

Reimagining the Classroom - *Teach to One: Math* in Elizabeth Public Schools

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Over the last three decades, the education reform movement has sought to accelerate students' learning progress by helping school districts rethink school management and human capital. Meanwhile, the advance of technological innovation has led to the creation of new instructional and learning tools. While there has been significant progress, we must still address the question of differentiation: How do we best leverage all elements of the classroom—time, space, curriculum, the talents of teachers, and the power of technology—to give each and every student a personalized education that meets their needs and abilities? And, how can we scale these innovations throughout the country, beyond early adopters in large urban districts?

New Classrooms Innovation Partners (New Classrooms) is addressing this question by reimagining the traditional classroom to enable teachers to personalize learning for students despite the wide variability of learning levels in the average classroom. Our flagship model, *Teach to One: Math (TTO)*, combines resources from multiple classrooms into one open space where students learn different skills at the same time. Instruction is delivered at the right academic level, using the most suitable instructional format for each student, each day. Students may work independently, online or with printed materials; collaborate in small groups around discrete projects; and study with larger groups led by a teacher. Students' personalized learning plans determine how and what each student is learning and at what time. These plans are generated daily by a sophisticated scheduling algorithm, and teachers use these plans to personalize instruction based on each student's learning style and academic level.

In the 2013-14 school year, New Classrooms operated *TTO* in 15 middle schools across 5 regions (New York City, Chicago, Charlotte, NC, Northern New Jersey and Washington, DC), serving approximately 6,000 students. Early program results have been promising; students are learning at rates that are 1.5 times that of the national mean.

Beginning in the 2013-14 school year, New Classrooms has partnered with Elizabeth Public

Schools (EPS) in Elizabeth, NJ to implement the *Teach to One: Math* model in one district K-8 school, serving over 180 students in grades 5-8. With the requested i3 Development Grant, New Classrooms, in partnership with EPS and the Consortium for Policy Research in Education (CPRE), at Teachers College, Columbia University, aims to build on our partnership with EPS by testing and scaling our reimagined classroom model, *Teach to One: Math*. The project will implement and evaluate *TTO* in 5 additional EPS schools, serving approximately 1,500 5th- 8th grade students per year over 3 school years, to better understand the impact of *TTO* and to build the foundation to scale *TTO* to more schools, in both large and mid-sized districts, nationwide.

A. Significance

(I) Absolute Priority

New Classrooms' *Teach to One: Math* is more than a product – it is a complete personalized instructional *model* that leverages both the talents of teachers and the power of technology to completely reimagine the classroom experience. New Classrooms seeks to provide all students with access to a personalized, adaptive, and self-improving learning experience in order to optimize instruction for learners with a variety of needs. The proposed project uses technology to meet Absolute Priority 5(a) through the following features:¹

1. An Algorithm that Converts Student Data into Recommended Individualized Student Schedules. A number of off-the-shelf-products provide teachers with information on student progress, but teachers still need to spend their limited time to determine how best to use this data. New Classrooms has taken the next step: we have developed an adaptive learning algorithm that analyzes student performance data to create and update a unique “skill library” for each student. This personalized skill library is composed of the skills that a student is expected to learn during

¹ Note that through our alignment with the Common Core State Standards and efforts to improve student achievement and engagement and teacher efficacy through integrating technology, we also would satisfy the requirements of Absolute Priority 5(b).

the school year: grade-level skills combined with the below-grade skills that students may need to fill gaps and above-grade skills for students ready to stretch themselves further. Each skill in a student’s skill library is drawn from New Classrooms’ underlying skill map, which is constructed based on Common Core State Standards and defines the non-linear relationships and dependencies of skills spanning from Grade 3 through Algebra (See Appendix J.a on the skill map). As students progress through their skill libraries, the algorithm uses daily assessment data to create a recommended schedule, lesson assignment, and room location for each student and teacher each day based on the student’s previous day’s performance. These daily personalized learning plans ensure that each teacher’s instruction meets the needs of all students.

2. **Modalities.** The *TTO* model integrates multiple technology-enabled and live instruction modalities into the classroom at the same time. While most off-the-shelf products offer a single means of instruction (e.g. online videos), *TTO* aims to provide students with multiple ways of instruction that are fully integrated into the learning model so that they have different opportunities to learn the same skills in different ways through both discrete, single-session lessons and multi-day, project-based “Tasks.” As such, instruction becomes dynamic and tailored to how and what students need to learn. *TTO*’s learning modalities include:

Single Session Modalities		
Teacher-Led	Live Investigation	Students work with a teacher to explore a particular mathematical concept or skill; teachers can use lessons provided by <i>Teach to One: Math</i> or use their own.
Collaborative	Small Group Collaboration	Three to six students work collaboratively to solve a math problem.
	Peer-to-Peer	Two to three students teach one another strategies to solve a math problem.
Virtual	Coached Virtual Instruction	A teacher-supported digital lesson provides instruction related to a particular skill.
	Virtual Reinforcement	An independent, virtual lesson reinforces specific concepts and allows students to practice skills.
	Virtual Live Tutor	A student works 1:1 with a live virtual tutor; students and tutors interact through voice and online chats
Independent	Independent Practice	Students work independently on printed lessons and worksheets to practice specific skills.

