USDOE EIR Early-Phase (CFDA 84.411C) Submission
PML Family Playlists

Table of Contents

A. SIGNIFICANCE

A.1. Promising new strategy. This project will address the problem of algebra readiness among students with high needs—a problem of great magnitude and severity across the United States and one that has been described as a civil rights issue because it affects access to higher education, economic mobility, and full citizenship.[1] (We define "high-need students" as students having a family income level that qualifies for the federal Free or Reduced-Price Lunch (FRPL) program; we use the term "underserved" to refer to these students.) Algebra readiness is developed in grades 4 and 5, and, in 2019, a startling 74% of our nation's 4th graders who are underserved were not proficient in math.[2] The average level of math proficiency has historically dropped between grades 4 and 5,[3] and the impact of COVID-19 is expected to exacerbate this issue among students who are underserved given the disproportionate effects of learning interruptions on math progress generally (+0.4 for students from wealthy families and -15.5 for students from low-income families from January 2020 to May 2021).[4]

PowerMyLearning (PML)'s project—called "Family Playlists: Improving High-Need Students' Academic Performance and SEL In Response to COVID-19"—will develop and evaluate an intervention designed to raise the quality of teacher and family practices around math homework in grades 4 and 5 (the algebra-readiness years) for students who are underserved. This project represents an exceptional approach to Absolute Priorities 1 and 4 and addresses Competitive Preference Priorities 2 and 3.

Our project design builds on established research-backed premises in three major areas: (1) students teaching others ("learning by teaching"), which has evidence of improving comprehension and the development of a deeper and more persistent understanding (Chase et al 2009[5], Kobayashi 2019[6]); (2) teachers supporting students' psychological needs for autonomy,

competence, and relatedness ("self-determination theory"), which has been shown to facilitate students' academic performance, social-emotional learning (SEL), and well-being (Ryan & Deci 2000[7], Niemiec et al 2009[8]); and (3) families participating in learning activities at home, a "family engagement" strategy that has been shown to improve children's academic success (Flamboyan 2011[9], Van Voorhis 2011[10]). Our proposal is an exceptional approach to AP1 and AP4 (See Figures A.1 and A.2).

Figure A.1

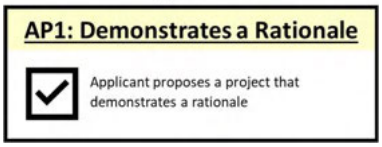


Figure A.2

We focus this project on teacher and family practices around homework because it is a part of the learning process that can have a big effect on student achievement (as large as 0.8 standard deviations (SD)).[11] Given the magnitude of instructional loss due to COVID-19, it is likely that the best solution will be a set of interventions that can be implemented concurrently. Homework interventions are well situated to be in that set because they are additive to classroom instruction interventions; when a homework and a classroom instruction intervention are implemented concurrently, they have no overlap and add up as expected (e.g., "Homework Intervention" (0.8 SD) + "Classroom Instruction Intervention" (0.7 SD) = 1.5 SD). In addition, homework prior to the pandemic was not of high quality: teachers spent an average of 15% of their weekly school-related time on homework, and 76% rated the quality of homework assigned by their school as "less than excellent."[12] Finally, homework can support a COVID-related change to education that parents want to keep –having a window into their child's learning.[13]

The promise of our new strategy rests on the assumptions that families from underserved communities will have access to smartphones and will be willing to engage in the program. There are common misconceptions about this we want to address right up front: (1) Smartphone

