

# Minnesota Reading Corps Pre-K Program Cost Analysis

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## ABSTRACT

The Minnesota Reading Corps (MRC) program is a statewide AmeriCorps early literacy initiative that aims to foster emergent literacy skills of children to ensure reading proficiency by the end of grade 3. MRC and its host organization, Reading & Math, Inc. (RMI), aim to address the resource gaps within under-resourced schools by bringing AmeriCorps members into Pre-K classrooms to provide literacy enrichment for the whole class and tutoring services for specific at-risk students. An impact evaluation of the program conducted in 2013-2014 by the University of Chicago-based research center, NORC, showed positive impacts on emergent literacy outcomes for 3-, 4-, and 5-year-olds (Markovitz *et al.*, 2015). Building on the existing evidence on the program effectiveness, this study estimates the costs of providing the MRC Pre-K program that are associated with the impact measured by the 2013-2014 impact evaluation.

Rigorous economic evaluations of educational interventions provide important information about the resources necessary to implement a program. Such evaluations bridge the gap between knowledge on program implementation and program impact by identifying the resources utilized to generate outcomes of interest. As such, cost analyses intend to inform policymakers facing decisions to replicate or scale up a program, or trade-offs related to limited resources. Our study used the ingredients method—an approach widely applied to examine costs of educational interventions—to estimate the MRC Pre-K program’s cost (Levin, McEwan, Belfield, Bowden & Shand, 2018). We conducted interviews, surveys, and classroom observations, as well as reviews of program documents, administrative records and past research in order to collect data on all resources utilized to derive program impact based on its theory of change. Wherever important data were missing, we used a Monte Carlo simulation strategy to explore site-level variation on resource use and costs.

Overall, the costs of MRC were identified as \$1.5 million per year to serve 1,261 students across twenty-five schools, or \$1,210 per pupil on average. Costs were found to vary substantially by site, by ingredient category and by who bears the burden of the costs across the 25 sites evaluated. Our analyses of the distribution of who bears the costs suggest that the average cost per student per site borne by schools ranges from \$680 to \$210, or approximately 25% of the total costs per student. Comparable cost estimates are limited by a lack of similar Pre-K programs that have conducted both impact and cost analysis evaluations. Our study is one of the few rigorous cost analyses in Pre-K programs conducted alongside effectiveness research on a supplemental Pre-K literacy program to date. Nevertheless, these results suggest the Minnesota Reading Corps program leverages a substantial amount of resources into Pre-K classrooms in a way that feasibly distributes costs.



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## 1. INTRODUCTION

Establishing literacy proficiency early in life is fundamental to ensuring academic success, not only in reading, but across all subjects studied in school. Pre-K programs are a promising avenue for developing literacy skills early in life. However, not all young students have access to a preschool (Pre-K) education, and when they do, not all programs have the resources required to provide a rich language environments and individualized support tailored to struggling readers' needs.

One promising approach for helping struggling readers is to hire certified teachers or specialists as tutors for every classroom (e.g. May *et al.*, 2013; Slavin, Lake, Davis & Madden, 2011). Nevertheless, this can be costly and impractical for under-resourced schools. Alternatively, using volunteers or paraprofessionals as additional support may be a less costly solution; however, uncertified volunteers may yield lower quality instruction. Additionally, volunteer-based programs may require intense supervision and support to be effective and can be challenging to bring to scale (Grossman & Furano, 1999).

The Minnesota Reading Corps (MRC) program is a statewide AmeriCorps early literacy initiative that aims to foster emergent literacy skills of children to ensure reading proficiency by the end of grade 3. MRC and its host organization, Reading & Math, Inc. (RMI), aim to address the resource gaps within under-resourced schools by bringing AmeriCorps members into Pre-K classrooms to provide literacy enrichment for the whole class and tutoring services for specific at-risk students. The program's mission also includes providing professional development to existing Pre-K teachers as a strategy to improve outcomes for children by ensuring teachers use data to inform their instruction and are trained in effective early learning teaching strategies. These teachers participate in the program as Educator Corps AmeriCorps members. In addition to the on-the-job professional development, these Educator Corps members also earn an Education Award of approximately \$4,700 that they can then use to further their teaching credentials.

An impact evaluation of the MRC Pre-K program in the 2013-2014 school year found that the program had significant positive effects on outcome measures of emergent literacy (e.g. phonological awareness and vocabulary) for 3-, 4-, and 5-year-olds (Markovitz, Hernandez, Hedberg & Silbergitt, 2015). While evidence of program impact is necessary for understanding whether a program is achieving desired outcomes, it is not sufficient for policymakers to make informed decisions about resource allocation or replication of the program without information on costs. A cost analysis of the program is required to understand the magnitude of the benefits that are generated as a result of the required investments.

The purpose of this study is to estimate the economic costs of providing the MRC Pre-K program that are associated with the impacts (i.e., increased reading skills) measured by the 2013-2014 evaluation. Thus, the descriptions and analyses included in this report focus on the Minnesota Reading Corps Pre-K model as it was implemented in the 2013-14 school year. In addition to estimating the average costs per site and per student, this cost study will also assess variation in cost among sites or among different bundles of resources with a specific focus on the portion of costs borne by schools.

Though previous literature has investigated the cost-effectiveness of early literacy programs, evidence suggests high variability in costs depending on program design (Hollands *et al.*, 2013; Simon, 2011). While a literature review of early literacy programs found that interventions focused on improving classroom instruction coupled with providing individualized instruction focused on phonics (Slavin *et al.*, 2011) are promising in terms of impact, few cost analyses have been conducted on programs with such designs (see for example Sawhill & Karpilow, 2014), and none to our knowledge have been conducted on a Pre-K program. A careful cost analysis of the MRC program, which retains many of these promising program components, can help us better understand the resources required to replicate the program impact, how much of each resource is necessary, and how cost-effective the program is relative to alternatives.

## **2. BACKGROUND AND CONTEXT**

### **The Challenge of Early Literacy**

Reading competency is foundational for children’s learning and academic success in all subjects. Children struggling with reading may experience difficulties in other subjects (e.g., Chall, Jacobs & Baldwin, 1990). If not addressed, early challenges in literacy may continue during school years (e.g., Baydar, Brooks-Gunn, & Furstenberg, 1993; Felton, 1998) and into adulthood (Bruck, 1998). A critical task assigned to K-12 schools in the United States today is to ensure that every student becomes a proficient reader.

The 2015 National Assessment of Educational Progress (NAEP) reading assessment results show that only about one in three (i.e., 36 percent) American fourth graders achieve at or above the “Proficient” level of reading proficiency (NAEP, 2015a). This challenge is exacerbated by evidence of stark achievement gaps among disadvantaged subgroups. Assessment results among low income fourth graders (as defined by eligible for the National School Lunch Program) indicate that one in five (i.e., 21 percent) fourth grade students are at or above the “Proficient” level (NAEP, 2015a). Among African American students, the percentage of students scoring at or above the “Proficient” level is even lower (NAEP, 2015a).

Pre-K programs can be an effective vehicle to reduce these gaps because building literacy skills early in life can prevent later difficulties in reading. A major challenge in providing effective Pre-K programming is that schools with struggling readers are more likely to lack sufficient resources. Moreover, at the Pre-K level, no “one-size-fits-all” policy works due to the complexity of how Pre-K programs are organized. In the absence of one overarching entity that governs “Pre-K education,” public preschools, Head Start programs, and community child care centers are all regulated and funded differently. Several different models of reading programs have been examined and evaluated at the Pre-K level. Understanding costs of these approaches together with their effectiveness can contribute to the knowledge base that policymakers can use for effective decisionmaking.

Minnesota is no exception in facing these challenges. In 2015, only one in three (i.e., 35 percent) fourth graders read proficiently in Minnesota, as measured by NAEP (2015b). The reading achievement gaps in Minnesota were also on par with national average: only one in five (i.e., 20 percent) low income (as defined by eligible for the National School Lunch Program) fourth graders, and one in six (i.e., 16 percent) African-American fourth graders were proficient readers as measured by NAEP (2015b).

While Minnesota has set a goal of addressing these literacy gaps early in life and enhancing school readiness of preschool-aged children as important policy objectives, resources to realize such goals are limited. General funding for Pre-K programs in Minnesota is constrained; access to Pre-K in Minnesota still remains among the lowest in the nation (Bridges, 2015). Understanding ways to overcome these resource constraints in the Minnesota context, and to do so at a reasonable cost, is critical.

The MRC Pre-K program was launched in 2003 as a way to provide add-on reading tutors and research-based reading instructional strategies into existing classrooms. It began with four Head Start sites and now operates at more than 300 sites including Head Start centers, public preschools, and community-based Pre-K centers. In what follows, we provide a brief review of related research behind this model and an overview of the program.

### **Previous Evidence on Early Literacy Interventions**

Rigorous evaluations of literacy interventions show that one-on-one tutoring delivered by certified teachers is effective in improving reading performance (e.g., May *et al.*, 2013; Slavin, *et al.*, 2011), even relative to alternative interventions such



as small group tutorials, classroom instructional approaches and computer assisted learning (Slavin *et al.*, 2011). A review of 96 evaluations of alternative literacy interventions for struggling readers in grades K-5 concluded that a promising approach to addressing gaps in literacy for students lagging behind is combining improved classroom instruction with individualization focused on phonics (Slavin *et al.*, 2011).

Providing one-on-one tutoring by trained teachers is both time and resource intensive. Hiring additional specialists or certified teachers as tutors may not be practical for already resource-constrained schools. An alternative approach to certified teachers is that of enlisting volunteers or paraprofessionals, which are less costly, but may yield lower quality instruction. There is recent literature documenting the effectiveness of placing paraprofessionals or volunteer tutors in schools to improve the reading proficiency of students lagging behind (e.g., Jacob, Armstrong & Willard, 2015). However, the literature on the effectiveness of this approach remains thin, and still somewhat mixed. For instance, Slavin *et al.* (2011) reviews three evaluations of such interventions—*Experience Corps* (Morrow-Howell, Jonsen-Reid, McCrary, Lee, & Spitznagel, 2009), *Book Buddies* (Meier & Invernizzi, 2001) and *HOST* (Ramey, 1991)—however, the findings were inconsistent. Additionally, evidence suggests that bringing to scale interventions that rely on volunteers may be challenging (Grossman & Furano, 1999; Hager & Brudney, 2004). In particular, the success of volunteers can depend heavily on the support that they receive (Grossman & Furano, 1999).

Rigorous evaluation of supplemental early literacy programs has remained scarce in the literature. This is particularly true for costs analyses. Two rigorous cost analyses of effective early literacy interventions for students in grades K-3 find significant variation in the costs required to implement these various interventions (Hollands *et al.*, 2013; Simon, 2011). Cost variation in these studies is found to depend critically on program design and implementation. Furthermore, an evaluation of a literacy intervention using community volunteers to provide one-on-one instruction found such interventions can be a low-cost option for schools when the majority of the costs are in-kind contributions (Jacob, Armstrong, Bowden, & Pan, 2016).

The challenge of addressing early literacy is three-fold: How can early literacy programs ensure (1) quality instruction, (2) at a reasonable cost, and (3) using resources that can be operationally viable at scale? To address these challenges in early literacy, the Minnesota Reading Corps and its host organization, Reading & Math, Inc., undertook an approach to bring AmeriCorps members into Pre-K classrooms to provide literacy enrichment for the whole class and tutoring services for at-risk students.

### **3. MINNESOTA READING CORPS PRE-K PROGRAM**

#### **Minnesota Reading Corps: Theory of Change**

The Minnesota Reading Corps (MRC) program is a statewide AmeriCorps early literacy initiative that aims to foster emergent reading skills of children to ensure reading proficiency by the end of grade 3. The theory of change underlying the program is designed to specifically address three aspects of the early literacy challenge. First, there are resource insufficiencies in some Pre-K programs, by which the programs alone are unable to provide students with the individualized support that they need to become kindergarten ready. Second, even though additional support may be available through paraprofessionals or volunteers, such resources may yield lower quality instruction than a certified teacher. Third, even if paraprofessionals or volunteers are effective at a small scale, bringing such programs to scale across the nation is a significant challenge due to the amount of support required and uncertainty about the supply of volunteers.

The MRC Pre-K program addresses these challenges through three key components of the program: (1) additional classroom instructional capacity through a full-time or part-time tutor (either a Community Corps or an Educator Corps) that implements classroom activities and provides one-on-one and group tutoring sessions, (2) a dedicated coaching and a supervisory support structure that enhances instructional skills of AmeriCorps members and supports them in their day-to-day activities; and (3) an interactive and skills-focused literacy instructional model, called “SEEDS of Emergent Literacy,” which is based on current research in early childhood. This model includes classroom-based strategies and daily targeted one-on-one and small group interventions. The model also uses a Response-to-Intervention (RTI) framework that identifies at-risk students, through defined benchmarks and regular assessments, who are targeted for individualized intervention.

These features of the program enable AmeriCorps members to provide tiered support that targets students falling behind by assessing students’ learning levels and providing one-on-one or small group literacy sessions to at-risk students throughout the school day. Through regular assessment of the students, daily classroom activities for all students, and targeted interventions for students lagging behind, the MRC Pre-K program is designed to help students improve their academic performance in literacy and achieve Minnesota state “Kindergarten Ready” targets before entering kindergarten.

