, all OST tutoring providers, whether digital or nondigital, were required to provide pre- and posttest scores for every student in their program. Some districts offer or require the use of their own assessments as pre- and posttest (e.g., progress assessments given in the fall, winter, and spring). Other districts require providers to obtain and administer their own. For providers in our study, digital assessments were either developed by the provider in-house or purchased from another company, or the provider had access to district assessments for use as pre- and posttests. For those providers administering their own pre- and posttests, assessments were in a digital format, except in the case of one provider that conducted verbal assessments of kindergarten and first-grade students who might have problems navigating the digital platform.

All of the providers in our sample also used some type of formative assessment to measure progress and potentially revise the scope and sequence of a student's learning plan. These formative assessments were often short sets of problems designed to gauge whether students understood a concept. Some software would either not allow students to move forward unless they correctly responded to these problems, or a live tutor approved their progress and moved them to the next activity. What is very clear from our analysis at this point is that, as in nondigital tutoring, there is considerable variation in how digital OST tutoring providers describe what they do, the actual services they offer, how students access these services, and what is delivered.

Publicly Available Information on Instructional Setting

Our in-depth examination of the digital OST instructional setting described above offers important insights into some of these challenges of determining if and how digital tutoring affects student achievement. One of these critical insights is how different digital formats can be from one another in terms of how they are described by providers (the intended curriculum) in publicly available information, such as provider applications or parent brochures. For example, a provider may simply indicate that its program includes a particular type of software, but not specify whether it is used for pre- and postassessment or actual instruction. Based on analyses of provider applications to the state of Texas for offering services in Dallas ISD, we identify the following preliminary patterns in the types and quality of information provided to parents for choosing providers.

First, the information parents receive about vendor programs can be diluted and misleading. For example, a vendor might say that they provide services for students with disabilities but do not actually hire tutors with special education training. Vendor program descriptions often provide minimal information for parents on how they actually use technology as part of instruction. For instance, some provider applications made mention of the use of instructional websites, but a closer reading of the application indicated that only the tutors (and not the students) access these websites to gather curricular materials. Second, it is difficult to find a single, consistent source of program descriptions. On a number of occasions, the program description in providers' state applications differed from the description in district parent information. Third, some providers were described as having digital platforms 1 year but not the next. Fourth, there are many different types of digital platforms, which are often not specified in the application. Finally, there are providers that do not include digital tutoring as any part of their program description or marketing materials, but individual tutors may choose to include digital learning tools as part of the regular curriculum. One example is teachers in one district having the kids do part of their tutoring session on a classroom computer with the same instructional software program the district uses with all students in day school instruction.

Digging Deeper to Classify Dimensions of Digital Tutoring

Drawing on the analysis described above of the nature of curriculum, instruction, assessment, and information in enacted tutoring, we developed a categorization system for digital providers for use in rigorous estimation of OST tutoring program effects. The work of developing the new taxonomy for digital tutoring was done iteratively with the work of classifying digital tutoring programs based on the self-descriptions in their Texas provider applications. To specify the universe of our taxonomy, we defined "digital" tutoring services as those in which students directly interact with digital technology. For our classification purposes, we generally considered "digital technology" to be any multipurpose computer device at least as sophisticated as an iPod or other tool of equivalent functional capacity, which also includes tablets, netbooks, laptops, and desktop computers but does not include less versatile electronic tools such as digital calculators.

The complexity of the latter work—the application analysis and provider classification process—varied considerably among provider applications. Among the applications we analyzed, there were a number of reasons why a tutoring program's characteristics might have been hard to discern from the provider application. These classification challenges included inadequately framed or specified application questions, vague information in provider responses, insufficient details about program characteristics in provider responses, conflicting details about program characteristics in provider responses, and inconsistent degree of details on different modes of tutoring in provider responses (when providers offer multiple tutoring modes). In these cases, we not only had to iteratively refine our taxonomy while classifying providers' tutoring programs according to that taxonomy, but we also had to iteratively assess each tutoring program's actual characteristics for classification, while determining which application text excerpts were relevant for justifying those classifications and cross-checking them with available district administrative data on provider attributes.

Based on descriptive analysis of the applications of approved tutoring providers in Dallas ISD during the 2012–2013 school year, we developed the following categorization that both leverages and digs deeper into characteristics (instruction, curriculum, assessment) identified in observational work.

- Tutor location: Where does the student access the tutor?
  - Online or via the phone (remote access)
  - Face-to-face (in-person access)
- Tutor synchronicity: How immediate is the student's communication with the tutor?
  - Asynchronous (time-delayed)
  - Synchronous (live)
- Instruction driver: Who or what is guiding the student's learning?

    - Curriculum-based software (locally installed or delivered online)
    - Tutor actively working through curriculum-based software with the student
    - Tutor without curriculum-based software (often using a digital whiteboard if online)
- Curriculum location: Where does the student access the course content?
    - Via a digital device, over the Internet (includes mobile device software that needs ongoing Internet access to provide content)
    - Via a digital device, using locally installed software (includes mobile device software that does not need the Internet to provide content once installed)
    - Via nondigital resources (e.g., books, worksheets, chalk/whiteboard, etc.)[4]

In our analyses of Dallas ISD digital OST tutoring programs, we have used this structure and a set of categorizations to explore associations between digital provider and program attributes and student achievement. We summarize preliminary findings of the quantitative analysis below.

Preliminary Empirical Findings on Digital Provider Effects on Student Achievement

A primary objective of this empirical work was to explore the potential effects of different types of digital tutoring (and their delivery) that contribute to student achievement. The analysis of digital providers in Dallas ISD links the data extracted and coded (per the categories of digital tutoring described above) from the state applications of 35 digital providers (with the largest student market shares in the 2011–2012 school year) to district administrative data on digital providers and student-level data on 11,111 students served by these providers. We think it is important to emphasize again that these data are based in part of information self-reported from the digital providers, and thus, some caution is warranted in examining associations between digital provider attributes and student characteristics and achievement.

Tables 4 and 5 present basic descriptive information on the types of digital programs/providers and the proportions of students they enroll, as well as how hourly rates charged by the providers vary across formats/types. Using two-group mean comparison tests, cross-tabulations with chi-square tests, and logistic regression, we examined student selection into different types of digital providers, looking for associations between student characteristics and the provider characteristics as shown in Table 5. The strongest (statistically significant) associations we found (specifying $\alpha = .05$ and two-tailed tests) were for students with special needs and the instruction driver and tutor synchronicity attributes of providers. Specifically, both two-group mean comparison tests and cross-tabulations with a chi-square test showed that students with disabilities were more likely to be tutored with curriculum-based software ($p = .0256$) or a tutor with software combination ($p < .0001$), while English language learners were also more likely to receive OST tutoring through a combination of tutor and software-driven instruction ($p < .0001$). In addition, these descriptive tests showed that English language learners ($p < .0001$) and students with disabilities ($p = .0250$), as well as students of Hispanic origin ($p < .0001$), were significantly *less* likely to receive OST tutoring in synchronous formats.

The logistic regressions controlled for the same student characteristics as shown in Table 1 and predicted the probability of receiving tutoring from a digital provider with a given provider characteristic, as shown in Table 5. The results of these analyses confirmed the statistically significant associations found in the descriptive analyses and provided additional information on their magnitude. For example, the odds of a student with disabilities being tutored with curriculum-based software were 49% higher than for students without disabilities. And while we expect synchronous formats of tutoring to be more effective, the odds of Hispanic students receiving tutoring in this format were 34% lower than for non-Hispanics, and they were also 17% lower for English language learners and 20% lower for students with disabilities. These analyses also showed other interesting associations between student characteristics and digital program attributes, such as that students absent from school more often were significantly more likely to receive all of their tutoring online (with no

TABLE 5
Profile of Digital OST Tutoring Providers in Dallas Independent School District, 2011–2012

Digital provider characteristic	% of students (2011–2012)
Tutor location	
Entirely on Internet	6.36
All in-person	10.78
Face-to-face and online	82.84
Instruction driver	
Curriculum-based software	7.77
Tutor-structured	1.39
Tutor with curriculum-based software	7.29
Combination tutor with software-driven and tutor-driven	24.23
Software-driven and tutor-driven	52.88
Curriculum location	
Curriculum location only digital online	17.78
Curriculum location only nondigital	0.01
Digital-online and local-nondigital combination	60.09
Digital-online and digital-local combination	20.35
Tutor synchronicity	
Asynchronous	2.67
Synchronous	19.31
Combination of synchronous and asynchronous	78.00
Described as blended	2.50

Note. OST = out-of-school time.

face-to-face tutoring).[5] Although it is plausible that digital providers tailored some of their OST offerings to meet the special needs of particular subgroups of students, our qualitative field research showed that, more often than not, digital providers were not prepared to differentiate instruction to better serve students with special needs (i.e., lacking the information necessary to do so, such as student individual education plans, or the capacity, such as bilingual tutoring staff).

