Crane Center for Early Childhood Research and Policy

Ready 4 Success

Evaluation Report
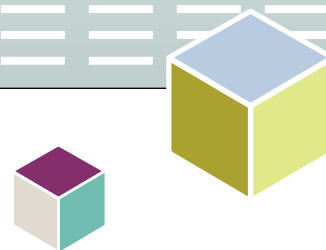
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THE OHIO STATE UNIVERSITY

COLLEGE OF
EDUCATION AND HUMAN ECOLOGY

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Executive Summary

This report presents data from the 2016-2017 academic year of the Ready 4 Success (R4S) initiative, which is funded by the city of Columbus through FutureReady Columbus. The primary goal of this initiative is to examine and improve early childhood programming in the city of Columbus in order to increase the kindergarten readiness skills of four-year-old children attending prekindergarten programs.

This goal is achieved in two primary ways: 1) assessing children's literacy and math skills at the beginning and end of the school year, and 2) providing opportunities for their prekindergarten teachers to participate in high-quality professional development trainings focused on supporting literacy and math instruction and/or participating in individualized coaching sessions. As a final step, information regarding children's kindergarten readiness across a broad spectrum of developmental areas (i.e., academic, social, physical) is assessed by the prekindergarten teachers.

In the 2016-2017 year, a total of 804 children were screened across 80 classrooms that were eligible for R4S services. Although all children in classrooms were screened, only a subset received Early Start Columbus (ESC) funding to attend these programs. In total, 305 children received ESC funding and were screened at pretest in the beginning of the school year. Data in this report, however, focuses on the subset (n = 251) who were recipients of ESC funding and for whom both pretest and posttest data was available. ESC serves four-year-old children in the prekindergarten year, providing opportunities for them to attend high-quality prekindergarten programs. Kindergarten readiness information was available for 133 of these children. Results showed that children demonstrated significant gains in both literacy and math throughout the school year. Overall, kindergarten readiness for these children was high with 120 children rated as being "proficient", and only 13 children rated as "in progress", indicating that their skill development was below expected levels of proficiency. Teacher attendance in professional development (PD) and participation in coaching sessions was lower than in previous years, although overall teacher satisfaction with PD content was very high.

Key Recommendations

- Develop a comprehensive, needs-based coaching plan that uses screening information from individual classrooms, and provides teachers the opportunity to identify classroom strengths and needs.
- Make professional development content more accessible to reach a greater number of teachers. For example, an online platform may provide more professional development opportunities for all teachers.
- Move to CEE-Hive as a data collection platform to help teachers access child-level data as well as coaching plans and classroom objectives.
- Increase data collection efforts pertaining to both children and teachers in R4S to allow for a more nuanced understanding of why some children remain at risk in the spring, and identify ways these children might be better supported.

Introduction

Program Context and Background

Entrance into kindergarten is a critical and significant milestone in a child's academic career. Although kindergarten is considered to be children's formal initiation to schooling, children's success in the classroom is often related to their level of kindergarten readiness, or the skills, knowledge and behaviors they possess when starting school. Unfortunately, research suggests that there are socio-economic status (SES) disparities with respect to kindergarten readiness (Hair, Halle, Terry-Humen, Lavelle, & Calkins, 2006; Wertheimer, Moore, Hair, & Croan, 2003; Wright, Diener, & Kay, 2000). Specifically, children from low-income or low-resource homes often begin their kindergarten year with significantly poorer abilities in literacy and math, and these lags may continue beyond the academic year (Hair et al., 2006). As such, a number of early childhood education and prekindergarten programs are focused on identifying ways to support and enhance the kindergarten readiness skills of children who may be at risk for early lags in literacy and math.

Programs aimed at preparing children for kindergarten, regardless of their starting point, underscore the importance of high-quality prekindergarten instruction. Children who attend high-quality early childhood programs demonstrate significant gains in early literacy and math throughout their prekindergarten year (Barnett, Lamy, & Jung, 2005). A complementary strand of research suggests that in addition to quality curricula, preparing and supporting prekindergarten teachers to provide evidence-based instruction is an integral component of the kindergarten readiness construct (Landry, Anthony, Swank, & Monseque-Bailey, 2009). Specifically, teachers who receive professional development or in-service training may demonstrate improved instructional techniques, which extends to improvements in children's learning outcomes (Wasik & Hindman, 2011).