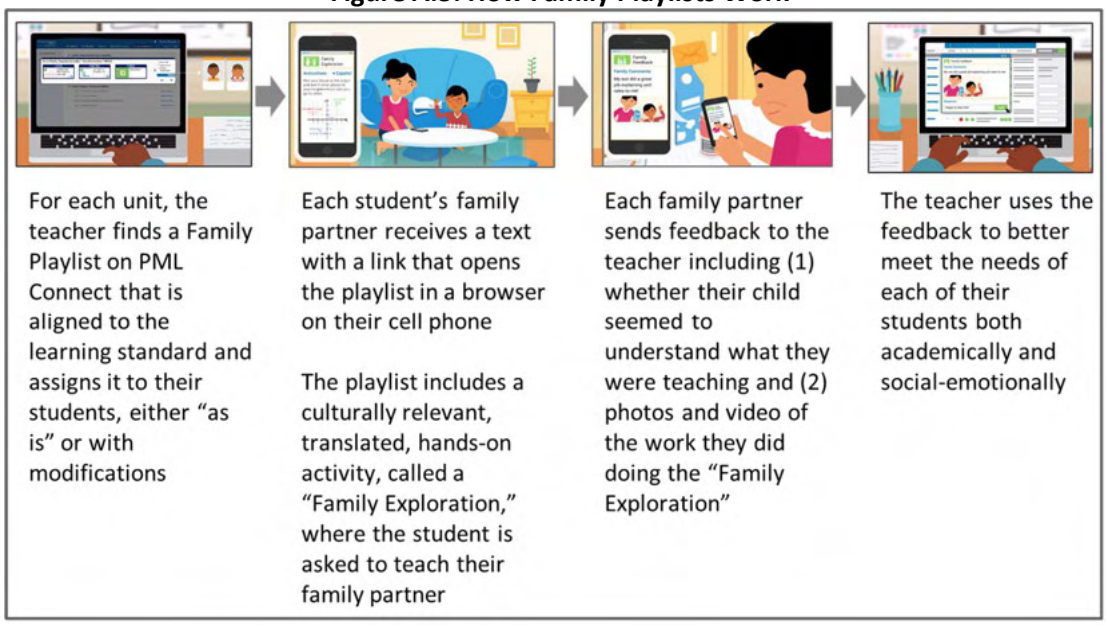
access does not pose a threat to the promise of our proposed strategy. A study released by the New America Foundation in June 2021 found that, for families with children ages 3-13 living under the poverty level, **96% have smartphones and 99% have some form of Internet access**. This finding has enormous implications and may take time for the public to metabolize, given that tech access has been viewed as a barrier for so long. (2) The willingness of families from underserved communities to participate also does not pose a threat. This erroneous perception likely derives from our country's history around class and race and the way these families are depicted in the media. While we plan to dive into the details of Family Playlists program later, we want to share here that a 2017 pilot with a school located in a high-poverty neighborhood in New York City saw a full 91% of grade 6 families participate in this homework intervention (See Appendix J.2). Even during the difficult time of COVID-19, more than 93% of families said they enjoyed doing the homework. As stated by one parent: "My child's teacher started assigning them [Family Playlists] during the beginning of our at home school order in March [2020]. I really enjoyed it because I was a bit overwhelmed as a mom of three small kids with homeschool. These lists were easy for us to do together, and my daughter enjoyed them."

PML, in partnership with Miami-Dade County Public Schools (M-DCPS), submits this application for an Early-Phase EIR grant designed to improve algebra readiness for students who are underserved. [See more about M-DCPS in the Needs section, B.3.] Abt Associates (Abt) will be the independent evaluator and [redacted] from Harvard (the nation's leading expert on family engagement and author of one of the most cited publications on the topic from the U.S Department of Education) will serve as an advisor. This project includes teacher professional development (PD) and an innovative mobile technology tool called Family Playlists. Over the last decade, PML has developed strong expertise in PD —impacting thousands of teachers

nationwide. In addition, Family Playlists were recognized as a 2021 Top Ed Tech Product by the Future of Education Technology Conference and were featured in the *New York Times* in 2018 (See Appendix J.3).

To ensure all stakeholders (teachers, students, and families) get the most out of using Family Playlists, our PD will focus on building teacher capacity in SEL, implicit bias, and data-driven decision making in addition to training on how to use the technology. Family Playlists are homework assignments that ask students to teach a family member (e.g., a parent or caregiver) what they are learning in school and then that family member is asked to provide feedback to the teacher about the experience. Teachers assign a Family Playlist at the end of each unit via PML Connect (PML's online learning platform). It is then delivered to families' cell phones in more than 100 languages. See Figure A.3 for how Family Playlists work.

Figure A.3: How Family Playlists Work



PML creates *Family Explorations* to ensure suitability for all families, regardless of the resources they may or may not have at home (e.g., homes that do not have a ruler). PML leverages its expertise in rigor and coherence throughout the process. Family Playlists are available in 100+ languages.

As seen above, there are two core components of a Family Playlist. The first is the **Family Exploration**, which allows the student to be the expert and actively drive their own

learning. Student are put in the role of the teacher and asked to walk their family partner through a fun, culturally relevant activity. Family Explorations are offline activities around core math skills that might, for example, ask a student to teach a family partner about the coordinate plane by taking a piece of paper and together drawing a grid and axes, plotting their home at the origin (0,0), and then plotting other places of importance in their neighborhood. "Learning by teaching," referenced earlier, has evidence of improving student outcomes because students are able to engage with academic material more deeply. In addition, students do not use the technology passively or for drill-and-practice. Rather, they use it in a robust and creative way to increase their mastery of math content, improve their growth mindset (leading to greater persistence), and strengthen feelings of agency, competence, and family- and teacher-relatedness.