Multi-Session Modalities		
Project-Based	Task Sessions	<p>Task sessions take place over multiple days. Students use a variety of related skills in real-world applications. For example, students might analyze the costs and benefits of purchasing a hybrid car and use the skills they acquire through this work (e.g., multiplication, estimation, calculating gas mileage) to defend a purchasing decision</p> <p>Over the course of each task, teachers can draw on a variety of modalities as well as their own approaches</p>

3. **A Comprehensive Digital and Live Lesson Bank.** New Classrooms is better able to customize instruction by providing diverse instructional content. To do so, New Classrooms sources live, digital, and collaborative content from more than 20 content vendors (e.g. Pearson and LearnZillion) and creates original lessons. To date, New Classrooms has rigorously screened over 80,000 lessons and selected the 10,000 highest-quality for use in our model. We prioritize lessons based on quality, effectiveness, and teacher feedback from.

4. **Web-Based Portal.** The *TTO* portal offers complete, real-time information about students' progress and enables students and teachers to navigate their schedules and review performance history. Students take ownership of their learning by viewing their progress and accessing a variety of resources to supplement, reinforce, and advance in-class learning. Students are able log in to the portal 24 hours a day to review lessons, prepare for exams, and share their progress with their parents. See Appendix J.b. for more about how teachers and students use the portal.

(II) A Novel Approach

The failure of K-12 to innovate and adopt even basic online or blended learning programs in schools is striking. The Keeping Pace K12-2013 report (KPK12), which analyzed existing evidence of online or blended learning, estimated that less than 10% of districts nationwide provide comprehensive opportunities for online or blended learning to a significant number of its students. Moreover, most districts that offer online and blended learning programs apply them in extremely narrow formats, targeting only a small subset of students with particular needs (e.g.,

recovering credit, Advanced Placement, dual credit) and with most of these efforts focused on high school students, rather than middle or elementary students.

The landscape of organizations creating personalized learning solutions is also still at a nascent stage. In fact, a 2013 survey of the field conducted by New Profit Inc. cited New Classrooms as one of only five organizations that have created “complete” classroom solutions - those that have redesigned how classroom learning happens to enable true personalization and have built the capacity to replicate those solutions in diverse school settings. Even among these “complete” classroom solutions providers, New Classrooms is unique. Only we offer a learning algorithm that can provide daily recommended schedules to teachers and students utilizing student performance data to maximize personalization without putting the burden on teachers to spend time analyzing data, grouping students, and customizing lesson content. Meanwhile, most other organizations in this space have focused their efforts in one of three ways:

1. **Digital Learning Products.** Most providers of personalized learning solutions have created products that are merely optional instructional tools grafted on to the existing classroom model – e.g. data and grading systems, digital instructional or assessment content, etc. This can result in a system where digital and live instruction aren’t fully integrated to achieve personalization, such as in many “rotational” blended learning models, where students may work with adaptive personalized learning software in a learning lab but receive instruction according to a one-size-fits-all curriculum when they rotate to teacher-led instruction.

2. **Charter School Models.** A handful of Charter Management Organizations (CMOs) have developed solutions that are only available to schools within their network. These solutions are thus limited in their ability to scale only as fast as the CMO itself, which requires significantly more capital and resources than scaling a model across existing schools.

3. **Consulting Services.** Some organizations provide consulting services to schools and districts

to help them develop new personalized learning solutions that are customized to the needs of that school and/or district. Often, these approaches integrate a number of different tools and systems in ways that can vary significantly across different sites.

In contrast to these other approaches, New Classrooms stands out for our unique ability to replicate an entirely reimagined classroom approach with fully-integrated digital, collaborative, and live teacher-led instruction across diverse public district and charter schools. Unlike CMOs whose solutions are only available to schools within their network or products and consulting solutions that can have significantly different implementations from school to school, only New Classrooms can implement our instructional model consistently and with fidelity in all types of schools. This provides a unique opportunity to evaluate the impact of this type of intervention and scale it to other schools and districts across the country.

(III) Potential Contribution

New Classrooms, in partnership with EPS and CPRE, is uniquely positioned to have a significant impact on the advancement of theory, knowledge and practice in the field of personalized learning. Through the proposed project activities we stand to contribute by: a) demonstrating validated, improved student outcomes b) demonstrating scalability and c) sharing our learnings with the field to catalyze further innovation.

1. Improve Student Outcomes and Establish Causality. Early results from *TTO*

implementations in EPS and other districts show that this approach has the potential to make a significantly improve students' skill mastery when compared to their peers in textbook-based classrooms. Preliminary results from our internal analysis of student assessment data from the 2013-14 school year show that participating students, on average, made 1.5 times the national average growth, as measured by Northwest Evaluation Association's (NWEA) Measures of Academic Progress (MAP) exam. Students in New Classrooms' current EPS partner school

demonstrated, on average, 1.75 years' worth of growth in the 2013-14 school year. We are awaiting independent validation of this data. See Appendix C for more about results.

New Classrooms' track record of accelerating student achievement greatly deepens our ability to impact student outcomes across EPS and the country. While we have worked with outside researchers at Teachers College, Columbia University to validate the gains participating students have made in math learning,² we have not yet been able to invest in a more rigorous third-party evaluation that could identify the causal relationships between our model and improved student outcomes. In partnership with CPRE, New Classrooms proposes to conduct a Quasi-Experimental Design study across 5 schools (described in more detail in Section D). With this study, New Classrooms can demonstrate causality and thereby provide an important proof point for the impact of personalized learning. This will further our work with EPS and other districts and charter operators to bring *TTO* to more schools across the country.