#### **Description of the Program**

The core activities of MRC and its host organization, Reading & Math, Inc. (RMI), are to recruit, place, train and coach AmeriCorps members who are placed into Pre-K classrooms to implement research-based literacy interventions and tutoring services. The program includes both an immersive “push-in” component, where AmeriCorps members provide literacy enrichment to the entire Pre-K classroom as well as individualized interventions to students struggling with emergent literacy skills. Struggling students are identified using a Response-to-Intervention framework.

#### **Target Population and Selection Criteria**

The Minnesota Reading Corps Pre-K program provides literacy enrichment support to 3-, 4-, and 5-year-old students at already existing preschool settings across Minnesota, including Head Start sites, public schools, and community-based programs. Existing Pre-K programs throughout the state can apply to be a part of the MRC program, and are selected and awarded AmeriCorps members based on need and ability to supply the required support staff. In the 2013-14 school year, the Minnesota Reading Corps Pre-K and K-3 programs placed more than 1,100 AmeriCorps members in 712 elementary schools, Head Start centers, and pre-schools to serve over 30,000 students across the state.

## Personnel Structure

*Classroom Personnel.* The key personnel supplied by MRC are the AmeriCorps members who are placed in Pre-K classrooms to implement the literacy rich schedule and individualized interventions. There are two types of AmeriCorps members: Educator Corps and Community Corps. Educator Corps are teachers currently employed at the site comprised of either a lead teacher or assistant teacher who are trained to incorporate Minnesota Reading Corps strategies into their instruction. Community Corps members are typically recruited from the community and brought into Pre-K classrooms full-time or part-time to implement MRC strategies. The lead teachers in classrooms where Community Corps members are placed also actively implement MRC activities. Since lead teachers host Community Corps members and collaborate with them throughout the day, they enter into an agreement that stipulates the roles and expectations over the course of the program.

*Supervisory Staff.* Both Educator Corps and Community Corps members are supported by Internal Coaches and Master Coaches, who play an important role by both ensuring the MRC activities are implemented with fidelity and by providing in-depth training and regular coaching to the tutors to optimize their success with students. Internal Coaches are employees of the Pre-K program who are trained to provide on-site literacy support, coaching, and oversight to AmeriCorps members. Master Coaches are literacy experts contracted by the program to support Internal Coaches with regular feedback through monthly observations and professional development sessions. All personnel also attend regular training, including an annual three-day Summer Training Institute and additional professional development that are taught by Master Coaches, and, in some cases, Internal Coaches.

## Key Components of the Program

The MRC Pre-K program is designed to address the challenges of early literacy through three key components: (1) additional tutors in the classroom, (2) curriculum and literacy content focused on the “Big Five” Essential Early Literacy Predictors, and (3) dedicated training and support to standardize the quality of instruction across Pre-K sites and classrooms.

*AmeriCorps Members.* The first key aspect of the program embraces the AmeriCorps members, either Community Corps or Educator Corps, who are put into Pre-K classrooms to develop their students’ emergent literacy skills. AmeriCorps members complete student assessments, implement the Literacy Rich Schedule and enact the SEEDS of emergent literacy instructional strategies and provide small group and one-one-one interventions to students falling behind.

*Literacy Instructional Strategies.* The second key component is the research-based literacy instructional strategies designed to address each of the following “Big Five” Essential Early Literacy Predictors (Lonigan & Shanahan, 2009): conversational skills, vocabulary and background knowledge, book and print rules, phonological awareness (i.e., rhyming and alliteration), and alphabetic knowledge (i.e., letter name recognition and letter sound correspondence). There are three main channels through which the MRC Pre-K program is designed to develop these Big Five skills.

First, instructional staff at participating sites together with AmeriCorps members provide classroom- and evidence-based literacy enrichment strategies (called “Literacy Rich Schedules”) to create a stimulating literacy learning environment focused on the Big Five. Literacy Rich Schedules include 12 distinct activities that engage children in daily routines, conversations, and activities (i.e., games, songs, etc.) aimed at enhancing their Big Five early literacy skills:

- Arrival,
- Sign-in,
- Meal Time,
- Large Group,
- Daily Message,
- Repeated Read Aloud,
- Tier 1 Small Group,
- Journal,
- Choice Time/Active Learning,
- Tier 2 or Tier 3 Small Group,
- Big 5 transitions
- Family

Second, an instructional approach called “SEEDS of Emergent Literacy” (Horst & Passe, 2004) guides AmeriCorps members and teachers to help children develop the social-emotional, language, and literacy skills necessary to be kindergarten-ready. “SEEDS” stands for the five key components of this approach:

- *Sensitivity* (i.e., listening to and understanding children’s needs),
- *Encouragement* (i.e., creating learning environments where children’s efforts are affirmed through verbal and non-verbal communications),
- *Education* (i.e., embedding activities that develop the “Big Five” literacy skills into daily routines in class),
- *Development of skills through doing* (i.e., helping students explore through hands-on activities), and
- *Self-image support* (i.e., supporting children to feel respected and capable).

AmeriCorps members, together with classroom teachers and Internal Coaches, are expected to realize these components in their classrooms through their interaction with and instructions to the children.

Third, MRC offers add-on, tiered support that targets the needs of at-risk and struggling students in reading. These tiers of students are determined based on MRC’s clearly-set literacy targets for each age group under the Response to Intervention (RTI)<sup>1</sup> framework. The framework is set so as to match student needs with an appropriate intensity of additional instruction. Periodic assessment is an integral part of this framework, and AmeriCorps members use a standardized, individually administered assessment tool called Individual Growth and Development Indicators (IGDI) for assessing rhyming, picture naming, and alliteration three times a year. For students identified as Tier 2 (at-risk) and Tier 3 (high-needs), individual or small group literacy tutoring is offered by AmeriCorps members. These students receive 15 minutes of additional instruction each day.

*Training and Coaching.* The third key aspect of the program is the coaching and support AmeriCorps members receive through interactions with supervisory staff (Internal Coaches and Master Coaches) and the training received through both the annual Summer Institute training and the on-going professional development sessions throughout the year.

**TRAINING:** The main activity through which members are trained on MRC strategies is the Summer Institute training, a three-day training session attended by all AmeriCorps members on an annual basis that provides expert training in the evidence-based literacy interventions used by the MRC program. Members also receive additional professional development, called Pre-K Fundamentals, throughout the year through sessions on topics such as oral language, child confidentiality, repeated read aloud method, and social and emotional development, as well as additional trainings on SEEDs.

**COACHING:** In addition to the regular trainings, Community Corps and Educator Corps members also receive intensive ongoing support through coaching from Internal Coaches and Master Coaches throughout the school year. This is a key part of how AmeriCorps members are coached to change their instructional strategies to include SEEDS of emergent literacy curriculum and other MRC practices in the classroom. Internal Coaches support AmeriCorps members with regular feedback through classroom observations and coaching sessions. Internal Coaches also work with Master Coaches to implement a classroom assessment, the Early Literacy and Language Classroom Observation (ELLCO) three times a year to assess the classroom environment and provide feedback on the language and literacy environment of the classroom.

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<sup>1</sup> For a more general description of Response to Intervention (RTI) and tiered instructional approach, refer to, for example, RTI Action Network (<http://www.rtinetwork.org/essential/tieredinstruction/tiered-instruction-and-intervention-rti-model>), or Balu, R., Zhu, P., Doolittle, F., Schiller, E., Jenkins, J., & Gersten, R. (2015). Evaluation of Response to Intervention Practices for Elementary School Reading (NCEE 2016-4000). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education.

Internal coaches typically spent 6-9 hours a month on these coaching and feedback sessions, which were also used to help integrate Community Corps members in to classrooms with lead teachers, and to ensure that the Literacy Rich Schedule is implemented with fidelity.

## 4. COST ANALYSIS IN A BROADER EVALUATION FRAMEWORK

### Previous Evaluations of the Minnesota Reading Corps Pre-K Program

The impact of the MRC Pre-K program was evaluated in the 2013-2014 school year by the University of Chicago-based research center, NORC (Markovitz *et al.*, 2015). The evaluation studied fifty Pre-K sites in the Minnesota area: twenty-five sites that were receiving the MRC program (the treatment condition) and twenty-five comparison sites that carried on with “business as usual” operations (the control condition), matched based on a number of educationally important pre-treatment characteristics. Matching methods seek to match treated sites to control site to construct a control group that is similar in its observed variables to that of the treated group. Under the assumption that no relevant unobservable variables were left behind in the matching strategy, both groups can be analyzed much like in a randomized experiment (Rosenbaum, 2010).

The impact evaluation found that the MRC Pre-K program had significant positive effects ranging from 0.4 to 0.72 standard deviations on five Individual Growth and Development Indicators (IGDI) outcome measures of emergent literacy for 4- and 5-year-olds (letter sound and letter name fluency, rhyming and alliteration fluency, and picture name fluency), and significant and positive effects on two of the four IGDI measures developmentally appropriate for 3-year-olds (letter name recognition and alliteration fluency). Effects were equally distributed across student demographics and type of site, indicating the possibility of replicating the program with similar impacts in multiple Pre-K settings.

### The Need for Cost Analysis

The impact evaluation was one of several complementary studies of the Minnesota Reading Corps program conducted to understand both implementation details and program impacts (Diaconis *et al.*, 2015; Markovitz *et al.*, 2015; Markovitz, Hernandez, Hedberg & Silbergliitt, 2014; Hafford *et al.*, 2013). However, in order to fully explore the resources required to generate the impacts measured and to better understand the magnitude of the benefits relative to the investments made, an estimation of the costs of the program is required. This type of analysis will provide policymakers and decisionmakers information to understand how to improve the program for the future, and the resources required to replicate the program in a new context.

This cost study, conducted by the Center for Benefit-Cost Studies of Education (CBCSE) at Teachers College, Columbia University, estimates the costs of replicating the MRC Pre-K program as implemented in the 2013-14 School Year that produced the impacts on students’ reading skills measured by the NORC outcome assessment in the twenty-five treatment sites evaluated. In addition to estimating the average costs per site and per student, this cost study also addresses and quantifies the variation in costs across sites and the distribution of costs, with a specific focus on the portion of costs borne by the schools. Consequently, this study will provide an understanding of the resources utilized to implement the program, as well as the mechanisms through which these resources contribute to the program impacts (i.e., increased reading skills).

This cost analysis complements the existing impact and process evaluations of the Minnesota Reading Corps Pre-K program in two key ways. First, it builds upon the rich data collected in the process assessment (Diaconis *et al.*, 2015) that documents the resources required to implement the Minnesota Reading Corps Pre-K program with fidelity, and the activities involved in the program’s delivery. This cost analysis carefully documents all of the resources provided by both the program (i.e. RMI) and by the community that enter into providing the program at Minnesota Pre-K sites. In addition, it identifies who provides these resources and how they vary along multiple dimensions<sup>2</sup>. In doing so, this cost analysis can provide a bridge

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2. Cost estimates are shown by ingredient category, by the perspective of who bears the burden of the costs and by site type.

between implementation and impact evaluations by addressing the question of what it takes to implement the Minnesota Reading Corps Pre-K program in order to achieve the observed impacts.

Second, a cost analysis can contribute to a better understanding of the program's replicability and scalability. This analysis can contribute to an understanding of whether the program itself can be implemented with fidelity in other contexts across the United States by documenting and valuing the resources that go into making the program happen. In doing so, it sheds light on the basic conditions that must be in place in order to achieve comparable impacts. It can aid in the identification of ingredients necessary, at both the school and program levels, to ensure fidelity of program implementation. Finally, it can help uncover potential efficiency gains for cost savings. This study will analyze which program components or ingredients are more or less costly and the way this varies across sites. It will also contribute to understanding whether certain bundles of resources, for example certain classroom personnel structures, are efficient relative to other potential configurations.

## **Research Questions**

The primary research questions being addressed in this cost analysis are:

- What is the average cost per student and average cost per site for the MRC Pre-K program?
- How were these costs financed? Specifically, what portion of the costs was borne by schools and what portion by other entities?
- As secondary research questions, we also investigate how costs, descriptions of ingredients, or allocation of resources differ among sites in the evaluation.

## 5. DATA AND METHODS

### Measuring Costs in Education

Estimating the costs of a program involves identifying and accounting for all of the resources used to implement activities that generate the program's impact on the outcomes of interest regardless of how they are budgeted and financed (Levin, McEwan, Belfield, Bowden, & Shand, 2018). In this study, we refer to the costs of a program as the value of the resources that are required to implement and/or replicate an intervention or program. Thus, for the purposes of this study, costs are explicitly different from finance, which focuses on the way the costs are paid and who pays for them.

For example, consider an education program that relies on parent time for the implementation of its at-home activities (such as homework or home-reading). If in the program's theory of change, home educational activities are important to obtain the impacts desired, then parent time is an important resource that is necessary for the program implementation. However, this resource will not appear in any budget or financial analysis, since the time devoted by parents is usually unpaid. If one were to replicate the program elsewhere, in an area where parents are not able to perform the activities required by the program, one would need to hire workers to replace parent time after school. Therefore, restricting costs only to those accounted for in financial budgets would understate the overall costs of the program because they do not include costs borne by sources other than the program itself.

Economic analysis of costs is based on the foundational concept of opportunity cost, the value of what is sacrificed by using a specific resource in one way rather than in its next best use (Levin, 1975, 1983; Levin *et al.*, 2018). The ingredients method is a cost accounting approach developed at the Center for Benefit-Cost Studies of Education (CBCSE) that uses this underlying concept to address costs (Levin, 1975, 1983; Levin *et al.*, 2018). This method has been widely validated in the fields of economics and accounting and provides consistency in cost estimation to allow for comparison across programs and interventions by basing estimates on the economic principle of opportunity cost (Levin *et al.*, 2018).

