

Actionable Evidence Initiative Case Study

Examining Family Playlists' Impact on Student Social Emotional Learning and Science Mastery through Short-Cycle RCTs

Authors: Dr. Julie Martin and Elisabeth Stock, PowerMyLearning Contributor: Jillian Frediani, Alliance College Ready Middle Academy #12



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PROJECT

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Led by Project Evident with funding from the Bill & Melinda Gates Foundation, the Actionable Evidence Initiative seeks to understand and remove barriers to building evidence that is equitable, useful, credible, and relevant for practitioners as they aim to improve the outcomes of students who are Black, Latino/a/x, or experiencing poverty. Please visit https://www.projectevident.org/actionable-evidence to learn more, join our network, and find partners interested in working together on actionable evidence solutions.

Actionable Evidence in Education Cases

This case is one in a series commissioned by the Actionable Evidence Initiative in 2020 and 2021. (Cases are published on the Project Evident <u>website</u>.) The series illustrates how researchers, evaluators, practitioners, funders, and policymakers across the country are exemplifying principles of the Actionable Evidence framework. It profiles a range of settings, actors, learning questions, methods, and products, unified by a commitment to practitioner-centered, timely, practical, equitable, and inclusive evidence building. Each case describes the origins, development, and results of a research or evaluation project, along with the authors' reflections on their experiences. Our hope is that these cases will provide both inspiration and practical guidance for those interested in generating and using evidence that leads to better and more equitable outcomes for youth and communities.



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Actionable Evidence in Education: Examining Family Playlists' Impact on Student Social Emotional Learning and Science Mastery through Short-Cycle RCTs

Authors: Dr. Julie Martin and Elisabeth Stock, PowerMyLearning Contributor: Jillian Frediani, Alliance College Ready Middle Academy #12

Executive Summary

In the spring of 2021, the national education nonprofit PowerMyLearning conducted a research study to examine the impact of Family Playlists on social emotional learning (SEL) outcomes and academic mastery. Family Playlists are interactive digital learning assignments that invite families into the homework process and empower students to learn by teaching their family members what they are doing in school. PowerMyLearning's Theory of Change posits that Playlists have a positive impact on academic mastery and SEL skills. While we had already found significant positive impact of Family Playlists on state math test scores, we had only anecdotal evidence of impact on SEL.

With the generous support of the Leon Lowenstein Foundation, we partnered with the 6th grade science teacher at a Los Angeles public charter school to carry out the research described in this case. PowerMyLearning staff supported the teacher in assigning Family Playlists aligned with her science curriculum. This allowed the team to conduct short-cycle randomized control trials (RCTs) designed to examine the impact of individual playlists vs. standard solo homework assignments on student learning outcomes. By conducting a "trial run" and two RCT cycles, we were able to generate valuable insights into how users (teachers, students, and family members) experienced Family Playlists and generate two rounds of impact data within just a few months. The short-cycle nature of the research allowed us to make timely improvements, and the RCT design allowed for causal attributions about Family Playlists' impacts.

Results from this research showed that, compared to standard solo homework assignments, Family Playlists had a statistically significant positive impact on key SEL outcomes related to student agency, including intrinsic motivation, perceived competence, and perceived choice. Results showed that the positive SEL impacts of Family Playlists were especially pronounced for English Language Learners.



About the Project

Origins

Family engagement is a powerful driving force for student success. Many studies show that students with family members actively involved in their education earn higher grades and test scores and show greater engagement in schoolwork.¹ Research suggests that family engagement has the greatest impact on students when learning takes place outside of the school environment and families engage in learning activities with their children at home.^{2,3} Yet, as noted in Karen Mapp's Dual Capacity-Building Framework for Family-School Partnerships, many teachers receive minimal training on how to effectively engage families, and they need support and tools to connect family engagement to students' learning and development.⁴

Student agency, a social emotional skill, is also a critical driver of student learning and growth. Over the past few decades, educators and researchers have come to realize the central role that agency plays in students' academic success. In her book, *Culturally Responsive Teaching* & the Brain (2015)⁵, Zaretta Hammond argues that the goal of culturally responsive teaching is to develop independent learners, and that inequity in schools disproportionately leads students of color and English language learners to become dependent learners. Dependent learners are less likely to learn content deeply because they are not given the opportunity to engage in the complex cognitive work that leads to deep processing of information. Thus, encouraging students to be leaders of their own learning is a central aim of culturally responsive teaching and an important component of addressing inequities in students' academic outcomes.

PowerMyLearning (PML) is a national education nonprofit that advances educational equity and accelerates students' social emotional learning (SEL) and academic achievement. PML developed Family Playlists to promote the types of home learning interactions that have the most impact on student learning and to increase students' agency by leveraging the "Protégé Effect." The Protégé Effect is a well-researched phenomenon in which students learn more effectively when they teach others.⁶

⁶ Leading learning scientists have found strong evidence that students who teach concepts develop a deeper and longer-lasting understanding of the material than students who do not. The most prominent analysis to date, conducted by Dr. Richard Mayer and Dr. Logan Fiorella, showed a large impact on student learning in a laboratory setting (d= 0.77) when students used this strategy. Fiorella, L., & Mayer, R. E. (2015). Learning as a generative activity: Eight learning strategies that promote understanding. New York, NY: Cambridge University Press.