In our multisite study of OST tutoring, we found that digital providers, on average, charged significantly more per hour (about US$20 more per hour) than nondigital providers and delivered fewer hours of services to students than face-to-face tutoring providers. In Dallas ISD, the average hourly rate charged by digital providers (in the 2011–2012 school year) was US$31/hour higher than that of nondigital providers (US$89/hour vs. US$58/hour). Students attending with digital OST providers also received significantly fewer hours of tutoring (13 vs. 22 hours) on average (or 41% fewer hours). The information in Table 6 includes the hourly rates only for digital providers in our Dallas ISD subsample and shows how they varied by digital program characteristics. Interestingly, the results show that digital providers that combined digital online with face-to-face instruction were charging the highest rates per hour (in terms of tutor location). In addition, those that were combining some form of tutor-structured with software-driven curriculum were also charging the highest rates among the varying forms of instruction drivers. This same pattern follows for curriculum location and tutor synchronicity as well: Blending different attributes within a given digital provider is associated with higher hourly charges for services. This begs the question: Are these provider attributes that are linked with higher hourly rates also associated with student achievement in reading and/or math?

The results from the value-added models (with school fixed effects) that examine associations between digital provider characteristics and student achievement (in math and reading) are

TABLE 6
Provider Rates by Digital Characteristics (Reporting Statistically Significant Differences)

Tutor location	Rate (US$)
Entirely on Internet	55
All in-person	74
Face-to-face and online	88
Instruction driver	
Curriculum-based software	80
Tutor-structured	69
Tutor with curriculum-based software	62
Combination tutor with software-driven	88
Software-driven and tutor-driven	86
Curriculum location	
Curriculum location only digital online	70
Curriculum location only nondigital	
Digital-online and local-nondigital combination	92
Digital-online and digital-local combination	86
Tutor synchronicity	
Asynchronous	58
Synchronous	66
Combination of synchronous and asynchronous	90

shown beginning in Table 7, which focuses on tutor location (i.e., where the student accesses the tutor). In this estimation, we look at the relationship between tutor–student interactions that are entirely on the Internet or all in-person (face-to-face) versus the reference category of a blend of online and face-to-face and student achievement in math and reading. Table 7 also shows the coefficient estimates and robust standard errors for student-level controls, but for brevity, it does not present the coefficient estimates for the school fixed effects or the indicator variables that control for grade level.

This first set of results (see Table 7) suggests that students who receive OST tutoring from digital providers in which access to the tutor is all face-to-face potentially realize significantly larger benefits in terms of their math achievement (compared with those where the tutor location is a blend of online and face-to-face); the estimated effect is also more than 3 times the size of that for students receiving tutoring entirely on the Internet. In addition, the coefficient estimate for all in-person/face-to-face is substantively large relative to the average effect sizes of OST tutoring that have been reported in our larger study and related research, typically ranging from .05 to .10 standard deviations (Heinrich et al., 2014; Heinrich, Meyer, & Whitten, 2010; Heistad, 2007; Rickles & Barnhart, 2007; Springer, Pepper, & Ghosh-Dastidar, 2009; Zimmer, Gill, Razquin, Booker, & Lockwood, 2007; Zimmer, Hamilton, & Christina, 2010). In effect, the highest priced (in terms of provider hourly rates) tutor location (online/face-to-face blend) appears to be the least effective for tutoring in math. We see no statistically significant associations between tutor location and student reading achievement.

Table 8 presents the findings of value-added models that compare the effectiveness of alternative instruction driver forms (who or what is guiding the students' learning) in digital OST tutoring. The results again differ for math and reading. The least effective instruction driver for math OST tutoring is a combination of tutor-with software-driven and tutor-driven instruction (relative to tutor-driven and software-driven), which is also billed at the highest hourly rate on average. For reading, however, curriculum-based software instruction drivers are significantly less effective in increasing student achievement. Tutor-structured—where the tutor structures and drives the student's learning without curriculum-based software—is negatively associated with student math and reading achievement, although these and the other estimated effects of instruction drivers are not statistically significant.

With respect to curriculum location (where the student accesses the tutoring content), there is only one statistically significant association with student achievement—a negative association between math performance and curriculum that is a combination of digital-online and digital-locally accessed (see Table 9). This is in comparison with the reference category—a digital-online and local-nondigital combination—which is the most prevalent and also the most expensive location (in terms of provider hourly rates) where students access tutoring content. Finally, we also see (in Table 10) a statistically significant, positive

TABLE 7
Value-Added With School Fixed-Effects Models of Digital Provider Effects: Tutor Location

Digital provider and student characteristics	Math score (standardized)		Reading score (standardized)	
	Coefficient	*SE*[a]	Coefficient	*SE*
Tutor location				
Online/entirely on Internet	0.040	.075	−0.037	.052
All in-person/face-to-face[b]	**0.153**	.034	0.055	.043
Prior year standardized score	**0.335**	.067	**0.391**	.036
Attended OST tutoring last year	0.037	.033	0.039	.026
Asian	0.194	.359	0.062	.298
Hispanic	0.094	.059	0.093	.058
Other race	0.075	.193	0.100	.095
White	−0.052	.094	−0.042	.116
Free-lunch eligible	0.026	.031	**0.124**	.037
English language learners	**−0.160**	.065	−0.077	.062
Student with disability	0.020	.187	0.110	.197
Female	0.046	.038	**0.088**	.029
Percentage of days absent from regular school in prior year	**−1.703**	.770	**−2.812**	.683
Retained in grade	−0.139	.129	**−0.709**	.207
Constant	−0.034	.207	0.562	.283

Note. Additional controls (not reported): School fixed effects and grade year. Boldface indicates statistical significance at .05. OST = out-of-school time.
[a]Robust standard errors.
[b]Omitted category: Online and face-to-face blend.

association between synchronous tutoring—in which the interaction between the student and tutor is live or immediate—and students' math achievement. This estimated effect is substantively large and is in reference to the most expensive form (a synchronous and asynchronous combination), again suggesting no positive correlation between the hourly rates charged for different types of digital tutoring and the programs' effectiveness in increasing student achievement.[6]

These findings, combined with our analysis of student selection into different types of digital tutoring, raise potential concerns about which students have access to the relatively more effective types or forms of digital tutoring. For example, our analysis of student enrollment with digital providers showed that English language learners and students with disabilities were significantly less likely to receive OST tutoring in synchronous formats, which the value-added model estimation suggests is more effective in increasing student math achievement. In addition, students with disabilities were *more* likely to receive tutoring with a curriculum-based software program that drives student learning—which is negatively associated with student reading achievement—or via a combination of tutor-with-software driven and tutor-driven instruction that is negatively associated with math achievement. In our multisite, longitudinal study of OST tutoring, we consistently found (across sites and over time) that English language learners and students with disabilities were less likely to realize achievement gains through OST tutoring.

It is also important to reiterate, however, that given the limitations of our measures of digital tutoring characteristics and the preliminary nature of this research, we see these findings as *suggestive* of potentially troubling patterns in access to different types of digital tutoring, rather than as definitive evidence of inequitable treatment in the provision of OST tutoring. More research is needed to confirm the associations we have found among attributes of digital tutoring offerings and measures of student achievement.