### The Ingredients Method

The ingredients method of cost analysis begins with the identification of the resources or *ingredients* that are required and used to implement the program being evaluated. Since one purpose of this cost analysis is to estimate the resources required to replicate a particular effect in a cost-effectiveness framework (see Section 4), our focus is on estimating the costs of the program as actually implemented, not as a theoretical goal. Both quantitative and qualitative characteristics of each ingredient are identified in order to identify the true opportunity cost of each resource. For example, the precise types and amounts of personnel are specified according to their qualifications, functions, and time commitments. A similar exercise is carried out for facilities, equipment, and other program inputs.

Under the ingredients method framework, ingredients or resources that are required and used to implement the MRC Pre-K program are identified and valued according to their market prices or equivalents. With this information, the true economic cost of the intervention can be estimated and then matched to effectiveness measures obtained from the 2013-14 outcome assessment in order to understand the resources that are required to obtain the impact realized. For this study, information on ingredients was obtained from existing documents of the process assessment and outcome evaluation of the MRC Pre-K program (Diaconis *et al.*, 2015; Markovitz *et al.*, 2015), from administrative data provided by RMI, and from both interviews with the program's personnel and observations from site visits. Data collection procedures and instruments are described in more detail below. All ingredients required for the intervention are identified and specified regardless of how they are financed.



Once the ingredients are identified, the next step entails establishing their economic costs. Market prices are used to establish the true economic value of each ingredient as the economic opportunity cost is usually considered to be approximated by the market price, i.e. the price that equates supply and demand in the competitive marketplace. Nonetheless, many markets do not have competitive market conditions that provide a true price of the resource and, in some cases, a market for the resource does not exist (for example, a unique source of talent). A deeper discussion of the methods and the assumptions used to estimate the opportunity costs of these resources is included below.

## **Data Sources and Data Collection Methods**

Data collection for this study began with developing a hypothesized list of ingredients under the categories of personnel, facilities, materials and equipment, training, and others, based on a thorough review of program documentation. These documents include the process assessment and the outcome evaluation of the MRC Pre-K program (Diaconis *et al.*, 2015; Markovitz *et al.*, 2015). In addition to these documents, the team had access to administrative data provided by RMI with important information of resource use during the implementation of the program in the academic year of 2013-14. This administrative data included the program's administrative records on the allocation of Educator and Community Corps personnel to each site.

Furthermore, reports on training expenses and site-level records of in-kind contributions of personnel time devoted to AmeriCorps member supervision, and of facilities and material use allowed us to recover relevant information for our analysis. From this hypothesized list, we identified gaps in our knowledge and developed interview protocols with targeted questions for Internal Coaches, lead teachers, Master Coaches, and other relevant RMI staff. Additional information on resource allocation was gained through on-site observation of the implementation of the MRC Pre-K program. Finally, current Master Coaches were surveyed via Qualtrics, an online survey research platform, with questions that allowed a deeper understanding of how different personnel structures were allocated across sites and their perceived effectiveness in terms of implementation and student outcomes.

The costs estimated here are intended to reflect the contrast between the MRC Pre-K program and what would have happened in the absence of the program ("business-as-usual"). By estimating the costs that are incremental to, or above and beyond, business-as-usual, this cost analysis is designed to uncover the costs related to the production of the program's documented impact. While our data are extensive, there are some aspects of program delivery for which the information was unavailable. In particular, we were not able to obtain the specific personnel structures within each of the classrooms in the previous evaluation, since the data were organized at the site level. Furthermore, we were not able to obtain information on the level of Educator and Community Corps' experience with the program; that is, whether they were new members or experienced members who are returning from the previous year. This piece of information was crucial because new members implied longer training time and more intensive supervision and support by Coaches.

Thus, some ingredients data were recovered by relying on assumptions based on information provided by the program and regarding typical Pre-K practices in Minnesota. These assumptions are explained in greater depth and are tested in a sensitivity analysis in Section 6. In cost analysis, it is important to examine sources of uncertainty in estimates and test the robustness of results to assumptions via sensitivity analysis. Thus, we follow Boardman, Greenberg, Vining, and Weimer (2011) and perform a series of parameter variation tests, by which we select the assumptions about which we are most uncertain or which are most likely to significantly impact our results, and test a range of plausible values. We then combine these sensitivity tests into "best case" (lowest cost) and "worst case" (highest cost) scenarios to estimate upper and lower bounds.

## Missing Data Strategies

Even with our extensive data collection efforts as described above, two important pieces of information critical to perform cost analysis were still missing. These were information related to: (i) whether each Community and Educator Corps member was new or returning, and (ii) classroom-level information on members, Internal Coaches and lead teachers. This section describes the rationale behind the importance of this information and the strategies we used to generate the missing information with the information already in hand.

### *Member experience*

Program documents and interview data from key MRC program personnel indicate that personnel time allocation across the program is directly linked to whether the AmeriCorps member assigned to each site is returning (and therefore experienced) or new. A returning member's experience within the program greatly alleviates Internal and Master Coach supervision time as well as implementation time allocation from key school staff. More specifically, during Fall and Spring semesters, Internal Coaches would spend 6 hours per returning member per month to conduct two classroom observations and provide follow-up support. In contrast, they spent 12 hours per month in the Fall and 8 hours in the Spring for a new member. These interactions between ingredients is an important aspect to estimating idiosyncratic site level costs. Nevertheless, our data were unable to identify whether a specific member was returning or newly assigned, or which exact member or personnel was assigned to which classroom within a site. Therefore, we utilized the data available to conduct a simulation procedure to fill in these missing data for our analysis. This section provides a description of the methods used in this procedure.

Within a specific classroom, each member's experience level (i.e., returning or new) was varied through Monte Carlo simulations, a statistical method often used to account for uncertainty and missing data. Monte Carlos methods rely on repeated random sampling to obtain numerical results to problems that are unfeasible to resolve through other statistical approaches (Greene, 2000). For this study, we used Monte Carlo simulation to draw from a probability distribution that would allow us to determine the experience of each member of the data at hand. We approximated the way returning or new members were distributed across sites to a "binominal" probability distribution—a distribution that can be drawn from a repeated random experiment of two possible outcomes, such as flipping a coin (i.e., "head" and "tail"). Each of these draws is called a "Bernoulli" trial. In our case, we conducted one Bernoulli trial of our two outcomes — "returning" and "new"— for each member at each site 50 times and averaged their time commitments across each simulation trial to obtain their time allocation across sites.

One strength of this simulation strategy is its capacity to incorporate data from actual practice, for example the share of returning and new members. We conducted a survey of all current Master Coaches (i.e, from the 2017-2018 school year) who were working closely with site level personnel, and asked questions about the experience level of AmeriCorps members that they supervise. The survey results showed that, on average, 58.37% of AmeriCorps members were new, implying that more than half of the sites in our sample would receive a greater amount of time allocated for supervision and support of its members. Assuming that current practice reflected the practice in the 2013-2014 school year, we used this percentage as an input to our Bernoulli trial. This assumption about the percentage of new members is varied and tested in the sensitivity analyses provided in Section 6.

### *Personnel structure*

Another piece of information that was missing in our data was the classroom-level personnel structure; that is, which AmeriCorps member or Internal Coach was assigned to which classroom within the site. In other words, we had member

and Internal Coach assignment information at the site-level, but the information was not further broken down by classrooms even when a site had multiple classrooms. Different personnel structures could potentially generate variation, both in student outcomes and in costs per site.

For example, each classroom has a lead teacher and he or she can also be an Educator Corps member. Lead teachers that are *not* Educator Corps would spend extra preparation time for MRC activities in addition to the preparation for their ‘business-as-usual’ activities in order to incorporate the MRC requirements. However, if the lead teacher is also an Educator Corps member, such additional preparation time would not be considered “incremental” and would be accounted for fully with the Educator Corps time commitment.<sup>3</sup> An interview with a Master Coach indicated that, in another instance, classrooms in which Educator Corps members were also the lead teachers and were not paired with a Community Corps member for additional support faced particular challenges in providing supplemental support to children behind their grade level targets. Such implementation difficulty may serve to impede the program’s ability to help develop children’s literacy skills.

In order to account for this missing information at the classroom-level, we performed two different analyses. First, using a similar Monte Carlo simulation approach, we simulated whether the lead teacher in each classroom in each site was also an Educator Corps member. That is, we made a random draw of two possible outcomes — “lead teacher is Educator Corps” and “lead teacher is not Educator Corps”— for each classroom in each site. To reflect actual practice in the simulation, we incorporated the Master Coach survey results about the percentage of lead teachers who are also Educator Corps members (i.e., 27.13%). This adjustment allows us to recover variation in lead teacher time arising from the way that the Educator Corps and lead teacher roles may overlap, which in turn can generate variation in cost across sites. The result of this approach is presented as part of our main analysis in Section 6.

There are other types of classroom-level personnel structures, such as lead teachers who also serve as Internal Coaches, that possibly lead to implementation difficulties. Our second approach to explore classroom-level personnel structure is intended to shed light on this phenomenon. These estimation exercises are not based on simulation, but rather on estimates of the average costs per classroom per ingredient. Drawing on these estimations allows us to estimate the costs of different personnel structures within the average classroom and provide insight on how different personnel assignment to each classroom might vary these costs. Results for this analysis are presented below in Section 6.

## Prices

After quantities and qualitative descriptions of all ingredients are obtained, the next step in the ingredients method is to apply an appropriate market or estimated market equivalent (Levin *et al.*, 2018) that represents the economic value of each ingredient. In this analysis, we utilize national average prices in 2014 US Dollars. Additional descriptions of the methods and assumptions used in this step are provided below.

We mainly utilized competitive market prices rather than idiosyncratic expenditure data. Average market prices represent the economic value for each ingredient because they are based upon the observed willingness to pay for each good revealed by the market. Resource prices particular to each program may not reflect the true value of the resource due to distortions of the local market. Thus, using a national price avoids mistakenly estimating costs that reflect special local market conditions rather than the true economic valuation of the resources being used for implementation. National prices were utilized here to ensure comparability across sites in different locations (rural, suburban, and urban) to inform replication efforts nationally, and to allow for comparison with other program alternatives for policy.

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<sup>3</sup> Educator Corps incremental time commitment to the MRC Pre-K program includes: (1) hours of coaching with Internal Coaches, (2) hours preparing for additional MRC in-class activities, and (3) hours attending Member Meet-Up sessions. Please refer to Technical Appendix for more details.

A majority of the national prices used in this analysis were obtained from the CBCSE Database of Educational Resource prices available through the cost tool, *CostOut* (Hollands *et al.*, 2015). Where appropriate, a corresponding fringe benefit cost was added for full-time personnel such as preschool principals or preschool teachers and non-temporary part-time personnel such as part-time Educator and Community Corps.

Ingredients in the personnel category include Internal and Master Coach time, as well as Educator Corps, Program Coordinator, lead teacher, and Principal time. As described above, the MRC program relies upon AmeriCorps, a nationwide federally supported program for young adults, retirees, or anyone above the age of 18 willing to serve in the community. Given the scale and availability of this program, this analysis values all Community Corps positions with the market value of the actual 2013-14 hire packages provided to Community Corps members<sup>4</sup>. If the program were replicated without the availability of the AmeriCorps program, the price value of these personnel may change. We explore this by conducting a sensitivity test that applies the national market rate of a minimum wage position to perform equivalent services.

Facilities and equipment costs were amortized to reflect the life value of these resources beyond the term of this evaluation to provide annualized measures. The prices were estimated using new construction or purchase prices amortized over 30 years for facilities, and 3 years for printers and laptops (2 years for small printer) at a 3.5% discount rate.

Training was also an important category of ingredients for the MRC program. MRC provides a standardized training, in partnership with RMI, for AmeriCorps members as well as for coaches. Since two biggest training resources—Summer Institute and Make-up Institute—included different sets of services that were specific to each and were difficult to disentangle (e.g., spaces for training sessions, transportation, accommodations for participants etc.), we used actual expenditure to value these services. The price/expenditure data for these services were provided by the RMI's operations department expenditure records. However, expenditure did not fully reflect the opportunity costs of providing training, for instance, trainers' time commitment or participants' time attending the training. Therefore, we added these costs and included them under the training category rather than in the personnel category. In the main analysis, the pricing for participants' (i.e., Community Corps, Educator Corps, Internal Coaches, and Master Coaches) time attending training sessions is matched with the corresponding prices in the personnel category. In the sensitivity analysis, we change the pricing of participants' time to minimum wage.

## **Estimation of Average Cost Per Site and Cost Per Student**

After we collected the quantity and price data for each ingredient, we produced cost estimates by multiplying each corresponding pair of quantity and price. Our quantity data were specific to each site, so the quantity-price multiplication generated a cost for each ingredient for each of the sampled sites. In our research questions, we had set out to estimate: (i) average cost per site and (ii) average cost per student. To yield average cost per site, we simply aggregated costs by site, and took the average among the 25 sites. For the average cost per student, we aggregated all costs regardless of the sites and divided by the total number of students served at the 25 sampled sites. Both of these estimates should be generalizable to other MRC program sites in Minnesota because our sample of 25 sites was a representative sample of Pre-K program sites in Minnesota with three or more years of experience in the program.