¹Emerson, L., Fear. J., Fox, S., and Sanders, E. (2012). Parental engagement in learning and schooling: Lessons from research. A report by the Australian Research Alliance for Children and Youth (ARACY) for the Family-School and Community Partnerships Bureau: Canberra.

² Harris, A. & Goodall, J. (2007). Engaging parents in raising achievement: Do parents know they matter?. Research report, University of Warwick. Available: <u>http://wiki.ict-register.net/images/0/0a/July_07_Every_parent_matters.pdf</u>

³ "What Kinds of Family Engagement Are Most Effective?" Flamboyan Foundation, 28 Jan. 2011, <u>https://s28742.pcdn.co/wp-content/uploads/2018/08/What-kinds-of-family-engagement-matter-1-28-2011.pdf</u>.

⁴ Mapp, K. L. & Bergman, E. (2019). Dual capacity-building framework for family-school partnerships (Version 2). Retrieved from: <u>www.dualcapacity.org</u>

⁵ Hammond, Z. (2015). Climbing out of the gap. In Hammond, Z & Jackson, Y., Culturally responsive teaching and the brain: Promoting authentic engagement and rigor among culturally and linguistically diverse students (pp. 14-15). Thousand Oaks, CA: Corwin, a SAGE Company.

Here is how Family Playlists work:



PML creates Family Explorations to ensure suitability for all types of families living in homes with all types of resources (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.

Family Playlists are designed to mitigate major barriers to family engagement. For example, playlists are delivered in the Family Partner's home language by leveraging Google Translate (which offers more than 100 languages), thereby removing the language barriers that can prevent families from participating in their children's learning. Family Playlists also have children teach their families, which allows the student to be the expert and actively drive their own learning while removing the prerequisite that family members must have content knowledge to participate in their students' learning.

A case study of Family Playlists conducted with the sixth grade at a high-poverty New York City public school in the South Bronx showed exciting results on teacher, family, and student attitudes and behavior and generated media attention, including an article in the *New York Times*.⁷ A subsequent year-long quasi-experimental study in two New York City schools showed that Family Playlists had a significant positive impact on 7th grade math achievement, as measured by New York State's standardized test scores.⁸

Evidence from the case study and quasi-experimental study is promising, but more research is needed to understand Family Playlists' effects and to build its evidence base. PowerMyLearning's Theory of Change posits that Family Playlists have a positive impact on

Case Study

https://content01.powermylearning.org/wp-content/uploads/PowerMyLearning_Family-Playlists-Impact-on-NYS-Test-Sco res-1.pdf



⁷ Bornstein, David. "When Parents Teach Children (and Vice Versa)." The New York Times, 12 Mar. 2018, <u>https://www.nytimes.com/2018/03/13/opin-ion/children-teaching-parents.html</u>.

⁸ "Evidence of Family Playlists' Impact on Math Achievement." PowerMyLearning, 2019,

academic mastery and social emotional learning (SEL) skills, particularly student agency and motivation, but prior to the 2020-21 school year, we had not explored SEL impacts in a research study.

Because Family Playlists are individual learning assignments, they lend themselves well to a short-cycle randomized control trial study design — that is, it is relatively simple to randomly designate some students to complete Family Playlists and others to complete alternative tasks, and this randomization can happen at the level of an individual lesson. Furthermore, PowerMyLearning has previous experience conducting short-cycle RCTs within our platform in a previous research project, which was highlighted in a publication from the Brookings Institution.⁹ We decided to seek out a teacher to partner with us for the 2020-21 school year to conduct short-cycle RCTs exploring the causal impact of Family Playlists on students' academic achievement and SEL competencies, such as student agency.

Partners

This project was a collaborative effort between PowerMyLearning and our practitioner partner Jillian Frediani, the 6th grade science teacher at Alliance College Ready Middle Academy #12 (ACRMA 12), a charter middle school located in the South Park Neighborhood of South Los Angeles. Dr. Logan Fiorella, a cognitive psychologist and learning sciences expert, also provided research guidance on the project. This work was supported by the Lowenstein Foundation.

Primary Research Team: PowerMyLearning Cross-Functional Working Group Research Advisor: Logan Fiorella, PhD, University of Georgia

As the Director of Research at PowerMyLearning, Julie Martin (a co-author) served as the project leader for this research effort, supported by her colleague, the Senior Manager of Research and Program Operations. Associates on PowerMyLearning's Content Team and the Program Teams were also collaborators, which was critical to ensuring that the shared vision for the project was fully realized. The group's collective expertise in research design and analysis, program implementation, and content design, combined with the flexibility of PowerMyLearning's digital platform, laid the foundation for a successful research study. This group met weekly with the practitioner partner to carry out the project and ensure implementation success. In addition, PowerMyLearning's Executive Director of the Greater Los Angeles region encouraged the partnership and managed the relationship with ACRMA 12's school leadership.

