IES Institute of Education Sciences

APPENDIXES
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Regional Educational Laboratory Northwest
At Education Northwest

State-Funded Preschool in the Last Frontier: Alaska's Pre-Elementary Grant Program

See https://go.usa.gov/xFV3B for the full report.

Appendix A. About the study

This appendix includes additional information about the Pre-Elementary Grant (PEG) program in Alaska, as well as a brief review of related research.

Alaska's Pre-Elementary Grant programs

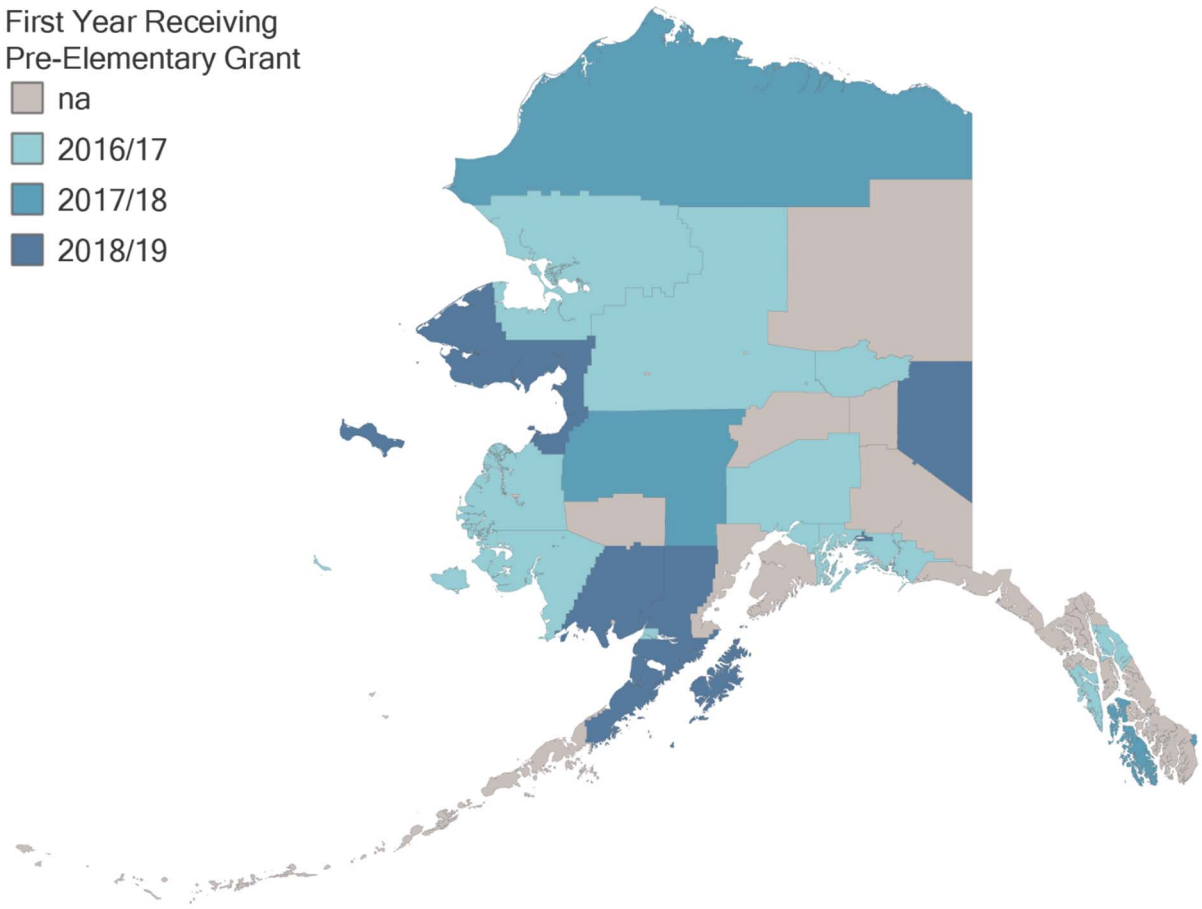
The Alaska Department of Education & Early Development (DEED) first offered PEGs in 2016 with the goal of expanding preschool options across the state, particularly for Alaska's most vulnerable children. PEG applicants must provide evidence of serving an "at-risk" population (Alaska Department of Education & Early Development, 2016). For example, PEG districts can identify specific racial/ethnic groups, English learner students, or students from low-income families as the populations in their communities that are most in need of support.

Before PEGs were available, DEED administered a prescriptive grant program that required districts and their partners to use the state's curricula and assessment frameworks. From 2009/10 to 2010/11 DEED conducted the Alaska Pilot Pre-Kindergarten Project, and from 2012/13 to 2015/16 it administered the Alaska Pre-Kindergarten Program. These earlier preschool program iterations had additional requirements for assessments (such as the Peabody Picture Vocabulary Test) and schedules (such as 3.5 hours a day, four days a week, and for the length of the school year) that were not included in the PEG requirements to give school districts more flexibility to meet local needs.

As with the Preschool Development Grants (PDG) program administered through the U.S. Department of Education, Alaska's PEG program provides two types of grants: development and renewal. One-year development grants are for districts looking to plan or launch new programs or to support existing programs (for example, by completing a needs assessment, engaging parents and families, piloting classrooms, and expanding access to existing programs). Four-year renewal grants are for districts that received funds in 2015/16 through the previous state program and are looking to expand their preschools and to transition to sustainability through alternative funding sources (for example, by engaging community stakeholders, leveraging other funding opportunities, and creating public or private partnerships to continue providing services for children; Alaska Department of Education & Early Development, n.d.).

Twenty-four districts (45 percent of districts with elementary school programs) received PEG funds for at least one year between 2016/17 and 2018/19 (figure A1). In August 2018 DEED announced that the statewide preschool program had received a one-time increment of $6 million, to be expended over two fiscal years (2018/19 and 2019/20; Jordan, 2018). Existing PEG districts could apply for the new funds, but DEED also offered PEGs to additional districts. Overall, 24 districts were awarded PEG funds in 2018/19 (table A1). Enrollment in PEG programs in 2017/18 ranged from fewer than 10 students to more than 350, depending on the district.

Figure A1. Twenty-four districts in Alaska received a Pre-Elementary Grant (PEG) in 2018/19



na is not applicable because the district did not receive a PEG in 2016/17, 2017/18, or 2018/19.
Note: PEG funding was first provided in 2016/17; all districts receiving a PEG in 2016/17 also received a PEG in 2017/18 and 2018/19.
Source: Authors' analysis of Alaska Department of Education & Early Development data.

Table A1. Number of kindergarten students in the 2018/19 cohort enrolled in a Pre-Elementary Grant program in 2017/18, by district

District	Number of students
Alaska Gateway School District	na
Anchorage School District	More than 300
Bering Strait School District	na
Bristol Bay Borough School District	[a]
Chugach School District	10–24
Fairbanks North Star Borough School District	10–24
Hoonah City School District	[a]
Iditarod Area School District	[a]
Juneau Borough School District	25–100
Kashunamiut School District	10–24
Kodiak Island Borough School District	na
Lake and Peninsula Borough School District	na
Lower Kuskokwim School District	100–200
Lower Yukon School District	10–24
Matanuska-Susitna Borough School District	100–200
Nome Public School District	25–100
North Slope Borough School District	100–200
Northwest Arctic Borough School District	100–200
Sitka Borough School District	[a]
Southeast Island School District	[a]
Southwest Region School District	na
Valdez City School District	na
Yukon-Koyukuk School District	25–100
Yupiit School District	10–24

na is not applicable because these districts received their first Pre-Elementary Grant in 2018/19 and thus did not have enrollment numbers available.
a. Data are suppressed to protect student identity.
Source: Authors' analysis of Alaska Department of Education & Early Development data.