2. Demonstrate Scalability. Because New Classrooms is a national organization with a strong central infrastructure and regional partnership model, we will be well-equipped to extend the impact of the project beyond the students and teachers in the five partner schools in Elizabeth, NJ. *TTO* New Classrooms can leverage our infrastructure and network to scale the program beyond the participating schools. As part of the proposed project, a part-time Regional Director will work to improve the capacity of EPS to sustain and expand this innovation beyond the life of this grant and to coordinate with other schools and districts across the region to conduct site visits and informational sessions to encourage adoption of ours and other innovative models.

While most of our early implementations have been in very large urban districts (e.g. Chicago Public Schools and New York City Department of Education), mid-size districts like

² An independent evaluation of 2012-13 student performance by researchers at the Center for Technology and School Change at Columbia University's Teachers College showed that students in our program made, on average, gains in their math learning that were 1.2 times the national average. The full report is included in Appendix J.c.

EPS (serving 15,000-35,000 students) serve 16% of the total K-12 student population in the U.S. Demonstrating efficacy and scalability in EPS will be an important entry point to the small and mid-size local districts where most students in the United States go to school. Furthermore, demonstrating that the program can successfully scale to five schools in a single district will show that comprehensive personalized learning is a feasible strategy not only for select “lighthouse” schools but also districtwide. While we began in New York City and have six partner schools there, New Classrooms has not yet established partnerships with more than three schools in a single district beyond New York. With the proposed project, New Classrooms will be implementing *TTO* in 25% of EPS district K-8 schools.

3. Contribution to the Field of Study. Implementation of the proposed project will yield critical information about student outcomes and scalability of personalized instructional models. In addition to disseminating CPRE’s findings from the qualitative and quantitative evaluation of the proposed project, New Classrooms would also work with EPS to jointly publish a case study which could serve as a guidebook for how districts can best position themselves to support the implementation of personalized instructional models like *TTO*. New Classrooms and CPRE have the ability to build on their existing networks and reputations as leaders in the field to share lessons learned and best practices to schools and districts, as well as researchers and other innovators, across the country.

New Classrooms is actively involved in helping inform the broader education field around the power of personalization and in assisting other innovators and education leaders to invent and adopt personalized approaches. Led by many of the creators of the pioneering *School of One* program, a personalized learning initiative piloted by the New York City Department of Education and named by TIME as one of the top inventions of 2009, New Classrooms was founded in 2011 to bring reimagined classrooms to schools and districts throughout the country.

New Classrooms' Co-Founder Joel Rose is a thought leader in the education community whose articles have appeared in *The Atlantic*, *EdSurge*, *Education Nation*, and *EdTech Magazine* and who has spoken at numerous convenings ranging from the American Federation of Teachers' annual conference to Teach for America's 20 Year Gathering. New Classrooms' program and results have also been featured in numerous publications (see Appendix J.d for recent press).

New Classrooms is also engaged in several high-impact communities of practice, including the New Profit Reimagining Learning portfolio network and the Community of Innovative Practice, and works with other innovators, including Summit Public Schools, to share best practices and build support for personalized learning more broadly. Recently, New Classrooms worked with Bellwether Education Partners to fund and disseminate a report called "[A Policy Playbook for Personalized Learning](#)," which suggests a number of ideas for how State and District leaders can support innovation.

CPRE has an outstanding reputation for effective dissemination and outreach. CPRE products, particularly policy briefs and research reports, are in demand and are respected for their quality and range of timely and important topics. CPRE's main web site (www.cpre.org) serves as the main portal and offers detailed descriptions of research projects, a library of downloadable publications, and links to educational sites. CPRE's website attracts over 96,500 visitors annually, and since 2001, visitors have downloaded nearly 2 million copies of CPRE publications. In addition, thousands of copies of printed publications have been distributed to policymaker organizations and practitioners. CPRE also maintains project-related websites at the University of Pennsylvania, Teachers College Columbia University, the University of Michigan, and the University of Wisconsin-Madison that are accessed extensively by researchers and policymakers. Its main electronic newsletter, CPRE In-Sites, launched in January 2002, reaches

approximately 1,750 subscribers and features descriptions and links to new publications and other timely information about ongoing research.

B. Quality of Project Design

(I) Project Goals

The proposed project aims to accomplish the following goals:

GOAL 1: Select, Prepare and Support 5 Schools Serving 1, 500 High-Needs Students in Elizabeth Public Schools to Implement *Teach to One: Math*.

EPS and New Classrooms will collaborate during both a pre-implementation planning phase and during implementation to ensure that the *TTO* model is implemented with fidelity. The strategy includes partnering to select 5 participating project schools serving 1,500 high-needs students in grades 5-8, prepare schools and teachers for the program, and support all 5 schools during the implementation of the program. New Classrooms has already partnered with EPS to successfully implement *TTO* in one school during the 2013-14 school year, and we will build on this collaboration between EPS, school staff, and New Classrooms to ensure program success.

GOAL 2: Accelerate Student Math Achievement.

New Classrooms believes that providing students with the right content at the right time and in the right modality is the most effective approach to accelerating learning for all students. For a full logic model of how the *TTO* model works and its anticipated outcomes, see Appendix D. With EPS, New Classrooms will determine concrete, ambitious growth and achievement targets at regular partnership meetings throughout the year. These growth targets will align with state testing and Common Core standards. As explained in Section D, we will work with CPRE to determine the qualitative and quantitative impact of our program using a Quasi-Experimental Design study that looks at student performance on state assessments in addition to classroom observations and interviews with teachers.