PowerMyLearning enlisted Logan Fiorella, PhD, to advise on the study design and analysis plan for the project. Dr. Fiorella is a cognitive scientist and Associate Professor in the College of Education at the University of Georgia. He is a leading expert in the study of learning-by-teaching, also known as the "Protégé Effect," which is a core component of Family

⁹Chatterji, A.K. & Jones, B.F. (2016). Learning What Works in Educational Technology with a Case Study of EDUSTAR. Policy Memo, The Hamilton Project, Brooking Institution. Available: https://www.hamiltonproject.org/assets/files/learning_what_works_in_ed_tech_pm.pdf



Playlists. Dr. Fiorella served in an advisory role, while the PML team implemented the study, randomized students, and conducted the analysis.

Practitioner Partner and School: Jillian Frediani, 6th Grade Science Teacher, Alliance College Ready Middle Academy #12

Our practitioner partner, Jillian Frediani, is in her sixth year of teaching and her fourth year at ACRMA 12. Jillian received her bachelor's degree in bio-chemical engineering with a minor in teaching from U.C. Davis and her master's degree in education from U.C.L.A. Jillian is part of a selective Teacher Leader Cadre program at ACRMA 12.



ACRMA 12 is a public charter middle school

located in the South Park neighborhood of South Los Angeles. According to California Department of Education 2019 data,¹⁰ 98% of the ACRMA 12 students identify as Hispanic, 21% are English Language Learners, and 98% of students come from low-income families (defined as qualifying for free or reduced-price lunch).

Jillian was the ideal teacher to partner with on this research project for several reasons:

- She had a proven track record of implementing Family Playlists effectively, with high family participation
- She was one teacher responsible for over 160 students, providing us with a large sample size and obviating potential teacher effects in the study design
- Her subject was Science, which we had not explored in a research study (all past studies had been in Math)
- She valued research and was willing to partner with us even amidst 100% virtual learning and a pandemic!

Jillian was interested in partnering with PowerMyLearning because of the value she places on research as a scientist herself. I agreed to partner with PowerMyLearning because I have worked with PML for a couple of years and did Family Playlists last year. I thoroughly enjoy doing Family Playlists. I love the opportunity for my students to go home and teach their family partners the science we are learning in class. As a scientist, I love research and I wanted to help with the study so I could see if the playlists had all the positive benefits that I thought they did.

Jillian Frediani 6th Grade Science Teacher

Funder: The Leon Lowenstein Foundation

The Leon Lowenstein Foundation is a family foundation whose mission is to support transformational solutions to some of the world's most challenging issues in order to leave

¹⁰ https://www.greatschools.org/california/los-angeles/27177-Alliance-College-Ready-Middle-Academy-No.-12



the world a better place for future generations. The Foundation's general interests are related to health, environment, and education. Within the field of education, the Foundation's focus has been on student-centered learning and support for a more robust evidence base which can help advance this field of learning. PowerMyLearning has received grant funding from the foundation for the implementation, analysis, and communication of two short-cycle randomized control trials designed to provide valuable contributions to this overall initiative.

Approach

In 2018, PowerMyLearning partnered with Project Evident to develop a Strategic Evidence Plan for PML's then brand-new product, Family Playlists. This Strategic Evidence Plan is a multi-year roadmap for how to structure our evaluation and continuous improvement work over time. As seen in Figure 1 below, the plan defines three learning goals to be explored across five years. In the beginning years of the plan, more energy is spent on learning how to optimize teacher adoption and ensure that the product is strengthening the triangle of learning relationships among teachers, families, and students. As time progresses and the first two learning goals are better understood, the agenda starts to include more student impact evaluation.



Figure 1. Strategic Evidence Plan Learning Agenda

As noted earlier, PowerMyLearning had already found significant positive impact of Family Playlists on state math test scores but had only anecdotal evidence of impact on SEL. Going into the third year of our Strategic Evidence Plan, we particularly wanted to conduct a high-quality research study to examine Family Playlists' impact on social emotional learning outcomes and academic mastery. We chose to conduct short-cycle RCTs because of the opportunity they provide to reflect and adjust, as well as the ability to examine whether certain effects replicate over multiple trials.



Designing the Study

To effectively carry out the research project, a cross-functional team was formed in July 2020 consisting of content, program, and research staff from PowerMyLearning. Over the summer, we secured a partnership agreement with our teacher partner, Jillian, and her school leadership. The team met with Jillian for the first time in September 2020 and began meeting weekly with her beginning in October 2020 to understand the full context of her environment and to plan for study implementation. Given contextual factors, such as the curriculum, Los Angeles's 100% distance learning policy in the COVID-19 pandemic environment, and class schedules, the team worked with Jillian to determine the study procedures that worked best for the class, while still ensuring quality and rigor in the study design. The study was intended to integrate into classroom routines as seamlessly as possible. For example, the academic mastery outcome variable for the study consisted of questions from the Amplify unit assessments that the teacher already incorporated into her instruction.¹¹ See Table 1 for details on the study design.