In the city of Columbus, efforts to build and expand the high-quality prekindergarten options for young children have increased. As part of these efforts, FutureReady Columbus funded Ready 4 Success (R4S), a service with the mission to provide high-quality prekindergarten instruction for young children from low-SES backgrounds and to support the prekindergarten teachers who serve these children. R4S utilizes a multi-faceted approach to achieve this goal, including assessing the skills and knowledge that children have at prekindergarten arrival, measuring gains in basic literacy and math skills throughout the academic year, evaluating the kindergarten readiness of these children, and providing ongoing professional development opportunities for teachers in the R4S program.

Evaluation Aims

The R4S initiative seeks to support both teachers and children in preparing a greater population of Columbus-area children to be successful in kindergarten and beyond. This report presents data on each component of R4S, guided by the following aims:

> Aim 1: To what extent do children served by R4S exhibit risk in literacy and math at prekindergarten entry?

> Aim 2: To what extent do children served by R4S continue to exhibit risk in literacy and math at the end of their prekindergarten year?

Aim 3: To what extent do children served by R4S demonstrate kindergarten readiness at the end of their prekindergarten year?

Aim 4: To what extent do teachers participate in professional development (PD) and coaching provided by R4S?

Aim 5: To what extent are children's gains in literacy and math throughout the academic year associated with specific teacher influences?

Methods

Population

The City of Columbus provides funding via Early Start Columbus (ESC) to children attending childcare centers and prekindergarten programs. In order to be eligible for ESC funding, programs must have 3-, 4-, or 5-star ratings through Ohio's Step Up to Quality (SUTQ) Tiered Quality Rating System, and serve families of four-year-old children who live within 300% of the Federal Poverty Level. Any teacher with children receiving ESC funding is a candidate for R4S services (i.e., screenings and PD/coaching opportunities). In the 2016-2017 year, 80 teachers from 56 childcare centers were eligible to participate in and receive R4S services.

Children within these classrooms whose receipt of ESC funding was documented in the available dataset were included in this evaluation. In the 2016-17 year this included 148 girls and 103 boys. The average age of children was 53 months (SD = 5.1, $Range$ = 37 – 64 months) at the time of pre-test screening. Information concerning specific socioeconomic status (SES) of ESC-funded children was not available.

Research Design and Procedures

The R4S program utilized a multi-faceted approach to support the kindergarten readiness of Columbus city prekindergartners that included three main steps. First, children were screened at the beginning of the school year on early literacy and math assessments. The vast majority of these assessments were conducted by trained assessors within a six-week window (October 1 – November 15), although there were some children tested in early December. In the spring of the school year, children were again screened in literacy and math, using the same assessments. Screening occurred between April 1 and May 15. Second, following pre-test screenings, R4S staff contacted all R4S teachers via email to offer professional development sessions and individualized coaching. R4S staff informed teachers about the four PD opportunities (described in detail in the Data Collection Tools section) that would be offered through the R4S program. The frequency of the coaching sessions was agreed upon between R4S staff and the teacher, based on availability and desired consistency. Finally, teachers provided their year-end assessment of children's kindergarten-readiness skills with the Kindergarten Transition Summary. This information was collected and available for review in early July.

Data Collection Tools

Data from four measures were collected to address the research aims in this study:

Get Ready to Read (GRTR). The GRTR (Whitehurst & Lonigan, 2001) is a 25-item screener for children ages three to five years designed to evaluate the extent of their early literacy skills, and knowledge needed for learning to read. It takes approximately ten minutes to administer, and comprises five questions focused on letter knowledge, three questions on letter-sound knowledge, six questions on phonological awareness, eight questions on print knowledge, and three questions on rhyme awareness. All 25 items are administered directly to the child and scored as "1" if correct and "0" if incorrect. Scores are summed and reflect the total number of correct responses by the child. This summed score, along with the child's age, is used to classify the child's performance as *below average*, *average*, or *above average*, based on data from a normative sample.