In 2016/17 Alaska also provided one-year bridge grants for early learning programs to a set of districts that had previously received funding through the *Moore v. Alaska* settlement, which provided funds for the lowest performing schools in the state to improve early learning, teacher retention, and high school exit exam supports (see Pierson et al., 2018, for an evaluation of the early learning portion of the *Moore v. Alaska* settlement). The bridge grants were funded through a $1.2 million allotment from the Alaska Legislature to prepare districts to apply for development or renewal PEG funds. Those bridge grants were extended to a second year in 2017/18. Lower Kuskokwim and Yukon-Koyukuk were the only districts that received both *Moore* settlement funds and PEG funds. However, six of the *Moore* districts also received PEG funds in subsequent years: Kashunamiut, Lower Yukon, North Slope Borough, and Yupiit in 2017/18, and Alaska Gateway and Bering Strait in 2018/19. These districts were included in this report as PEG districts for the applicable years.

Related research literature

This section summarizes relevant literature on preschool student characteristics and student outcomes related to preschool.

Preschool student characteristics. Preschool enrollment varies across demographic groups. By examining demographic data, researchers can gain a better understanding of who is being served by preschool programs and whether funds are reaching the target populations. Nationally, about half of 3- and 4-year-olds are enrolled in prekindergarten (Annie E. Casey Foundation, 2019; U.S. Department of Education, 2018a). The highest enrollment rates for preschool-age children were among White, Asian, and Multiracial children, as well as students whose parents have more advanced degrees (U.S. Department of Education, 2018b). Data on English learner students' enrollment in preschool are limited because many state programs do not collect data on students' home languages, even though English learner students account for almost a quarter of the preschool-age population nationwide (Friedman-Krauss et al., 2018).

In Alaska 36 percent of 3- and 4-year-olds are enrolled in preschool, compared with 48 percent nationally (Annie E. Casey Foundation, 2019). According to Alaska's statewide enrollment report, Alaska Native students accounted for 35 percent of state-funded preschool students and nearly 22 percent of all K–12 students in the state (Alaska Department of Education & Early Development, 2019).

Student outcomes related to preschool. Much of the foundational research on the impact of preschool for young children is built on longitudinal studies of the High Scope Perry Preschool program and the Abecedarian Preschool Project, both established more than 40 years ago. The programs were shown to produce academic benefits, health improvements, reductions in crime, and improved economic outcomes such as higher earnings and reduced need for public benefits. The High Scope Perry Preschool students had an almost 20 percent higher high school graduation rate, and children in the Abecedarian Preschool Program were four times more likely to graduate college than students in the control group (Campbell et al., 2012; Schweinhart et al., 2005).[1]

Additionally, longitudinal studies of Chicago's Child-Parent Center Program provided evidence of the long-term impact of preschool on children's academic and social outcomes. A follow-up study with participating children at age 35 found that participants had significantly higher rates of four-year high school graduation, college attendance, and completion of a postsecondary degree compared with the control group (Reynolds et al., 2018). The differences between the two groups were even more robust for children whose parents had lower levels of education.

Many other studies also suggest a positive relationship between preschool participation and student outcomes. Barnett (2008) found that preschool can lead to positive long-term effects, such as higher test scores and lower grade repetition, and that the strongest evidence of the effects was for economically disadvantaged children. However, some studies have suggested that the benefits of early education fade over time, often by grade 3, as demonstrated by test scores (Barnett & Carolan, 2014; Puma et al., 2012). The quality of the early education program and researchers' selection of student outcomes temper the fade-out effects, with higher quality programs showing a more lasting influence on student outcomes and student outcomes (such as grade repetition and special education) showing a longer term relationship with early education participation compared with test scores (Barnett & Carolan, 2014).

Fewer studies have examined state-funded preschool programs and the relationship between the programs and later student outcomes. Examples of state-funded preschools with evidence of positive effects on early literacy

[1] The HighScope Perry Preschool program and the Abecedarian Preschool Project studies compared the outcomes of children in high-quality center-based programs to children who did not participate in any preschool programs. Large impacts such as those found in these studies are not likely to occur in other studies of preschool programs, where children in the comparison group might attend other forms of preschool.

and math skills at kindergarten entry include those in Arkansas, New Jersey, North Carolina, and Tennessee (Hustedt et al., 2007; Lamy et al., 2005; Lipsey et al., 2015; Peisner-Feinberg, 2014). In addition, Peisner-Feinberg et al. (2017) found gains through grade 1 across all domains of learning, including language, literacy, math, and social skills, for students who attended Georgia's preschool program. Similarly, Leitner (2015) found positive effects at kindergarten entry and through grade 2 following participation in Nevada's state-funded preschool program, including additional gains for English learner students that narrowed the initial achievement gap.

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Appendix B. Methods

This appendix describes the data sources, sample, and methodology used in the study of Alaska's Pre-Elementary Grant (PEG) program.

Data

This study used three data sources:

- Materials that PEG school districts submitted to the Alaska Department of Education & Early Development (DEED).
- Interviews conducted with PEG program directors.
- Administrative data provided by DEED.

Materials that PEG school districts submitted to DEED. District grant applications and budgets provided information about initial plans and infrastructure (table B1). Strategic plans provided information on the implementation progress of PEG programs (table B2), including six goal areas:

- Promoting kindergarten readiness.
- Identifying and providing support for students with the greatest need.
- Collaborating with community partners.
- Using child assessments.
- Supporting students in their transition to kindergarten.
- Training preschool staff members.

Table B1. Available grant documents for each Pre-Elementary Grant district, 2018/19

School district	Grant application	Strategic plan	Budget
1	X	—	X
2	X	X	X
3	X	—	X
4	X	X	X
5	X	X	X
6	X	X	X
7	X	X	X
8	X	—	X
9	X	X	X
10	X	—	—
11	X	—	X
12	X	—	X
13	X	X	X
14	X	—	X
15	X	X	X
16	X	X	X
17	X	—	—
18	X	X	X
19	X	X	X
20	X	—	X
21	X	—	X
22	X	—	X
23	X	X	X
24	X	—	X

X document provided. —document not available.
Note: Six districts did not have a strategic plan because they were new to the program in 2018/19.
Source: Authors' analysis of grantee materials provided to the Alaska Department of Education & Early Development.

Table B2. Strategic plan sections and elements, 2018/19

Strategic plan section	Strategic plan element
Summary of progress	Met and unmet goals
Program description	Children served; staffing
	Staffing
Planning process	Stakeholder/partner involvement in planning; planning team participants; potential planning partners; other community engagement efforts
	Planning team participants
	Potential planning partners
	Other community engagement efforts
Information and data gathering	Planning tools; data collection processes and sources of data
	Data collection processes and sources of data
Preschool needs	Current resources and community needs
	State-funded 4-year-olds; unmet need for 4-year-olds
Program description	Description of Pre-Elementary Grant program
Program goal 1: Promote school (kindergarten) readiness	Instructional practices and curriculum
	Alignment preschool to grade 3
	Developmentally appropriate learning
Program goal 2: Provide support for those most in need	Identifying those in need of support
	Providing support for children and families
Program goal 3: Encourage community collaboration	Plans for collaborating
	Description of any mixed-delivery model
	Identification and response to needs for services beyond pre-kindergarten
Program goal 4: Support valid and reliable assessment	Use of Teaching Strategies GOLD
	Use of child assessment system (other than Teaching Strategies GOLD)
	Use of instruct-assess-instruct cycle
	Communication of assessment results to families
Program goal 5: Support transition to kindergarten	Alignment of standards, curriculum, instruction, and assessment for pre-kindergarten to grade 3
	Partnership and family relationship activities supporting transition
	Including families in transition
Program goal 6: Ensure adequate preparation	Qualification requirements for lead teachers
	Qualification requirements for assistants
	Staffing training in curriculum and assessment
	Professional development needs and plan for addressing the needs
	Ensuring high-quality teacher/child interactions
	Classroom Assessment and Scoring System (CLASS) and training to use CLASS
Sustainability planning	Steps taken to address sustainability
	Plans for sustainability

Source: Authors' analysis of grantee materials provided to the Alaska Department of Education & Early Development.

DEED previously required PEG districts to submit year-end progress reports but stopped doing so when the program moved to the Teaching Strategies GOLD (TS GOLD®) assessment, which provides data to DEED through the Teaching Strategies platform.