Table 1. Study Details

Study Objective

• Examine the impact of science Family Playlists on student social emotional learning (SEL) and mastery of science unit content

Study School and Participants

- Los Angeles Public Charter Middle School (ACRMA 12)
- 100% virtual instruction this year
- 162 6th grade science students across 5 class sections with the same teacher
- Student population is 98% Hispanic, 21% ELL, 98% Free or Reduced-Price Lunch Eligible

Study Design

- Prior to starting the study, students completed two playlists to get familiar with Family Playlists.
- Each short-cycle RCT included one homework assignment within a content unit.
- Within each class section, for each RCT, students were randomly assigned to complete either a Family Playlist or a standard solo homework assignment. The random assignment was conducted using a random number generator for each class section. The PowerMyLearning team then assisted the teacher in assigning students to their respective assignments within the platform.
- Following the homework assignment, students completed an online survey (to assess SEL impact and gather feedback) and their typical end-of-unit assessment (to assess science content mastery impact). These surveys and assessments were administered outside of our platform.
- In addition, feedback was collected from families after they completed each playlist through a survey administered within our platform, as the last part of each playlist.

¹¹ Amplify is a K-12 curriculum and assessment provider.



Timeline

- We conducted a trial run in December 2020 to examine how the study would unfold in practice and work out study implementation logistics. The unit of focus was Traits and Inheritance.
- Taking what we learned in December into account, we conducted a short-cycle RCT in March 2021 (RCT 1). The unit of focus was Thermal Energy.
- We conducted a final short-cycle RCT in May 2021 (RCT 2). The unit of focus was The Water Cycle.

While we could gauge academic mastery with pre-existing questions from the Amplify science curriculum used in Jillian's classes, designing a tool to examine students' social emotional learning required more effort. According to CASEL (The Collaborative for Academic, Social, and Emotional Learning),¹² social emotional learning is "the process through which all young people and adults acquire and apply the knowledge, skills, and attitudes to develop healthy identities, manage emotions and achieve personal and collective goals, feel and show empathy for others, establish and maintain supportive relationships, and make responsible and caring decisions." A case could be made for the impact of Family Playlists on nearly all of the CASEL core SEL competency areas.¹² For example, Family Playlists may increase students' social awareness (e.g., perspective-taking, belonging) and relationship skills (e.g., communicating effectively) because students must take the perspective of their learners (family partners) and think about the best way to communicate new concepts. Connecting students' school lives to their home lives may also increase students' sense of belonging at school because students see that their families are being invited into the learning process. Family Playlists may also increase students' self-management skills (e.g., agency, persistence, motivation) because Family Playlists require students' active participation and involve working with the people they love, which may be intrinsically motivating to students. Although we would ideally love to understand Family Playlists' impact on all of these SEL competencies and more, we knew that our student survey could only be so long. We needed to determine which SEL competencies to prioritize investigating in the survey.

Speaking with Jillian about the potential impacts of Family Playlists on SEL, she shared that student motivation and agency was especially important to her, and that the excitement her students had for Family Playlists was one of the key benefits of the product. Student agency is also arguably the SEL competency with the most direct connection to Family Playlists, as Family Playlists require students to take the lead in teaching their family partners what they are learning in school. Student agency was also of particular interest to our funder, The Leon Lowenstein Foundation. Furthermore, empowering students to be independent learners, or leaders of their own learning, is a central aim of culturally responsive teaching (CRT),

¹² "SEL: What Are the Core Competence Areas and Where are they Promoted?" CASEL, 2021, <u>https://casel.org/sel-framework/</u>.



according to CRT experts.¹³ For these reasons, we decided to focus our survey questions on dimensions of student agency and motivation.

Our research advisor, Dr. Logan Fiorella, assisted us in identifying a validated scale, the Intrinsic Motivation Inventory, ^{14, 15} to assess constructs related to student agency. The Intrinsic Motivation Inventory is a multidimensional measurement device that assesses intrinsic motivation as well as perceived competence and perceived choice, which are theorized to be key drivers of intrinsic motivation. According to Self-Determination Theory, students are more likely to be intrinsically motivated to engage in a task when they feel they have 1) the freedom to make choices about how they engage in learning (perceived choice), and 2) the ability to complete a task (perceived competence). Intrinsic motivation and agency are strongly related because, by definition, intrinsically motivated students are acting out of their own volition to achieve their goals. In addition to items from the Intrinsic Motivation Inventory, we also added single items to examine additional SEL-related constructs, like belonging and academic identity.

Challenges and Responses

Implementing rigorous research in schools is a significant undertaking, never without its obstacles and challenges. Below are a few of the major challenges we faced in carrying out this research:

- Finding a teacher to partner with us was a challenge. We needed to find a teacher who had enough students for an adequately powered study, was willing to partner with us during a pandemic, had demonstrated successful implementation in the past, and was teaching a STEM subject (a grant requirement). All of these criteria left us with a small pool of eligible teachers, and we are so grateful to Jillian for agreeing to partner with us for the research. PowerMyLearning's pre-existing relationship with the teacher and the school likely played an important role in securing the partnership.
- Remote learning presented its own set of challenges. In a normal year, Jillian met with five class sections every day. During remote learning, she only met with each class section twice a week. This made her time with students more precious than ever and required us to be especially mindful of the importance of not intruding on class time. In addition, she started the year with only three class sections, but moved to a five-class section model later in the year, which required us to create new class setups within our platform. Remote learning also made it more difficult to ensure participation from the students in homework, unit assessments, and surveys. Jillian implemented a number of strategies to increase participation (reminders to students and families through multiple channels, publicly recognizing students who participated as a form of

¹⁵ Monteiro, V., Mata, L., & Peixoto, F. (2015). Intrinsic motivation inventory: Psychometric properties in the context of first language and mathematics learning. *Psicologia: Reflexão e Crítica*, *28*, 434-443.