Preschool Early Numeracy Screener – Brief (PENS-B). The PENS-B (Purpura & Lonigan, 2015) is a 24-item screener for children ages three to five years designed to evaluate the extent of their early numeracy skills needed for subsequent instruction in mathematics. It takes approximately ten minutes to administer directly to the child. The questions focus on assessing children's understanding of basic math principles: four questions assess children's knowledge of cardinal numbers, four questions focus on number combinations, three questions assess number operations, five questions focus on one-to-one number correspondence, three questions pertain to set/numeral comparisons, and the remaining three questions assess children's ability to solve math story problems. Answers are scored as "1" if correct and "0" if incorrect. Testing is discontinued after three consecutive incorrect responses. Scores are summed and reflect the total number of correct responses by the child. The summed score, along with the child's age, is used to classify the child's performance as *below average*, *average*, or *above average,* based on data from a normative sample.

Kindergarten Transition Summary (KTS). The teacher-completed KTS consists of 54 items, a subset of the more than 150 Ohio Early Learning Content and Development Standards. Based on a survey and focus groups, kindergarten teachers selected the indicators they consider most important at the start of the school year. Five broad domains of development are assessed with this checklist, including Social-Emotional Development, Approaches to Learning, Cognitive Development, Language and Literacy Development, and Physical Development. Total scores range from 0-110 and are organized into to three categories: a) *not yet evident*, b) *in progress*, and c) *proficient*. Teachers had the option of completing this summary on paper or through the online data system called CEE-Hive. The KTS is a requirement by the city of Columbus for children receiving ESC funding, however, only the data for 133 children submitted online through CEE-Hive are available for analysis for this report.

Professional Development (PD) and Coaching. Throughout the early months of 2017, teachers in the R4S program had multiple opportunities to attend PD workshops, and were also offered individualized coaching sessions to support their literacy and math classroom strategies. Four PD workshops were offered. Content areas covered: 1) Repeated Read-Alouds (January), 2) Phonological Awareness (February), 3) Emergent Reading (March), and 4) The Language of Math (April). The R4S project director informed center directors and teachers about the PD schedule at the beginning of the year, and again prior to each PD workshop. Each workshop was offered on two different dates. At the end of the PD workshop, attendees completed a brief survey about attendee satisfaction, usefulness of the information, and open-ended responses for additional comments.

Data Analysis

To address the program aims, descriptive statistics, t-tests, and a Chi-square test evaluated children's levels of risk, as well as differences between children's scores on the literacy and math screeners in the fall and spring. Descriptive analyses from the KTS were used to determine relative areas of strengths and weaknesses of school readiness across the five KTS domains. Results from PD follow-up surveys estimated overall attendance and attendee satisfaction. Finally, intra-class correlations (described further below) estimated the amount of variance in children's gains on the GRTR and PENS-B assessments that were attributable at the classroom, or teacher, level. Such analyses provide preliminary information concerning how influential teachers are on children's gains in literacy and math and confirm the importance of teacher training and support.

Results

The R4S program seeks to provide high-quality prekindergarten environments for young children across the city of Columbus and support the teachers who serve these children. A large part of this initiative is to provide a snapshot of the early literacy and math skills that young Columbus city children possess at prekindergarten entry, and examine the patterns of growth in these skills over time as they approach kindergarten. Results from each program aim are described in this section.

Aim 1: To what extent do children served by R4S exhibit risk in literacy and math at prekindergarten entry?