The descriptions of the programs examined in this study are limited to data available in the documents and the nine supplemental interviews. In most cases it is impossible to draw precise conclusions about the percentage of districts that have or have not implemented particular practices. All documents included in the document analysis were submitted by the 24 grantees in 2018/19, although the documentation was not consistent across PEG districts: 24 districts provided grant applications, 22 districts provided budgets, and 12 districts provided strategic plans. There was also little consistency in the structure of grant applications. The strategic plans provided a structure for districts to document progress and collect data on topics such as professional development, curriculum, and assessment. Six districts received PEG funding for the first time in 2018/19 and thus were not yet obligated to submit a strategic plan. Strategic plans included fields for districts to document each of the data elements listed in table B2.

Interviews conducted with Pre-Elementary Grant program directors. For the second data source the study team conducted interviews in 2019 with PEG program directors in nine school districts and used the data to supplement the documents submitted by the PEG districts. (The interview protocol is provided at the end of this appendix in box B1.) The interview data provided further detail about program delivery and participants' perceptions of strengths, challenges, and needed supports.

Administrative data provided by the Alaska Department of Education & Early Development. The third data source, DEED administrative data, was used to describe district characteristics and to examine the characteristics and student outcomes of PEG program participants and nonparticipants. DEED administrative data included student demographic information (such as race/ethnicity, gender, and economically disadvantaged status) and school-level characteristics (such as school urban or rural locale, region of the state, and number of students). For the student outcome measures the study team used kindergarten readiness scores, grade 3 standardized assessment scores in math and reading, attendance rates in grades K–3, and English language proficiency scores in grades K–2.

Key demographic information included flags indicating race/ethnicity, economically disadvantaged status, English learner student status, and Individualized Education Program (IEP) status. Economically disadvantaged students are those eligible for the National School Lunch Program in kindergarten or otherwise identified as economically disadvantaged by their school. English learner students are those identified as receiving English learner services in kindergarten (or in later grades, depending on when the student enters the school system). In Alaska, students are classified as needing English learner services based on their score in kindergarten (or grade 1 for students who do not attend kindergarten) on an English language proficiency screening assessment. Students with IEPs are those who have an identified need for an IEP before preschool, during preschool, during kindergarten, or at any time they are enrolled in public school. Alaska Native students are those who identified as Alaska Native at any point in their public school enrollment based on available years of data and are compared with students who identify as Asian, Black, Latinx, Native Hawaiian or other Pacific Islander, White, or Multiracial. All demographic information used in the analyses was taken from the kindergarten year.

TS GOLD data from DEED were used in tandem with enrollment records to create a flag for student PEG participation, as well as to examine expected growth in TS GOLD domains between fall and spring for PEG students (see tables C2 and C3 in appendix C). TS GOLD is an observational assessment that provides data on students' cognitive, language, literacy, and math development during preschool. This flag does not capture all PEG participants, as some districts did not report either TS GOLD or enrollment records for PEG students. PEG participation is not a required element in DEED's data collection. Specifically, 2 of 13 districts did not have a PEG flag for five or more students in 2016/17 (the threshold used for public reporting by DEED). In 2017/18, 3 of 18

districts did not report a PEG flag for five or more students. In 2018/19 this was the case for 3 of 24 districts. Districts that did not report a PEG flag for five or more students were excluded from the within-PEG-district analyses (the descriptive statistics comparing PEG students and non-PEG students within PEG districts and the analyses examining the relationship between PEG participation and student outcomes within PEG districts). TS GOLD data are reported at three points each year: fall, winter, and spring (Alaska Department of Education & Early Development, 2017).

The Alaska Developmental Profile (ADP) was used to create two different outcome measures. The ADP is an observational assessment that teachers complete for all kindergarten students at school entry and submit to DEED by November 1. Students receive a 0 (does not demonstrate), 1 (demonstrates at least 50 percent of the time), or 2 (demonstrates consistently, or at least 80 percent of the time) in each of 13 goal areas. Examples include demonstrating strength and coordination of small motor muscles, demonstrating phonological awareness, and demonstrating awareness of print concepts. According to DEED's definition, students who receive a 2 in at least 11 of the 13 goal areas are said to be "demonstrating kindergarten readiness skills." In 2016/17, 70 percent of kindergarten students statewide did not meet this threshold (Alaska Department of Education & Early Development, 2017). This threshold of kindergarten readiness is used as an outcome in the study, along with the number of goal areas in which a child achieved a score of 2 (consistently demonstrates skill). The 13 goal areas fall into five domains:

- Physical well-being, health, and motor development.
- Social and emotional development.
- Approaches to learning.
- Cognition and general knowledge.
- Communication, language, and literacy.

The ADP has not been studied for reliability and validity among the overall population in Alaska or on specific groups of students.

Additional outcome measures were annual attendance rates (the percentage of days attended divided by days enrolled) and English language proficiency (as measured for English learner students only by the Assessing Comprehension and Communication in English State-to-State [ACCESS] for English Language Learners 2.0 exam).

Sample

For research question 1 the study team analyzed student-level administrative data for all Alaska students who attended districts with PEG programs from 2016/17, the first year of the PEGs, through 2018/19, focusing on first-time kindergarten students. The number of first-time kindergarten students in PEG districts increased over time, from 7,826 to 8,410, as the number of districts increased from 13 to 24 (table B3). The study team also looked at the number of districts in which five or more students in a given year had a PEG flag indicating participation in the PEG program. Districts with four or fewer PEG students were excluded from the analyses within PEG districts. In 2016/17 two districts were excluded for lack of a PEG flag, while in both 2017/18 and 2018/19 three districts were excluded. For analyses including statewide results across all districts, 1 of Alaska's 54 districts was excluded from the comparisons because it has only a high school and therefore has no kindergarten students. Also, in 2016/17 and 2017/18 Pelican City School District did not have any kindergarten students and was excluded from comparisons in those years.

Table B3. Number of Pre-Elementary Grant (PEG) districts, students in PEG districts, students in non-PEG districts, and students who participated in PEG programs, 2016/17–2018/19

		Non-PEG districts	All PEG districts	PEG districts with five or more students with PEG flag		
Year	Number of PEG districts	Number of kindergarten students in non-PEG districts	Number of kindergarten students in PEG districts	Number of PEG districts	Number of kindergarten students in PEG districts	Number of kindergarten students with PEG flag
2016/17	13	2,589	7,826	11	7,764	937
2017/18	18	2,363	7,995	15	7,954	1,015
2018/19	24	1,794	8,410	21	8,339	1,339

Note: Alaska has 54 school districts, but 1 has only a high school and was excluded from the comparisons. Anchorage School District enrolls more than twice as many students as any other district and in 2018/19 enrolled 36 percent of all kindergarten students in the state.
Source: Authors' analysis of Alaska Department of Education & Early Development data.

For research question 2 the study team employed three methods: document analysis, interview analysis, and review of administrative data on the characteristics of PEG districts. The document analysis included a review of all available grant applications, budgets, and strategic plans for the 2018/19 PEG districts and included data from 2016/17, the first year that PEGs were offered, through 2018/19. All 24 districts had to submit a grant application to be considered for funding in 2018/19 (or in prior years, depending on year of initial grant receipt). Eight PEG districts submitted more than one grant application (for different years of grant funding) by 2018/19. Twenty-two of the districts included budgets with their applications. Twelve districts submitted strategic plans in or before 2018/19. Strategic plans were used to document progress in implementing existing PEG programs. Six districts received PEG funding for the first time in 2018/19 and thus were not yet obligated to submit a strategic plan.

The study team selected nine districts receiving PEGs in 2018/19 for interviews, making every attempt to select districts that were representative of all 24 PEG districts on student characteristics, region of the state, percentage of rural students, PEG type (development or renewal), and prior receipt of *Moore vs. Alaska* funds (table B4). The study team asked the program directors in each of the selected districts to participate in interviews. Program directors in three districts declined or were unresponsive to the interview requests, and the study team replaced these districts with other districts with similar characteristics.

Table B4. Average district characteristics of all Pre-Elementary Grant districts (PEGs) and the nine interviewed PEG districts, 2018/19

District	White students (percent)	Alaska Native students (percent)	Economically disadvantaged students (percent)	English learner students (percent)	Pre-kindergarten–12 student enrollment (number)	Rural remote schools in district (number)
All PEG districts (24)	30	53	52	16	4,672	5.2
Interviewed districts (9)	32	46	51	12	3,661	5.6

Source: Authors' analysis of Alaska Department of Education & Early Development data.