## **Distribution of Costs**

In a final step of the cost analysis performed in this study, the distribution of the cost burden is analyzed across categories of ingredients (i.e., personnel, facilities, materials and equipment, training, and other) and by perspective of who bears the

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<sup>4</sup> The 2013-14 hire package for Community Corps members included a bi-weekly living stipend of \$484 and an education award of \$5,500 for full-time members.

burden of the costs (i.e., schools, the program, members, and students' families). Knowing the resources that feed into a program, their costs, and who pays for them is valuable information that allows a deeper understanding of how the impacts of the program are generated, the resources the program leverages, in addition to the program's financial resources and how replication of the program is viable elsewhere.

For this analysis, we are primarily concerned with the costs borne by the implementing agency of the Minnesota Reading Corps program. However, for comparative purposes it is also important to document the total costs from a social perspective. This includes all ingredients regardless of who provides them, and whether there is a monetary cost or if they are provided in-kind by schools, such as personnel time and facilities space. From a school's perspective, however, the program may provide great value due to the resources provided by the program, by members and by families. In addition to analyzing costs according to perspective, and total costs from a social perspective, we also analyze how costs vary according to different bundling of resources, such as by different classroom personnel structures, and by school site. Ultimately, this cost analysis helps us understand the resources that must be present to obtain effectiveness results reported, and who is responsible for providing them and bearing those costs.

## 6. RESULTS

In this section, we present estimates of the total incremental cost of the Minnesota Reading Corps Pre-K Program, or the estimated costs above and beyond “business-as-usual,” as well as the average per student cost and the ways costs vary by school site, and by bundling of various resources, such as personnel structures. We also examine the cost borne by various perspectives, such as by the program, by the school sites, by members, and by families.

### Main Results

Table 1 presents the total cost of Minnesota Reading Corps and the average cost per student. The table also includes information about how costs varied among the sites in the evaluation. Note that for all reported findings, figures are presented in 2014 US dollars and rounded to the nearest \$10 to avoid false precision. The total cost of the MRC program as evaluated in 2013-14 in 25 sites, serving 1,261 children, is \$1,515,970 per year. Each site serves between 17 and 164 students. On average, the cost per student is \$1,210. This average is weighted for site size.

The average cost per student at each site varies substantially with an average of \$1,400 per student and a standard deviation for \$560. This variation is due to the fact that the assignment of Educator Corps and Community Corps varies across sites. Some sites have exclusively Community Corps members assigned to them while others have only Educator Corps. Since these two resources have different opportunity costs and different incremental time allocation<sup>5</sup>, these assignment variations are translated into variation in total personnel and training costs across sites.

**Table 1. Total Costs of Minnesota Reading Corps**

<b>Estimate Type</b>	<b>Cost</b>
<b>Total Cost for 24 Sites</b>	\$1,515,970
<b>Weighted Average Cost Per Student</b>	\$1,210
<i>Variation at the Site Level</i>	
<b>Average Cost Per Student</b>	\$1,400 (\$560)

*Note: Dollars reported in 2014 US \$ and rounded to the nearest ten. Standard errors of student-level statistics are in parenthesis.*

Table 2 shows the distribution of the costs across categories of ingredients. As is the case typically in education, most of the costs to deliver the program are in the categories of personnel and training. These two categories together account for 93% of the costs of the program. Once again there is great variation in costs per student across sites within each ingredient category. This variation reflects differences in the way the program is delivered across sites. Average personnel costs per student per site are \$1,000 with a standard deviation of \$480, while average training costs per site are \$150 and have a standard deviation of \$80. This variation is driven by the number of members allocated to each site and by whether or not the members are new to the program.

<sup>5</sup> A Community Corps hour is valued at \$9.90 while an Educator Corps hour is valued at \$24.30 which is the hourly rate of a Child Care Center Teacher at the national level.

**Table 2. Distribution of Weighted Average Costs Per Student by Ingredient Category**

	<b>Personnel</b>	<b>Facilities</b>	<b>Materials &amp; Equipment</b>	<b>Training</b>	<b>Other</b>
<b>Weighted Average Cost Per Student</b>	\$1,000	\$20	\$40	\$150	\$30
	(\$480)	(\$10)	(\$10)	(\$80)	(\$10)
<b>Percent</b>	81%	2%	3%	12%	2%

*Note: Dollars reported in 2014 US \$ and rounded to the nearest ten. Costs shown are weighted averages of student-level costs. Standard errors of student-level statistics are in parenthesis.*

Personnel and training costs represent the majority of the costs of implementing the MRC program. Thus, a deeper exploration of the resources that go into these categories and their costs is important to understand the program’s implementation of the resource categories that are integral to the program’s theory of change. Table 3 presents the quantities and costs of training and coaching ingredients of the program. The training costs consist of a series of training sessions and training materials designed to help the members and Internal Coaches implement the MRC Pre-K program’s instructional strategies in classrooms with fidelity. Our training cost estimates include costs for the following five resources: Literacy Handbook, Summer Institute, Make-Up Institute, Pre-K Fundamentals, and SEEDS Training.

Costs for Literacy Handbook include costs for printed copies of Literacy Handbook. Summer Institute—an annual three-day training in the summer—includes costs for trainer hours, trainers’ materials, participants’ (i.e., Community Corps, Educator Corps, Internal Coaches, and Master Coaches) time attending the sessions, Train the Trainers session held prior to the Institute, and fees for the venue, transportation, and accommodation. Similarly, costs for Make-Up Institute—training provided for those who missed Summer Institute—include trainer hours, trainers’ materials, participants’ (i.e., Community Corps, Educator Corps, Internal Coaches, and Master Coaches) time attending the sessions, and fees for the venue, transportation, and accommodation. Pre-K Fundamentals is a series of follow-up training and its costs comprise with trainer time, participants’ time (i.e., Community Corps, Educator Corps, and Internal Coaches) attending the training, and the fees for the venue. SEEDS Training costs include trainer hours and Internal Coaches hours attending the sessions.

Per student costs for training resources are approximately \$1 for Literacy Handbook, \$70 for Summer Institute, \$20 for Make-Up Institute, \$50 for Pre-K Fundamentals, and \$40 for SEEDS Training. Costs for trainers, costs for training participants’ time, and costs for services to hold training sessions (e.g., venue, transportation, room) take up the bulk of training costs.

**Table 3. Weighted Per-Student Quantities and Costs of Training and Coaching Ingredients**

		<b>Unit</b>	<b>Quantities</b>	<b>Cost</b>
<b>Training Ingredients</b>	Literacy Handbook	Units	0.05 (0.03)	\$1.17 (\$0.71)
	Trainers	Hours	0.07 (0.04)	\$5.53 (\$2.80)
	Trainer materials	Units	0.00 (0.00)	\$0.02 (\$0.01)
	Community Corps	Hours	0.39 (0.29)	\$2.81 (\$2.09)
	Summer Institute			
	Educator Corps	Hours	0.31 (0.45)	\$7.51 (\$11.00)
	Trainers for Train the Trainer	Hours	0.00 (0.00)	\$0.17 (\$0.09)
	Internal Coaches	Hours	0.46 (0.22)	\$20 (\$9.69)
	Master Coaches	Hours	0.04 (0.05)	\$3.12 (\$3.60)
	Service (venue, transportation, accommodation)	Units	0.07 (0.03)	\$30 (\$11.79)
	Trainers	Hours	0.02 (0.01)	\$1.77 (\$0.90)
	Trainer materials	Units	0.00	\$0.01 (\$0.00)
	Community Corps	Hours	0.10 (0.07)	\$0.70 (\$0.52)
	Educator Corps	Hours	0.08 (0.11)	\$1.88 (\$2.75)
	Internal Coaches	Hours	0.11 (0.06)	\$4.98 (\$2.42)
	Master Coaches	Hours	0.01 (0.01)	\$0.78 (\$0.90)
	Service (venue, transportation, accommodation)	Units	0.02 (0.01)	\$7.06 (\$3.15)
	SEEDS Training			
	Trainers	Hours	0.02 (0.01)	\$1.66 (\$0.84)
	Internal Coaches	Hours	0.95 (0.46)	\$40 (\$20.20)



		Trainers	Hours	0.09 (0.05)	\$6.71 (\$3.40)
		Community Corps	Hours	0.38 (0.28)	\$2.74 (\$2.04)
	Pre-K Fundamentals	Educator Corps	Hours	0.30 (0.44)	\$7.30 (\$10.70)
		Internal Coaches	Hours	0.76 (0.37)	\$30 (\$16.16)
		Venue	Units	0.00 (0.00)	\$0.13 (\$0.07)
<b>Coaching Ingredients</b>		Internal Coaches	Hours	3.40 (2.10)	\$150 (\$91.72)
		Master Coaches	Hours	1.70 (1.30)	\$130 (\$97.07)

*Note: Dollars reported in 2014 US \$ and rounded to the nearest ten whenever costs are larger than \$10. Quantities and costs are a weighted average of the per-student resource use. Standard errors of student-level statistics are in parenthesis*

These training sessions aside, both Community Corps and Educator Corps members receive frequent support and oversight from Internal and Master Coaches on a regular basis. Coaching is designed to be an integral part of the MRC Pre-K program model in ensuring that MRC Pre-K strategies are implemented in classrooms with fidelity throughout the year. The resources utilized for coaching are worth highlighting here because they are embedded under personnel category. Specifically, we consider Internal Coaches and Master Coaches as coaching resources. As shown in Table 3, Internal Coaches on average spend approximately 4 hours for coaching activities per student per year, which in total represents approximately \$150 per student per year. Similarly, Master Coaches on average spend approximately 2 hours for coaching activities per student per year, representing approximately \$130 per student per year. These coaching resources together represent 28% of total costs showing that the MRC Pre-K program is a coaching intensive program.

Further exploring the distribution of total costs across relevant variables, Table 4 shows the distribution of costs across schools, the program, members, and students' families. Schools provide in-kind resources such as facilities and materials and key on-site personnel time that contribute to the implementation of the program. Members also contribute the time that they allocate to the training sessions in the summer and throughout the school year. Finally, families contribute to the program by assisting students at home with reading assignments that are part of the program's designed activities. Family costs are included in the estimation because they are a resource leveraged by the program to help their children acquire literacy skills. Their contribution to the programs' theory of change is critical to replicate the impacts found on student literacy outcomes.

On average, approximately two-thirds of the costs of the implementation of the program are borne by MRC (61%). The other third of the program's costs are borne mostly by the school (26%) and parents and families (11%). Members contribute to the remaining 2% of the economic costs of the program. Cross-site variation of the distribution of who bears the costs is consistent with earlier patterns as there is substantial variation across sites in how costs are distributed. The majority of the costs borne by the schools are personnel costs, which include principal time, lead teacher time and Internal Coach time.

**Table 4. Distribution of Weighted Average Costs Per Student by Perspectives**

	School	Program	Members	Families
<b>Personnel</b>	\$210 (\$100)	\$670 (\$400)	- -	\$140 -
<b>Facilities</b>	\$20 (\$10)	\$10 (\$10)	- -	- -
<b>Materials and Equipment</b>	\$30 (\$10)	\$20 (\$10)	- -	- -
<b>Training</b>	\$80 (\$50)	\$50 (\$30)	\$20 (\$30)	- -
<b>Other</b>	- -	\$30 (\$20)	- -	- -
<b>Total</b>	\$320 (\$140)	\$750 (\$420)	\$20 (\$30)	\$140 -
<b>Percent</b>	26%	61%	2%	11%

*Note: Dollars reported in 2014 US \$ and rounded to the nearest ten. Costs shown are weighted averages of student-level costs. Standard errors of student-level statistics are in parenthesis.*

Finally, Table 5 shows the distribution of costs across different site types: Head Start, public preschool and community-based sites. There are two important sources of variation in costs across site type. First, costs vary significantly across site types. Community-based sites generally have larger costs of implementing the program than Head Start and public preschool sites. Second, even though there is variation of total costs per student across site type, the allocation of these resources across ingredient category remains similar across site types.

**Table 5. Distribution of Weighted Average Costs Per Student Across Site Types**

	Head Start	Public Preschool	Community-Based Preschool/Child Care Center
<b>Total Costs</b>	\$293,590	\$1,045,440	\$188,680
<b>Cost Per Student</b>	\$1,570	\$1,080	\$1,780
<i>Ingredient Category</i>			
<b>Personnel</b>	\$1,350 86%	\$880 82%	\$1,450 81%
<b>Facilities</b>	\$20 1%	\$20 1%	\$20 1%
<b>Materials and Equipment</b>	\$40 3%	\$40 3%	\$50 3%
<b>Training</b>	\$150 9%	\$130 12%	\$240 13%
<b>Other</b>	\$20 1%	\$30 2%	\$40 2%

*Note: Dollars reported in 2014 US \$ and rounded to the nearest ten. Costs shown are weighted averages of student-level costs. Percentages are shown below the main estimate.*

## Personnel Structures

This section presents estimates of the costs associated with different types of classroom-level personnel structures. Information on the perceived efficiency of each classroom personnel structure was obtained from a survey completed by Master Coaches in the 2017-2018 school year in which they were asked to rate each classroom structure efficiency from 1 to 5, where 5 indicated the most efficient structure. Estimates of perceived efficiency are thus 2017-18 measures and must be taken with caution as they might not reflect the actual efficiency of each personnel structure as implemented in the 2013-14 school year.