In the fall of their prekindergarten year, children on average correctly answered 13 out of 25 questions on the GRTR (range from 0-25), and 7 out of 24 questions on the PENS-B (range from 0-24). These scores were weighted according to the child's age, in order to classify their knowledge levels as *below average*, *average*, or *above average* for their age. As shown in Figure 1, a significant proportion of children in the R4S programs exhibited *below average* skills in both early literacy and math in the fall.
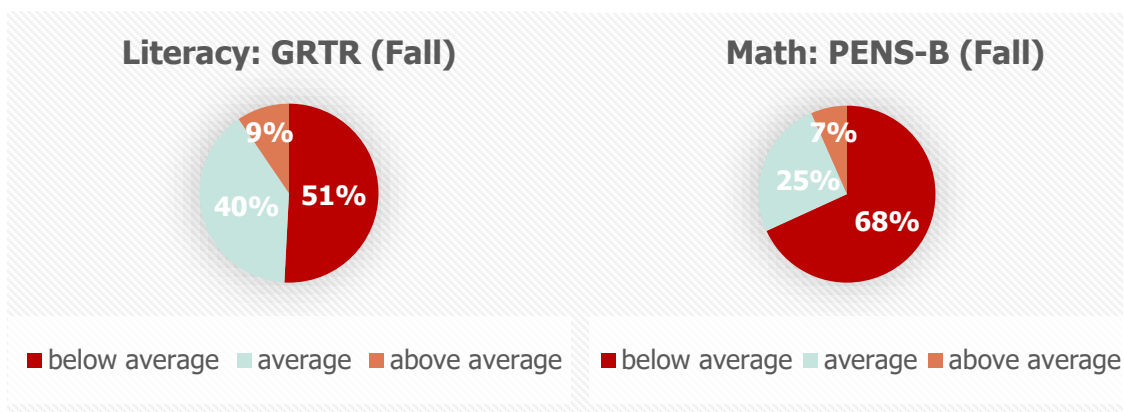

Figure 1. Proportion of R4S children at each performance level in literacy (GRTR) and math (PENS-B) in fall.

Aim 2: To what extent do children served by R4S demonstrate gains in literacy and math throughout the prekindergarten year?

Critical to the R4S initiative is an in-depth understanding of how literacy and math skills develop in four-year-old children – particularly those who exhibit lags at the beginning of the year. We examined children's gains in two ways. First, we considered the differences in raw scores from fall to spring, and second, we determined the extent to which children scored *below average* for their age in both the fall and spring, or moved from *below average* in the fall to the *average* or *above average* category in the spring.

As shown in Figure 2, children demonstrated significant gains in both literacy and math scores throughout the school year. A paired samples t-test confirmed that differences in average scores from fall to spring were statistically significant for both literacy ($t(238) = -18.324$, $p < .001$) and math ($t(238) = -19.23$, $p < .001$). Effect sizes were also calculated to determine the magnitude of children's gains over time. Cohen's d calculations of effect sizes can be interpreted as small (.3), medium (.8), or large (.8). The effect size for gains in literacy was .83 and .89 for math, indicating a very large magnitude of change over time.
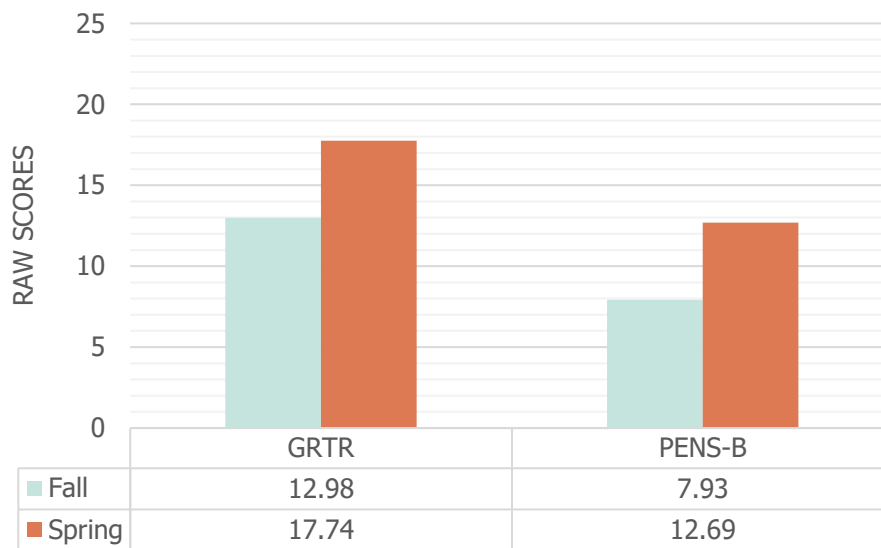

	GRTR	PENS-B
Fall	12.98	7.93
Spring	17.74	12.69

Figure 2. Raw score gains in literacy (GRTR) and math (PENS-B) from fall to spring.

In addition to comparing fall and spring raw scores on each measure, we further considered the extent to which initial ability in the fall was associated with how well children did on the spring screening. A linear regression analysis indicated that both age and fall scores were significant and positive predictors of spring scores. In other words, children who were older and had higher fall scores were significantly more likely to have higher spring scores than younger children with lower fall scores.