For research question 3 the study team analyzed student-level administrative data on Alaska kindergarten students from 2014/15 through 2018/19, including earlier years of state-funded preschool in 2014/15 and 2015/16. Including the two earlier years allowed for analysis that incorporated grade 3 assessment scores. The sample included students who entered kindergarten for the first time between 2014/15 and 2018/19 (students who repeated kindergarten were included only in their first year in kindergarten) who were in a PEG district that reported five or more students participating in state-funded preschool in a given year. Cohort size varied from 5,913 to 8,339 kindergarten students, with 10–16 percent of the cohort enrolled in state-funded preschool in the year prior to kindergarten (table B5).

Table B5. Kindergarten entry year cohort sizes, 2014/15–2018/19

Kindergarten cohort	Number of districts	Number of students in cohort in state-funded preschool districts	Number of state-funded preschool (including PEG) students in cohort	Percentage of cohort in state-funded preschool the year before
2014/15	4	5,913	589	10
2015/16	4	5,863	625	11
2016/17	11	7,764	937	12
2017/18	15	7,954	1,015	13
2018/19	21	8,339	1,339	16

PEG is Pre-Elementary Grant.
Note: Sample sizes were calculated by excluding PEG districts where fewer than five students reported participating in PEG. Alaska has 54 school districts, but 1 has only a high school and was excluded from the comparisons.
Source: Authors' analysis of Alaska Department of Education & Early Development data.

Methodology

This section describes the study methodology.

Document analysis. Data from the document analysis helped answer research question 2 about PEG implementation. The study team reviewed all documents submitted to DEED by the 24 school districts that received funds in 2018/19. Each document was read and categorized into a series of descriptive themes, and the themes were used to organize information about each school district's PEG program.

The study team first identified organizational themes (such as preschool schedules) that would provide descriptive information about the PEG programs in each district. One member of the study team then read through all program documents to gather available data for each theme in each district. Once this process was complete, another team member read through documents from eight of the PEG districts to validate the initial results. The study team then discussed the results until consensus was reached for each theme in each of the eight districts. After the study team reached consensus, a team member went through the data for each theme to identify patterns. For example, team members went through the data on schedules and counted the number of districts offering full-day preschool, part-day preschool, or a combination of full- and part-day preschool at different sites.

Interview analysis. Interviews provided more detail to help answer research question 2. The study team selected 9 of the 24 Alaska school districts receiving PEG funding in 2018/19. The study team then conducted interviews with PEG program directors from the sample of nine districts to learn about the implementation of their program. Specifically, interviewers gathered data on program structures, goals, staff supports, instructional practices, community and family engagement efforts, and program successes and challenges.

After the interviews, the study team developed themes using the categories from the document analysis and an initial review of the interview transcripts by two members of the study team. Each of the nine transcripts was then categorized using the themes. To capture additional data, several themes were added to the original list. The thematic coding system enabled the study team to better understand the structures, systems, and practices used in the implementation of the nine districts' preschool programs. The data were entered into qualitative analysis software (Atlas.ti), which allowed for analysis by theme and district. Researchers used the software to run queries on the number of districts with different goals, structures, supports, practices, successes, and challenges.

Review of administrative data. DEED administrative data were the final source used to answer research question 1 and provide detail on implementation for research question 2. Specifically, the study team examined the characteristics of students in PEG and non-PEG districts over time (2016/17, 2017/18, and 2018/19). The study team compared the characteristics of PEG and non-PEG districts to provide information on how the districts were similar and different over time. Results of the analyses were also used to determine whether PEG districts were serving populations that are considered historically disadvantaged. Examined characteristics included race/

ethnicity, economic disadvantage, gender, English learner status, IEP status, and school locale. The report highlights differences in descriptive statistics of 3 percentage points or greater between PEG and non-PEG districts and students.

To continue to answer research question 1, the study team calculated descriptive statistics of student characteristics, school characteristics, and outcomes. The descriptive statistics included averages for kindergarten students in PEG districts who participated in a PEG program, averages for kindergarten students in PEG districts who did not participate in a PEG program, and averages for all kindergarten students in PEG districts for each item in each year of the PEGs included in this report (2016/17, 2017/18, and 2018/19). The study team also examined student characteristics and outcomes by school locale and region. For the analyses within PEG districts the study team restricted data analysis to PEG districts with a student-level flag for PEG participation and excluded the two to three districts in each year that did not report the data.

For research question 3 the study team used regression modeling to estimate the relationship of participation in state-funded preschool programs (including PEG) to student outcomes (table B6). For this research question the analysis expanded to include all state-funded preschools available in the data, beginning with the 2013/14 school year and the 2014/15 kindergarten cohort. The study examined pre-PEG state-funded preschool programs to look at the relationships between participation in state-funded preschool programs and medium-term student outcomes, such as grade 3 standardized assessment scores in math and reading. Student characteristics in the analysis included gender, race/ethnicity, economically disadvantaged status, English learner status, special education status, and age at time of school entry. An indicator for each school was included in the analysis to control for characteristics of the school (school fixed effects).

Outcomes examined were:

- Kindergarten readiness (whether a student scored a 2 on 11 of 13 goals on the ADP, as well as number of goals for which student scored a 2 on the ADP) .
- Kindergarten attendance (the percentage of school days attended) and grade 1, 2, and 3 attendance.
- English language proficiency in kindergarten (standardized student score on English language proficiency assessment) and in grades 1 and 2.
- Grade 3 assessment scores in math and reading.

Table B6. Outcome by kindergarten entry year cohort, 2014/15–2018/19

Student outcome	2014/15	2015/16	2016/17	2017/18	2018/19
Kindergarten readiness	Y	Y	Y	Y	Y
Kindergarten attendance	Y	Y	Y	Y	Y
Grade 1 attendance	Y	Y	Y	Y	N
Grade 2 attendance	Y	Y	Y	N	N
Grade 3 attendance	Y	Y	N	N	N
Kindergarten English language proficiency	N	N	Y	Y	Y
Grade 1 English language proficiency	N	N	Y	Y	N
Grade 2 English language proficiency	N	N	Y	N	N
Grade 3 assessment scores in math and reading	Y	Y	N	N	N

Y indicates that the outcome was available in the data and was analyzed for that cohort; N indicates that the outcome was not available in the data and thus was not analyzed.
Source: Authors' analysis of Alaska Department of Education & Early Development data.

The study team analyzed the relationship between preschool participation and student outcomes by kindergarten entry cohort in each grade for which data were available to understand whether the relationship between

participation in state-funded preschool and the outcome changed as students aged into higher grades. The team analyzed the relationship between participation in state-funded preschool and outcomes for all state-funded preschool districts that reported five or more students participating in a program.

The study team estimated the ordinary least squares model (equation B1) using data from 2013/14 to 2018/19. The data covered state-funded preschool cohorts in those years and kindergarten cohorts from 2014/15 to 2018/19. The model was used for the continuous outcomes of interest (attendance, grade 3 assessment scores in math and reading, and English language proficiency, as well as the kindergarten readiness measure of the number of goals for which a student consistently demonstrated the skill on the ADP):

$$Y_{is} = \alpha + \beta T_i + \gamma \mathbf{X_i} + \delta \mathbf{D_s} + \varepsilon_{is} \quad \text{(B1)}$$

where Y_{is} is the dependent variable for student *i* in school *s; T* is a binary indicator for whether the student participated in a state-funded preschool (the coefficient of interest), **X** is a vector of student characteristics (measured in kindergarten), $\mathbf{D_s}$ is a vector of indicators for each school, and ε_{is} is an error term.