TABLE 8
Value-Added With School Fixed-Effects Models of Digital Provider Effects: Instruction Driver

Digital provider and student characteristics	Math score (standardized)		Reading score (standardized)	
	Coefficient	*SE*[a]	Coefficient	*SE*
Instruction driver				
Curriculum-based software	−0.132	.084	**−0.142**	.066
Tutor-structured	−0.035	.126	−0.202	.161
Tutor with curriculum-based software	0.035	.057	−0.006	.063
Combination tutor with software-driven[b]	**−0.141**	.050	0.016	.042
Prior year standardized score	**0.334**	.067	**0.393**	.036
Attended OST tutoring last year	0.024	.033	0.034	.026
Asian	0.211	.367	0.056	.300
Hispanic	0.082	.061	0.091	.056
Other race	0.062	.190	0.098	.095
White	−0.062	.098	−0.047	.117
Free-lunch eligible	0.029	.031	**0.123**	.037
English language learner	**−0.152**	.065	−0.079	.062
Student with disability	0.018	.188	0.113	.197
Female	0.044	.038	**0.089**	.029
Percentage of days absent from regular school in prior year	**−1.669**	.760	**−2.808**	.679
Retained in grade	−0.134	.132	**−0.703**	.208
Constant	0.038	.211	**0.562**	.278

Note. Additional controls (not reported): School fixed effects and grade year. OST = out-of-school time.
[a]Robust standard errors.
[b]Omitted category: Software-driven and tutor-driven.

Furthermore, our empirical analysis of tutoring effects is limited to just one of the five sites in our larger study, and we have seen across school districts how administrative policies and practices can also influence access to quality OST tutoring and its effectiveness in increasing student achievement.

Conclusions and Implications for Policy and Future Research

Although exploratory, our study of digital OST tutoring illustrates the many dimensions along which digital tutoring may vary, including the role and location of the tutor, the type of software used, and the nature of the curriculum, as well as the extent to which these varying attributes might potentially be associated with digital providers' effectiveness in increasing student achievement. Indeed, these are not technical, peripheral variables in the instructional settings of digital tutoring, but rather, our qualitative work suggests they may matter as much as other well-established factors such as time on task, teacher qualifications, student–teacher ratio, and so on, in explaining instructional effects in traditional classrooms.

We also considered the significance of these patterns in the context of broader patterns of student characteristics and participation in OST programming overall. In our prior work, we have found that English language learners and students with disabilities are more likely to attend OST tutoring (Heinrich et al., 2014). This is good news given the intended focus of educational reform efforts on these subgroups, but it will be dampened if other research confirms our findings, suggesting that students with special needs are less likely to receive the more effective forms of digital OST tutoring.

Furthermore, our analysis suggests that digital providers are more rapidly gaining market share

TABLE 9
Value-Added With School Fixed-Effects Models of Digital Provider Effects: Curriculum Location

Digital provider and student characteristics	Math score (standardized)		Reading score (standardized)	
	Coefficient	*SE*[a]	Coefficient	*SE*
Curriculum location				
Curriculum location only digital online	−0.078	.051	−0.047	.046
Digital-online and digital-local combination[b]	**−0.159**	.053	0.001	.037
Prior year standardized score	**0.334**	.067	**0.391**	.036
Attended OST tutoring last year	0.024	.033	0.037	.026
Asian	0.213	.365	0.062	.297
Hispanic	0.080	.061	0.092	.057
Other race	0.058	.193	0.097	.093
White	−0.065	.096	−0.043	.116
Free-lunch eligible	0.028	.031	**0.122**	.037
English language learner	**−0.152**	.066	−0.078	.063
Student with disability	0.016	.188	0.111	.197
Female	0.046	.038	0.087	.029
Percentage of days absent from regular school in prior year	**−1.667**	.761	**−2.814**	.682
Retained in grade	−0.133	.131	**−0.707**	.207
Constant	0.038	.211	**0.557**	.278

Note. Additional controls (not reported): School fixed effects and grade year. OST = out-of-school time.
[a]Robust standard errors.
[b]Omitted category: Digital-online and local-nondigital combination.

than providers of face-to-face private tutoring, while they are charging higher hourly rates and delivering fewer hours of OST tutoring to students. These higher rates might be justified if students and families were getting higher quality services for their money, but our exploratory research comparing the effectiveness of digital versus nondigital providers, as well as different types of digital providers, does not find positive linkages between tutoring quality and rates charged. In addition, our longitudinal, multisite study in five large, urban districts has consistently shown a very strong association between hours of tutoring received and OST tutoring effectiveness in increasing student achievement (Heinrich et al., 2014). The significantly lower number of hours of OST tutoring received by students served by digital (vs. nondigital) tutoring providers also likely contributes to the overall negative correlation we find between digital tutoring and student mathematics and reading achievement (when compared with students served by nondigital providers).

It is also important to emphasize one more time, however, the clear need for more research to support greater understanding of the effects of particular forms of digital tutoring on student achievement and the characteristics of the instructional setting that may contribute to or hinder positive effects. In addition, further research is needed to disentangle attendance patterns and program effects by subgroups, including family socioeconomic background, with specific attention to students from low-income settings. The potential for selection bias in our quantitative analysis remains, and this type of research would also be important for improving our specification of models for estimating program effects.

Our field research also illuminates the challenges in documenting and measuring technology use and the many pathways through which it might mediate the effectiveness of educational interventions on student learning. As digital programming continues to expand, there is an urgent need for more rigorous, independent evaluations

TABLE 10
Value-Added With School Fixed-Effects Models of Digital Provider Effects: Tutor Synchronicity

Digital provider and student characteristics	Math score (standardized)		Reading score (standardized)	
	Coefficient	*SE*[a]	Coefficient	*SE*
Tutor synchronicity				
Asynchronous	−0.069	.143	−0.016	.093
Synchronous[b]	**0.104**	.037	0.032	.037
Prior year standardized score	**0.335**	.067	**0.391**	.036
Attended OST tutoring last year	0.036	.033	0.039	.026
Asian	0.198	.360	0.063	.300
Hispanic	0.092	.058	0.092	.058
Other race	0.080	.192	0.099	.094
White	−0.053	.095	−0.042	.116
Free-lunch eligible	0.027	.031	**0.124**	.037
English language learner	**−0.159**	.065	−0.076	.062
Student with disability	0.018	.187	0.110	.197
Female	0.045	.039	**0.088**	.029
Percentage of days absent from regular school in prior year	**−1.705**	.767	**−2.818**	.682
Retained in grade	−0.142	.131	**−0.710**	.207
Constant	−0.022	.204	0.553	.284

Note. Additional controls (not reported): School fixed effects and grade year. OST = out-of-school time.
[a]Robust standard errors.
[b]Omitted category: Combination of synchronous and asynchronous.

of its effectiveness to inform federal, state, and local policy decisions regarding the role and application of technology in educating underserved students. Currently, the limited, self-generated information that is disseminated by providers to parents and students does not usefully guide parent and student choices of digital providers or aid school districts in their program improvement efforts. Generating more accurate estimates of digital tutoring effects will require a more precise and comprehensive taxonomy of digital tutoring, as we have attempted to advance here.

We are currently engaging in new research that will help us to further test and refine our taxonomy of digital tutoring and supplemental instruction in day school as well as OST settings. We are also looking at different models for integrating face-to-face instruction (to varying extents) with content accessed digitally in different educational settings to better understand the role and importance of face-to-face instruction. Because of the number of dimensions on which digital education can vary in implementation, it is challenging to characterize and confirm what defines or determines effective practice. Yet this is critically important work for supporting the dissemination and scalability of effective digital educational practices. A recent review of studies focused on the potential for digital educational technology to support personalized instruction (Enyedy, 2014) found a lack of studies focused on the K–12 context, as did the Means, Toyama, Murphy, Bakia, and Jones (2010) and Means, Toyama, Murphy, and Bakia (2013) meta-analyses. Given the rapidly expanding and wide-ranging uses of digital educational technology in K–12 schools today, we need more efforts to compile the lessons learned from this type of research.