Table 6 presents the costs estimates of the most common personnel structures as reported by Master Coaches. Some personnel structures, for example those that involve the presence of both a Community and an Educator Corps member in the classroom, have a great deal of variation in costs that depend on whether each member is full-time or part-time and whether they are returning or not. For these personnel structures, standard errors are presented that reflect the variation of the costs generated by different ingredient combinations. Table 6 also presents Master Coaches' perception of the efficiency of each staffing structure. However, due to small sample size issue we caution readers when interpreting these results.

**Table 6. Costs Estimates Associated to Different Classroom-level Personnel Structures**

		<b>Classroom Cost</b>	<b>Cost Per Student</b>	<b>Efficiency</b>
1	Community Corps + Lead Teacher + Internal Coach	\$27,810	\$1,390	4.07
2	Community Corps + Educator Corps + Lead Teacher + Internal Coach	34,910 (\$4,180)	\$1,750 -	4.16
3	Educator Corps who is also Lead Teacher + Internal Coach	\$22,060	\$1,100	3.3
4	Community Corps + Lead Teacher who is also an Internal Coach	\$27,090	\$1,350	4
5	Community Corps + Educator Corps who is also Lead Teacher + Internal Coach	\$36,980 (\$3,450)	\$1,850 -	4*
6	Community Corps + Educator Corps + Lead Teacher who is also an Internal Coach	\$34,180 (\$4,180)	\$1,710 -	5*

*Note: Dollars reported in 2014 US \$ and rounded to the nearest ten. Standard errors of student-level statistics are in parenthesis. \* indicates that efficiency estimates were recovered from 5 or less observations*

The estimates show an important variation of costs per student across different classroom personnel structures. A classroom structure where there is only an Educator Corps who is also a lead teacher in the classroom (#3) is the least costly personnel structure with an average cost per student of \$1,100. The costliest personnel structure is one where a Community Corps member and an Educator Corps member who is also a lead teacher are present in the classroom (#5). This personnel structure generates an average cost per student of approximately \$1,850. Due to the important variation of costs related to different staffing structures within the classroom, further research that explores how different staffing structures relates to the efficiency of providing the program to students, would inform the policymaker of the most cost-effective options of allocating resources.

## Uncertainty and Sensitivity Analyses

In estimating our main results, we made a number of assumptions. In this sub-section, we perform sensitivity analysis to examine four major assumptions that we made: (i) the proportion of new versus returning members, (ii) the pricing

of Community Corps time, (iii) training costs, and (iv) families' time. Our sensitivity analyses show that, varying or relaxing certain assumptions generates some variation in costs, the change in the estimations is somewhat substantial. The estimated bounds derived from our sensitivity analyses show that average costs per student per site can vary from \$1,100 to \$1,780 per student. However, it is important to note that some of the assumptions were varied substantially from the current program implementation to reflect cost changes that potential structural changes of the program implementation could generate. The following subsections describe with detail the way these assumptions were varied.

### *Proportion of new vs returning members*

Our analyses utilized missing data simulations to estimate the site-level cost of MRC. By imputing the years of experience for AmeriCorps members, there are potential implications for the value of personnel and training based upon a new or returning AmeriCorps member in each classroom. We test the sensitivity of the assumptions underpinning this simulation by providing an upper bound estimate wherein all members are new (rather than nearly 60%). In addition to providing an upper bound on costs, these estimates can be informative for start-up costs in new locations. In this scenario, personnel costs increase as Internal Coach time allocation increases when guiding new members through the program throughout the school year. If all members are new, there are also cost implications for training as all new members must attend the Pre-K Fundamentals training sessions. Table 7 presents this sensitivity analysis. According to these estimates, if all members are new, implementation costs would be 4.1% higher, representing on average, an increase of \$50 on the average cost per student per site. These changes would account for an increase of 5% on total personnel costs per student.

**Table 7. Changes of the Weighted Average Cost Per Student with Variation of Members' Experience Assumptions**

	Main Cost Estimates	New Cost Estimate	Changes in Costs	Percent Change
<b>Total Costs</b>	\$1,210	\$1,260	\$50	4.1%
<b>Personnel</b>	\$1,000	\$1,100	\$50	5.0%
<b>Training</b>	\$150	\$150	\$0	0.1%

*Note: Dollars reported in 2014 US \$ and rounded to the nearest ten. Costs shown are weighted averages of student-level costs.*

### *Pricing of Community Corps time*

In addition to varying the experience of the pool of members of the MRC program, we also perform a sensitivity analysis that varies the pricing of Community Corps time. If Community Corps members were not available, these positions would need to be replaced by the available local workforce. We assume the position would be filled by a teaching assistant based upon the open requirements and extensive training and support provided. Table 8 presents the average cost of the program per student under this sensitivity test. In general, these assumptions do appear to affect cost estimates as changes in Community Corps pricing would lead to an increase of 22.1% of the costs, approximately an increase of \$310 on the average per student costs. This in turn would generate an increase in 26.1% of the average costs per student allocated to personnel ingredients.

**Table 8. Changes of the Weighted Average Cost Per Student with Variation of Community Corps Pricing Assumptions**

	Main Cost Estimates	New Cost Estimate	Changes in Costs	Percent Change
<b>Total Costs</b>	\$1,210	\$1,470	\$260	21.5%
<b>Personnel</b>	\$1,100	\$1,260	\$260	26.0%

*Note: Dollars reported in 2014 US \$ and rounded to the nearest ten. Costs shown are weighted averages of student-level costs.*

### Training costs

We also performed sensitivity analysis on training costs as presented in Table 9. Training costs represents the second largest category after personnel and hence it is important to examine some of the major assumptions made in its estimation. We assumed in the main analysis that the training received by AmeriCorps members was used only in the year of implementation. We assumed this because the program provides training for all members regardless of whether they are returning or not. However, one can think of the knowledge acquired through training having a larger lifespan than one year. Our sensitivity analysis changed the lifespan of training to two and five years. This change in assumptions yields important decreases in the training cost per site and decreases the costs per student to up to 10%. This sensitivity analysis provides insights into the tradeoff member turnover and training costs. If members were to stay longer in the program they wouldn't need as much training as it is currently provided and costs of providing the program would diminish. However, in order to retain members for longer periods of time, members would need to be compensated for their opportunity costs in the form of higher pay.

**Table 9. Changes of the Weighted Average Cost Per Student with Variation of Training Lifespan Assumptions**

	Main Cost Estimates	New Cost Estimate	Changes in Costs	Percent Change
<b>2-year Lifespan</b>	\$1,210	\$1,140	-\$80	-6.2%
<b>5-year Lifespan</b>	\$1,210	\$1,100	-\$120	-9.7%

*Note: Dollars reported in 2014 US \$ and rounded to the nearest ten. Costs shown are weighted averages of student-level costs.*

### Families' time

Finally, a pricing assumption we used to recover the value of family time dedicated to home reading was to price this time at the national minimum wage (\$7.25 per hour). We decided to use this price because we assumed the skills needed to perform this task at home could be performed by someone with minimal qualifications. However, if the impact found in the outcome evaluation can be thought to be driven by higher skills and their effect on student outcomes through home reading activities, then the use of the minimum wage would underestimate the costs of the program. Thus, Table 10 presents sensitivity analysis estimations of the increase in the program costs if family time were to be valued at a higher price (\$22.5 per hour). Estimates indicate that valuing family time at a higher rate would generate an increase of 22% of the total estimated average costs which would account for a 27% increase in total average personnel costs.

**Table 10. Changes of the Weighted Average Cost Per Student with Variation of Parent Time Valuing Assumptions**

	Main Cost Estimates	New Cost Estimate	Changes in Costs	Percent Change
<b>Total Costs</b>	\$1,210	\$1,480	\$270	22%
<b>Personnel</b>	\$1,100	\$1,270	\$270	27%

*Note: Dollars reported in 2014 US \$ and rounded to the nearest ten. Costs shown are weighted averages of student-level costs.*

## Limitations

While this study represents a thorough and comprehensive study of the resources required to implement the MRC program, and the results of the study are robust to assumptions according to sensitivity analyses, there are several possible limitations of this study that should be taken into account when interpreting the results. First, these estimations were performed retrospectively and are subject to measurement error issues insofar as we were not able to account for observed and detailed implementation practices. By performing several sensitivity analyses, presented above, we address this issue by generating possible bounds of how our costs estimates might vary.

Second, although the cost estimates provided can shed light on the potential to replicate or scale the program in other areas of the country and the resources needed to do so, a generalizability problem still persists. Programs in more densely populated areas may exhibit economies of scale: fixed costs may be divided over a larger number of participants, sites may become more efficient by learning from others nearby, and the program may become large enough to have market power to drive down prices for its ingredients. These two competing factors offset one another, but the extent to which they do so is unclear *a priori*. These general equilibrium effects are not accounted for in the estimates provided above. Hence, the results presented in the sensitivity analysis must be interpreted cautiously, taking these considerations into account.

Third, the pricing assumptions used in the estimation assume that a national market exists for each ingredient considered. However, specific local price contexts may vary due to a number of circumstances that are not accounted for in the cost estimates. For example, a program that requires personnel with specific and rare skills for its implementation might not be able to find local workers with such skills in rural areas, because the local market does not attract the kind of human capital needed. Therefore, implementation would require these professionals to move to the areas of implementation, which may generate higher recruitment costs than it would if implementation were carried out in an otherwise costlier area of the country.

Finally, this analysis does not address other relevant questions that might be useful to understand about the MRC Pre-K program. For example, differences in personnel structure is one of the areas crucial for implementation quality and efficiency indicated by the prior evaluation of the MRC program (i.e., process assessment), as well as by our interviews and survey data. However, we are unable to know if the variation in costs across sites or across personnel structures is associated with commensurate differences in impact since the impact evaluation did not measure impacts by site or by personnel structure.

Despite these limitations, the cost estimates obtained from this analysis can offer useful information about the return on investment in the program, and specifically the costs borne by schools in a context in which Pre-K programs are underfunded and where improving early literacy skills remains an important policy objective.

## 7. CONCLUSION

This cost study examined the resources utilized in providing the MRC Pre-K program during the 2013-14 school year for a sample of schools that was evaluated for impacts on emergent literacy outcomes for 3-, 4-, and 5-year-olds. It contributes to the evaluation literature on Pre-K programs as one of the few rigorous cost analyses in Pre-K program conducted alongside effectiveness research on a supplemental Pre-K literacy program. The impact evaluation found positive significant impacts that did not vary significantly by program personnel demographic or by type of site, indicating potential for replication. Our study compliments this evaluation to measure the costs associated with the impacts measured. Overall, the costs of MRC are \$1.5 million per year to serve 1,261 students across twenty-five schools, or \$1,210 per pupil on average. Costs were found to vary substantially by site, by ingredient category and by who bears the burden of the costs across the 25 sites evaluated. This variation is primarily driven by the assignment of Educator Corps and Community Corps across sites.

Our survey data also suggest that different bundles of resources, or personnel structures, may have different relative efficiencies that are perhaps not commensurate to the cost savings. Although the impact evaluation and this accompanying cost analysis cannot directly measure the relative cost-effectiveness of different personnel structures, this analysis does indicate that costs vary between sites based on the number of assigned members, and by classroom personnel structure. These different classroom configurations may have implications for impact. While there are some variations in cost with these different personnel structures, it is possible that the associated impacts may vary disproportionately.

This suggests that focusing program design on ensuring Community Corps and Educator Corps members are optimally supported in the classroom may have significant implications for impact. To continue improving on program design, MRC might consider conducting future evaluations of the impact of different personnel structures or resource bundles within sites and classrooms to understand which personnel structures and combination of resources optimize the quality of classroom instruction.

The costs measured in this study represent investments made by MRC, schools, members, and families. The costs are distributed among these partners to implement the program. This is an important aspect to understand and interpret the costs of MRC, especially from a school's perspective. The portion of the costs borne by schools was about 26% of the total. These resources are mainly those that were reallocated to the MRC program. While these resources have a value, those that are reallocated, such as teacher time and classroom space, do not require an additional outlay of funds from the school's budget. The remaining 74% of costs are additional resources that are provided to schools and students through the MRC program without requiring the school to finance 100% of the costs of the intervention. Based upon the program model, the most important resource that schools receive through the MRC program are trained AmeriCorps members and personnel who have access to an intensive support structure that enables the program to supplement standard classroom practices.

In dollars, the average cost per student per site for resources provided by the school ranged from \$680 to \$210.<sup>6</sup> Depending on the alternatives available, the MRC Pre-K program may provide a low-cost option for Pre-K schools that is proven effective in enhancing reading support for young students. This is particularly valuable given a setting where Pre-K education is systematically budget-constrained.

Minnesota faces budget limitations in Pre-K funding, and as they increase investments toward a targeted approach, policymakers need information to understand which programs provide the greatest return on investment. Thus, it is important to interpret these findings within the context of traditional Pre-K funding in Minnesota. In 2016, student

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<sup>6</sup> The share of cost borne by schools and these dollar values should not be confused with how much schools need to pay or finance to implement the program. Costs are explicitly different from finance in this study, as we have demonstrated elsewhere in the report.

expenditure in Pre-K programs in Minnesota was \$7,924 per student (NIEER, 2016).<sup>7</sup> Even though this number does not account for opportunity costs of resources that were utilized, but not included in the program's budget, and is not directly comparable to our total cost estimate for the MRC program, this does give a sense of how important the MRC program is in terms of the resources it brings into the classroom. The average cost per student of \$1,210 for the MRC program indicates that the program is relatively resource intensive, which largely reflects a program model that includes intensive training and continued support throughout the school year. However, from the school's perspective, it is only bearing about 26% of that cost. Thus, the program offers a low-cost approach *for schools* relative to the additional resources being added to the classroom.