For the binary outcome of interest—kindergarten readiness, defined by consistently scoring a 2 on 11 of 13 goals on the ADP—the study team modified this approach to use a logistic regression model (equation B2):

$$\log\left(\frac{P_i}{1-P_i}\right) = \alpha + \beta T_i + \gamma \mathbf{X}_i + \delta \mathbf{D}_s + \varepsilon_{is} \quad \text{(B2)}$$

where *P* is the probability of success for the binary outcome measure for student *i*, *T* is a binary indicator for whether the student participated in a state-funded preschool (the coefficient of interest), **X** is a vector of student characteristics (measured in kindergarten), $\mathbf{D}_s$ is a vector of indicators for each school, and ε_{is} is an error term.

As a sensitivity analysis, the study team conducted the analyses for districts excluding Anchorage and for Anchorage alone to gauge whether trends in Anchorage were driving the results.

To explore how the relationship between PEG participation and an outcome varied by student group, the study team added interaction effects of selected student characteristics (Alaska Native, English learner, and economically disadvantaged) to the state-funded preschool indicator in the base models.

Missing data. The document analysis revealed that 2 districts were missing budgets and 12 districts were missing strategic plans. The study team mitigated the effect of the missing documents by using available data from grant applications, budgets, and interviews to fill in details for districts that did not have strategic plans. There were no missing data for the interviews, because representatives from nine districts participated in the interviews as planned.

Before starting the analyses, the study team examined the extent of missing data in the DEED administrative data for students with a kindergarten entry year in PEG districts between 2014/15 and 2018/19. No variables used in the regression analyses were missing more than 8 percent of cases. There were no missing data for the demographic variables, including gender, race/ethnicity, English learner status, economically disadvantaged status, and whether a student had an IEP. Data on age at kindergarten entry were missing for only 17 students. The flag for PEG participation (and similarly, the flag for Head Start attendance) had no missing values: during variable creation students without a positive flag were assumed not to have been in the program. Attendance rate had 1.7 percent missing records over the years analyzed (2013/14–2018/19). The ADP variables had higher amounts of missing data, at 7.7 percent. Among the kindergarten cohorts of 2014/15 and 2015/16, assessment scores in grade 3 were missing for 7.3 percent of cases for math and 7.2 percent of cases for reading. For ACCESS scores, 7.1 percent of English learner students in 2016/17, 2017/18, and 2018/19 (the years for which data were available) were missing an overall ACCESS score. The study team used complete case analysis, also known as listwise deletion, for each outcome, which resulted in 1.7 percent of cases being dropped for attendance analyses, 7.7 percent for ADP analyses, 13.6 percent for ACCESS analyses, and 13.3 percent for assessment score analyses.

Box B1. Interview protocol

The questions below were asked during interviews with PEG program directors.

1. Can you walk me through the history of preschool education in the district? How did the current program get started?
    - What other early learning options do families have in your community?
    - Who was involved in planning and setting up the program?
    - How long did planning and setup take?
    - How did you recruit families?
    - Who reviews and provides input on the program on an ongoing basis?

2. Tell me about your preschool program.
    - Probe on other funding streams (e.g., Head Start, local public funds, private funds)
    - Probe on schedule (half/full day, school year calendar)
    - Probe on children served (number of students and classrooms, ages served)
    - Probe on staff (teacher/child ratios, qualifications, supervision, and evaluation)

3. What is a typical day like in your preschool classroom(s)?
    - Probe on instruction (time in whole/small groups/one-on-one, content areas, specific curricula used, free play, activity centers, recess)
    - Probe on language development, immersion, or English learner programs
    - Probe on inclusion model for early childhood special education
    - Probe on classroom materials and supplies (e.g., technology)

4. How have community partners been involved?
    - Probe on which partners are involved and how they participated in planning and on an ongoing basis
    - Probe on collaboration with other entities that support families with young children at the federal, state, county, or community level (e.g., special education, mental health)

5. What kind of training and supports are provided to teachers and paraprofessionals in your program?
    - Probe on access to mental health and behavioral supports for students
    - Probe on staff development (e.g., coaching, professional development, technical assistance)
    - Probe on planning time and collaboration with other teachers (within preschool and with K–3)

6. What kind of information and supports are provided to families of children in your program?
    - Probe on academic and behavioral supports during preschool
    - Probe on supports to prepare students and families for transition to kindergarten

7. What types of academic and behavioral data do you collect on your program? How do you use these data?
    - Probe on social-emotional data
    - Probe on behavior data (e.g., challenging behaviors, suspensions, expulsions)
    - Probe on looking at the data at various levels (program, classroom, student) and in different contexts (e.g., reviewing student-level data in meetings with preschool students' families, reviewing classroom- or program-level data with K–3 teachers/administrators)

8. What have been your greatest challenges for implementation?
    - Probe on programmatic changes they have made to improve implementation
    - Probe on additional supports needed

9. What have been your greatest successes with this preschool program?
    - Probe on improving school (kindergarten) readiness (academical and behavioral) for children attending the program
    - Probe on improving the relationship between the school and local families

Reference

Alaska Department of Education & Early Development. (2017). *Alaska Pre-Kindergarten Grants: Child pre-elementary growth during school year: School year 2015–2016.* Retrieved October 10, 2018, from http://www.akleg.gov/basis/get_documents.asp?session=30&docid=1032.

Appendix C. Supporting analysis

This appendix includes tables and figures reporting on the results of descriptive statistics and regression analyses discussed in the main report.

Descriptive analysis

This section includes descriptive tables on Pre-Elementary Grant (PEG) and non-PEG districts and students. The student characteristics and outcomes for the state and for students in PEG and non-PEG districts varied from 2016/17 to 2018/19 (table C1).

Table C1. Characteristics of kindergarten students in Alaska, kindergarten students in Pre-Elementary Grant (PEG) districts, and kindergarten students in non-PEG districts, by cohort, 2016/17–2018/19

Panel A: All districts in the state

	2016/17			2017/18			2018/19		
Student characteristic and outcome	Alaska kinder-garten students	Kinder-garten students in PEG districts	Kinder-garten students in non-PEG districts	Alaska kinder-garten students	Kinder-garten students in PEG districts	Kinder-garten students in non-PEG districts	Alaska kinder-garten students	Kinder-garten students in PEG districts	Kinder-garten students in non-PEG districts
Students in rural remote schools (percent)	12	8	21	11	10	17	11	12	7
White students (percent)	47	47	49	47	45	54	48	45	63
Alaska Native students (percent)	21	17	32	21	19	26	20	20	19
Economically disadvantaged students (percent)	46	49	36	47	50	38	46	47	42
English learner students (percent)	14	16	6	12	14	5	12	14	4
Students with an Individualized Education Program (percent)	14	14	13	15	16	14	15	15	14
Students scoring a 2 in 11 of 13 Alaska Developmental Profile goal areas (percent)[a]	31	28	39	31	29	39	33	31	39
Average annual attendance in kindergarten (percent)	92	93	91	92	92	92	92	91	93
Average annual attendance in grade 1 (percent)	92	93	92	92	92	93	[b]	[b]	[b]
Number of kindergarten students	10,415	7,826	2,589	10,358	7,995	2,363	10,204	8,410	1,794
Number of districts	53	13	40	53	18	35	53	24	29

Panel B: All districts in the state except Anchorage

Student characteristic and outcome	2016/17			2017/18			2018/19		
	Alaska kindergarten students	Kindergarten students in PEG districts	Kindergarten students in non-PEG districts	Alaska kindergarten students	Kindergarten students in PEG districts	Kindergarten students in non-PEG districts	Alaska kindergarten students	Kindergarten students in PEG districts	Kindergarten students in non-PEG districts
Students in rural remote schools (percent)	18	17	21	18	19	17	17	21	7
White students (percent)	51	51	49	50	48	54	52	47	63
Alaska Native students (percent)	29	27	32	28	29	26	27	30	19
Economically disadvantaged students (percent)	40	42	36	42	44	38	41	41	42
English learner students (percent)	10	12	6	7	7	5	7	8	4
Students with an Individualized Education Program (percent)	14	15	13	15	16	14	15	15	14
Students scoring a 2 in 11 of 13 Alaska Developmental Profile goal areas (percent)[a]	32	27	39	34	31	39	33	30	39
Average annual attendance in kindergarten (percent)	92	92	91	92	91	92	91	90	93
Average annual attendance in grade 1 (percent)	92	92	92	91	91	93	[b]	[b]	[b]
Number of kindergarten students	6,534	3,945	2,589	6,513	4,150	2,363	6,489	4,695	1,794
Number of districts	52	12	40	52	17	35	52	23	29

Note: Student counts include students who ever attended public school during the school year.
a. The Alaska Developmental Profile is an observational assessment that teachers complete for all kindergarten students at school entry and submit to the Alaska Department of Education & Early Development (DEED). Students receive a 0 (does not demonstrate), 1 (demonstrates at least 50 percent of the time), or 2 (demonstrates consistently, or at least 80 percent of the time) in each of 13 goal areas. Students who receive a 2 in at least 11 of the 13 goal areas are said to be "demonstrating kindergarten readiness skills," according to DEED's definition.
b. Data are suppressed to maintain student anonymity.
Source: Authors' analysis of Alaska Department of Education & Early Development data.