GOAL 3: Obtain Teacher and District Support for Sustainability and Prepare for Scale.

The ultimate objective of this project is to create a proof point for personalized learning that can be leveraged to expand personalized learning across EPS and the nation. To do so, throughout the project we will work closely with school and district partners to provide them with the tools they need to sustain the program and to plan for ongoing implementation and further scale. In addition, we will evaluate, document and disseminate research on the impact the proposed project has on student achievement and create a case study of lessons learned to generate grass roots “market” demand for personalized learning from other EPS schools, schools and districts in the region and nationwide, and policymakers. This project will also allow us to improve the capacity of New Classrooms for regional scale by developing regional infrastructure to engage other local schools and districts. Over the next 5 years, New Classrooms expects to see significant growth in adoption of the *Teach to One: Math* model, estimating operations at 75-100 schools by the 2018-19 school year.

(II) Project Activities

The project aims to accomplish the above goals through the proposed plan and activities:

1. Phase 1: Comprehensive Planning Prior to Implementation (Jan. 2015-Aug. 2015)

Project activities in this phase will include:

- a. *Selecting Schools.* During the initial planning phase, EPS, in partnership with New Classrooms and CPRE, will select five K-8 schools to implement the proposed program in grades 5-8. We anticipate that the participating student population would reflect EPS averages with free-reduced lunch and English language learner populations of 86% and 14.8%, respectively. Schools will be selected based on each school’s student needs and its level of readiness to adopt the *TTO* model. A school’s readiness is based on a set of clearly defined cultural and technical thresholds that schools must demonstrate during the

selection process. See Appendix J.e for a sample *TTO* school selection rubric. New Classrooms will partner with EPS to identify and assess optimal partner schools and will together determine what district resources can be allocated to help schools operate the program with fidelity. School selection includes the following milestones:

Milestone	Activities	Stakeholders
Engagement	<ul style="list-style-type: none"> Conduct tours of existing sites implementing <i>Teach to One: Math</i> and in-person presentations with EPS leadership and school teams. 	<ul style="list-style-type: none"> EPS and NC leadership team
Capacity Assessment	<ul style="list-style-type: none"> Conduct site visits with each prospective school partner to present how the model works. Conduct building walk-throughs with EPS and school facilities and IT staff to assess the readiness of the space and IT infrastructure. 	<ul style="list-style-type: none"> EPS budget, procurement, facility, and technology teams School leadership/math teams NC Implementation Readiness and External Partnership teams
School Selection	<ul style="list-style-type: none"> Return to schools that emerge as viable partners for a more intensive conversation to assess the teachers' instructional philosophy and culture, answer their questions and gain staff buy-in. Together with evaluator, EPS and NC leadership, make final school selection. 	<ul style="list-style-type: none"> School leadership/math teams EPS and NC leadership CPRE
Contract	<ul style="list-style-type: none"> Negotiate final terms with school and evaluation partners. Kick-start implementation process. 	<ul style="list-style-type: none"> EPS and NC leadership team School leadership/math teams CPRE

b. *Program Orientation*. New Classrooms has designed and will help implement a robust pre-implementation orientation program that includes:

Phase	Timing	Description
Pre-launch program simulation	Prior to the formal launch of the model; 2-4 week period following the district's high stakes testing period	<ul style="list-style-type: none"> Conduct a prototype implementation that simulates the program model in a low-stakes environment for both students and teachers. The goal is to give teachers and students the opportunity to experience the program's key features and streamline program design elements before fall implementation.
Pre-launch teacher orientation	End of the summer	<ul style="list-style-type: none"> All participating teachers receive approximately 15 hours of pre-service professional development to learn each element of the program in-depth and collectively plan for student orientation.

c. *Space Redesign*. Fundamental to the proposed program is the belief that an open space classroom facilitates personalized learning by allowing students to work on different skills in different ways simultaneously, so that teachers can differentiate instruction. New Classrooms will work with EPS during the summer of 2015 to bring the program space at

the 5 identified schools in line with the program’s design philosophy and to help EPS purchase all technological hardware needed to implement the program.

2. Phase 2: Implement *Teach to One: Math* model in EPS (Sept. 2015-June 2018)

Proposed project activities for this phase include:

- a. *Continued Teacher Support.* New Classrooms staff will support teachers through the following activities:

Activity	Timing	Description
Warm-up Round	First four weeks of the program	Teachers and students will participate in modified implementation that is grounded in providing math instruction but also gives students and teachers time to transition to the <i>TTO</i> model
Common Planning	Daily	Participating teachers will spend at least one period of time in collaborative professional development, where they collectively review program data, discuss the progress of individual students, and coordinate on key program elements that require consistency across all participating teachers
Professional Development and Targeted Instructional Support	Ongoing	Instructional coaches will provide instructional and academic support to teachers throughout the year

- b. *Site Support.* Participating schools will be supported by New Classrooms field team.

Support typically includes a full-time, on-site Operations and Technology Associate at each school, a Program Manger to support two schools, and an Instructional Coach to support two schools. A locally-based part-time Regional Director and School Partnerships Manager will also be available to provide ongoing leadership and support. Job descriptions for these positions are included in Appendix F. In the third year of the grant, on-site support will decline as we train schools to become more self-sufficient.