¹³ Hammond, Z. (2015). Climbing out of the gap. In Hammond, Z & Jackson, Y., Culturally responsive teaching and the brain: Promoting authentic engagement and rigor among culturally and linguistically diverse students (pp. 14-15). Thousand Oaks, CA: Corwin, a SAGE Company.

¹⁴ Deci, E. L., Eghrari, H., Patrick, B. C., & Leone, D. (1994). Facilitating internalization: The self-determination theory perspective. Journal of Personality, 62, 119-142.

positive reinforcement, etc.), but participation was still less than what we would have seen if students had been learning in a physical classroom.

 As referenced above, selecting the SEL measures for the survey required some effort. There are many SEL outcomes that we hypothesize Family Playlists may impact, but we needed to keep the survey a manageable length for 6th graders. In addition, short-cycle RCTs measure very short-term, task-related outcomes, but many SEL scales are broad and are not written to capture impacts from specific tasks. We had to identify the SEL skills we most wanted to learn about through the survey and identify items/a scale that would be appropriate for post-task measurement. The Intrinsic Motivation Inventory was a strong fit with our needs because it measured our key SEL outcomes and is written to assess SEL constructs following specific tasks.

Lessons from the Trial Run

One of the best decisions we made in our study planning was providing enough of a cushion in our timeline to use our first short-cycle RCT in December 2020 as a trial run. The trial led to several improvements in both the study procedures and the playlists themselves. These improvements increased our likelihood of detecting Family Playlists' impacts, and also yielded ideas to improve Family Playlists more broadly. Below are a few of the lessons we learned.

Timely improvements to the study design

- Through the trial run, we learned that we needed to shorten the time between when students completed their homework assignment and when they were asked to complete the student survey, as many students had trouble remembering the specifics of the assignment by the time the survey was administered.
- We also realized that we needed to modify the study procedure because, in the trial run, the control group students received more instructional time with the teacher than the treatment group students, who spent some of their time in breakout rooms with PowerMyLearning staff learning about the Family Playlists.

Timely improvements to the product/playlists themselves

- Review of the students' submissions during the trial run left the teacher guessing the
 extent to which the students fully completed the activity. Specifically, it was hard to
 know whether the student actually taught their family partner. Thus, the activity was
 modified to ask the student to upload a video of themselves teaching their family
 partner. Jillian shared that this was one of the most helpful aspects of the Family
 Playlists for gauging her students' level of understanding and for learning more about
 their home lives.
- We also realized we needed to explicitly instruct students to take time to formulate their answers to the Family Playlist activity questions before teaching their family partner. This was a suggestion from our research advisor, Dr. Logan Fiorella, who has conducted research on the positive impact of "preparing to teach" on student learning.



- The trial run also showed us that a playlist can be aligned to the standards that an educator is expected to teach without necessarily being strongly aligned with the teacher's curriculum, and relatedly, the curriculum's assessment materials. Without strong alignment, it is difficult to see an effect. Thus, we paid more attention to curriculum alignment in the subsequent RCTs, and the content team worked with the teacher to modify playlists as needed.
- There were many other learnings we discovered about the platform from the partnership. For example, we learned of an issue that would occur when teachers tried to sync new Google Classrooms to the platform mid-year, which we have now addressed. The partnership was a wonderful way to uncover these areas for improvement and respond to them quickly.

Short-Cycle RCT Results

Following each RCT round, the research team and the teacher reflected on the findings together during our weekly team meetings. Meetings were also held with our research advisor, Dr. Logan Fiorella, after each RCT to debrief on the findings.

Study Participation

Because the post-homework survey questions asked about experiences with the homework assignment (e.g., "this homework was fun to do"), only students who participated in their homework assignment could complete the post-homework survey.

- For RCT 1, 44/78 (56%) Family Playlists group students and 41/84 (49%) solo homework group students participated in their homework assignment and took the survey.
- For RCT 2, 47/84 (56%) Family Playlist group students and 46/78 (58%) solo homework students participated in their homework assignment and took the survey.
- Thus, roughly equal percentages of both groups participated in the survey aspect of the study and were included in analyses.

Because all students could complete the academic unit assessment regardless of whether they participated in their homework assignment, we were able to examine the impact of Family Playlists on assessment scores using an intention-to-treat analysis. Anyone who took the assessment was included in analyses, regardless of whether they participated in their assigned homework. This method allows us to draw unbiased conclusions regarding the impact of the intervention.

- For RCT 1, 111/162 (69%) students completed the Thermal Energy unit assessment.
- For RCT 2, 145/162 (90%) students completed the Water Cycle unit assessment. The teacher attributed the higher participation rate in this assessment to students wanting to improve their final grades before year end.



Findings across RCTs 1 and 2

Intrinsic Motivation

SEL Outcomes – Intrinsic Motivation Inventory Measures

Results from surveys revealed that, in both RCTs, students in the Family Playlist condition reported significantly greater intrinsic motivation and feelings of competence than students in the standard solo homework condition (Figure 2). Family Playlists had a statistically significant positive impact on perceived choice in RCT 2 and trended in the positive direction in RCT 1 (but was not significant). These findings suggest that students felt greater agency and motivation when completing Family Playlists as compared to standard homework.