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Notes

1. Students eligible for out-of-school time (OST) tutoring under No Child Left Behind (NCLB) include those in public schools not making adequate yearly progress for at least 3 years who were also eligible for free or reduced-price lunch. Districts frequently also specify additional eligibility criteria, such as proficiency levels assessed via standardized tests, if the number of eligible students exceeds available resources.

2. Indicators were only included in this list if the averages come from at least 50 observation points (typically, there are two recorded per tutoring session) for digital sessions and 50 for nondigital.

3. For a fuller discussion of these findings and the research, see Good, Burch, Stewart, Acosta, and Heinrich (2014).

4. Within each dimension, we also added all combinations of classification options as classification options themselves. So, for example, we could accurately characterize a tutoring program that integrally features a combination of both Web-based and hard-copy curricula without dropping any information. We used this combinatorial option in at least two important contexts: Tutoring programs that incorporate multiple modes of service, all of which every enrolled student experiences at different times or during different sessions in the program. A program in which students independently complete curriculum-based software lessons installed on their iPods before meeting every week with in-person tutors would be an example. Tutoring programs that offer multiple modes of service, and each student chooses one of those modes at the outset of their enrollment, in effect creating multiple distinct subprograms. A program in which some students always work with their tutors in a physical classroom while other students always work with their tutors online would be an example.

5. The full set of results from these descriptive and logistic regression analyses are available upon request from the authors.

6. Across these models, approximately 16% of the variation in changes in math achievement and 35% of the variation in changes in reading achievement are explained by the models (as indicated by R^2 measures). The substantive results regarding the effects of the various provider attributes also hold when the measures of their different characteristics are combined into a single model for estimating changes in math (and reading) achievement. In addition, we estimated all of these models with student math and reading gains as the outcome (instead of controlling for prior student test scores on the right-hand side of the model) and found that the results on digital provider attributes were substantively the same.

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Authors

PATRICIA BURCH is an associate professor at the Rossier School of Education. Her work focuses on issues of equity and access in privatization trends in K–12 education. She is the author of *Hidden Markets: The New Education Privatization*.

ANNALEE GOOD is an associate researcher at the Wisconsin Center for Education Research at the University of Wisconsin-Madison. Her research examines dynamics within the K–12 education context, including the use of digital tools, private contracting, and academic tutoring.

CAROLYN HEINRICH is the Sid Richardson Professor of Public Affairs, affiliated professor of economics, and the director of the Center for Health and Social Policy at the University of Texas at Austin. Her research focuses on education, social welfare policy, workforce development, program evaluation, and public management and performance management.

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EDUCATION

Doctor of Philosophy (5/2016)	Urban Planning	Arizona State University
Masters of Public Administration	Planning and Management	Arizona State University
Bachelor of Science	Real Estate	Arizona State University
Bachelor of Science	Business Administration	Arizona State University

RESEARCH INTEREST

Urbanization, Globalization, Sustainability, Demographics, Planning under uncertainty

PROFESSIONAL EXPERIENCE

Chief Strategist **[11/96 – current]**
Lyon Capital

Honors Faculty **[8/10 – current]**
School of Politics and Global Studies
Arizona State University

Executive Producer **[5/06 – 10/2010]**
Embrem Entertainment
Boarder2Boarder Entertainment
Open-Wide Productions

Senior Analyst **[09/92 – 11/96]**
Financial Resource Management
Department of Environmental Quality
Maricopa County

Program Coordinator/Analyst **[9/89 - 9/92]**
Office of Environmental Affairs
City of Scottsdale

Research Analyst **[9-87 / 9-89]**
Arizona State Energy Office
State of Arizona

Research Analyst **[9-85 / 9-87]**
Morrison Institute for Public Policy
Arizona State University

Associate Vice President **[9-82 / 9-85]**
Drexel Burnham Lambert

TEACHING EXPERIENCE

SGS 303 – Global Trends **(2010 – 2014)**

Global Trends analyzes the role of neo-liberalism in the development of global trends through the investigation of the determinants and ramifications of globalization from the vantage of modern social sciences.

Students are expected to conduct and articulate independent critical analyses toward a more in-depth understanding of these social phenomena, global history, and particularly the global economy. Sixty or more students per semester.

SGS 394 – Global Climate Change **(2011 – 2014)**

Global Climate Change analyzes the scientific process of global climate variation, as well as, the many challenges we face including energy-dependent economies, biodiversity loss, sea level rise, lowered agricultural yields, and much more. Twenty or more students per semester.

RESEARCH EXPERIENCE

Research Analyst for the Morrison Institute for Public Policy at Arizona State University. This on-campus think-tank conductes client driven research on behalf of the Office of the President at Arizona State University, the Arizona State Legislature, as well as, private sector clients.

Research Analyst for the Arizona State Energy Office in Phoenix, Arizona. This energy policy/program development and implementation effort was concentrated on the formation and management of environmentally sensitive governmental and private sector programs for achieving added levels of energy efficiency in buildings, transportation systems, manufacturing processes, and through recycling of solid waste.

Research Analyst at the Chinese Academy of Sciences in Beijing, China. This 2013 summer appointment is focused on data collection for my dissertation on the topic of uncertainty in long-term planning for urban and economic development on an international scale.

PUBLICATIONS

Published Reports

Yan, B., Gao, X., & **Lyon, M.** (2014). Modeling satisfaction amongst the elderly in different Chinese urban neighborhoods. *Social Science & Medicine*, *118*, 127-134.

Lyon, M. (1992). Municipal Policy: Energy Conservation Funding. City of Scottsdale, AZ.

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_____ and **Lyon, M**. (1987). Minority Retention and Recruitment at ASU. Office of the President, Arizona State University.

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Lyon, M. (1987). Water Transfer: The New Range War. KAET-TV & Arizona State University.

Monographs

Lyon, M., et al. (1989). Energy Policy in Arizona: A Plan for Sustainable Development. Arizona State Legislature.

Melnick, R., and **Lyon, M.,** et al**.** (1987). Urban Growth in Arizona: A Policy Analysis. Morrision Instititue for Public Policy, Arizona State Legislature.

Manuscripts in Preparation

Lyon, M. (2015) Will Beijing achieve Global City Status? A scenario based assessment for the year 2050. Lyon Capital, Phoenix, AZ.

RESEARCH GRANTS

Research Grant. "Energy Policy in Arizona: A Plan for Sustainable Development" PI: Jerry Dion, Collaborators: Amanada Jones, Arizona Energy Fund, Arizona Department of Commerce, Arizona State Legislature ($150,000).

Research Grant. "Urban Planning in Arizona: A Policy Analysis" PI: Rob Melnick, Collaborators: David Pijawka, Arizona State Legislature ($250,000).

Production Grant. "Positive Youth" PI: Charlie David, Collaborators: Austin Head; LOGO Television & OUTtv Canada ($50,000).

Study Grant. "Sustainable Farming in North-eastern Croatia" PI: Paul Hirst, Walton Sustainability Solutions Initiative ($50,000).

PRESENTATIONS / GUEST LECTURE

SGS 204 / Global Career Development – **Careers in Social Media**, 10-10-10.

SGS 301 / Principles of Global Studies – Neoliberalism, 09-14-15, **Population,** 10-06-14, 09-22-15; **Case Study - Beijing**, 10-08-14.

SGS 311 / Urbanization in China – 02-25-13, 02-27-13, 03-04-13, 03-06-13, 03-18-13, 03-20-13.

PUP 544 / Land Use Planning – **Beijing**, 3-06-13, 03-22-13,

PUP 548 / Sustainable Cities – **Beijing, Infrastructure**, 02-25-13, 02-27-13, 03-04-13, 03-06-13, 03-18-13, 03-20-13.

FILM PRODUCTION

Executive Producer of six feature length films and the pilot of an eposidic televlsion project which have been distributed in six languages in over 30 countries. Several films are in current rotation on US and foreign cable channels while others are available exclusively through NETFLIX and/or iTunes.