- c. *Centralized Day-to-Day Operations.* New Classrooms’ central office staff in New York City will be responsible for ensuring the model runs efficiently and is responsive to both students’ and teachers’ needs on a daily basis. New Classrooms’ central staff will run ongoing quality assurance on daily schedules, manage and make technical adjustments to the portal in response to feedback, and gather and clean assessment data for analysis. Staff will also work closely with EPS to ensure program success.

- d. *Ongoing Student Assessment and Curriculum Adjustment TTO's* built-in assessment platform will provide teachers with regular performance-based assessments of students; updated, individualized student progress analysis; and growth metric testing, reporting and analysis to ensure that each student continues to receive the most appropriate material for his or her needs. This will also allow teachers to flag areas of the program that may need intervention by New Classrooms' staff.

3. Phase 3: Evaluate Project and Prepare for Scale (June 2018-Dec. 2018, and Ongoing)

Proposed project activities for this phase include:

- a. *Assess student achievement in math and teacher buy-in.* Results from state assessments will be used to evaluate students' math achievement, as compared to their peers and established goals. EPS and New Classrooms will also work with a CPRE evaluation partner to explore how other model elements influence classroom interactions and teacher satisfaction. For more information on the evaluation design please see Section D.
- b. *Work with evaluation partner to prepare and share findings.* New Classrooms will work with CPRE to prepare and disseminate research findings across the education community.
- c. *Use findings to support further scale.* If results support further scaling of *TTO*, New Classrooms will work with EPS to explore the continued and expanded implementation of *TTO* across the district and will use the evaluation and successful implementation as evidence to support efforts to scale the model to other districts and schools nationwide.

Risks and Mitigation Plans

The potential risks across all phases of the project and the related mitigation plans include:

Risk	Mitigation
School(s) drop out prior to full implementation of the grant.	New Classrooms and EPS will establish efficient and effective communication channels with schools to proactively troubleshoot challenges at the school as they occur and ensure collaborative and effective relationships between partner schools and the project team.

Significant leadership or teacher turnover at schools threatens to decrease effectiveness.	New Classrooms will provide additional professional development and ongoing support to a school’s new teachers and leadership staff. EPS will work with schools to promote continuity of staff and leadership throughout the project.
Technology, furniture, or space are not ready prior to program launch.	Should a mid-year upgrade of furniture or technology be needed, New Classrooms and EPS will work together to implement an interim solution with EPS’s available resources.
Students, parents and/or teachers have greater than anticipated difficulty in transitioning to new model.	A high level of oversight from both EPS and New Classrooms personnel will ensure that project staff will be aware of and responsive to community feedback. Potential strategies include: extended “warm-up” rounds for students; additional intensive professional development and training for teachers and leaders; and community meetings with school staff and/or parents.
ELL students and/or students with IEPs have unique learning challenges that must be met.	The program’s algorithm and instructional support mechanisms will ensure that instructional content that ELL students and students with IEPs will be exposed to as well as the means of instruction (whether virtual, live or collaborative) will be carefully selected to empower each individual student to excel. Students with IEPs will receive additional support through qualified special education teachers and paraprofessionals.

Section C. Quality of the Management Plan and Personnel

(I) Management Plan

In partnership with EPS, New Classrooms has developed a comprehensive management plan that clearly lays out how and when we intend to accomplish all project goals, summarizing all critical operational milestones that will be used to assess whether the project is on track.. The three key stakeholders of this project – EPS, New Classrooms, and CPRE – will schedule weekly check-ins to monitor progress, surface any risks or challenges, and determine the appropriate mitigation strategy, where needed.

Phase One Goals and Milestones (January 2015-August 2015):

Project Category	Key Milestone	Date Due	Who is Responsible
Implementation	Hire or identify central project team to oversee project	Feb 2015	NC
Implementation	Identify and select candidate schools that are ready to implement <i>Teach to One: Math</i>	Mar 2015	NC/EPS
Evaluation	Evaluator, EPS and New Classrooms select 5 schools that will receive <i>Teach to One: Math</i> and comparison schools that will not receive intervention	Apr 2015	NC/CPRE/EPS
Implementation	Kick-off implementation readiness work with district and selected schools, includes space redesign planning, technology planning and procurement, and furniture planning and procurement.	Apr 2015	NC/EPS
Evaluation	Conduct baseline observations and interviews with participating teachers	Apr 2015	CPRE
Implementation	Begin recruiting process for local NC staff who will be	Apr 2015	NC

	supporting <i>TTO</i> implementations at EPS		
Implementation	Finalize space design and furniture procurement	May 2015	EPS/NC
Implementation	Prepare and support selected schools to operate <i>Teach to One: Math</i> spring simulations	May 2015	NC/EPS
Implementation	Launch and operate <i>Teach to One: Math</i> spring simulations at all five schools	May-Jun 2015	NC
Implementation	Conduct and complete facilities construction/upgrades	Jun-Aug 2015	EPS
Implementation	Configure, install, and set-up all requisite program technology	Aug 2015	EPS/NC
Implementation	Hire and train all local NC program staff	Aug 2015	NC
Implementation	Complete space design and set-up at all selected schools	Aug 2015	NC/EPS
Implementation	Conduct pre-fall trainings at 5 selected schools	Aug 2015	NC
PHASE ONE: PERFORMANCE TARGET	Launch <i>Teach to One: Math</i> in 5 selected schools serving approximately 1,500 students	Aug 2015	NC/EPS

Phase Two and Three Goals and Milestones (September 2015-December 2018):