Student characteristics and outcomes varied between students in PEG districts who participated in PEG and those who did not (table C2).

Table C2. Characteristics of all kindergarten students in Pre-Elementary Grant (PEG) districts, kindergarten students who participated in PEG programs, and kindergarten students in PEG districts who did not participate in PEG programs, 2017/18 and 2018/19 cohorts

Panel A: All PEG districts in the state

Student characteristic and outcome	2017/18			2018/19		
	Kindergarten students in PEG districts	PEG kindergarten students	Non-PEG kindergarten students in PEG districts	Kindergarten students in PEG districts	PEG kindergarten students	Non-PEG kindergarten students in PEG districts
Students in rural remote schools (percent)	10	34	6	12	35	7
White students (percent)	45	21	48	45	24	49
Alaska Native students (percent)	19	49	14	20	49	15
Male students (percent)	51	50	51	52	50	52
Economically disadvantaged students (percent)	50	57	49	47	48	47
English learner students (percent)	14	17	14	14	15	13
Students with an IEP (percent)	16	14	16	15	12	16
Students scoring a 2 in 11 of 13 Alaska Developmental Profile goal areas (percent)[a]	29	29	29	31	34	31
Average annual attendance in kindergarten (percent)	92	89	92	91	89	92
Average number of TSG domains where students made expected growth between fall and spring in preschool	5	5	4	4	5	4
Average ACCESS composite score	2	2	2	2	2	2
Number of kindergarten students	7,954	1,015	6,939	8,339	1,339	7,000
Number of districts	15	na	na	21	na	na

Panel B: All PEG districts in the state except Anchorage

Student characteristic and outcome	2017/18			2018/19		
	Kindergarten students in PEG districts	PEG kindergarten students	Non-PEG kindergarten students in PEG districts	Kindergarten students in PEG districts	PEG kindergarten students	Non-PEG kindergarten students in PEG districts
Students in rural remote schools (percent)	19	53	12	21	48	14
White students (percent)	48	19	54	47	23	53
Alaska Native students (percent)	29	68	22	31	64	22
Male students (percent)	50	48	50	51	51	51
Economically disadvantaged students (percent)	44	48	43	41	38	41
English learner students (percent)	7	11	7	8	11	7
Students with an IEP (percent)	16	7	17	15	7	17
Students scoring a 2 in 11 of 13 Alaska Developmental Profile goal areas (percent)[a]	31	31	31	30	33	29
Average annual attendance in kindergarten (percent)	91	88	92	90	87	91
Average number of TSG domains where students made expected growth between fall and spring in preschool	4	5	4	4	4	4
Average ACCESS composite score	2	2	2	2	2	2
Number of kindergarten students	4,109	664	3,445	4,624	968	3,656
Number of districts	14	na	na	20	na	na

Panel C: Anchorage only

Student characteristic and outcome	2017/18			2018/19		
	Kindergarten students in PEG districts	PEG kindergarten students	Non-PEG kindergarten students in PEG districts	Kindergarten students in PEG districts	PEG kindergarten students	Non-PEG kindergarten students in PEG districts
Students in rural remote schools (percent)	na	na	na	na	na	na
White students (percent)	41	26	43	43	28	44
Alaska Native students (percent)	8	13	7	7	10	7
Male students (percent)	51	52	51	53	47	53
Economically disadvantaged students (percent)	57	75	55	56	74	54
English learner students (percent)	21	27	20	21	27	20
Students with an IEP (percent)	15	28	14	15	24	14
Students scoring a 2 in 11 of 13 Alaska Developmental Profile goal areas (percent)[a]	27	26	27	33	35	33
Average annual attendance in kindergarten (percent)	93	93	93	93	93	93
Average number of TSG domains where students made expected growth between fall and spring in preschool	5	6	4	5	6	4
Average ACCESS composite score	2	2	2	2	3	2
Number of kindergarten students	3,845	351	3,494	3,715	371	3,344
Number of districts	1	na	na	1	na	na

ACCESS is the Assessing Comprehension and Communication in English State-to-State assessment. IEP is Individualized Education Program. na is not applicable. TSG is the Teaching Strategies GOLD (TS GOLD®) assessment.

Note: Data were not available for non-PEG students in the year before kindergarten. The data for PEG and non-PEG students were for kindergarten students who were of preschool age the prior year. Thus, 2016/17, 2017/18, and 2018/19 kindergarten students were eligible for preschool services in the prior year (2015/16, 2016/17, and 2017/18). This table includes only PEG districts for which five or more students reported PEG participation. Student counts include students who ever attended public school during the school year.

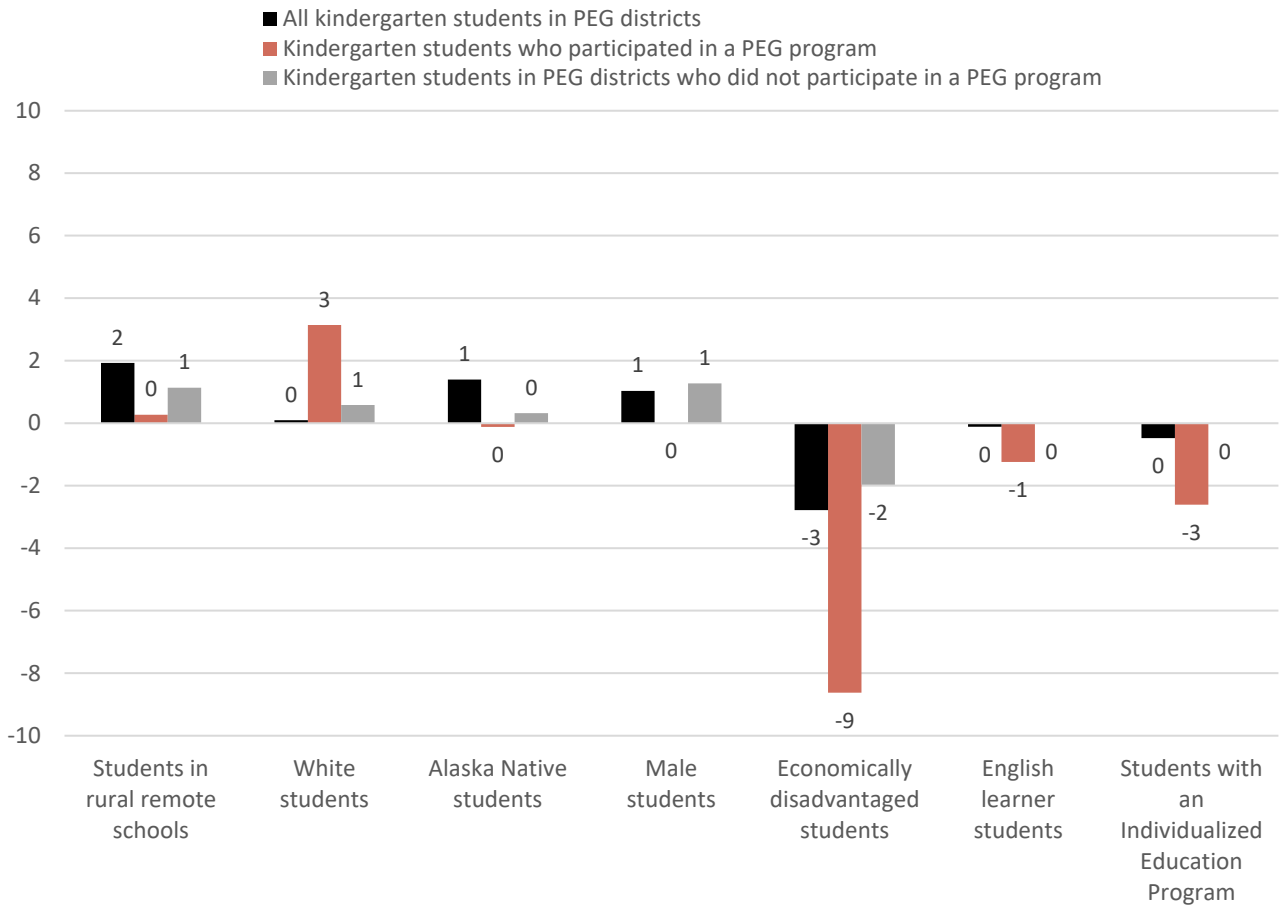
a. The Alaska Developmental Profile is an observational assessment that teachers complete for all kindergarten students at school entry and submit to the Alaska Department of Education & Early Development (DEED). Students receive a 0 (does not demonstrate), 1 (demonstrates at least 50 percent of the time), or 2 (demonstrates consistently, or at least 80 percent of the time) in each of 13 goal areas. Students who receive a 2 in at least 11 of the 13 goal areas are said to be "demonstrating kindergarten readiness skills," according to the DEED's definition.