Going Down in LA-LA Land (2012)
Violet Tendencies (2011)
The Big Gay Musical (2010)
Between Love & Goodbye (2009)
Mulligans (2007)
A Four Letter Word (2006)

AWARDS

Audience Award: Fire Island Film Festival
Audience Award: Barcelona GLBT Festival
Audience Award: Tels Quels Festival
Audience Award: Desperado Film Festival
Best Gay Film: QCinema Film Festival
Best Comedy: Out on Film
Best Comedy: Winnipeg Gay Film Festival
Grand Jury Award: Outfest
Best Gay Feature: Q Cinema
Best Ensemble Cast: Festival del Sol
Best Screenplay: FILMOUT

DOCUMENTARY PRODUCTION

Executive Producer of the documentary 'Positive Youth' which follows the lives of 4 HIV+ youth living in North America. **'Positive Youth'** is distributed through Films Media Group for educational use and has previously been broadcast and screened at the following festivals and on the following cable channels:

03/10/12	Phoenix International Film Festival	09/08/12	Louisiana Gay & Lesbian Festival
05/01/12	Sacramento Film Festival	09/12/12	Outflix Gay & Lesbian Film Festival
05/14/12	LogoTV Broadcast Premier	09/28/12	Portland LGBT Film Festival
05/19/12	LogoTV Broadcast	10/08/12	Austin Gay & Lesbian Film Festival
05/20/12	Toronto Inside Out Film Festival	10/10/12	Yorkton Short Film Festival
05/23/12	LogoTV Broadcast	10/10/12	Atlanta Out On Film Festival
05/25/12	LogoTV Broadcast	10/11/12	Seattle Gay Film Festival
05/31/12	FilmOut San Diego	10/12/12	Reel Pride Film Festival
06/01/12	Honolulu Rainbow Film Festival	10/18/12	Seattle International Film Festival
06/02/12	Q Cinema Fort Worth Film Festival	10/18/12	Brown University
06/08/12	Wolfsonian Museum	11/01/12	Les Gai Cine Mad
06/14/12	LogoTV Broadcast	11/11/12	Indianapolis LGBT Film Festival
06/16/12	FRAMELINE LGBT Film Festival	11/17/12	Hong Kong Gay Film Festival
06/19/12	LogoTV Broadcast	12/01/12	Image+ Montreal LGBTFestival
06/20/12	DVD Release	12/01/12	Hamilton, Alberta Film Festival
07/10/12	San Diego FilmOut	12/01/12	Fredericton, New Brunswick Festival
07/14/12	Philadelphia Inter. Film Festival	12/08/12	Belgrade Queer Film Festival
07/21/12	Cincinnati GLBT Film Festival	01/25/13	Out in the Desert LGBT Festival
07/25/12	CNKY Scene Film Festival	02/22/13	Bangalore Queer Film Festival
07/29/12	Houston Gay Film Festival	02/26/13	OutTV Canada; 9PM EST
08/17/12	Louisville LGBT Film Festival	03/22/13	UNC - Carolina Rain
08/21/12	LogoTV Broadcast	02/08/13	ReelOut Queer Film and Video
08/25/12	Out On Screen Vancouver		

COMMERCIAL REAL ESTATE DEVELOPMENT PROJECTS

On behalf of private sector clients, conduct various aspects of energy/environmental planning for large-scale commercial real estate projects. This work is focused on evaluation of proposed uses in preparation for acquisition, development, or disposition, including due diligence activities for lenders including UBS, Bank of America, Merrill Lynch, GE Credit, Cantor Fitzgeral, Sabal Financial and Lehman Brothers.

Activities and responsibilities include land use planning, project level financial analysis, use of correlation tools for determining remedition costs and/or auditing of complex transactions (ie., work plans, expense summaries, profit and loss statements), as well as, associated management reports for hotels, multi-family facilities, retail, raw land, and office buildings:

Sponsor	Project	Lender/Equity	Type	Equity/Finance	Location
Nelson	Corviglia	Lehman	Master	$13,000,000.	Scottsdale, AZ
D&R	Master	GE Credit	Multi-Family	$8,400,000.	Columbus, OH
D&R	Dayton Center	Deutsche	Office	$1,250,000.	Daytona, FL
Tamarac	Brentwood	Merrill	Multi-Family	$3,150,000.	Columbus, OH
Tamarac	Willow Glen	Archon	Multi-Family	$11,000,000.	Columbus, OH
Pensus	Park Centrak	UBS	Mixed-Use	$37,000,000.	Phoenix, AZ
Exeter	Colonial	GE Credit	Office	$1,640,000.	Valparaiso, IN
Exeter	Lancaster Apts	Archon	Multi-Family	$3,316,000.	Indianapolis, IN
Exeter	Willow Glen	Merrill	Multi-Family	$12,136,000.	Indianapolis, IN
Exeter	Confidential	GE Credit	Office	$6,974,000.	*Confidential
Tamarac	Westlake Plaza	GE Credit	Office	$1,000,000.	Columbus, OH

Vesey Street	Embassy Suites	Lehman	Mezz Loan	$5,000,000.	Garden, CA
Durrant Group	CCA	Deutsche	Confidential	$100,000,000.	Phoenix, AZ
TCH, LLC	Confidential	UBS	Hotel	$80,000,000.	*Confidential
Confidential	Confidential	UBS	Mixed-Use	$100,000,000.	Phoenix, AZ
Margala	Minot Center	Cantor	Residential	$169,000,000.	Minot, ND

SUPERFUND, WQARF & LUST SITE REMEDIATION

Developed/implemented an internal program to manage the technical and financial analysis activities associated with the rehabilitation of environmentally contaminated real assets (212 facilities) owned/operated by the City of Scottsdale and Maricopa County on behalf of senior management. This included preparation and implementation of work plans for the remediation of CERCLA sites, RCRA violations, WQARF groundwater quality violations, and compliance with all NEPA regulations.

Directed activities of professional/legal/technical teams in the areas of interpretation and application of state and federal regulatory standards for environmental compliance; performed technical studies, managed data collection, designed remediation and/or management strategies (including managing well construction, subsurface groundwater and vadose zone investigation/remediation), and coordinated administrative, legislative, and public outreach activities.

Site	Type	Contaminate	Project Cost
Hassyampa Landfill	CERCLA	Various	$25,000,000.
Maricopa Medical Center	NEPA	Asbestos	$5,000,000.
Phoenix Petroleum Terminal	WQARF	BTEX	$7,000,000.
Papago Park Military Reservation	WQARF	Jet Fuel	$1,000,000.
Motorola 52nd Street	CERCLA	HVOC	$150,000,000.

REGULATORY AFFAIRS / SITING PUBLIC FACILITIES

As a Senior Environmental Officer participated in the siting of regionally significant governmental facilities (e.g., landfills, HHW collection facilities, major league baseball stadium) for Maricopa County, Arizona.

Senior Environmental Analyst for the Maricopa County Air Quality Department. This is a regulatory agency composed of professional and technical teams managing enforcement of local, state, and federal standards for air quality, water quality, waste water management, and environmental health permitting (ie., code enforcement). Supervised performance of technical studies (including management of regional air quality monitoring system, private well survey, and analysis/permitting of wastewater systems), managed data collection for regulatory compliance, approved applications for air sparging and soil remediation systems, for this regulatory agency serving a population of 3.5 million residents.

On behalf of the City of Scottsdale, responsible for environmental planning activities associated with the development and implementation of a comprehensive program focused on protection and restoration of the urban environment (including oversight of negotiations with EPA and ADEQ) through a reduction in

the consumption of resources (e.g., resource recovery and solid waste recycling); energy efficiency retrofit of municipal buildings/fleets; design of environmentally sensitive governmental buildings, development of energy/water efficient building codes, review of urban plans, and municipal ordinances, hazardous waste stream management); oversight of consultant contracts; introduction of a long term municipal energy/water program related to environmentally benign production and conservation of depletable resources.