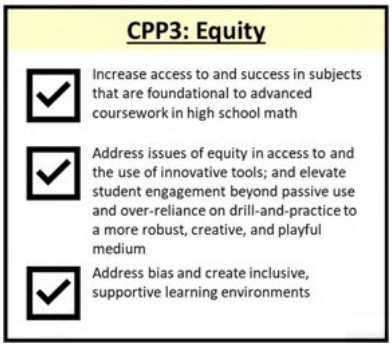
The second core component is **family-teacher feedback**. Family partners use their phone to take a photo or video of what they have done with their child (e.g., the coordinate plane they have drawn) and share it with the teacher. They also provide a sentence or two around how confident their child was when teaching and share any struggles. Our PD, focused on SEL and implicit bias, supports teachers to use this feedback to awaken to biases they might hold; to use this "window" into students' home lives and lived experiences to strengthen teacher-student relationships (e.g., "In the photo of you holding up the coordinate plane you drew, I noticed a puppy in the background. I love puppies."); and to create more inclusive and supportive learning environments. Finally, our PD on data-driven decision-making builds teachers' capacity to use family feedback to differentiate instruction and meet students' academic needs.

Even though our Family Playlists program is still in development, we have been able to conduct a few pilots that have shown promising results on academic achievement and SEL for students who are underserved. A quasi-experimental study in two NYC schools showed that our

Family Playlists program had a significant positive impact on grade 7 math achievement (see Appendix J.4). A 2021 study in one Los Angeles school found that our Family Playlists program had a statistically significant positive impact on SEL outcomes, including intrinsic motivation, perceived competence, and perceived choice, with positive SEL impacts especially pronounced for English Language Learners (see Appendix J.5). Student demographics were 66% Hispanic; 30% African American, 7% ELLs, and 93% student in poverty for the first study and 98% Hispanic, 21% ELLs, and 98% students in poverty for the second. As seen from this section, this project addresses CPP2 and CPP3 (see Figures A.4 and A.5)

Figure A.4

Figure A.5



A.2. Dissemination Plan. PML's Communications Department will disseminate the results of this project in ways that enable others to use the information and strategies. The team has experience building awareness of research findings via case studies, blog posts, videos, and practice guides. To share findings with researchers, we will work with Abt to submit to peer-reviewed journals on math learning and instruction (e.g., Education Studies in Mathematics) and propose conference presentations at events for math researchers (e.g., National Council of Teachers of Mathematics).

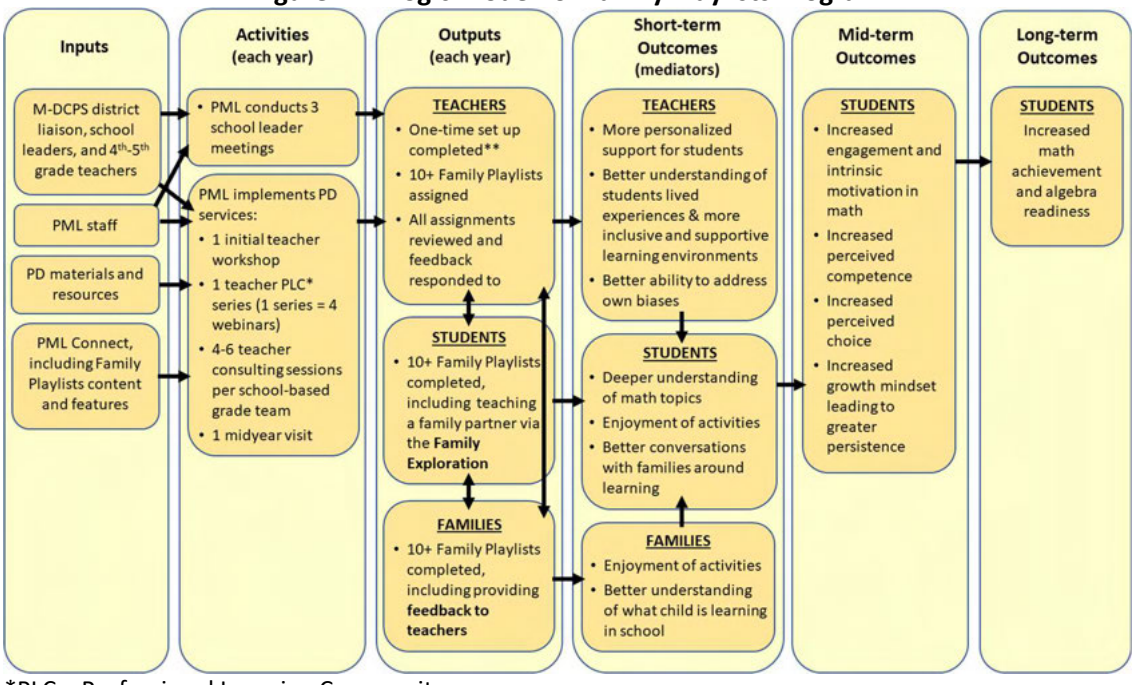
To disseminate learning widely, we will offer content, including practice guides, for download on our website (our website provides a user-friendly interface and receives an average of more than 20,000 monthly users). We will present at conferences and also host our own webinar series for district and state leaders, thereby building on our strong track record as a