Notes: All effects are significant at the $p \le .05$ level, with the exception of Perceived Choice in RCT 1 (p=.20). These scales come from the Intrinsic Motivation Inventory, a multidimensional, validated measurement device grounded in Self-Determination Theory that assesses intrinsic motivation as well as key drivers of intrinsic motivation, such as perceived competence and perceived choice.





SEL Outcomes – Single Item Measures

In addition to the core Intrinsic Motivation Inventory outcomes above, we included a number of single item measures to assess other SEL outcomes of interest without taking up too much survey space. Across both RCTs, the impact of Family Playlists trended in the positive direction for the majority of SEL measures, including belonging, academic identity, self-efficacy, and effort. For academic identity, this difference was statistically significant in RCT 2 but not RCT 1.

Students in the Family Playlists condition also reported enjoying teaching their family member more than students in the solo homework condition reported enjoying teaching themselves, though this effect was only statistically significant in RCT 1.

Academic Mastery Outcomes

Across both RCTs, the impact of Family Playlists on the end-of-unit assessments trended in the positive direction, but the effects were not statistically significant.

Family Playlists are designed to be end-of-unit assignments that reinforce the content students have learned in class. For RCT 1, the Thermal Energy curricular unit was seven weeks long. Given that the RCT homework represented one homework assignment out of many given over the course of the 7-week unit, it makes sense that the effect size for the impact of one Family Playlist on the end-of-unit assessment would be small. We tried to account for this in the design of RCT 2 by focusing on the first subsection (the Water Cycle) of the Weather Patterns unit, but the Water Cycle subsection was still four weeks long, and the RCT homework was only one of multiple homework assignments given during that period.

The academic mastery results helped us to recognize that expecting to see a significant difference in student achievement between the Family Playlists group and the control group on an end-of-unit assessment may be unrealistic (especially when the Family Playlists group is assigned just one Family Playlist while both groups are assigned many traditional "solo" homework assignments). In our program model, we assert that students should complete Family Playlists regularly over time (at least one Family Playlist per academic unit) to see significant impacts on academic achievement, as found in our quasi-experimental research studies that have shown impact on State math tests.¹⁶ The short-cycle design works well for measuring immediate or short-term effects of momentary interventions, but it does not lend itself to measuring the more long-term outcomes of sustained use of the program over time.

Spotlight on English Language Learners

Roughly 30% of the students in the 6th grade class were English Language Learners whose first language was Spanish. We wanted to explore the impact of Family Playlists on this group specifically, because ELL students often face barriers to learning that non-ELL students do not

¹⁶ "Evidence of Family Playlists' Impact on Math Achievement." PowerMyLearning, 2019, <u>https://content01.powermylearning.org/wp-content/uploads/PowerMyLearning_Family-Playlists-Impact-on-NYS-Test-Sco</u> <u>res-1.pdf</u>



face, and we hypothesized that Family Playlists may be uniquely equipped to address those barriers. According to the English Learners Success Forum's Guidelines for Improving Curricular Materials for English Learners¹⁷, materials should give English Learners the opportunity to leverage their own language and cultural assets. Because Family Playlists are delivered to family partners' phones in their home languages, ELL students are able to see and work on the assignment in their home language along with their family members.

In both RCTs, ELL students reported significantly higher intrinsic motivation and perceived competence in the Family Playlist condition than in the solo homework condition, and they reported significantly higher perceived choice in the Family Playlist condition than the solo homework condition in RCT 2.

In addition, in RCT 1, ELL students reported a significantly higher sense of belonging at school, agreement that the assignment helped their teacher better understand their family, and enjoyment of teaching (family vs self) in the Family Playlists condition than in the solo homework condition (see Figure 3). Thus, ELL students' sense of belonging at school and enjoyment of schoolwork seemed to be especially affected by getting to work on homework in their home language with their family.



Figure 3. RCT 1 suggests significant SEL impacts of Family Playlists for ELL students

ELL Students' Responses by Homework Condition

Note: All differences significant at the p<.05 level.

¹⁷ "Guideline for Improving Math Materials for English Learners", English Learners Success Forum, 2021, <u>https://assets.website-files.com/5b245df5d227e581c41b7c4b/5d0978903d6e1c8052a8493f_ELSF%20Math%20Guidelin</u> <u>es.pdf</u>



Student, Family, and Teacher Feedback

In addition to examining SEL and academic outcomes, we also collected feedback from students, families, and our teacher partner (Jillian) on their experiences using Family Playlists. In the student survey, we asked students a series of questions about their satisfaction with Family Playlists, and also included open-ended items where students could share what they liked and what could be improved. A family feedback section is built into the end of every playlist. For Jillian, we solicited feedback regularly as part of our weekly meetings, and also engaged in a reflection interview at the end of the project.

Family Feedback

Among families, 95% indicated that they enjoyed the Family Playlist activity, and 96% of Family Partners indicated that Family Playlists helped them better understand what their child is learning in school.

Family Playlists are an easy way for me to understand the teacher's program, and it has been great to communicate with Ms. Frediani.

6th grade Spanish-speaking parent

I really liked being able to help and share time with my daughter and know that she is learning. Thank you, Ms. Frediani.