As a next step to understanding how well children improved over the academic year, we determined that the proportion of children considered *below average* for their age decreased considerably for both literacy and math. Recall that in the fall, 51% of children were considered *below average* in early literacy and 68% of children were considered *below average* in math. Figure 3 illustrates that in the spring, only 25% of children remained in the *below average* category in literacy, and 48% of children remained *below average* in math. A chi-square analysis confirmed that significantly fewer children were classified as *below average* in the spring as compared to the fall for both literacy ($X2$ (4, N = 239) = 110.77, $p<.001$) and math ($X2$ (4, N = 239) = 76.98, $p<.001$).
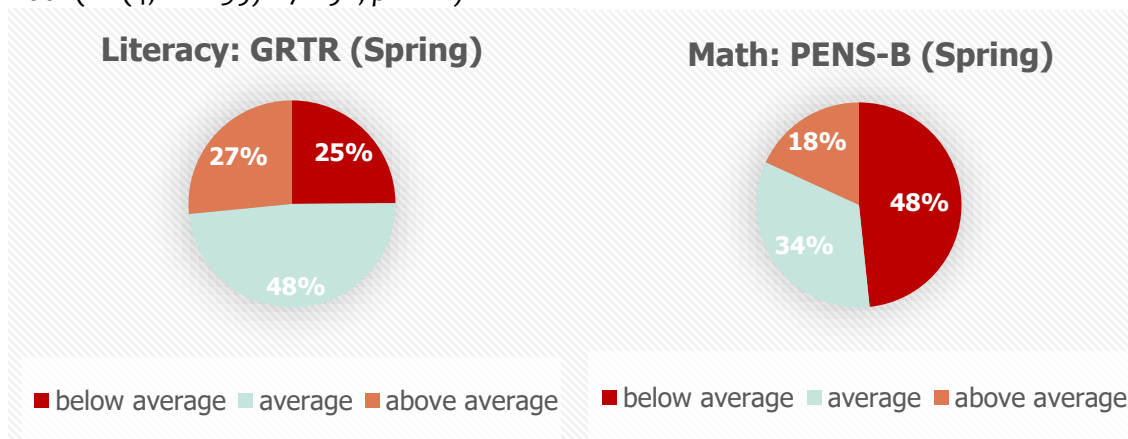

Figure 3. Proportion of children at each performance level in literacy (GRTR) and math (PENS-B) in spring.

A closer examination of the specific child characteristics that were associated with movement from the *below average* category into the *average* or *above average* category showed that children who had higher test scores in the fall – even if categorized as *below average* – were more likely to transition out of the *below average* category by the spring. Children with the lowest scores in the fall were more likely to remain in the *below average* category, even if their scores improved over the year.

Aim 3: To what extent do children served by R4S demonstrate kindergarten readiness at the end of their prekindergarten year?

Teachers were asked to submit the KTS for the children in their classrooms who were part of the R4S program. Table 1 depicts the KTS scores across the five domains, for children in this program. The overwhelming majority (90.2%) of children appeared well positioned to attend and be successful in kindergarten.

Table 1. Number of Children in Each KTS Domain Category Rating.

Domain	Not Yet Evident	In Progress	Proficient
Social Emotional Development	1 (.01%)	26 (19.5%)	106 (79.7%)
Approaches to Learning	0 (0.0%)	22 (16.5%)	111 (83.4%)
Cognitive Development	1 (.01%)	16 (12.0%)	116 (87.2%)
Language and Literacy	0 (0.0%)	12 (.09%)	121 (90.9)
Physical Development	0 (0.0%)	5 (.04%)	128 (96.2%)
Overall	**0 (0.0%)**	**13 (9.7%)**	**120 (90.2%)**

Aim 4: To what extent do teachers participate in PD and coaching provided by R4S?

In the 2016-2017 year, all teachers (*n* = 80) at ESC locations were provided with the opportunity to participate in PD workshops and/or coaching sessions. Attendance at the first two PD sessions was somewhat lower than expected; therefore, the remaining PD sessions were advertised to the community of teachers at large, beyond those in R4S. This effort did increase overall attendance at the PD sessions, as detailed in Table 2. Despite the decreased attendance over time by R4S teachers, overall satisfaction ratings at each session were very high (3.86 out of 4). Nine teachers (11%) opted to participate in coaching sessions.