Project Category	Key Milestone	<u>Date Due</u>	Who is Responsible
Evaluation	Conduct teacher interviews/observations at all implementation schools	Sept - June 2015/16/17/18	CPRE
Implementation	Provide ongoing operational and instructional support to schools	Sept – June 2015/16/17/18	NC
Implementation	Provide teachers and students with daily customized schedules for approximately 1,500 students	Sept – June 2015/16/17/18	NC
Evaluation	Administer year-end standardized state assessment at both selected and control schools	March-April 2016/17/18	EPS
Implementation	Conduct annual program reflection and lessons learned; identify improvements and/or modifications to implement for following year	July/Aug 2016/17/18	NC/EPS
Evaluation	Complete analysis of annual results	Aug 2016/17/18	CPRE
Implementation	Complete any tech/facilities upgrades or modifications in preparation for following year	Jul-Aug 2016/17/18	NC/EPS
Implementation	Conduct staff training in preparation for following year's implementation	Aug 2016/17/18	NC
PHASE TWO: ANNUAL PERFORMANCE TARGETS	1. Deliver daily schedules and support instruction for approximately 1,500 students per school year 2. Participating teachers and schools demonstrate commitment to continue the program for the following school year 3. Students demonstrate interim incremental progress on improving Math performance (exact benchmarks TBD on an annual basis) 4. Students demonstrate more engagement in learning as observed by evaluators and teachers	August 2016/17/18	EPS/NC
Project evaluation	Complete full evaluation, summarize lessons learned and disseminate findings	August 2018	CPRE
Project scalability	Assess <i>Teach to One: Math</i> expansion to additional EPS schools and to additional schools regionally and nationally	Jul-Aug 2018	NC/EPS
PHASE THREE:	Refine plan for sustaining program beyond i3 grant term	December 2018	NC/EPS

PERFORMANCE TARGET	and, if applicable, expanding program into additional EPS and other schools in region		
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In addition to monitoring progress on the above operational milestones and goals, New Classrooms will also work with our CPRE evaluation partner and with the EPS team to track student achievement progress throughout the implementation of the *TTO* program. New Classrooms has built into the management plan three points in time (annually, after the completion of each implementation year) to assess the impact *TTO* is having on students’ mathematics achievement – specifically around growth in students’ math proficiency, as measured by state assessments. The ultimate goals and timeline for evaluating student achievement and progress are outlined in Section D.

(II) Evidence of Support

New Classrooms is currently partnering with EPS to implement *TTO* in one school, and both New Classrooms and the EPS community have expressed strong support for continued partnership and expansion of the program. Letters of support are included in Appendix G.

(III) Feedback and Continuous Improvement

New Classrooms is dedicated to continuous improvement and learning, which is supported by the following process: (1) Set and communicate measurable and achievable goals – both interim, end-of-year, and end-of-program; (2) define roles and responsibilities; (3) collect and evaluate data to assess progress against interim and longer-term goals; and (4) refine/adjust. New Classrooms’ field team and central office staff will work closely with EPS to continuously assess progress relative to interim and overall program goals and, if necessary, implement mid-course adjustments.

EPS and New Classrooms will establish the following series of meetings to ensure active communication, effective accountability and continuous improvement across the program:

Activity	Timing	Description
Teacher Check-ins	Daily	New Classrooms' local team will meet with teachers and teacher leaders to surface any operational/instructional issues and identify interventions in real-time to ensure seamless and effective daily operations of <i>TTO</i> at the school level
School Leader Check-ins	Weekly	New Classrooms Program Managers will meet with school leadership to ensure overall program operations are running smoothly, that programs are well resourced, and that school staff is well supported.
District and Project Leadership Check-ins	Quarterly	New Classrooms' senior central team, the site-based School Partnerships Manager and Regional Director, and EPS' leadership team will meet to review progress towards major operational milestones and assess/discuss any areas that require modifications or adjustments. This may include at least one mid-year check-in to review performance indicators to see if students are on track to achieve math growth goals.
End-of-Year Summit	Annually	Key members of the New Classrooms, EPS, and CPRE evaluation teams will meet to review the previous academic year's program and prioritize potential areas of improvement for the following school year.

In addition to these qualitative feedback sessions, EPS and New Classrooms will also use quantitative metrics – such as daily assessments and other real-time performance data – to inform improvements to student learning throughout the life of the project via New Classrooms' algorithm. Data will also be reviewed during daily Common Planning at the school level, and EPS and New Classrooms will analyze summative data such as PARCC scores to inform ongoing program improvements.

(IV) Project Staffing Plan

Key project staff will include:

1. Project Director. The Project Director will manage the high-level aspects of project and district relationship management while *TTO* is implemented in EPS. Based out of the New York City office, the Project Director will oversee both site-based and central New Classrooms staff.

This role will be filled by New Classrooms' Chief Executive Officer and Co-Founder, Joel Rose. Before founding New Classrooms, Joel was the Chief Executive Officer of *School of One*, a personalized learning initiative within the New York City Department of Education (NYCDOE). Prior to conceptualizing and leading *School of One*, Joel served as Chief Executive for Human Capital and as Chief of Staff to the Deputy Chancellor at NYCDOE. Joel has been

involved in education for more than 15 years, first as a fifth grade teacher in Houston and later as a senior executive at Edison Schools.