6th grade Spanish-speaking parent

Student Feedback

Many students wrote that the best thing about Family Playlists was the chance to spend time with and teach their family partner.





Teacher Feedback from Jillian Frediani

Jillian shared that she appreciated the excitement that Family Playlists generate for students, and the opportunity they give families to participate in their children's learning by giving them a clear role in homework activities.

Jillian also shared that she plans to use the research process she learned this year to test the impacts of new efforts in her classroom going forward.

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The students were more excited for Family Playlists, compared to regular assignments.

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A lot of parents have told me that they have been looking for ways to connect with their kids about what they're learning in school but didn't really know how to do that. They have told me that Family Playlists are a really great, structured way to have those conversations with their children and learn what they're learning in science.

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I think that using evidence in the future will become a definite permanent feature in my classroom. I loved the process that I learned through this study and want to continue using similar studies next year. It was very powerful to try something and see how it changed my students' test scores. I want to do that more.

Alignment with Actionable Evidence Principles

| Principle | In This Case |
|---|--|
| Centers on Community Needs and Voices Addresses the context, perspectives, priorities and assets of students and families, along with the challenges they face | Unlike the traditional homework model, Family Playlists are designed to invite families into students' learning. They are designed such that families give feedback at the end of each playlist, and we collect end of year surveys from students and teachers as well to understand their experiences and needs. As an organization, PowerMyLearning works predominantly with Title 1 schools. Our partner school for this project is a Title 1 school, with 98% of students qualifying as low-income. |



| Prioritizes Practitioner Learning and Decision-making Answers questions that are highly relevant to policy and practice, and that help practitioners prioritize decisions in service of students and families | PowerMyLearning's products and programs team needed to know whether we are having the impacts on student learning that we are aiming to have, and also what SEL skills Family Playlists are impacting, if any. Our practitioner partner, a teacher, expressed a need to help families engage in their students' learning. Supporting families was important to her because she could see that families wanted to engage productively with their children around homework, but they did not know how to do so. |
|---|--|
| Enables Timely Improvements Allows practitioners to make evidence-informed decisions in a timely manner | The short-cycle nature of the research allowed us to iterate on the study design and on aspects of the program to make it more useful to the teacher. For instance, we started writing in the activity prompts that the students should share/upload videos so that the teacher could better observe students' understanding of the content. |
| Credible and Transparent Uses high-quality data and analysis, aligning methods with practitioner questions, timeline and context | The randomized control trial design was important for generating unbiased estimates of impacts. Assignment to groups was random within each class, and the individual survey responses were not seen or evaluated by the teacher. |
| Responsive to Operational Context of Practitioners <i>Reflects the context in which</i> <i>practitioners operate, including</i> <i>organizational settings, relationships</i> <i>and resources, and political and policy</i> <i>environment</i> | Understanding the teacher's context was critical to the success of the research project. At the time that we partnered with Jillian, we did not yet know if school would be in person, distance, or hybrid. Once we learned that school would be 100% virtual, we designed the study to fit into that environment. At the beginning of the partnership, we spent time gathering information about how the school operates, Jillian's class schedules, the curriculum plan for the year, etc. Our weekly meetings helped us adapt to changes in the teacher's context (e.g., changes to schedules, curriculum, technology, etc.). |
| Accessible and User-Centered Clearly communicates research design, analysis, and findings to facilitate practitioner understanding and use | Following each RCT round, the research team shared out the results in the weekly team meetings. Findings were shared orally but also visually via slide decks that we saved in a shared drive. Sharing out the results in the weekly meeting provided a space for discussion and reflection on results, which informed the teacher's practice moving forward as well as improvements to the study design for subsequent RCTs. |



| Builds Practitioner Capacity for R&D Provides practitioners with data, products, tools and trainings to own and advance their evidence agenda | The simplicity of the study design combined with the flexibility of the Family Playlists digital platform creates the conditions in which our teacher partner could easily do much of what we did together on her own. |
|--|--|
| | We walked our teacher partner through the random assignment process, and she can do this on her own in the platform in the future if desired. She can also edit the playlists as much as desired or even create new playlists from scratch for future hypothesis testing. All teachers have the ability to assign different playlists to different students within the platform. |
| Attends to Systemic and Structural Conditions Considers systems, policies, practices, cultural norms, and community conditions that drive inequity, including those related to poverty and racism | Family Playlists are designed with equity in mind, mitigating common obstacles such as language barriers, content knowledge gaps, and digital divides that can prevent underserved families from participating fully in their students' learning. |

Reflections and Conclusion

This project illustrates how a short-cycle RCT design can generate actionable evidence. The biggest advantages of the short-cycle RCT design were that it provided credible and reliable causal findings and allowed for timely improvements and team reflection. The research design allowed us to both examine the causal impact of Family Playlists on students' outcomes and uncover contextual data about how Family Playlists are used in practice, which have informed timely improvements to the product. Furthermore, the simplicity of the design was easy for the teacher to comprehend and to replicate on her own in the future if desired.