REFERENCES

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RECENT PRESS

Dunn, Eric, (2015), Read, write, rate: The top RateMyProfessors at ASU, *State Press Magazine*, 4/14/15.

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Academic Background

2007 Ph.D. Creative Writing with specialization in **Creative Nonfiction**, *Union Institute and University*, Cincinnati, OH.

1999 M.A. English with specialization in American and Children's Literature, *Brooklyn College* at the *City University of New York*, Brooklyn, NY.

1994 B.A. English, Minor in **English Education**, *Brooklyn College* at the *City University of New York*, Brooklyn, NY. **Cum Laude.**

Education Administration, Teaching, and Writing and Editing Experience

8/15/11-Present **Training and Development Coordinator and English Faculty**
Coconino Community College
Flagstaff, AZ

- Taught Developmental Writing, First and Second Year Composition, and Creative Writing-Nonfiction to a diverse, multicultural population of first and second year students. Also taught Caviat H.S. students.
- Taught first ever Blended Learning Creative Nonfiction course while piloting the new Canvas LMS.
- Mentored new faculty and performed classroom observations and evaluations.
- Participant in the First ever Blended Learning--Learning Community at Northern Arizona University.
- Used/using instructional technology such as iClickers, iPads, Google docs, Google sites, blogger.com, and publishing programs like Microsoft Publisher, iDesign, and Microsoft OneNote.
- Took the Quality Matters all day course and signed up to become a QM Certified Peer Reviewer.
- Served as the advisor and on the Editorial Board and as a consultant for the fledgling Kaleidoscope LGBTQ group at CCC.
- Founder and director of the CCC Writer's Critique Group for faculty members.
- Interim Editor and Creative Consultant for CCC's student magazine, *OnCourse*.
- Was the go-to person to bring Canvas training for online instructors to CCC. Arranged all meetings and trainings. Worked hand-in-hand with Canvas' implementation team.

- Worked with the IT and eLearning departments weekly to update each other on the new Canvas LMS implementation progress and brainstorm problem solving and new ideas.
- Interview, train, and supervise student workers.
- Prepared for and delivered New Faculty Orientation.
- Hired and tracked new faculty mentors.
- Provided one-on-one tutoring to all faculty and staff in technical and pedagogical areas.
- Served as Chair of the Training and Development committee.
- Served on the eLearning committee.
- Served on the Online Course Design and Review committee.
- Utilized CCC's strategic plan to establish goals and objectives for the training and development program.
- Completed all PAFs to insure payment of mentors.
- Interviewed and hired outside trainers for many of the new CCC Professional Development classes.
- Surveyed the college, brainstormed, coordinated, and offered 93 brand new trainings.
- Facilitated Admin 101 for new employees.
- Identified training and professional development needs for both faculty and staff. Created surveys to ascertain T&D needs of the college.
- Brainstormed and coordinated two Employee Development Days per year.
- Received applications for Professional Development funding, distributed applications to Training and Development committee members, met to discuss and vote on applications for funding.
- Managed Training and Development budget.
- Facilitated the CARE program (Community Advocacy Respect Excellence) a foundational program designed to strengthen the college community, promote healthy communities that celebrate diversity and our unique assets,

develop advocacy skills for challenging interactions, and provide principles and tools to guide healthy internal and external service interactions. Tracked CARE participants over the four sessions.

- Created the new Leadership Academy Curriculum.
- Created new content for the Training and Development web page.
- Brainstormed new training venues—ex. www.Lynda.com and Technology Tuesday (Technology in the Classroom training) for faculty.
- Coordinated technical trainings for all employees throughout the year.

11/01/10-8/01/12 **Volunteer Writing Instructor Afghan Women's Writing Project**, **Online**

- Taught/Teaching Developmental Writing Skills to Afghan Women to help give them a voice in a society that forbids them to have one.

6/08- Present **Nonfiction Writer and Copy/Editor** Freelance

Some examples of writing and editing work:

- Provide editing and copyediting for dissertations, books, scholarly articles, business proposals, blurbs for advertising copy, scholarship application essays, resumes, and other types of writing.
- Writing short nonfiction articles related to Mind, Body, Health and the Art of Living.
- Finishing a book-length piece of Creative Nonfiction based on research done for my dissertation.

8/06-Present **College English Instructor** Mesa Community College
Mesa, AZ

- Created and taught the first Online Creative Nonfiction 180 course using Canvas. Course teaches four subgenres of nonfiction, how to research a Writer's Market Report, how to create and upkeep a blog and create an author's website.
- Taught English Composition 101 and 102 with Interdisciplinary Focus.
- Taught Personal Exploratory Writing 242.
- Created the first online Memoir Writing course using Blackboard.
- Served on the Humanities Learning Community Committee.
- Committed to Professional Development (see Professional Development section).

8/14-Present—**Online English Instructor** Southern New Hampshire
University—Online

- Taught Intro to Creative Writing, and Creative Nonfiction.
- Taught English 122-English Composition One, English 123-English Composition Two. Classes are in 8 week semesters.

8/07-12/07 **English Faculty Associate** Arizona State University, Downtown Campus, Phoenix, AZ

- Taught expository writing in English Composition 101 to freshman nursing students. Course had Creative Nonfiction, Interviewing, Ethnography, Research Methodologies, and Persuasive/Argumentative components.
- Worked together with the Computing Director of Specialized Labs at Arizona State University to incorporate *Microsoft OneNote* into my classes in order to facilitate creative group work by enabling students to collaborate on creating e-magazines while each person was sitting at his/her own computer. The software was such a success that we were invited to give a presentation for teachers at Arizona State University's Microcomputers in Education Conference (MEC).

9/98--9/99 **College English Instructor** Brooklyn College Outreach Program, Brooklyn, NY

- Traveled to various Brooklyn High Schools to teach college level **Basic Skills and Developmental Writing** to prepare college-bound H.S. seniors for the newly developed regents and college English 101 and 102 classes.
- **Managed** other teachers working in the program.
- Maintained excellent working relationships with teachers and students.

8/95-12/96 **Assistant/Team ESL Instructor** Brooklyn College, Brooklyn, NY

- Taught students **one-on-one** during the workshop half of the ESL class, proofread graduate and undergraduate papers; worked with adult students to highlight errors and teach grammar and writing skills.
- **Worked in Brooklyn College's Writing Center tutoring graduate and undergraduate ESL students in writing.**
- Maintained excellent working relationships with students.

<u>Academic Teaching Highlights</u>

- Designed rigorous yet creative, interdisciplinary, multi-cultural courses that incorporated the university/college's stated objectives for each course, incorporated art, drama, creative writing, the media, film, Native American/African American/ Jewish/ Women's/ American history, minority literature, and literature from marginalized populations; the curriculum was also designed to provide interactive learning activities, teach public speaking, enhance self-esteem, and promote cultural awareness.
- Incorporated the online learning tools in LMS's such as **Canvas/Blackboard/ WebCT** into students' learning process.
- Orchestrated the creation of interdisciplinary papers, group magazines that incorporated multiple intelligences, showcased the papers students had worked on all semester, and kept the students very interested and involved with their learning.
- Transformed the above stated group magazine final project to focus on the Nursing discipline for the nursing students at Arizona State University.
- Worked together with the Computing Director of Specialized Labs at Arizona State University to incorporate *Microsoft OneNote* in order to facilitate group work and create e-magazines instead of hardcopy. To see an actual student magazine: http://sls.asu.edu/lc/english/activitydocs/arini-mag3.pdf.
- Served on the Humanities Learning Community at Mesa Community College with the objective of assessing Community College students' knowledge in the humanities.
- Created creative paper topics, homework assignments, and exams to peak students' interest and intensify their learning experience.
- Held one-on-one conferences with each student to give them a chance to communicate their concerns and insecurities with regards to their writing and for me to offer them encouragement with regards to their writing progress.
- Devoted the first three weeks of every class to developmental writing.
- Held personal tutoring sessions with students in regards to developmental writing.
- Built and maintained excellent working/coaching relationships with students.
- Incorporated computer use into our writing workshops.
- Was very involved with the Center for Teaching and Learning and their cafe credits program.
- Trained for and then designed Mesa Community College's first online Writing Memoir course, CRW 242AA.