Table 2. Teacher Attendance at each PD Session.

PD Session	Total Attendance	R4S Teachers
PD1: Repeated Interactive Read Aloud	18	18
PD2: Phonological Awareness	17	17
PD3: Emergent Writing	26	13
PD4: The Language of Math	25	8
Total PD Attendance	**86**	**56**

Aim 5: To what extent are children's gains in literacy and math throughout the academic year associated with specific teacher influences?

As a final step in understanding how best to support the kindergarten readiness of four-year-old children in Columbus, it was of specific interest to quantify the degree to which individual teachers influenced children's gains in literacy and math. Indeed, the variability with which children learn and grow is intrinsic to the child and the child's own skills and capabilities. However, because children in the same classroom learn and receive instruction from the same teacher throughout the school year, it is also likely that children in the same classroom might demonstrate gains in similar patterns to each other, and that these patterns might be markedly different between different classrooms. In order to examine between-classroom differences on average gains in literacy and math, we calculated an intra-class correlation (ICC). A large ICC indicates significant and large differences between classrooms; a small ICC suggests that children's gains across classrooms are very similar (i.e., very little teacher influence). With the current population of teachers and students involved in this evaluation of R4S, analyses determined that the degree of variation in children's gains between classrooms, attributable to teachers, was 14% on the GRTR and 18% the PENS-B. This percentage is slightly larger than what is reported in the research literature concerning teacher effects, which is often approximately 10-13% (e.g., Nye, Konstantopoulos, & Hedges, 2004), and suggests that teachers are differentially effective with respect to improving children's outcomes in literacy and math. In other words, approximately 14 to 18% of the variance in children's literacy and math development, respectively, could be attributed to the classroom teacher.

Discussion

Interpretation of Results

R4S is an important initiative in the city of Columbus as it strives to support both children and the teachers who serve them. Providing high-quality prekindergarten education programs to the city's children is a fundamental first step for supporting their long-term success and achievements throughout school. The data collected from this program each year continue to inform our understanding about the skills and knowledge our city's children typically possess at the beginning of the prekindergarten year, and the extent to which they develop, learn, and are prepared for kindergarten. Analyses from the 2016-2017 year yielded several essential findings that can be used to continue to build and improve upon R4S.

First, children receiving ESC funding to attend prekindergarten programs in Columbus demonstrated generally poor abilities in literacy and math in at the beginning of the school year (i.e., fall assessment). No additional data were available regarding their previous school experience or other variables that may explain the why children lag in these two academic areas. However, this outcome certainly confirms the need for the services provided by R4S, and further underscores the critical need for high-quality prekindergarten programming in the city of Columbus.

Second, despite the relatively slow start in both literacy and math for many of these children, the children in R4S programming demonstrated significant gains in both areas. On average, children scored 4.5 points higher in the spring for both measures. Although literacy and math scores improved for many children throughout the prekindergarten year, a significantly larger proportion of children improved on the literacy score than the math score. Our analyses revealed that both a child's age and fall scores were positively associated with their spring scores; therefore, it appears that that there is a developmental component to the acquisition of skills. The fact that fewer children are able to transition from the *below average* category by spring on the PENS-B, however, suggests that more instruction surrounding early math skills could be included in prekindergarten classrooms.

Kindergarten readiness, as measured by the children's teachers, was exceptionally high for the subset of children for whom data were available. In following years, this assessment will be required and made available for evaluation, so a more nuanced and comprehensive overview of kindergarten readiness will be permitted. In future years, teachers may also have the option to use the KTS as a way to measure progress and assess children's readiness across domains at the beginning and end of the year. Using the KTS measure in this way may be more useful and informative to teachers as they evaluate children's development throughout the year.