Source: Authors' analysis of Alaska Department of Education & Early Development data.

The characteristics of students in PEG and non-PEG districts changed from 2016/17 to 2018/19 (figure C1).

Figure C1. The characteristics of kindergarten students in Pre-Elementary Grant (PEG) districts who participated in a PEG program and those who did not participate in a PEG program changed between 2017/18 and 2018/19

Percentage point change



Note: Data were not available for non-PEG students in the year before kindergarten. The data for PEG and non-PEG students were for kindergarten students who were of preschool age the prior year. Thus, 2017/18 and 2018/19 kindergarten students were eligible for preschool services in the prior year (2016/17 and 2017/18). See table C2 for results for all groups. This figure includes only PEG districts for which five or more students reported PEG participation.
Source: Authors' analysis of Alaska Department of Education & Early Development data.

Student characteristics and outcomes differed for PEG and non-PEG students, depending on the locale of their school (table C3) and their region of the state (table C4).

Table C3. Characteristics of all kindergarten students in Pre-Elementary Grant (PEG) districts, PEG kindergarten students in PEG districts, and non-PEG kindergarten students in PEG districts, by locale, 2018/19 kindergarten cohort

	Urban			Urban fringe			Rural hub/fringe			Rural remote		
Student characteristic and outcome	Kindergarten students in PEG districts	PEG kindergarten students in PEG districts	Non-PEG kindergarten students in PEG districts	Kindergarten students in PEG districts	PEG kindergarten students in PEG districts	Non-PEG kindergarten students in PEG districts	Kindergarten students in PEG districts	PEG kindergarten students in PEG districts	Non-PEG kindergarten students in PEG districts	Kindergarten students in PEG districts	PEG kindergarten students in PEG districts	Non-PEG kindergarten students in PEG districts
White students (percent)	45	30	46	71	59	72	24	21	26	11	9	13
Alaska Native students (percent)	7	12	7	12	23	11	61	60	63	85	88	83
Male students (percent)	52	49	52	51	53	51	50	49	52	51	50	52
Economically disadvantaged students (percent)	52	68	50	38	41	37	40	34	47	44	39	48
English learner students (percent)	16	23	15	5	7	5	12	8	18	19	15	22
Students with an IEP (percent)	16	22	16	16	8	17	12	10	16	9	5	13
Students scoring a 2 in 11 of 13 Alaska Developmental profile goal areas (percent)[a]	31	38	31	34	37	34	31	31	30	26	30	21
Average annual attendance in kindergarten (percent)	92	93	92	92	91	92	87	87	87	85	85	86
Average number of TSG domains where student met growth	5	5	4	4	5	3	4	4	b	4	4	3
Average ACCESS composite score	2	3	2	2	[b]	2	2	2	1	2	2	2
Number of students	5,179	449	4,730	1,740	165	1,575	454	261	193	966	464	502
PEG kindergarten students (percent)	na	8.7	na	na	9.5	na	na	57.5	na	na	48.0	na

ACCESS is the Assessing Comprehension and Communication in English State-to-State assessment. IEP is Individualized Education Program. na is not applicable. PEG is Pre-Elementary Grant. TSG is the Teaching Strategies GOLD (TS GOLD®) assessment.

Note: This table includes only PEG districts for which five or more students reported PEG participation. Student counts include students who ever attended public school during the school year.

a. The Alaska Developmental Profile is an observational assessment that teachers complete for all kindergarten students at school entry and submit to the Alaska Department of Education & Early Development (DEED). Students receive a 0 (does not demonstrate), 1 (demonstrates at least 50 percent of the time), or 2 (demonstrates consistently, or at least 80 percent of the time) in each of 13 goal areas. Students who receive a 2 in at least 11 of the 13 goal areas are said to be "demonstrating kindergarten readiness skills," according to DEED's definition.

b. Data are suppressed to maintain student anonymity.

Source: Authors' analysis of Alaska Department of Education & Early Development data.

Table C4. Characteristics of Pre-Elementary Grant (PEG) and non-PEG kindergarten students in PEG districts, by Alaska region, 2018/19 kindergarten cohort

Student characteristic and outcome	Central		Northern		Southeastern		Southwestern		Western	
	PEG kindergarten students in PEG districts	Non-PEG kindergarten students in PEG districts	PEG kindergarten students in PEG districts	Non-PEG kindergarten students in PEG districts	PEG kindergarten students in PEG districts	Non-PEG kindergarten students in PEG districts	PEG kindergarten students in PEG districts	Non-PEG kindergarten students in PEG districts	PEG kindergarten students in PEG districts	Non-PEG kindergarten students in PEG districts
Students in rural remote schools (percent)	[a]	1	71	81	[a]	[a]	84	88	65	75
White students (percent)	41	53	10	34	38	46	[a]	[a]	[a]	2
Alaska Native students (percent)	15	8	80	56	18	15	92	85	90	96
Male students (percent)	49	52	50	52	57	50	45	50	50	53
Economically disadvantaged students (percent)	62	48	28	39	38	36	35	41	54	55
English learner students (percent)	18	13	[a]	[a]	[a]	5	[a]	[a]	41	35
Students with an IEP (percent)	18	16	4	21	[a]	20	20	[a]	7	12
Students scoring a 2 in 11 of 13 Alaska Developmental Profile goal areas (percent)[b]	38	31	32	31	53	36	24	16	19	13
Average annual attendance in kindergarten (percent)	93	92	85	90	91	91	86	83	86	83
Average number of TSG domains where student met growth	5	4	5	[a]	5	[a]	4	[a]	4	3
Average ACCESS composite score	3	2	2	[a]	[a]	3	[a]	[a]	2	2
Number of kindergarten students	617	6,147	401	170	68	381	49	34	210	453

ACCESS is the Assessing Comprehension and Communication in English State-to-State assessment. IEP is Individualized Education Program. TSG is the Teaching Strategies GOLD (TS GOLD®) assessment.
Note: This table includes only PEG districts for which five or more students reported PEG participation.
a. Data are suppressed to maintain student anonymity.
b. The Alaska Developmental Profile is an observational assessment that teachers complete for all kindergarten students at school entry and submit to the Alaska Department of Education & Early Development (DEED). Students receive a 0 (does not demonstrate), 1 (demonstrates at least 50 percent of the time), or 2 (demonstrates consistently, or at least 80 percent of the time) in each of 13 goal areas. Students who receive a 2 in at least 11 of the 13 goal areas are said to be "demonstrating kindergarten readiness skills," according to DEED's definition.
Source: Authors' analysis of Alaska Department of Education & Early Development data.