Secondary Teaching Experience

8/01--6/02 **English Teacher** Atkinson Middle School, Phoenix, AZ

- Taught Literature and Developmental Writing to At-Risk eighth grade students.

9/99--8/01 **English Teacher** David A Boody Intermediate School, Brooklyn, NY

- Taught English to **Gifted** students and ESL, Reading, and Developmental Writing to students in the sixth, seventh, and eighth grade.

9/98--6/99 **Teacher** Adelphi Academy, Brooklyn, NY

- Taught drawing, sculpting, pottery making, oil painting, weaving, candle making, mixed media, and Art History to grades K-12.

4/98-9/98 **Substitute Teacher** NYC Board of Education, Brooklyn, NY

- Taught English and Art to children in grades K-9.
- Managed five classrooms with up to 200 ESL and multicultural students daily.

English and Math Tutor Sylvan Learning Center Brooklyn, NY

- Tutored elementary and junior high school students in English and Math

8/95-8/97 **Admissions/Academic Counselor** C.U.N.Y. Office of Admissions, New York, NY

- Assisted incoming freshman and transfer students by guiding them to the appropriate CUNY college to meet their educational objectives; informed students about which colleges offer particular programs, minimum grade point average accepted, paperwork and documentation needed to apply.
- Adhered to all FERPA regulations regarding student privacy and to all state and federal accreditation regulations.
- Provided the first stages of **academic advisement**.
- **Reviewed and evaluated the credentials of students and advised them regarding their academic goals.**
- Traveled to high schools in Brooklyn, NY and made classroom presentations to **recruit** new students.
- Participated in other **recruitment and enrollment** activities.
- Answered all phone and in-person inquiries

1/94-6/94 **Student Teacher** Abraham Lincoln H.S., Brooklyn, NY

- Taught 10th grade English.

- Developed the English curriculum for that semester.
- Maintained grading, progress reports, and classroom documentation.

1/90-4/98 **ESL Tutor** Lorraine Byrnes Tutoring and Writing Center, Brooklyn, NY

- Taught English, ESL, Reading and Developmental Writing to students from Korea and China.

Secondary Teaching Highlights

- **Permanently certified by New York City and State to teach English 7-12: File #0725050.**
- **Provisionally certified by Arizona State to teach English 7-12.**
- Created and implemented the school-wide reward system for books read within the Accelerated Reader program at Atkinson Middle School; created a school store and the "token system" used to purchase merchandise; stocked and managed the store; managed the **budget** for rewards.
- Created a *gifted and advanced* English/History curriculum for seventh and eighth graders at David A. Boody Junior High; created an interdisciplinary English curriculum that incorporated art, drama, creative writing, the media, film, Native American/African American/ Jewish/ Women's/Asian and American history, minority literature, and literature from marginalized populations; the curriculum was also designed to provide interactive learning activities, teach public speaking, enhance self-esteem, and promote cultural awareness.
- Collaborated with the NY Historical Society to develop and implement a new Musicals curriculum for public intermediate schools. Created lesson plans and team-taught with History teacher, Louis Leonini.
- Created a *remedial* interdisciplinary English curriculum for the At Risk student population of Atkinson Middle School that incorporated Developmental Writing, Art, Drama, the Media, Film, History, Minority Literature, and literature from marginalized populations; the curriculum was also designed to provide interactive learning activities, teach public speaking, enhance self-esteem, and promote cultural awareness.
- Developed, documented, and implemented an entirely new Art Curricula for grades K-12 at Adelphi Academy.
- Developed a reward system to motivate students to participate and ensure classroom management.
- Maintained grading, progress reports, and classroom documentation.
- Managed six classrooms of up to 210 students daily at Atkinson Middle School and five classrooms with up to 200 ESL and multicultural students daily at David A. Boody Junior High.

- Conducted student assessments in cases where students were failing.
- Coordinated field trips and parental permission slips.
- Maintained excellent working relationships with students.
- Organized displays of student's Art work at Adelphi Academy.
- Tutored after-school students in English.

Related/Other Experience

Responsibilities/Accomplishments

8/02--9/04 **Grant Writer** Safe Haven, Inc., Phoenix, AZ

- Researched foundations, independent philanthropic trusts, and state-funded programs that would potentially support the mission statement of Safe Haven, Inc.
- Wrote letters of inquiry and grant proposals to obtain funding for operational and individual program costs; generated over $250,000.
- Initiated and maintained communication with contacts at various private and public philanthropic foundations and organizations.
- Created and edited the Safe Haven Newsletter.
- Coordinated the creation of the Safe Haven website.
- Procured funding for and acted as **Director and Program Coordinator** of the Ladies' Club, a program for economically disadvantaged older women. I brought in speakers from Southwest Naturopathic Medical Center to educate the women on how to manage their diabetes through diet, developed relationships with neighboring non-profits including Fresh Start Women's Resource Center who provided so many free services for the women. I created mini-workshops for the women where they would learn new skills or receive ESL training.
- Was an active participant in Quest for Kids, an after school mentoring program for students.
- Kept track of and organized food pantry.

10/95—6/96 **Marketing Assistant** Henry Holt Publisher, NY, NY

- Maintained financial and budget tracking on Excel spreadsheets.
- Coordinated travel arrangements for Book Fairs.
- Coordinated manuscripts with the Sales, Publicity, and Art departments.
- Took all notes at meetings.
- Performed all Administrative Assistant tasks.

Publications

- 2015 "*The Putana and Santa Rosalia"* (an autoethnographic piece of Creative Nonfiction)—ASU's *Canyon Voices Literary Journal*

- Currently seeking publication for literary nonfiction/memoir, *Confessions of an Ex-Religious Fundamentalist.*
- *2012 Curios Journal of Northern AZ*—"Sacred Space" and "One+One=Infinity" (poems) 2012.
- Founder and director of the CCC Writer's Critique Group for faculty members, 2011.
- **2007 Dissertation:** *The Observer and the Observed: An Ex-fundamentalist Speaks. T*his is a book-length piece of scholarly creative nonfiction, which I am currently rewriting as a memoir for the general public. The new working title is *Confessions of an Ex-fundamentalist.*

Academic/Research/Teaching Interests

Creative Nonfiction, Mindfulness in Education, Mindfulness in the Workplace, Creative Writing, Social Action Writing, Writing to Heal, Personal Exploratory Writing, English Composition, Autoethnographic Research, Heuristic Research, Narrative Inquiry, Narrative Psychology, Fundamentalisms with special interest in Christian Fundamentalism, Women and Fundamentalism, Brainwashing and Fundamentalism, Former Fundamentalists, Literature and Psychology.

Professional Development

- Universal Design for Online Classes—NAU Sept-Dec 2015
- Compassion in Higher Education Conference—NAU March 2015
- CPR certification—Feb 2015
- Emotional Intelligence in the Workplace—Jan 2014 to May 2015
- Essential Skills for Committee Chairs—Jan to May 2014
- Quality Matters for online courses—June 2014
- Writing Articles for Publication—Feb 2014
- Essentials for Workplace Trainers—Jan 2014
- Improving Online Course Accessibility for Students with Disabilities Webinar—June 2013
- Webinar on Undocumented Students—Jan 2013
- Safe Zone LGBTQA training certification Nov 2012
- Canvas LMS Workshops: Course Design Workshop, Migrating to Canvas, Canvas Collaborations, Canvas Roll Out. Sept 2012
- Community and Service Learning—April 2012
- Inspiring Our Students—A Student Panel—April 2012
- ELI/Educause Keynote Presentation: If Not Now, When? Technology in Education—April 2012
- **C.A.R.E.** (Community Advocacy Respect Excellence) a foundational program designed to strengthen the college community. Feb. 2012
- New Directions in Diversity: Issues in Teaching and Scholarship 2011-2012 Symposium Series.
- iPads and eBooks for the Future—Nov. 4, 2011