2. Internal Evaluation Liaison. Based out of New Classrooms' central New York office, the Evaluation Liaison will help streamline communications across multiple channels including the CPRE evaluation partner, the district, the Project Director, and school stakeholders.

This role will be filled by the Director of Assessment and Evaluation at New Classrooms, Jennifer Stillman, Ph.D. Jennifer works closely with Joel Rose to help visualize and present student and program performance data to external stakeholders, including private foundations, school and district partners and others in the policy and education communities. Most recently she has coordinated with professors from Teachers College, Columbia University who conducted an evaluation of *TTO* student MAP test data from the 2012-13 school year and with Jonah Rockoff and a team of researchers at Columbia Business School who conducted a Randomized Control Trial evaluation of the *School of One* program in New York City.³

3. Principal Investigator. The CPRE Principal Investigator will be Douglas Ready, a CPRE Senior Researcher and an Associate Professor of Education and Public Policy at Teachers College, Columbia University, where he teaches graduate courses in applied statistics and longitudinal data analysis. His research examines the links between education policy, social policy, and educational equity, with a particular focus on inequalities related to student race/ethnicity and social class. He is currently co-PI for the five-site CPRE evaluation of Pearson Corporation's *Common Core System of Courses*, and the PI of study of retention and performance outcomes among Teach for America teachers in Duval County (Jacksonville) Florida. Representative work has appeared in *Educational Evaluation and Policy Analysis*, *Educational Policy*, *Sociology of Education*, *American Educational Research Journal*, and

³ This evaluation was supported by an i3 grant awarded to the New York City Department of Education in 2011.

American Journal of Education, among other publications. He earned his Ph.D. from the University of Michigan.

4. Project Manager. The Project Manager will provide administrative and project management support to the Project Director and Evaluation Liaison and will assist in coordination efforts with CPRE, EPS and site-based personnel.

5. Site-based Personnel. Beginning in late August/early September of Project Year One, in addition to the central New Classrooms personnel described above, grant funds will support the activities of up to 10.5 New Classrooms site-based staff who will work in the 5 participating schools selected as project sites. These staff members include a part-time Regional Director, part-time School Partnerships Manager, Instructional Coach(es), Program Manager(s), and Operations and Technology Associate(s). The primary responsibilities of these New Classrooms site-based personnel are described in the attached job descriptions in Appendix F. New Classrooms staff dedicated to the project will receive extensive training both in the New Classrooms central New York office and in Elizabeth to ensure that all personnel are able to both implement the model with fidelity and adapt to local school and community conditions.

6. Central Support. New Classrooms staff located in the New York City central office will provide support during Phase One of the project for school selection and project planning, Phase Two of the project for central coordination and operation of the program, and during Phase Three of the project for additional support of evaluation-related activities. A description of the central New Classrooms teams and leadership is included in Appendix F.

In addition, EPS's Supervisor of Innovative Programming, Monica Martinez, will provide project oversight and assist in coordinating evaluation and implementation efforts for EPS (See Appendix F for her resume). New Classrooms will also work with the principal and other school leadership as well as Math department instructional staff at all partner schools.

Section D. Evaluation

(I) Key Questions and Goals

The formal evaluation of the proposed expansion of *Teach to One: Math* will be conducted by the Consortium for Policy Research in Education (CPRE), at Teachers College, Columbia University and led by Principal Investigator Doug Ready. The evaluation will comprise two primary components. Quasi-experimental methods will estimate the impact of *TTO* on student mathematics performance, while qualitative field work in the participating schools will identify elements of *TTO* that facilitate or impede student success. This work will be guided by a series of research questions, each of which are addressed by one of these two analytic streams:

Quantitative Impact Evaluation
<ol style="list-style-type: none">1. How does <i>TTO</i> impact student mathematics performance? (GOAL 1)2. Do students with particular academic or socio-demographic backgrounds benefit more or less from <i>TTO</i>?3. Does the program's potential impact strengthen or weaken over time as students and schools become more accustomed to the model?
Quantitative Impact Evaluation
<ol style="list-style-type: none">1. Was the program implemented as intended by New Classrooms? What characteristics of teachers and schools explain any variability in implementation across schools? (GOAL 2)2. To what extent does <i>TTO</i> alter instructional practice and the linkages between teaching and learning? Specifically, what roles do the key elements of the <i>TTO</i> model play, including the redesigned space and the individualized nature of instruction?3. How do students and teachers respond to <i>TTO</i> in terms of engagement and commitment, and to what extent does this vary across particular modalities within classrooms?

(II) Methods, Data and Outcomes

Quantitative Impact Evaluation

New Classrooms will identify five schools in Elizabeth, New Jersey that have the technology infrastructure to implement *TTO*, and are also willing to participate. The sample for the impact evaluation will include these five treatment schools as well as five matched comparison schools (described below). Samples in both treatment and control schools will include mathematics students in grades 5-8, with approximately 3 classes in each grade and 25 students in each class. Over the course of the three-year evaluation, the treatment and control groups will thus each contain approximately 2,250 students (75 students per grade, four grades

per school, five schools, plus a new cohort of fifth graders each in years two and three). See Appendix J.f for a full discussion of statistical power, including the minimum detectable effect size (MDES), related to this proposed sample and attendant analytic models.