Given previous literature on the effectiveness of various early literacy interventions, under-resourced schools within Minnesota face an important decision of how to address resource constraints to provide the individualized attention that struggling readers might need. This gap can either be filled by additional certified teachers, who are costly and may be in low supply, or volunteers, who likely require intensive support to ensure quality of instruction and scalability. To be effective, volunteer based-programs likely need to be relatively resource-intensive. The results of this study indicate that the MRC Pre-K program provides the resources and a support structure with the necessary intensity to ensure the instructional quality of AmeriCorps members, and delivers impacts on emergent literacy with little required additional investment from under-resourced schools. Identifying such a design that delivers impact and at a relatively small cost to schools is important for decisionmakers aiming to address the challenges of early literacy faced not only by Minnesota, but by the entire nation.

<sup>7</sup> [http://nieer.org/wp-content/uploads/2017/05/Minnesota\\_YB16.pdf](http://nieer.org/wp-content/uploads/2017/05/Minnesota_YB16.pdf)



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## TECHNICAL APPENDIX

### Description of Ingredients

This study used the ingredients method to estimate the costs of providing the MRC program for one year for the 25 sites that were evaluated in the outcome evaluation (Markovitz *et al.*, 2015). The first step in the ingredients method is to identify all ingredients utilized to implement a program and to qualitatively describe each of them and determine quantity. All personnel, materials, equipment, facilities, training, or any other services or goods required for replicating the program are considered as ingredients regardless of who paid for or contributed them.

Then, each ingredient is assigned prices based on market values in order to recover the total cost of the program and the cost per student. Furthermore, the distribution of costs for each ingredient category, costs borne by schools or by the central program office and the distribution of costs across each site type are also analyzed. This section of the Technical Appendix describes key ingredients included in the MRC cost analysis and assumptions made to estimate the quantity and price of these ingredients.

### Personnel

*Community Corps Member Time.* Community Corps member time was assumed to be one hundred percent incremental to the program. During site visits and interviews with lead teachers, Internal Coaches and Master Coaches, the interviewees mentioned that the program strived to make sure the Community Corps member that was assigned to each classroom did not replace teacher time that was already allocated in business-as-usual. Internal Coaches make sure Community Corps members to not replace the lead teacher in the class if she/he were to become absent and make sure the Community Corps members follow the program curriculum with fidelity. Following the program's administrative data, QuickBase, 1,440 hours per academic year were assigned Community Corps members who had a full-time commitment to the program and 720 hours per year were assigned to part-time Community Corps members.

*Educator Corps Member Time.* Because Educator Corps members are typically teachers or teacher aides that receive additional training and supervision/coaching to implement the MRC program in their classroom, their time allocation is not one hundred percent incremental. This is because even without the program, Educator Corps member would have spent an important amount of time in the classroom performing their business-as-usual activities. Thus, the time allocation of Educator Corps members to the implementation of the program was estimated as the addition of the following components:

- Member Meetups: these meetings take place in areas where there are 5 members or more. More detail on the definition of these areas is provided below.
- Preparation time: two hours per day for full-time Educator Corps members and 1 hour per day for part-time Educator Corps members. This estimate was taken from interviews with Educator Corps members from site visits.
- Internal Coach Observation: the time needed for one-on-one coaching with the Internal Coach. We assumed that a full-time member needed as much coaching as a part-time member and that one-on-one coaching with Internal Coach was equivalent to 20% of the total time Internal Coaches dedicate to observations that occur twice a month. These assumptions were informed from the information gathered during the site visits. In addition, this time is tied to whether the Educator Corps is new or returning. Since this information was not available to the team, we relied on simulation strategies to recover this ingredient. More information on the simulation strategy is provided below.

*Internal Coach Time.* The majority of the time commitment of the Internal Coaches are is dedicated to observations that occur twice a month. The time Internal Coaches allocated to these observations is directly linked to whether the member is new or returning. Internal Coaches spend on average six hours per month on observations with returning members, while their time allocation increases to twelve hours per month in the Fall and eight hours per month in the Spring with new members. Since this information on member experience was not available to the team for estimation, we relied on simulation strategies to recover this ingredient. More information on the simulation strategy is provided below. In addition to member observations, Internal Coaches also engage in the following activities:

- Member Meetups: these meetings take place in areas where there are 5 members or more. More detail on the definition of these areas is provided below.
- Monthly meeting with Master Coach: The frequency of this observation varies with Internal Coach experience. We assumed that Master Coaches meet with Internal Coaches once every other month if the Internal Coach is returning and every month if he/she is new. This assumption was informed by interviews with Master Coaches during the team site visit.
- Additional monthly meeting with Master Coach where there are more than one Internal Coach per site: this meeting is two hours and a half long.

*Master Coach Time.* Master Coaches engage in the following incremental activities related to program implementation:

- Member Meetups: these meetings take place in areas where there are 5 members or more. More detail on the definition of these areas is provided below.
- Monthly meeting with Internal Coaches: frequency of these meetings varies depending on Internal Coach experience as explained above.
- Additional monthly meeting with Internal Coaches where there are more than one Internal Coach per site: this meeting is two hours and a half long.
- Data review meeting: this meeting takes place three times a year.
- Meetings with Program Coordinator: these one-hour meetings take place every month.

*Program Coordinator Time.* Program Coordinator have a full-time allocation for the program. We assume that each Program Coordinator oversees 60 members.

*Lead Teacher Time.* In order to recover the number of lead teachers working in each site, we assumed that each Pre-K classroom served on average a total of twenty students. If the lead teacher is also an Educator Corps, then the total amount of her time is already accounted for in the Educator Corps time estimation. If instead, the lead teacher is not part of the MRC program, they take on average ten minutes per day to adjust their business-as-usual activities to the MRC program. However, the team was not able to identify with the data available, which Educator Corps was also a lead teacher. In order to account for this, the team relied on simulation strategies to recover this time commitment. More information on the simulation strategy is provided below.

*Principal Time.* Our site visits and interviews, indicated that principals provide general support and oversight to the implementation of MRC through check-ins and meetings with Internal Coaches. To quantify principal's time contribution, we assume one 5-minute check-in meeting every week during the school year and three one-hour meetings to review IGDI reading assessment results per year. Note that this assumption is upper bound because one school indicated that the principal has no incremental time commitment for the program.

*Students' Families Time.* The time that parents and families dedicate to MRC home reading assignments is important for the implementation of the program and is an important driver of the MRC impact results obtained. Traditional Pre-K curricula does not include home reading assignments. Thus, parent and family time allocated to home reading activities is incremental and is counted for in the estimation of costs. WE assume that parents and families allocated a total of thirty minutes a week to home reading activates. This assumption was informed by interviews with lead teachers and AmeriCorps members during the site visit.

## **Materials & Equipment**

*Printers and Copiers at RMI Offices.* Program records and interviews with RMI staff indicated that there are 2 heavy duty printers at the RMI headquarter office and 1 small copier for each of the 7 regional offices. Since this cost is at the central office level, site-level cost was calculated by dividing these quantities by the number of all MRC Pre-K sites.

*Printers in schools.* Based on the interviews with AmeriCorps members and Internal Coaches, we assume that 30 percent of printer use at the program site is for MRC Pre-K.

*Program Coordinator computer.* Based on the program records and interviews with RMI staff, we assume that each Program Coordinator receive one laptop computer with the expected life of 3 years. Note that the number of all Program Coordinator working for MRC Pre-K was an approximation. We knew that one Program Coordinator on average oversees about 60 AmeriCorps members, so we divided the number of AmeriCorps members at each site by 60 to gain the quantity of Program Coordinators time for each site.

*Site level computer for members.* Based on interviews with AmeriCorp members, we assume each member spends 2 hours each day for preparation and communication during the school year.

*ELLCO assessment materials.* Internal Coaches conducts official assessment of implementation fidelity for each AmeriCorps member using ELLCO assessment tool twice a year. ELLCO assessment tools are provided by RMI. We quantify the number of ELLCO assessment materials needed at each site by multiplying the number of members by two.

*IGDI assessment materials.* IGDI Early Literacy Assessment Kit contains materials for evaluating the following emergent reading skills of children: picture naming, rhyming, sound identification, comprehension, and alliteration. All MRC Pre-K classrooms utilize IGDI three times a year to assess students' progress and to screen struggling students that need extra reading support. We assume each classroom gets one IGDI assessment tool which has the expected life of 5 years.

*Member Gear.* Member Gear is a set of materials that includes 3 articles of clothing (i.e., fleece, T-shirt, and polo-shirt), lanyard, nametag, and a bag distributed at Summer Institute. We assume each member receives one Member Gear per year.

*Member/ Coach Bag.* MRC provides supplies such as pencils and sticky notes for the members and coaches at the Summer Institute in Member/Coach Bag. We assume each member, Internal Coach, and Master Coach receives one bag per year.

*Other teaching/ learning materials.* Interviews with members and Internal Coaches indicated that MRC sites provide extra learning materials for students such as journals for each student. We assume that this is incremental to business-as-usual Pre-K classroom in Minnesota, and include one journal for each student as part of MRC material.

*“Talk, Read and Write with Me” Bag.* The MRC Pre-K program has a parent component called “Talk, Read, and Write with Me” and provides each family with a kit that include picture books, a student tote bag, parent tip pages, a journal, a dry erase board, markers, and crayons. We assume that each child receives one bag to take home for their family.

*TIES edSpring software.* The MRC Pre-K program is a data-intensive program that regularly collect student-level data on emergent literacy skills. The data are used to determine the intensity of reading support for each child, receipt of tutoring support, and to monitor progress. This requires a software that can keep all of the assessment data in one place for easy progress monitoring and intervention tracking. The MRC Pre-K program currently uses TIES edSpring software for this purpose. We assume that a similar software would be necessary to replicate the impact of MRC Pre-K and include per year per student cost for a data-management software.

*OnCorps software.* The MRC Pre-K program mobilizes a large number of AmeriCorps members. To manage each of their timesheets, the program currently uses OnCorps software where each member can track and report their timesheets. We assume that a similar software would be required to replicate the program and include per year per member cost for a timesheet management software.

## **Facilities**

*Internal Coach Office (per year).* Based on our site visits, we assumed that each program site has an office for Internal Coaches to have meetings with students and other activities in the size of about 120 Sq. Ft. located within the school building. We also assume that thirty percent of the use of this room is for MRC Pre-K and is only used during the school year (9 months).

*Tutoring Space (per day).* This is a small space at the site where AmeriCorps members provide reading tutoring for students identified as needing extra help. Our site visit indicated that tutoring can happen anywhere at the site such as in the classroom or in the hallway or storage room. Based on the interviews, we assumed that one tutoring session is held for 15 minutes for each class, every day during the school year (i.e., 180 days) using a space of about 50 Sq. Ft.

*Program Coordinator Office (per year).* Program Coordinators were based at the RMI office, and they were each provided a small working space. We assumed that each Program Coordinator has a cubicle space of about 75 Sq. Ft. with a desk and a chair located in a business office building. Note that the number of all Program Coordinator working for MRC Pre-K was an approximation assuming that each Program Coordinator oversees 60 AmeriCorps members.

## **Training**

*Literacy Handbook.* Based on interviews with RMI staff, we assume that a printed copy of Literacy Handbook of about 400 pages is provided to each AmeriCorps member.

*Summer Institute.* Summer Institute is the biggest annual training for the program for all AmeriCorps members, Internal Coaches, and Master Coaches. Based on program records and interviews with RMI staff, we assume that the Summer Institute is a 3-day training event and held yearly. We also assume that 80 percent participation of all AmeriCorps members and Coaches attend based on the record of approximate number of participants that the Operations team of RMI provided. Note that our cost estimate for the Summer Institute only considers costs for MRC Pre-K component, but the Summer Institute is not only for MRC Pre-K, but also for MRC K-3 program and Minnesota Math Corps. Our data are limited, and we needed to make some strong assumptions, some of which are tested in the sensitivity analysis. Our estimate of Summer Institute costs consists of the following eight specific resources.

- **Trainer Hours:** There are 20 trainers who lead MRC Pre-K training sessions. Based on interviews with trainers, we assume that each trainer spends 6 hours of preparation time, attends 6 hours of Train the Training workshop, and teach 6 hours for each of the three days.

- **Trainer materials:** Based on the program record, we assume that there are 20 trainers for MRC Pre-K component, and they each prepare some materials for training sessions during Summer Institute.
- **Community Corps Hours:** We assume that there is some opportunity costs to Community Corps members attending the training. We assume that their time commitment is 6 hours per day for the three days of Summer Institute.
- **Educator Corps Hours:** We assume that Educator Corps members' time commitment to attend the training is also 6 hours per day for the three days of Summer Institute.
- **Internal Coach Hours:** Similarly, Internal Coaches' time commitment to attend Summer Institute is 6 hours a day for the three days during the Summer Institute.
- **Master Coach Hours:** Internal Coaches also have opportunity costs of attending Summer Institute. They spend 6 hours a day for three days during the Summer Institute.
- **Training Coordinator:** Every year before the Summer Institute, Train the Training workshop is organized for the trainers. Based on the interview, we assume that this requires the training coordinator to prepare for the workshop for 6 hours and lead the workshop for another 6 hours.
- **Services:** Holding Summer Institute and gathering people from different cities in Minnesota requires services such as renting the Summer Institute venue, supporting transportation support, and providing accommodations.