convener. For example, in August 2021, PML ran a webinar in partnership EdWeek that resulted in 2,307 registrants (230% higher than the EdWeek average) and 890 live event attendees (296% higher than average). Finally, we will conduct media outreach to influential outlets that have written about our work in the past (e.g., EdWeek, THE Journal, EdSurge, and the National PTA).

B. PROJECT DESIGN

B.1. Conceptual framework. The logic model for PML's Family Playlists program is in Figure B.1 below and Appendix G. The crux of the logic model is the Family Exploration and the family-teacher feedback (see Section A.1 for a descriptions of these components). As mentioned in Section A.1, neither smartphone access nor family willingness to participate pose a threat to this logic model. Studies conducted of a few pilots have shown promising results on some logic model outcomes (e.g., enjoyment of activities; increased engagement and intrinsic motivation; increased perceived competence and choice; and increased math achievement).

Figure B.1: Logic Model for Family Playlists Program



*PLC = Professional Learning Community

** Set up includes family outreach, creating student and family accounts, and delivering a launch lesson

B.2. Goals, objectives, and outcomes. PML's three major goals for this project are: (1) Drive Impact on Algebra Readiness: Teachers in M-DCPS implement the Family Playlists program with fidelity (herein defined via the logic model as participating fully in the PD shown in the activities column, assigning Family Playlists with the appropriate frequency, and using the family feedback to accomplish the short-term outcomes). These steps should drive student readiness for algebra (including mindsets and achievement) among 4th and 5th graders who are underserved; (2) Design a Scalable Model: Refine a tech-enabled PD model that supports high-fidelity teacher implementation of the Family Playlists program, and implement product enhancements that eliminate barriers and enable widespread use by teachers, families, and students; and (3) Conduct a Rigorous Evaluation: Evaluate the impact of the Family Playlists program using methods that meet WWC standards without reservations. This project will thereby strengthen the evidence base around academic achievement and generate new evidence around SEL outcomes we have not yet studied, such as increased growth mindset. See Figure B.2 for further details.

Figure B.2: Family Playlists Program: Project Objectives and Outcomes (by Goal)

Objectives*	**Outcomes**
Goal 1 – Drive Impact on Algebra Readiness: Teachers in M-DCPS implement the Family Playlist program with fidelity, driving student readiness for algebra (including mindsets and achievement) among 4th and 5th graders who are underserved.	
1. Improve teacher practice around homework where students teach others	• 80% of teachers will report improved practices on PML Teacher Self-Assessment Tool (TSAT), i.e., understanding of students as whole children, personalized support given to students
2. Increase family participation in learning with their child at home	• 75% of families complete the "Family Feedback" section of Family Playlists
3. Increase student SEL outcomes (e.g., growth mindset) and academic achievement in math	• 80% of students will demonstrate stronger growth mindset compared to control, as measured by Mindsets, Essential Skills, and Habits assessment tool (MESH)**(target effect size=.24 SD) • 80% of students will demonstrate higher achievement compared to control, as measured by 4th and 5th state math test scores (target effect size=.24 SD)
Goal 2 – Design a Scalable Model: Refine a tech-enabled PD model that supports high-fidelity teacher implementation of the Family Playlists program and make product enhancements that eliminate barriers and enable widespread use by teachers, families, and students.	