- Exploring Our Future Online Learning System—Canvas—Nov. 4, 2011
- Creativity in the Classroom—Nov. 4, 2011
- *Desert Nights Rising Stars* Creative Writing Conference 2008—Tempe, AZ
- *Desert Nights Rising Stars* Creative Writing Conference 2004—Scottsdale, AZ
- Education 250 Overview of the Community Colleges
- PowerPoint for Creative People
- What You Can Do with Web CT
- Web CT Communications
- Web CT Gradebook
- Web CT Quizzes
- Quizzes with Respondus
- Breeze Fundamentals
- Adjunct 101

Computer/e-learning Skills: Microsoft Word, Excel, PowerPoint, Publisher, Outlook, OneNote and Mac applications. iClickers, iPads, Google Docs, Google Sites, Weebly.com, blogger.com, youtube.com, Turnitin.com, Prezi.com, iCloud to link all MAC apps and other web applications in the classroom. WebCT/Blackboard/Canvas (online learning system with e-learning tools such as discussion boards, mail systems, and live chat, along with content including documents and web pages), Smartboards, Scanners, Overhead projectors, DVDs/Videos/CDs, and the college portal. PeopleSoft, Banner, and student database systems used for admissions. Adobe InDesign, Adobe Reader, and Photoshop. Internet and Social Media applications.

Academic Presentations

Communication in Action—Creating for upcoming year.

Self-Care in the Workplace—Creating for upcoming year.

CARE (Community, Advocacy, Respect, Intelligence) "Self-Advocacy in the Workplace." Feb. 2013. "Respect in the Workplace." Nov. 2013, Mar. 2014, Nov 2014, Mar. 2015 Coconino Community College.

MEC: Microcomputers in Education. "Microsoft OneNote: Making Group Work Easy and Fun." Co-presenter Peter Lafford, Computing Director of the Specialized Labs at Arizona State University. MEC.ASU.EDU March 10, 2008.

Current Associations/Memberships

- Afghan Women's Writing Project – Writing Mentor, 2011
- FormerFundamentalists.com—Contributor, Mentor, 2010-11
- The Literacy Center—teach Basic Literacy, Developmental Writing, ESL, and

Basic Computer Skill—Teacher, Social Media Coordinator 2011

References

Jeff Andelora Ph.D, Chair of the English Department at Mesa Community College, 480-461-7343, jandelora@mesacc.edu.

Colleen Carscallen, Dean of Arts and Sciences at Coconino Community College, 928-226-4364(work) 928-600-1012 (cell), colleen.carscallen@coconino.edu.

Tracy Glau, Art Instructor at Coconino Community College and Librarian at Northern Arizona University, 602-618-1118, tracy.glau@nau.edu or trglau@gmail.com. (I was manager for Tracy and also co-presented with her several times.)

Nick Faulk, Librarian at Champlain College (former librarian and English Instructor at Coconino Community College. I was Nick's mentor when he began teaching.) 520-904-2948.

Mitch Driebe, Student Service Coordinator at Coconino Community College, mitch.driebe@coconino.edu, 928-522-3988. (Mitch and I co-presented several times and did years of committee work together.)

Rosa Mendoza-Logan, Human Resources Coordinator, Coconino Community College, 928-226-4350 or rosa.mendoza-logan@coconino.edu.

Sam Piper, English Instructor, Coconino Community College, 928 221-6707, sam.piper@coconino.edu

Robin Rickli, Anthropology Professor at Northern Arizona University and Coconino Community College, 928-310-8176 (cell), 928-525-9256 (home), or robin.rickli@coconino.edu.

Zach Frenette

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Education

Bachelor of Liberal Arts, Secondary Education	California State, East Bay
Associates of Science, Cognitive Development	Glendale Community
College Associates of Art, American Sign Language	Coconino Community

Research Interest

Secondary Education, Childhood Development, Psychology, Sustainability

Professional Experience

Director — Aspen Tree
[01/16 – Current]

Assistant to the Director — GlyEco, Inc
[09/15 – 01/16]

Special Education Teacher — Innovation Through Education
[01/12 – 06/15]

Lead Campaigner — Planned Parenthood Action Fund
[04/12- 03/14] — Southern Poverty Law Center

Chief Coordinator — Aurora Entertainment
[01/12 – 02/15]

Technician Analyst — Online Equipment Liquidation
[10/07 – 01/12]

Teaching Experience

Kindergarten-12th Grade – English, Math Sciences (2012 – 2015)

Comprehensive education in all state standardized subjects and their respective state testing processes. Tracked the development of students by implementing new pedagogical strategies, designing specific outlines, and assisting with special needs students as needed.

Students are expected to analyze materials, conduct their own studies, and articulate what they have 'earned. Students showed an increase of 15% or better in test scores which translates into one or more letter grade improvements.

Academic Awards

Granted Award. October 2015, "*Deans List*" California State University, East Bay. Graduated winter term with honors and a grade point average of 3.8 noted on my transcript. California State University, East Bay: (510-885-3000)

Granted Award. January 2013, "*Vice President's List*" Coconino Community College. Notation on transcript for achieving a weighted grade point average of 3.72 during the Fall semester. Coconino Community College: (928-527-1222)

Granted Award. February 2010, "*Phi Theta Kappa*" Glendale Community College. Induction into the Phi Theta Kappa honor society for outstanding academic achievement. Glendale Community College: (623-845-3333)

Granted Award. January 2009, "*Honor Roll*" Flagstaff Arts & Leadership Academy. Certification awarded for academic excellence for the commitment to the prestigious Flagstaff Arts & Leadership Academy. Flagstaff Arts & Leadership Academy: (928-779-7223)

Publications

Nguyen, N., Goodsin, P., & **Frenette, Z.** (2015). G.P. Goodsin Studios. Solis Magazine.

Goodsin, P., Nguyen, N., & **Frenette, Z.** (2014). Goodsin Studios Glitter Punk Editorial, United Kingdom. Feroce Magazine, 2, 28-34.

Tesorero, J., Bushaw, K., Jaffe, M., & **Frenette, Z.** (2013). Halloween Cover Story Executive Art Direction and Model. Ion Arizona Magazine, Cover, 93, 101-102.

Rowell, J., Jaffe, M., & **Frenette, Z.** (2012). Giuseppina Magazine, cover, 46-47.

Jaffe, M., **Frenette, Z.** (2011). Spirit Project Feature. Echo Magazine, 28.

Frenette, Z. (2010). Publication of "Spirit", Front Page Feature on the Deviant Art Community Website. Deviant Art.

Volunteer Experience/ Causes

Causes and opportunities in which I have been included follows; Animal Welfare, Arts and Culture, Children, Civil Rights and Social Action, Disaster and Humanitarian Relief, Economic Empowerment, Education, Environmental Regulation, Human Rights, Poverty Alleviation, Science and Technology, and Social Services. Totaling over 200 non-profit hours, I have been included in relief projects since 2006.

Fosterer, (2015). Worked directly with the President of **Adopt a Doggie** for over ninety non-profit hours. The project aimed to transport dogs from Taiwan to the United States for adoption, in an effort to alleviate rampant starvation in the East. San Francisco, California.

Botanist, (2009). Worked in the Coconino National Forest with **Arizona Game & Fish** removing invasive plant species including Dalmatian Toadflax for over fifty non-profit hours. This species of plant threatened local wildlife and their food sources. Flagstaff, Arizona.

Educator, (2008). Over thirty-five nonprofit hours reading to children and ladling/preparing soup for the Flagstaff Sunnyside low-income families at the **Soup Kitchen**. Flagstaff, Arizona.

Artist, (2007). Painted vintage luggage obtained from secondhand stores for over fifty nonprofit hours. **Love Luggage** incorporates messages of hope for foster children and donates toiletries, toys and paints. Flagstaff, Arizona.

Sculptor, (2006). Thirty-five nonprofit hours sculpting and selling ceramic bowls through the **Empty Bowls Project**. All proceeds were disbursed among foundations aiming to end world hunger. Flagstaff, Arizona.

References

Dr. Marianne Arini
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