*Make-up Institute.* Make-up Institute is organized four times a year mainly for AmeriCorps members who miss the Summer Institute or who join in the middle of the semester. Each Make-up Institute is three days like the Summer Institute, and we assume that 20 percent of AmeriCorps members and Coaches attend Make-up Institute. Our estimate of Make-up Institute costs includes the costs of the following seven resources.

- **Trainer hours:** Based on interviews with RMI staff, we assume that there are two trainers for each of the four Make-up Institutes for MRC Pre-K component. We assume that each trainer's time commitment is 6 hours per day for three days of the Institute.
- **Trainer material:** We assume that there are 2 MRC Pre-K trainers for each of the four Make-up Institute, and they each prepare some materials for training sessions.
- **Community Corps Hours:** We assume that Community Corps members have opportunity costs of attending Make-up Institute. They spend 6 hours a day for three days during the Make-up Institute.
- **Educator Corps Hours:** Educator Corps members' time commitment to attend the training is also 6 hours per day for the three days of Make-up Institute.
- **Internal Coach Hours:** Internal Coaches time commitment to attend the training is 6 hours per day for the three days of Make-up Institute.
- **Master Coach Hours:** Internal Coaches time commitment to attend the training is 6 hours per day for the three days of Make-up Institute.
- **Services:** Services required for Make-up Institute are: renting the Summer Institute venue, supporting transportation support, and providing accommodations.

*SEEDS of Learning Train the Training.* Training for SEEDS of Learning takes the form of Train the Training model in which Internal Coaches are trained once a year in a week-long training (5 days). Our estimate for SEEDS Train the Training costs include trainer hours and time commitment of Internal Coaches participating in the training.

- **Trainer hours:** We assume that there are 5 trainers for SEEDS Train the Training, and each spends 6 hour preparing for the sessions, teaches 6 hours during the 5 days of the training. Since we needed to obtain the costs only for the 25 sites assessed for the outcome evaluation, we divide the aggregated hours of 5 trainers by the number of all MRC Pre-K sites to approximate the site-level costs.
- **Internal Coach:** We assume that each Internal Coach spends 6 hours during the 5 days of SEEDS Train the Training.

*Pre-K Fundamentals.* Pre-K Fundamentals is a series of follow up training sessions throughout the school year for AmeriCorps members and Internal Coaches to deepen their understanding of MRC Pre-K instructional strategies. Pre-K Fundamentals are held four times a year (i.e., September, October, November, and February) and organized regionally by each of the seven RMI offices.

- **Trainer hours:** Our interviews with RMI personnel indicated that each trainer spends 6 hours to prepare prior to each of the four Pre-K Fundamental training and attends one 1-hour preparation meeting with all other trainers. Also, each training session is 6 hours in length and happens 4 times a year at 7 locations, and 2 trainers are there each session at each location.
- **Member time.** Consistent with other types of training, we consider that participants bear opportunity costs to attend Pre-K Fundamentals training. Since attending Pre-K Fundamentals is required for all new members, we assume that 100% of new members attend.
- **Internal Coach time.** Our interviews with RMI staff indicated that Internal Coaches are encouraged to attend if he or she coaches new AmeriCorps member(s) or if the he or she is new to the role of Internal Coach. Due to limitation of available data, we assume that 75 percent of Internal Coaches attend the training based on our interviews with RMI staff.
- **Venue.** We assume that a room of about 770 Sq.Ft. room is used for Pre-K Fundamentals training.

### Other

*Internal Coach Travel.* Our interviews with RMI staff indicated that Internal Coaches have travel allowances for driving miles. We assumed that Internal Coaches claim miles for 9 months a year.

## Data Sources

**Table 11. List of Data Sources**

Data source	Information contained
<i>Documents</i>	
Outcome Evaluation Report	<ul style="list-style-type: none"> <li>• Detailed description of MRC program implementation for the 2013-2014 School Year</li> <li>• Types and qualifications of human resources</li> <li>• Types of activities that Community Corps and Educator Corps contribute to</li> <li>• Description of Master Coach and Internal Coach role</li> <li>• Description of Summer Training Institute that MRC offers to staff every summer</li> </ul>
Process Assessment Report	<ul style="list-style-type: none"> <li>• Detailed description of MRC program implementation for the 2013-2014 School Year</li> <li>• Types and qualifications of human resources</li> <li>• Types of activities that Community Corps and Educator Corps contribute to</li> <li>• Description of Master Coach and Internal Coach role</li> <li>• Description of Summer Training Institute that MRC offers to staff every summer</li> <li>• Detailed description of daily implementation, including activities involved in the Literacy Rich Schedule</li> </ul>



QuickBase Database	<ul style="list-style-type: none"> <li>• Number of awarded and accepted roles per site of Community Corps and Educator Corps</li> <li>• Full time and part time commitments for each Community Corps and Educator Corps per site</li> </ul>
In Kind Reports	<ul style="list-style-type: none"> <li>• Description of facilities and materials use at the site level</li> <li>• Training expenditures and assistance records for the Summer Institute and the Pre-K Fundamentals</li> </ul>
<i>Interviews/email communication</i>	
MRC program staff	<ul style="list-style-type: none"> <li>• Rough estimates of how each of MRC program staff allocate their time: Internal and Master Coaches, Community and Educator Corps, Program Coordinators, lead teachers and principals</li> <li>• Information on professional development sessions run throughout the year, including Pre-K Fundamentals SEEDS of Emergent Literacy, and monthly meet-ups</li> <li>• Activities at each school site under the Family domain and the frequencies of each activity</li> </ul>
ServeMN staff	<ul style="list-style-type: none"> <li>• Estimates of costs for Summer Institute training from 2013-14</li> <li>• Detailed information regarding staffing structure of Program Coordinators and Master Coaches, and time allocation of coaching and supervision</li> <li>• Information regarding site and classroom placement of AmeriCorps members</li> <li>• Information regarding development and content of literacy curriculum</li> <li>• Information regarding average lifetime of key program materials</li> </ul>
On site interviews with Educator Corps, Lead Teachers, Principals and Internal Coaches	<ul style="list-style-type: none"> <li>• Description of the type and quantity of personnel, materials and equipment, facilities, training and other resources involved in implementation of MRC program at each school site</li> </ul>

## Sources of National Prices

All prices in this study were adjusted to the year 2014 to achieve comparability and consistency across ingredients. Several sources of prices were used to find the best match of the ingredient to its true opportunity cost. For personnel prices, price sources for central and school level staff include the Bureau of Labor Statistics, and the College and University Professional Association for Human Resources, which provides survey data with information on salary and benefits for higher education administrators, professionals, faculty, and other staff. National prices for roles such as lead teacher and Educator Corps were also obtained from the National Education Association, which provides estimates of teacher pay across the country. For the role of Community Corps member, we used the actual 2014 value of the full-time AmeriCorps stipend and educational award for Community Corps members. Since AmeriCorps is a national program, this price most accurately captures the value of recruiting a Community Corps member for such a program across the nation. Similarly, for the role of Master Coach, we used the actual hourly contract wage for Master Coaches. Parents and families time was valued at the price of minimum wage in 2014, as priced in the National Bureau of Labor Statistics, to reflect the opportunity cost of the time spent by families to read at home.

When pricing personnel ingredients, an important assumption used is the number of hours for a full-time and part-time job commitment. This can vary significantly across professions. In this study teachers were assumed to have a full-time load of 1260 hours per academic year. All other personnel were assumed to have a full-time load of 1440 hours per academic year. Part-time loads were divided by two for both teachers and other personnel ingredients.

Opportunity costs for facilities were taken from College Planning and Management magazine, and School Planning and Management magazine. Finally, for material and equipment ingredients, the prices were taken from national retailers such

as Staples, Google shopping, Walmart and Dell where resources used by the program, such as computers and printers, can be purchased. For software prices, such as TIES and OnCorps, actual purchase prices were taken from financial records from RMI.

Training prices were taken from financial records from RMI on the actual expenditure of facilities, transportation, and accommodation for the Summer Institute and Make-up Institute training held in the 2013-14 academic year. Under the training costs, we also included trainees' time (i.e., Community Corps, Educator Corps, Internal Coaches, Master Coaches) attending the training sessions, and in the main analysis, the prices for these are equivalent to the prices used for the personnel section. However, we used minimum wage for all trainee time in the sensitivity analysis to reflect the fact that attending training sessions requires less skills than teaching students or coaching tutors.

### ***Other assumptions***

Among the other assumptions used for the cost analysis we include the interest rate that was set to 3.5%. Facilities were amortized over 30 years, while some materials and equipment ingredients, such as computers and tablets, were amortized over 3 years (while small printers were amortized over 2 years). Another assumption that was maintained across the study was the assumption of the size and hours of use for facilities. Some facilities were assigned a fixed area, such as classrooms, which were assumed to have 900 square feet. In addition, all facilities were assumed to be potentially used for 2080 hours per year.

We also added appropriate fringe benefits for all full time employees, including teachers, principals, program coordinators, and the lead training coordinator.

Finally, determining which sites were part of areas with five or more MRC AmeriCorps members and held additional member meetups was important in order to recover several personnel time allocations across sites. For the identification of these sites we relied on information provided by RMI and determined that the following sites were located in areas with five or more MRC members:

- Community Action Partnerships of Ramsey & Washington Counties: Mt. Airy
- Duluth Head Start
- YWCA of Minneapolis
- Diamondhead
- North Branch
- YMCA of Greater St. Paul
- St. Paul Public Schools
- Fair Oaks
- Zimmerman

### **Simulation Strategy**

Despite the detailed data that was available to the team for program cost estimation, two important site-level variables were still missing. First, program documents and interview data from key MRC program personnel indicate that their time commitments are directly link to the experience of the AmeriCorps members allocated to each classroom. In particular, whether each member is returning or not determines the time requirements of coaching from Internal Coaches and the incremental time of Educator Corps members. However, this information could not be recovered from the data available to us. Second, information on classroom-level personnel structure was also missing from the data available to the team.

Different personnel structures at the classroom level could potentially generate variation, both in student outcomes and in costs per site.

In order to account for personnel time variation with members' experience at the site level, simulation procedures were used. Each member's experience level (i.e., returning or new) was varied through Monte Carlo simulations, a statistical method often used to account for uncertainty and missing data. Monte Carlos methods rely on repeated random sampling to obtain numerical results to problems that are unfeasible to resolve through other statistical approaches (Greene, 2000). For this study, we used Monte Carlo simulation to draw from a probability distribution that would allow us to determine the experience of each member of the data at hand. We approximated the way returning or new members were distributed across sites to a Bernoulli probability distribution—a probability distribution of a random variable which takes the value of two possible outcomes, such as flipping a coin (i.e., “head” and “tail”). In our case, we conducted one Bernoulli trial of our two outcomes — “returning” and “new”— for each member at each site fifty times and averaged their time commitments across each simulation trial to obtain their time allocation across sites. The Bernoulli trials were calibrated in a way such that the probability of being new for any given member was 58.37%. This parameter was informed by survey responses to Master Coaches that were part of the program in the 2017-18 school year.

Table 12 presents the variation across the fifty Bernoulli trials estimated when recovering the Educator Corps' time commitments that were dependent on their experience. Note that not all sites are reported in Table 12 because not all sites were assigned an Educator Corps during the 2013-14 school year. Educator Corps time allocation to the implementation of the program is tied to their own experience because one-on-one coaching time with the Internal Coach is longer if they are new to the program. The average simulated hours per year for Educator Corps vary from 13 hours to 203 hours per site. This variation depends on the number of Educator Corps members assigned to each site. Standard errors indicate that variation from the average across simulation trial is not important. In general, simulated Educator Corps hours account from 4% to 16% of the total estimator Educator Corps time commitment to the program.

**Table 12. Simulation Variation in the Estimation of Educator Corps Hours**

Site	Total	Average Simulated Value	Percent Simulated
Site 1	373,68	13,68 (3,54)	4%
Site 4	373,824	13,82 (3,56)	4%
Site 10	613,44	73,44 (17,97)	12%
Site 11	1283,58	136,08 (24,41)	11%
Site 13	215,748	13,25 (3,43)	6%
Site 14	428,4	68,40 (17,54)	16%
Site 15	1553,04	203,04 (30,86)	13%
Site 16	473,4	68,40 (17,69)	14%
Site 18	373,824	13,82 (3,56)	4%

*continued*

Site 19	858,24	138,24 (24,50)	16%
Site 20	193,248	13,25 (3,43)	7%
Site 21	790,56	70,56 (17,97)	9%

*Note: Standard errors of site-level statistics are in parenthesis. Not all sites are presented because not all site were assigned an Educator Corps member.*

Table 13 presents the variation across the fifty Bernoulli trials estimated when recovering the Internal Coach time commitments that were dependent on the AmeriCorps member’s experience at each site. Each Internal Coach’s time allocation to the implementation of the program is directly tied to the experience of the members they oversee. The average simulated hours per year for Internal Coaches vary from 64 hours to 425 hours per site. This variation depends on the number of AmeriCorps members assigned to each site. Standard errors indicate that variation from the average across simulation trial is important. This is because time commitments of Internal Coaches are sensitive to the member’s experience of each site. In general, simulated Internal Coach hours account from 58% to 97% of the total estimation of Internal Coach time commitment to the program. This is not surprising given that most of the Internal Coach responsibilities with program implementation is directly tied to observation and coaching of AmeriCorps member, which in turn, varies according to whether they are returning or not.