4. Refine PML's cost-efficient, tech-enabled PD model and Family Playlists product to support teachers in implementing program with fidelity	• 80% of teachers will assign Family Playlists with each curricular unit (at least 10 times/year) demonstrating that we have addressed barriers to use and thereby set ourselves up for scale
5. Refine PML's Family Playlists product to eliminate barriers to widespread use	• 75% of students and their families will participate in Family Playlists demonstrating that we have addressed barriers to use and thereby set ourselves up for scale
Goal 3 – Conduct a Rigorous Evaluation & Disseminate Learnings: Evaluate the impact of the Family Playlists program using methods that meet WWC standards without reservations and disseminate learnings.	
6. Conduct RCT with Abt to analyze impact of Family Playlists program	• 100% of study findings of the Family Playlist program will meet WWC standards without reservations
7. Share knowledge gained from studying teacher and family homework practices implemented in this project	• Learnings shared via 15 news articles and/or blog posts, 10 speaking engagements, and 800 downloads of resources from PML's website

* See performance measures and timelines for each objective in the Management Plan in Section C.

** See Section D for more details on Mindsets, Essential Skills, and Habits assessment tool (MESH)

Project Design: PML will use the first one-and-a-half years of the project (from January 2022-July 2023) as a ***Formative Phase*** to finalize the draft implementation fidelity measures with input from M-DCPS leaders and Abt (See Appendix J.8) and to refine key aspects of the program model. This phase will focus on optimizing both the Family Playlists product and the predominantly remote delivery model for PD, to ensure successful teacher implementation of the Family Playlists program and promote the desired teacher-student-family interactions that will lead to improved student outcomes. This formative work will happen at five M-DCPS Title 1 schools (these schools will not be involved in the impact study later in the grant period) and will focus on small tests of change to better understand and optimize outputs and short-term outcomes (see continuous improvement section, C.4, for more details). The second and third full school year of the project (August 2023-July 2025) will be the ***Evaluation Phase***. During this time, PML will implement the optimized model with fidelity across 12 Title 1 M-DCPS schools while working with Abt to conduct a rigorous RCT evaluation designed to meet WWC standards without reservations (as described in Section D). The final full school year of the project (August 2025-June 2026) will be the ***Delayed Control Phase*** when we will deliver delayed treatment to

the 12 control schools in the study. We will also use this period to finalize the evaluation. We will disseminate learnings throughout the project with a major push on dissemination from July 2026-December 2026, once we receive our final report from Abt.

B.3. Needs of the target population. As described earlier, the Family Playlists program focuses on students with high needs: those whose family income level qualifies them for the federal FRPL program. Nationwide, almost three-quarters of 4th graders who are underserved are not proficient in math and the average level of math proficiency drops as students advance to grade 5. The pandemic is predicted to exacerbate this issue further.

Addressing the challenge of improving mathematics proficiency is a top priority in our design-partner district, Miami-Dade County Public Schools (M-DCPS). As the fourth largest school district in the United States, M-DCPS serves 347,069 students,[14] of which 72% are Hispanic.[1] Seventy-three percent (73%) of its elementary students are high need.[15] COVID-19 has had a strong negative impact on M-DCPS students who are underserved. In both grades 4 and 5, students experienced a 20 percentage point drop in math proficiency from 2018-19 to 2020-21 (the test was not administered in 2019-20). This drop was 65% to 45% in grade 4 and 60% to 40% in grade 5.[16] M-DCPS's leaders look to this program as one in a set of interventions that can be implemented concurrently with other classroom instruction initiatives. (As described earlier, homework interventions are additive to classroom instruction interventions.)

We will work with five Title 1 M-DCPS elementary schools in the ***Formative Phase***, 12 new Title 1 elementary schools in the ***Evaluation Phase*** and another 12 new Title 1 elementary schools in the ***Delayed Control Phase***. At PML, we have been working with students and families from underserved communities for more than two decades and have a deep understanding of how to meet their needs. For example, here are a few principles we adhere to as

we design products and supports: (1) We design for cell phones and not other devices (as described earlier, 96% of families with children ages 3-13 living under the poverty level have smartphones); (2) We make Family Playlists available in English and Spanish as well as other languages (in M-DCPS, 72% of students are Hispanic, and, nationally, about 23% of school-age children speak a language other than English at home);[17] (3) We have students teach content to their family partners (not the other way around) because many adult family members lack the content knowledge to feel confident helping with schoolwork and because students learn better when teaching their family and enjoy it:

At PML, we also have been working with teachers for more than a decade and have a strong understanding of their needs as well. We know from our own experience that teachers need support helping their students feel autonomy, competence, and relatedness. We know they think it's important to student success that families be involved in their children's learning but need PD and tools to make this happen. For example, a Scholastic survey found that 74% of teachers agree that they need help engaging the families of their students in support of children's learning[18]. We also know that there is growing evidence that, while teachers want to support strong student outcomes, a teachers' implicit bias can play a role in how they interact with students and can have a deleterious effect on student outcomes.[19]

C. RESOURCES AND MANAGEMENT PLAN

C.1. The adequacy of the management plan. The **Management Plan** below outlines how PML plans to achieve the goals and objectives of this project.