To estimate the impact of *TTO* on student mathematics performance, we will employ a quasi-experimental approach—a comparative interrupted time series design (CITS; see Rubin, 1991; Winship & Morgan, 1999), also known as the difference-in-difference approach. This identification strategy will produce estimates of the unbiased effect of *TTO* on student mathematics performance, and will allow us to approximate the unobserved counterfactual: how much would *TTO* students have learned in the absence of the program? The CITS design has been used widely in education research and evaluation (see Bloom, 1999; Bloom, 2003; Shadish, Cook, & Campbell, 2002), and the researchers associated with this proposal have successfully applied it to similar research questions.

CITS is a regression-based longitudinal approach that employs observations before and after an intervention takes place, thus affording robust estimates of developmental trajectories for individuals or groups both pre and post intervention. The approach stems from two premises: that past experience is the best predictor of future experience, absent any systematic change, and; that multiple observations of past experience predict future experience better than a single observation (Bloom, 2003). Although differences in post-treatment trajectories can indicate treatment effects, trajectory inflections may also flow from other contemporaneous events unrelated to the treatment. By incorporating a statistically comparable untreated comparison group into the analyses, CITS approaches largely eliminate such concerns, as trajectories for both the treatment and control groups are estimated during the same time period. As a final step, trajectory inflections among the treated group are compared to those estimated for the group that has not received the treatment.

In order to identify the untreated comparison schools for these analyses, we will employ propensity score matching techniques (see Rubin, 1997). This approach will yield a comparison group that is as similar as possible to the “treatment” group on measured characteristics. Matching on the propensity score takes place in two steps. The first step estimates a logistic regression equation predicting the probability of selection into the program on the basis of these observable characteristics of program participants and nonparticipants. For each participating and nonparticipating school, the regression equation yields the estimated probability of being selected into the program based on the school’s academic and socio-demographic background characteristics. The second step then matches participating and non-participating schools on the basis of this probability, known as the propensity score.

The multi-level model used to evaluate the impact of the program on student performance in mathematics is a Linear Trend Model (Bloom 2003), which uses a linear approximation to model the pre-intervention relationship between test scores and time. This model assumes that in the time periods before the intervention, test scores increase or decrease linearly over time. Without the intervention, we would therefore assume that this trend would continue. Thus by examining the differences in performance trajectories over time (in both treatment and comparison schools), we will be able to: 1) measure the impact of the *TTO* program on student mathematics achievement; 2) determine whether the program is particularly effective for certain sub-groups of students (e.g., by socio-economics status or by initial performance level), and: 3) evaluate whether program effects increase/decrease with time.

The outcomes used for these analyses will include student-level test scores from the mathematics portion of the New Jersey Assessment of Skills and Knowledge (NJ ASK) and PARCC assessments, which will be introduced statewide in the 2014-15 school year. Because NJ ASK has been administered since 2008, we will be able to employ time series data for all

students back to their third-grade year. These data are linked longitudinally by unique student, teacher, and school identifiers, allowing us to study student growth over time. We will also have access to the full complement of student academic and socio-demographic data.

Qualitative Process Evaluation

In addition to measuring the impact of *TTO* on student mathematics performance, we will also examine program implementation, how it influences instructional practice, and how teachers and students respond to and interact with the program. We will begin by attending the “pre-launch” program simulations and teacher orientations in Spring of 2015. Once the program is fully implemented in Fall, 2015 we plan to conduct a series of classroom observations (in program schools only) over three years: one baseline observation prior to implementation (Spring 2015), followed by two sets of observations during each of the three full academic years of the evaluation period.

The researchers conducting this study will use the UTOP classroom observation protocol (CITE), which captures classroom instruction across four areas: classroom environment, lesson structure, lesson implementation, and lesson content. The protocol will be adapted somewhat to fit the unique format of the *TTO* program. Following the development of the *TTO* model within classrooms will help us to determine the extent to which the program has been implemented with fidelity and whether this varies by school/teacher. Further, tracing the evolution of teaching practices (including the use of various modalities) and learning within the same classrooms pre- and post-*TTO* will allow us to better evaluate the extent to which the program promotes instructional change and will highlight particular practices that are most dramatically altered by the intervention (and those that are most engaging to students), thus shedding light on program elements that potentially impact student learning.

In addition to the classroom observations we will also conduct a series of initial semi-structured teacher interviews in Spring 2015 and then twice per year during the academic years (fall and spring). Baseline interviews (with a representative sample of four teachers per *TTO* school) will explore to what extent teachers have used personalized instruction in their classrooms prior to *TTO*, their view and expectations for the anticipated program, and potential challenges the program may pose. Interviews conducted throughout the school year will focus on teacher reactions to the technology-assisted personalized instruction model. These interviews will explore teacher perceptions of the efficacy of the *TTO* program, their views of the level and kind of personalization generated for students, their evolving role as a teacher in a classroom where student instruction is largely personalized and prescribed through the help of technology; their views on which elements of the program most impact the successes and limitations of the initiative—and why.

All qualitative data (i.e., interview and classroom observation data) will be analyzed through the qualitative data analysis program, *Atlas.ti*, which will facilitate the coding process in which themes across data sources are identified and grouped. Based on our research questions, the research team will work iteratively and collectively to develop thematic categories to guide analysis.

(III) Evaluation Outcomes and Resources

Through the above described evaluation, the proposed project aims to demonstrate a statistically significant positive impact on the New Jersey state mathematics exam test scores of students participating in the program relative to students in the control group. We have allocated approximately 10% of total project costs to support the evaluation. Please see the logic model in Appendix D for more information on the anticipated evaluation and project outcomes and Appendix J.g for CPRE personnel and resources supporting the evaluation.