**Table 13. Simulation Variation in the Estimation of Internal Coach Time**

Site	Total	Average Simulated Value	Percent Simulated
Site 1	146,52	137,52 (26,89)	94%
Site 2	221,4	212,40 (31,45)	96%
Site 3	100,62	69,12 (17,82)	69%
Site 4	78,84	69,84 (17,91)	89%
Site 5	73,08	64,08 (16,26)	88%
Site 6	166,86	135,36 (22,45)	81%
Site 7	100,62	69,12 (17,82)	69%
Site 8	96,84	69,84 (17,82)	72%
Site 9	81	72,00 (18,00)	89%
Site 10	142,74	138,24 (25,19)	97%
Site 11	374,94	343,44 (40,81)	92%

Site 12	173,34	141,84 (26,18)	82%
Site 13	256,86	207,36 (26,00)	81%
Site 14	218,52	209,52 (30,17)	96%
Site 15	456,3	424,80 (40,48)	93%
Site 16	372,6	345,60 (35,19)	93%
Site 17	78,12	69,12 (17,69)	88%
Site 18	149,4	140,40 (28,94)	94%
Site 19	292,68	283,68 (35,14)	97%
Site 20	75,96	66,96 (17,35)	88%
Site 21	147,96	138,96 (23,72)	94%
Site 22	102,78	71,28 (18,00)	69%
Site 23	165,42	133,92 (25,19)	81%
Site 24	102,06	70,56 (17,97)	69%
Site 25	117,18	67,68 (17,54)	58%

*Note: Standard errors of site-level statistics are in parenthesis.*

Finally, in order to account for classroom-level personnel structure variation across sites, we relied on Monte Carlo simulation strategies to simulate whether the lead teacher in each classroom in each site was also an Educator Corps member. This was also approximated by drawing of a Bernoulli distribution. That is, we made a random draw of two possible outcomes — “lead teacher is Educator Corps” and “lead teacher is not Educator Corps”— for each classroom in each site. The Bernoulli trials were calibrated in a way such that the probability of being new for any given member was 27.13%. This parameter was informed by survey responses to Master Coaches that were part of the program in the 2017-18 school year. This adjustment allows us to recover variation in lead teacher time arising from the way that the Educator Corps and lead teacher roles may overlap, which in turn can generate variation in cost across sites. Thus, this simulation strategy can allow us to approximate the true incremental lead teacher time commitment to the program’s implementation.

Table 14 presents the variation across the fifty Bernoulli trials estimated when recovering the lead teacher time commitments that were dependent on whether they were also an Educator Corps or not. Note that not all sites are reported in Table 14 because not all sites were assigned an Educator Corps during the 2013-14 school year. In this case, lead teacher time allocation to sites where there were no Educator Corps members assigned is one hundred percent incremental.

The average simulated hours per year for lead teachers vary from 20 hours to 65 hours per site. This variation depends on the number of Educator Corps members assigned to each site and the number of classrooms within each site. Standard

errors indicate that variation from the average across simulation trial is important. This is because time commitments of lead teachers are sensitive to whether they are also and Educator Corps or not. If a lead teacher is also an Educator Corps, then none of their time is incremental as it would already be accounted for in the Educator Corps time estimation.

In general, simulated lead teacher hours account from 22% to 100% of the total estimation of lead teacher time commitment to the program. Reliance of total lead teacher time to simulated estimates depends on the number of classrooms in each site. For example, if a site has only one classroom and one Educator Corps assigned to it, then, lead teacher time estimation will rely one hundred percent on simulated estimates. This is because it will depend on whether that one Educator Corps is also the lead teacher of the classroom or not. If instead, a site has two classrooms, but only one Educator Corps assigned to it, then the lead teacher time estimate will depend on the simulated estimate by 50%. This is because there is one classroom where the lead teacher could also be an Educator Corps member.

**Table 14. Simulation Variation in the Estimation of Lead Teacher Time**

Site	Total	Average Simulated Value	Percent Simulated
Site 1	115,2	25,20 (11,09)	22%
Site 4	21,6	21,60 (13,25)	100%
Site 10	52,8	22,80 (12,52)	43%
Site 11	94,2	64,20 (23,74)	68%
Site 15	245,4	65,40 (22,96)	27%
Site 18	80,4	20,40 (13,83)	25%
Site 19	51,6	21,60 (13,55)	42%
Site 21	19,8	19,80 (14,28)	100%

*Note: Standard errors of site-level statistics are in parenthesis. Not all sites are presented because not all site were assigned an Educator Corps member.*

## Interview Protocol

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### Minnesota Reading Corps Cost Study Interview Protocol

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*To the interviewer: This document will serve as a guide for you to conduct interviews with individuals affiliated with programs and evaluations included in our study. Some of the interviews will be iterative, meaning that you will develop additional questions as you obtain answers to the questions suggested below. Please take clear notes and be sure to be kind and considerate. Smile! It will come through in your voice.*

#### **Document Check**

*Be sure that you have given the individual a copy of the participant's rights form and that you have a signed copy of the informed consent on file before conducting the interview. We may be able to send an email and ask them to respond by email.*

#### **Introduction**

##### *Minnesota Reading Corps Cost Study*

ServeMinnesota, together with NORC, conducted an evaluation of the effectiveness of the Minnesota Reading Corps (MRC) Pre-K program during the 2013-2014 school year. The evaluation examined the school-level difference in student outcomes between 25 MRC Pre-K school sites and 25 comparison Pre-K sites. This study focuses on these same sites and is an extension of the existing evaluation work to determine the costs of the MRC Pre-K program. This cost study focuses on all the resources utilized to implement the program during the evaluation years (i.e., the 2013-2014 school year). This study is *not* a comparative cost-effectiveness analysis of the alternative programs and Minnesota Reading Corps. Rather it is an examination of the costs of the treatment and control groups from the NORC evaluation.

All responses will be anonymous and confidential as per IRB protocol # (17-445).

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Program name: Minnesota Reading Corps

Site served:

Interview date:

Start time:

End time:

Interviewer name:

Tel. number called:

Interviewee name:

Current position:

## OPENING QUESTIONS

What is your current connection with Minnesota Reading Corps?

What was your involvement in the program at this or any other site during the 2013-2014 school year?

How many students are currently served at this site and how many were served during the 2013-2014 school year? Can you please provide the number of students served by each classroom?

Please provide a general description of the activities the program entailed at your site at the time of the evaluation. Did the activity serve the entire class, or some sub-set of students? Were students pulled out of class?

Over how many weeks did the program occur? How often did each activity occur? For how long each time? When? Was it all during the school day, or at least in part during times outside of regular school hours, like nights, weekends, or summers?

Where did each activity occur? Specifically, were the students in their regular classrooms, or some other location?

Who was directly involved in each activity? Were any personnel required above and beyond what would be required for ordinary classroom instruction?

## PERSONNEL

*The questions listed below are intended to gather detailed data on personnel.*

We are interested in all personnel involved in the program – planning, implementing (i.e. actually delivering the services), supervising, or volunteering.

### *School – administration*

What was the principal's role in the program? (meetings, professional development, scheduling, student selection, etc.)

How much time did the principal spend on the program during the evaluation period?

What are the principal's qualifications? (e.g., degree, years of experience) How long has the principal (or other administrators involved in the program) been at the school? Does tenure at the school impact the principal's ability to administer the program effectively?

### *School – teachers*

Were teachers involved the program? How so?

How much time did the typical teacher spend on the program during the evaluation period, including implementation and prep time?

Were teachers asked to identify students to participate in the program? How did they identify students? About how much time did this take?

How were teachers selected to participate in the program?

Can you think of any special qualifications or characteristics about the teachers selected to implement the program? Did the program require teachers to have a particular level of experience to successfully implement it?



***School – volunteers (Educator and Community Corps):***

How many Educator Corps and Community Corps were involved typically per site?

Did the Educator Corps and/ or Community Corps need any special qualifications, or experience?

What is the typical time allocation for each, including implementation and prep time?

Do all classrooms at one MRC site receive the help of Community Corps? How does this vary across sites?

If there are X number of Community Corps members helping X number of classrooms at a site, will there be only one Educator Corps teacher supervising all of Community Corps members, or will there be X number of Educator Corps (one for each Community Corps)?

Do schools typically use substitute teachers for Educator Corps teachers attending make-up/follow-up training sessions during the school year?

***School - Internal Coaches:***

What is the internal coaches typical time allocation and distribution across sites?

***School - Parents/families:***

Can we learn anything more about how much time parents and families spent supporting MRC activities on average, ie. Talk, Read and Write with me? – Community Corps or Internal Coach

***School – other personnel***

Were there any other personnel at the school involved in providing the program?

*Ask for quantities and descriptions of each if necessary.*

***District staff***

Were there any personnel in the school district involved in the implementation of the program?

If so, who was involved in the program at the district level? Role in the program? Time spent on the program? (hours per week, percentage, etc.) If appropriate, ask about background requirements (qualifications, years of experience) for the position.

Was there anyone else who was part of the program at the district level?

***Central staff***

***Master Coaches***

How is the average master coach time distributed?

***MRC Program Coordinator***

How many sites do they oversee? Is it determined by the number of members, or internal/master coaches?

How is coordinator time distributed across schools? Are there any general rules?

We see in the data that many coordinator rotate to several different sites on a monthly bases, why is this?

What are the travel costs for site visits. How frequent are they? What determines frequency?

What is the number of master coaches or internal coaches or staff the Program coordinator is overseeing/ working with?

Are there any other central program staff?

## **TRAINING**

### *Summer Institute:*

Do all master coaches, internal coaches, and AmeriCorps members attend this training? Is there an attendance list? What are the associated travel costs for trainers and trainees?

How long is the training, how many times do you attend training, once, every year? (also for members)

Was any training provided by the program to any of the personnel before and during the evaluation period?

Who did the training? What were the trainers' qualifications?

### *Follow up PD sessions*

Are there follow up sessions after the Summer Institute? How do they differ, frequency?

Duration? Timing - was it during the school day or after-school/summer training? What facilities were used and where? If off site - lodging, travel, per diem? What materials and equipment were used?

Is there any other training involves?

Do Corps members and staff have access to online training materials (Literacy Handbook)? What do these look like?

## **MATERIALS & EQUIPMENT**

What materials, such as student workbooks, teacher manuals, and school or office supplies, were required for the program?

How many of each were required?

How often did they need to be replaced - for each, was it something that you needed to purchase once, or did it need to be replenished on a regular basis?

Did the program require the use of computers? If so, how many computers were required, for how long, and how often?

Were the computers in any sort of specialized location, like a lab, or were they located in the classroom?

Did the program receive any contributed donations of materials, supplies, or equipment? If so, what donated materials were used by the program?

Are there other classroom materials besides computers, printers, weekly assessment materials, IGDI/FAST benchmark assessment materials, picture book and "Talk Read and Write with Me"?

What resources are used for the TIES edSpring and OnCorps software?

How many years can one typically use the IGDI for?

## FACILITIES

### *School level*

Did the program take place in any location besides the regular classroom, or did it require the use of the classroom beyond the time ordinarily used for class?

If so, what spaces were required - for instance, a smaller classroom or office for small-group instruction or tutoring? How often were these spaces used, and how large were they?

At the school level, what office space and equipment were provided for people who work on the program? (Try to identify the square feet of the space)

What is the typical space used for one-on-one tutoring?

What is the typical office space size for Educator Corps?

What is the typical office space for Internal Coaches?

What percentage of the time was that space used by the program?

Did the program require use of any other office space, storage space, or meeting space at the school for administration or training purposes? If so, what spaces, how large were they, and how often?

*Other space used for program staff:* Are there other spaces needed than the space for the program coordinator?

### *District level*

At the district level, what office space and equipment was provided for people who worked on the program?

What percentage of the time was that space used by the program? (Try to identify the square feet of the space)

## OTHER QUESTIONS

Did the program involve any travel for personnel or students? If so, who traveled, to where, using what mode of transportation, how often?

Did the program provide any additional goods or services to student participants, for example, as rewards or incentives for performance? This may include small prizes, food, field trips, movie tickets, etc.

Did the program require any inputs from students' families? For example, did parents need to come in for additional conferences?

Are there any other aspects of the program - including resources paid for by the school and other donated goods and services - that we haven't covered?

Do you have any additional cost or budget data about this program?

Do you have any idea how much of the program cost was paid for by different agencies?

### *Questions to understand context and counterfactual*

Discuss the policy context and variation in implementation across sites (potentially even across Head Start versus Public versus Community)?

Are there any similar programs provided in any of the sites? ie. in Head Start schools where MRC is not implemented, do they have other programs?

How is Head Start or other programs different in the absence of MRC?

Is it common that PreK classroom usually have teaching assistants or teacher aides or tutor for reaching, than are community Corps members incremental?

We would like to learn about the community sites. Only community sites listed in the outcomes assessment are YWCA of Minneapolis and YMCA of Greater St. Paul, so maybe we can ask Pete or someone from RMI?



**Center for Benefit-Cost Studies of  
Education**

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