[redacted]

[redacted]

[redacted]

Figure B.4: Family Playlists Program: Management Team and Responsibilities

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C.3. Costs. The costs of this program are reasonable in relation to its objectives, design, and potential significance. PML has an extensive history of budgeting for large grants and meeting outcomes within allocated budgets. Based on experience with similar research projects and detailed deliverable analysis for this project, PML developed a zero-based budget based on actual cost estimates for each budget category; for example, personnel and contractor hours are projected based on work to be performed on project deliverables and will be tracked and monitored accordingly. The Budget Narrative justifies each cost component in direct relation to project success and provides explanations of procurement procedures and cost reasonableness. Also note that the evaluation contractor Abt has conducted or is conducting evaluations for seven (7) EIR grants, and the evaluation budget proposed in this application is aligned with its previous budgets.

The Family Playlists program is a scalable and cost-effective intervention. The project budget consists largely of upfront costs related to program development, research, and dissemination. [redacted] PowerMyLearning has researched and analyzed previously awarded EIR grants from 2020, 2019, and 2018 and found that these costs are reasonable compared to similar projects implemented at scale.

C.4. Feedback and continuous improvement plan. Since launching our Family Playlists program, we have put in place a formal continuous improvement process as part of our five-year *Strategic Evidence* that PML developed with Project Evident. PML was selected as the only education non-profit and one of only three nonprofits overall for Project Evident's first cohort in 2017. Project Evident has told us that they selected organizations based on their "evidence-focused leadership; organizational readiness, including having base evaluation staff and data capacity in place; opportunity for scale; and potential for field building impact."

PML has intentionally planned a one-and-a-half-year formative period of smaller-scale implementation (five schools) to focus on program and product refinement prior to starting the impact study. During this period, we will work with Abt identifying specific areas for improvement, such as changes to the PD model (e.g., modifications in the sequence of teacher workshops), changes to the prompts given to families to support their participation, and changes to the frequency of teacher assignment of Family Playlists. For the areas identified, we will develop alternative ways to implement the program and identify data we can track to determine which alternative produced better outcomes. Potential data sources include teacher responses from surveys, focus groups, and interviews regarding their instructional practice and student engagement outcomes; responses from coach questionnaires; data on PD implementation stored in Salesforce, real-time implementation data captured by PML Connect (which will surface the family and student voice); and user experience data gathered in JIRA. These small tests of change will inform modifications needed prior to the RCT and enable us to test and understand each component of our logic model. This work will be led by PML's EIR Project Director with support from the Manager of Program Research and Operations and the broader Management Team, which will meet biweekly throughout the grant period.

D. PROJECT EVALUATION

D.1. Addressing WWC Standards *without* Reservations. *Overview and research questions.* Abt Associates, a highly qualified evaluation firm with a long history of conducting rigorous impact and implementation studies, will conduct an independent evaluation of the PML Family Playlists project. The evaluation will include a ***Formative Phase*** (from January 2022-July 2023), when PML will engage in continuous improvement research and theory-building for the intervention model and finalize school recruitment and Abt will finalize the evaluation design and pilot measures in the social-emotional learning (SEL) domain (e.g., growth mindset), which mediate student achievement outcomes.

The evaluation will also include an ***Evaluation Phase*** (August 2023-July 2025), in which PML will implement the fully developed Family Playlists program in classrooms in grades 4 and 5, and Abt will conduct a school-level, cluster random assignment study to assess the impact of the Family Playlists program on student outcomes identified in the logic model (see Figure B.1). The impact study is designed to meet ***What Works Clearinghouse (WWC) Standards without Reservations***. During the ***Evaluation Phase***, Abt will conduct an implementation study to (a) provide performance feedback and periodic assessment of the extent to which the key components of the intervention (see "Activities" and "Outputs" in the logic model, Figure B.1) were implemented with adequate fidelity; (b) document teacher, student, and family needs and the mediating changes that are hypothesized to lead to student outcomes; and (c) summarize how the Family Playlists program addresses those needs and is a replicable educational strategy.