Attendance data from the PD workshops suggested that only a small proportion of teachers were able to attend, despite the fact that two different dates were offered. Because follow up data are only available from those who attended, it is unclear why more teachers were not able to participate. One possible reason is that the content of the PD – designed to align with the skills that the screening tests measure – was the same as in the previous year. As such, there may have been teachers who had already attended those sessions. Indeed, the fact that total attendance increased when the opportunity was opened to all prekindergarten teachers, not only those in R4S, suggests that the content areas were of great interest to teachers. However, it is also possible that in-person attendance at PD workshops is difficult for many teachers. In the upcoming year, we will seek alternative ways to provide this instructional content to teachers (i.e., online PD). It should also be noted that the math-focused session was the most poorly attended by R4S teachers ($n = 8$). Again, it is unclear why this might be. However, because so many children continued to exhibit poor math skills even in the spring, it is critical that teachers continue to receive support in incorporating math instruction.

Analyses regarding the degree of influence individual teachers exert on children's gains in literacy and math confirm the importance of providing support for teachers. Results showed that a substantial amount of the variance in children's gains in literacy and math was specifically attributable to the classroom teacher. The primary implication from this result is that teachers do indeed make a significant difference in a child's learning. As such, this evidence strongly supports the need to continue to offer PD and coaching opportunities, especially for teachers that serve many children in the *below average* category.

Recommendations and Changes for 2017-2018

Based on the findings from this year's data, we offer the following recommendations and changes for improving the R4S program in 2017-2018.

First, it is recommended that the R4S project director work with individual teachers to develop a comprehensive, needs-based coaching plan that uses the screening information from the classroom, as well as conduct a classroom observation. This will ensure that every teacher will have the opportunity to receive an overview of the classroom strengths and weaknesses in the fall. In addition, it is recommended that teachers have the opportunity to choose whether to receive additional coaching sessions.

Second, because only a small proportion of teachers were able to attend all the PD sessions in person, it is recommended that R4S provide online content that is relevant to the academic areas of interest (literacy and math), to increase the accessibility of this information for all teachers. From the PD workshop survey reviews, it is evident that the content and instruction provided is useful and important to those who attend. Moreover, data from the 2016-2017 year regarding children's abilities in these two domains suggests that informed instruction is critical to boosting children's knowledge, particularly in math.

Third, it is recommended that teachers and R4S staff work collaboratively in the coming year to monitor and understand the skill development of children in the classroom across academic domains, but also domains included in the KTS, such as social-emotional development. Specifically, staff can assist teachers as needed to access the child-level data from the database where information is stored. In the 2017-2018 year, teachers are required to maintain demographic and attendance information of the R4S children in a database called CEE-Hive. All GRTR, PENS-B, and KTS scores will be stored in the same database at the classroom level. Additionally, information regarding coaching plans and objectives for each classroom teacher will be maintained in CEE-Hive. Therefore, teachers will be able to access all this information and potentially use it to monitor their class' progress. Additionally, the collection of more robust data from the KTS will permit in-depth analysis of the validity of this tool. R4S staff will support teachers who may be unfamiliar with the database and wish to use the information.

A final recommendation for improvement in the coming year is to increase data collection efforts pertaining to both children and teachers in R4S. More data concerning children's school attendance rates, demographic backgrounds, and disability status will allow for a more nuanced understanding of why some children remain at risk in the spring, and why others may need stronger supports. Additionally, more information regarding teacher's backgrounds, teaching styles, and classroom environments will also inform how best to support prekindergarten teachers.

Conclusion

The R4S program collects valuable information and offers much-needed support for Columbus area children by developing their kindergarten readiness skills, and their teachers by providing professional development training. Data from this year show that these children made significant progress throughout the year, thanks in no small part to their teachers. Data from this year also show that a large proportion of children started their prekindergarten year with considerable lags in literacy and math. This information strongly supports the idea that the R4S program meets a critical need among young children in Columbus and the early childhood education programs that they attend. Therefore, the recommendation and plan for the 2017-2018 year is to continue to gather data about the skills and school readiness of youngsters in our city, and provide enhanced opportunities to support the teachers who make a remarkable impact on children's lives.

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Author Note

The Crane Center for Early Childhood Research and Policy (CCEC)

The Crane Center for Early Childhood Research and Policy (CCEC), in the College of Education and Human Ecology at The Ohio State University, is a multidisciplinary research center dedicated to conducting high-quality research that improves children's learning and development at home, in school, and in the community. Our vision is to be a driving force in the intersection of research, policy and practice, as they relate to children's well-being.

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