One of the most critical qualities of our teacher partner that allowed the project to succeed was her commitment to the work. When researchers come into schools from the outside, they have little access to and no prior relationship with the students and families who are participating in their research. Teachers are the experts on their own classrooms, and it is the researcher's job to learn all that they can from that teacher's context in order to design a feasible and useful study. As the people who are with the students every day, teachers hold an enormous amount of power in ensuring that any intervention is implemented successfully. We are so grateful to Jillian for her commitment to making the research project a success. We are also grateful to ACRMA 12's school leadership for their support of this project.

Weekly team meetings with the teacher were also essential to the project's success because they provided the space for collaboration, reflection, and relationship building, and they enabled us to design RCTs that were responsive to the changes in the teacher's context. Allowing space in the project timeline for things to not go as planned — and to gather feedback on operational and implementation issues before examining impact — was also incredibly important for the project's success.



Additional strategies that enabled the project to be successful included:

- Forming a cross-functional internal team consisting of content, program, and research staff from PowerMyLearning
- Creating a shared and mutually beneficial vision for the project among the team and teacher to generate buy-in
- Collaborating with the teacher from the start
- Being mindful of school context in the study design

Our short-cycle RCTS revealed that, compared to standard solo homework, Family Playlists have a significant positive impact on key SEL outcomes that are strongly linked with academic growth over time, including intrinsic motivation, perceived competence, and perceived choice. Student, family, and teacher feedback suggested that students are excited to teach their Family Partners what they are learning in school, and families enjoy the positive interactions with their child around learning. We also found that the positive SEL effects of Family Playlists were especially pronounced for English Learners. As a result of these findings, we are now exploring whether we should customize Family Playlists to target English Learners in the subject of math.

Outside of the impact data, partnering closely with Jillian allowed us to gain a deeper understanding how teachers, students, and families use Family Playlists and how to improve the user experience. Overall, short-cycle randomized control trials offer a model for researchers and practitioners looking to conduct impact research with a quick turn-around on actionable results.

Resources and Further Reading

- Family Playlists were developed based on the evidence-based Teachers Involve Parents in Schoolwork (TIPS) program from Johns Hopkins. For more information about the TIPS program and evidence base, visit <u>https://www.sfcp.jhucsos.com/tips/</u>
- To see Family Playlists' initial case study, which is also an example of the Actionable Evidence Framework in action, visit <u>https://powermylearning.org/learn/impact/case-studies/family-playlists/</u>
- To see a quasi-experimental study on the impact of Family Playlists on middle school math achievement, visit <u>https://content01.powermylearning.org/wp-content/uploads/PowerMyLearning_Family-Pl</u> <u>aylists-Impact-on-NYS-Test-Scores-1.pdf</u>



About the Authors

Julie Martin, Director of Research at PowerMyLearning, is responsible for leading the design and execution of research to evaluate the impact of PowerMyLearning's products and programs. Julie has over 7 years of experience conducting applied research in education settings, including Temple University, Wake County Public School District, and Duke Social Science Research Institute. Immediately prior to PowerMyLearning, Julie was Learning Research Associate at the non-profit leadership organization YPO, where she conducted thought leadership and evaluation research. Julie is also currently a Harvard Strategic Data Project Fellow, through which she receives research and leadership training that directly informs her work at PowerMyLearning. Julie holds a Ph.D. and M.A in Social Psychology from Duke University and a B.A. in Psychology from Lafayette College.

Elisabeth Stock, CEO & Co-Founder of PowerMyLearning, built the organization from a nascent non-profit in 1999 into a national leader in the K-12 educational equity space. Recognized as an expert in her field, Elisabeth is a Pahara-Aspen Education Fellow and a life-long Ashoka fellow. She has given a TEDx talk and high-level briefings at the White House, the U.S. Department of Education, and the Federal Communications Commission, and she has served as an advisor to the Corporation for Public Broadcasting and the NYC Department of Education. Elisabeth has been featured in the Wall Street Journal and on National Public Radio and has published Op-Eds in media outlets such as Education Week and the Huffington Post. In 2001, she was honored by Crain's New York Business as one of 40 New Yorkers under 40 shaping the city. From 1996-97, Elisabeth served as a White House Fellow in the Office of the Vice President, where her experience as the principal architect of a government-wide education technology program led her to launch PowerMyLearning a year later. Elisabeth was a high school teacher for two years while a Peace Corps volunteer and later worked for the World Bank on appropriate technology in Africa. She also worked at the Vera Institute of Justice and helped the Open Society Institute start the After-School Corporation. Elisabeth served as a member of the MIT Board of Trustees and is the youngest individual ever to be appointed to the MIT Executive Committee. Elisabeth has earned four degrees from MIT. She also holds a patent for a medical device.

Jillian Frediani, 6th Grade Science Teacher at Alliance College Ready Middle Academy #12 (ACRMA 12), is in her sixth year of teaching and her fourth year at ACRMA 12. Jillian received her bachelor's degree in bio-chemical engineering with a minor in teaching from U.C. Davis and her master's degree in education from U.C.L.A. Jillian is part of a selective Teacher Leader Cadre program at ACRMA 12.



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Case Keywords

K-12 | English Language Learners | low-income | program improvement | impact evaluation | random assignment | rapid-cycle evaluation | experiment | surveys | student assessments | nonprofit service provider | teachers | foundation | internal evaluator | academic learning outcomes | social emotional outcomes | equity