The key research questions for the evaluation are listed on the next page in Figure D.1:

Figure D.1: Research Questions
Impact Study Research Questions: Confirmatory Analyses
1. What is the impact of one year of the Family Playlists program on math achievement of grades 4 and 5 students in treatment schools compared to business-as-usual in control schools?
2. What is the impact of one year of the Family Playlists program on the growth mindset of grades 4 and 5 students in treatment schools compared to business-as-usual in control schools?
3. What is the impact of two years of the Family Playlists program on math achievement of grade 5 students in treatment schools compared to business-as-usual in control schools?
4. What is the impact of two years of the Family Playlists program on the growth mindset of grade 5 students in treatment schools compared to business-as-usual in control schools?
Implementation Study Research Questions
5. What is the level of fidelity of implementation of the Activities and Outputs in the Family Playlists program model in each of the two years of the impact study? Does fidelity of implementation vary by grade or by teacher characteristics?
6. What are the strengths or challenges that treatment teachers experience when implementing the Family Playlists program? What changes do teachers recommend to facilitate successful scaling of the program to broader groups of teachers?
7. Do teachers implementing the Family Playlists program report increases in positive interactions with students' families around learning, provision of personalized support for student learning, and increased understanding of the students as whole children?
8. Do families participating in the Family Playlists program report increases in positive interactions with their children, enjoyment in their involvement in their children's learning, and increased understanding of what their children are learning in school?
Questions about Implementation and Outcomes
9. Is there a relationship between the fidelity of implementation of the Family Playlists program and the outcomes for students?

Evaluation design that meets WWC Evidence Standards without reservations. The school-level cluster randomized design will, when well implemented, meet the WWC standards *without reservations*. We will assign schools in late spring of Year 2 of the grant (2023). A pool of 24 interested M-DCPS elementary schools serving a high percentage of students who are underserved will be stratified by school size and then randomized to treatment or control conditions. In each treatment school, all grades 4 and 5 teachers will receive training on and access to Family Playlists and PML's PD in the summer of 2023 and throughout the 2023-24 school year, while control teachers will continue with business-as-usual.

Sample, consent, and data collection methods that meet WWC standards. In Year 1, the students in the study sample will be defined as all grades 4 and 5 students who are enrolled in the

schools in the fall. (Joiners no longer pose a risk of bias.[2]) Parent consent to participate in the study will be obtained for students in the fall. In Year 2, the study will follow the grade 4 students who return to these schools in grade 5. Figure D.2 shows the expected sample size.

Figure D.2: Projected Sample Sizes by Year				
	2021-22 School Year (4th & 5th grades—1-year impacts)		**2022-23 School Year (grade 5 only—2-year impacts)**	
	T	**C**	**T**	**C**
Schools	12	12	12	12
Classrooms[a]	36 Grade 4 36 Grade 5 72 total	36 Grade 4 36 Grade 5 72 total	36 Grade 5	36 Grade 5
Students[b] (estimated 20/class)	720 Grade 4 720 Grade 5 1,440 total	720 Grade 4 720 Grade 5 1,440 total	648 returning Grade 5 students	648 returning Grade 5 students

[a] We assume 3 classrooms per school per grade.
[b] We estimate 20 students per class in Year 1 and 18 students per class (10% estimated attrition) in Year 2.

Eligible outcomes that meet WWC standards. One goal of this evaluation is to strengthen and extend the evidence of the impacts of the Family Playlists program. Therefore, the key outcomes for students are math achievement (long-term outcome) and behaviors related to SEL (mid-term outcomes) like increased growth mindset leading to greater persistence. These measures meet the WWC outcome standards for reliability and validity[3] (see Figure D.3). The proposed achievement measure is the Florida state math achievement test. The proposed measures of growth mindset and persistence are the MESH, developed by researchers at MIT, and an evaluator-developed student self-report survey. The measurement of SEL is a rapidly growing field, and during the ***Formative Phase*** we will continue to look for other new measures as well as piloting potential measures with PML's partner schools.

[2] When schools are randomly assigned to conditions, students who join the school after random assignment are *not* considered to pose a risk of bias; see page 10 of the current WWC review protocol (January 2021; found here).
[3] See page 8 of the current WWC review protocol.

Figure D.3: Measures and Timing of Student Outcome Data Collection				
Domain	**Measure**	**Reliability/ Validity**	**Timing of Baseline data collection**	**Timing of Outcome data collection**
Math Achievement	State administered math test	Standardized test	Spring 2023 (grade 3 and grade 4 test scores)	Spring 2024 (grades 4 and 5 test scores) Spring 2025 (grade 5 test scores)
Social Emotional Learning	Teacher rating of Mindsets, Essential Skills, and Habits (MESH) and student survey on persistence	IRR = .50 Face validity established	Fall 2023 (beginning of 4th and 5th grade)	Spring 2024 (end of 4th and 5th grade) Spring 2025 (end of 5th grade)

Abt will acquire linked student demographic and pretest math achievement data from M-DCPS for students in treatment and control schools at each time point, and teachers will be asked to complete the MESH on study students using a secure online platform managed by Abt. All data will be stored on Abt's secure data storage servers.

Analytic approach that meets WWC standards. The one- and two-year impacts of the Family Playlists program will be estimated using a 2-level regression model that includes a treatment indicator at the school level (the level of assignment), block terms for school size, and accounts for clustering of students within schools. All schools and students will be included in the analysis, regardless of actual implementation fidelity or dosage (an intent-to-treat analysis). The one-year impact analysis will combine age-adjusted test scores for grades 4 and 5 and include a grade dummy variable. Baseline measures of the outcomes will be included as covariates to increase the precision of estimated treatment effects. Although overall and differential attrition rates are expected to be low, if the study has high attrition as defined by the WWC, Abt will establish that the treatment and control students are equivalent on baseline measures of the outcomes. Inclusion of the baseline measures in the impact model will serve as an appropriate adjustment should the baseline differences exceed .05 SD but are no more than .25 SD, as required by the WWC to meet standards with reservations. Additional student

covariates to be included in the models include gender, age at baseline, eligibility for FRPL, race/ethnicity, English Language Learner status, and special education placement. See Appendix J.6 for the statistical model describing the analysis approach. Abt's power analysis shows that with the proposed sample, the study will be able to detect an effect size of 0.24 (see Appendix J.7 for more details).

D.2. Performance feedback and periodic assessment of progress. Abt and PML will collaborate during the ***Formative Phase*** to monitor project implementation activities and outputs as well as progress toward short-term outcomes for teachers and families so that PML can make mid-course corrections if needed. Fidelity of implementation will be assessed by defining a set of quantitative indicators for each key component in the logic model and generating an overall implementation score; in partnership with PML, Abt will establish a threshold for each key component that defines adequate implementation fidelity in the study sample. Fidelity will be assessed during each year of the ***Evaluation Phase*** for all treatment schools and will serve as important feedback to the grantee on challenges to full implementation and where additional teacher training and feedback are needed. Primary sources of fidelity data will include PML program records and PML Connect data (see Appendix J.8 for a draft fidelity measure). [redacted] For changes in teachers, we will use the teacher self-assessment tool, which will be administered by PML, to capture teachers' perceptions of their instructional practices (i.e., understanding of students as whole children and personalized support given to students) and growth in key domains related to the implementation of the Family Playlists program (i.e., mediators), as well as perceptions of the intervention and strengths and

challenges with implementation. See the feedback and continuous improvement plan in section C.4 for more detail.

D.3. Increase in understanding of educational problems and effective strategies. Our evaluation strategy will increase our understanding of the algebra readiness problem among students with high needs—a problem of great magnitude and severity across the United States. It will also increase our understanding of broader educational problems that result from the learning environments that exist in many underserved communities, such as (a) students interacting at only a surface level with academic content; (b) students feeling unengaged and uninspired because their autonomy, competence and relatedness is not nurtured; or (c) families' being pushed aside—something they are deeply worried will happen post-pandemic.

Documenting the effectiveness of the Family Playlists program, along with the facilitators and barriers to implementing it, will help us identify strategies to address the problems described above. This project will also help the field begin to consider how homework that offers student an opportunity to teach others and to feel autonomy, competence, and relatedness to their families and teachers could improve student outcomes in other subjects and grades and can influence future practice.

We are committed to leveraging PML's Communications Department to disseminate the results of this project in ways that enable others to use the information (see A.2). We hope the evaluation reports will contribute to the academic and policy literature in the fields of learning by teaching, self-determination theory, and family engagement. We also plan to broadly disseminate detailed practice guides aimed at supporting educators to replicate the strategies in their own classrooms.