Regression analysis

This section includes additional results from the regression analyses. The tables present regression coefficients, except the tables with the outcome of kindergarten readiness (student scored a 2 in 11 of 13 ADP goals), which present odds ratios (tables C5 and C6).

Table C5. There was a positive relationship between participation in state-funded preschool and kindergarten readiness among all kindergarten cohorts for 2014/15–2018/19

Panel A: Whether student scored a 2 (indicating consistent demonstration of goal) in 11 of 13 domains of the Alaska Developmental Profile (odds ratios)

Independent variable	2014/15 kindergarten cohort (2013/14 preschool)	2015/16 kindergarten cohort (2014/15 preschool)	2016/17 kindergarten cohort (2015/16 preschool)	2017/18 kindergarten cohort (2016/17 preschool)	2018/19 kindergarten cohort (2017/18 preschool)
State-funded preschool	1.812***	2.187***	1.969***	1.471**	1.638***
	(0.263)	(0.321)	(0.248)	(0.196)	(0.171)
Alaska Native	0.592***	0.594***	0.527***	0.517***	0.557***
	(0.0776)	(0.0891)	(0.0899)	(0.0679)	(0.0741)
American Indian	0.528	0.691	0.360*	1.085	0.718
	(0.231)	(0.249)	(0.150)	(0.276)	(0.252)
Asian	0.893	1.087	0.738	1.174	1.186
	(0.192)	(0.206)	(0.134)	(0.201)	(0.196)
Black	0.893	0.799	0.572*	0.677*	0.959
	(0.155)	(0.168)	(0.130)	(0.124)	(0.174)
Latinx	0.868	0.725*	0.603***	0.692**	0.808
	(0.131)	(0.114)	(0.0911)	(0.0885)	(0.0968)
Native Hawaiian or other Pacific Islander	0.515*	0.488**	0.469**	0.711	0.915
	(0.133)	(0.109)	(0.119)	(0.138)	(0.163)
Multiracial	0.771*	0.936	0.849	0.824*	0.797*
	(0.0793)	(0.113)	(0.120)	(0.0735)	(0.0710)
English learner	0.482***	0.572***	0.535***	0.517***	0.617***
	(0.0759)	(0.0743)	(0.0724)	(0.0639)	(0.0859)
Male	0.593***	0.591***	0.598***	0.576***	0.627***
	(0.0418)	(0.0398)	(0.0512)	(0.0323)	(0.0333)
Has an Individualized Education Program	0.284***	0.241***	0.244***	0.261***	0.244***
	(0.0490)	(0.0369)	(0.0371)	(0.0269)	(0.0304)
Economically disadvantaged	0.562***	0.518***	0.485***	0.503***	0.504***
	(0.0463)	(0.0553)	(0.0436)	(0.0435)	(0.0337)
Age at kindergarten entry	2.951***	3.505***	3.536***	3.106***	2.498***
	(0.322)	(0.489)	(0.487)	(0.287)	(0.253)
Head Start	na	na	na	1.133	1.104
				(0.192)	(0.154)
Constant	0.000772***	0.000126***	0.000126***	0.00126***	0.00359***
	(0.000469)	(9.73e-05)	(9.73e-05)	(0.000672)	(0.00204)
Number of observations	5,665	5,275	5,034	7,029	7,092

Panel B: Number of goals in which student scored a 2 (indicating consistent demonstration of goal) on the Alaska Developmental Profile (coefficients)

Independent variable	2014/15 kindergarten cohort (2013/14 preschool)	2015/16 kindergarten cohort (2014/15 preschool)	2016/17 kindergarten cohort (2015/16 preschool)	2017/18 kindergarten cohort (2016/17 preschool)	2018/19 kindergarten cohort (2017/18 preschool)
State-funded preschool	1.045***	1.318***	1.239***	1.151***	1.033***
	(0.211)	(0.231)	(0.205)	(0.212)	(0.199)
Alaska Native	–1.081***	–0.937***	–1.172***	–1.243***	–0.825***
	(0.241)	(0.227)	(0.236)	(0.197)	(0.227)
American Indian	–0.915	–0.493	–0.378	0.116	–0.486
	(0.720)	(0.543)	(0.565)	(0.544)	(0.553)
Asian	–0.407	–0.316	–0.395	0.0729	0.498
	(0.321)	(0.330)	(0.320)	(0.267)	(0.327)
Black	–0.200	–0.442	–0.941**	–0.706*	–0.430
	(0.271)	(0.327)	(0.344)	(0.358)	(0.311)
Latinx	–0.584*	–0.610**	–0.758***	–0.692***	–0.448*
	(0.251)	(0.203)	(0.224)	(0.196)	(0.198)
Native Hawaiian or other Pacific Islander	–0.984*	–1.548***	–1.254***	–0.758*	–0.398
	(0.407)	(0.283)	(0.316)	(0.332)	(0.339)
Multiracial	–0.238	–0.311	–0.246	–0.361*	–0.361*
	(0.163)	(0.188)	(0.189)	(0.153)	(0.159)
English learner	–1.176***	–0.692***	–1.028***	–1.084***	–1.114***
	(0.210)	(0.168)	(0.190)	(0.177)	(0.207)
Male	–0.960***	–1.065***	–0.922***	–0.927***	–0.853***
	(0.0954)	(0.0992)	(0.137)	(0.0900)	(0.0886)
Has an Individualized Education Program	–2.468***	–2.457***	–2.458***	–2.519***	–2.773***
	(0.208)	(0.173)	(0.194)	(0.141)	(0.167)
Economically disadvantaged	–1.268***	–1.326***	–1.373***	–1.297***	–1.351***
	(0.132)	(0.157)	(0.148)	(0.139)	(0.123)
Age at kindergarten entry	2.126***	2.467***	2.182***	2.128***	1.980***
	(0.168)	(0.200)	(0.208)	(0.151)	(0.168)
Head Start	na	na	na	0.202	0.280
				(0.245)	(0.225)
Constant	–4.036***	–7.497***	–7.531***	–4.523***	–3.392***
	(0.918)	(1.108)	(1.148)	(0.851)	(0.932)
Number of observations	5,914	5,482	5,213	7,368	7,372
R-squared	0.370	0.342	0.366	0.387	0.333

Panel C: Sensitivity analysis with Anchorage only and excluding Anchorage for whether student scored a 2 (indicating consistent demonstration of goal) in 11 of 13 goals of the Alaska Developmental Profile (odds ratios)

Independent variable	2014/15 kindergarten cohort (2013/14 preschool)	2015/16 kindergarten cohort (2014/15 preschool)	2016/17 kindergarten cohort (2015/16 preschool)	2017/18 kindergarten cohort (2016/17 preschool)	2018/19 kindergarten cohort (2017/18 preschool)
State-funded preschool, all	1.812***	2.187***	1.969***	1.471**	1.638***
	(0.263)	(0.321)	(0.248)	(0.196)	(0.171)
State-funded preschool, Anchorage only	1.734*	2.249***	1.950***	1.498	1.995***
	(0.393)	(0.438)	(0.334)	(0.309)	(0.305)
State-funded preschool, excluding Anchorage	2.016***	2.166**	2.048***	1.471*	1.422**
	(0.408)	(0.522)	(0.414)	(0.252)	(0.188)

Panel D: Sensitivity analysis with Anchorage only and excluding Anchorage for number of goals in which student scored a 2 (indicating consistent demonstration of goal) on the Alaska Developmental Profile (coefficients)

Independent variable	2014/15 kindergarten cohort (2013/14 preschool)	2015/16 kindergarten cohort (2014/15 preschool)	2016/17 kindergarten cohort (2015/16 preschool)	2017/18 kindergarten cohort (2016/17 preschool)	2018/19 kindergarten cohort (2017/18 preschool)
State-funded preschool, all	1.045***	1.318***	1.239***	1.151***	1.033***
	(0.211)	(0.231)	(0.205)	(0.212)	(0.199)
State-funded preschool, Anchorage only	1.211***	1.698***	1.301***	1.183***	1.283***
	(0.270)	(0.272)	(0.261)	(0.273)	(0.299)
State-funded preschool, excluding Anchorage	0.885*	0.779	1.066**	1.136**	0.888**
	(0.341)	(0.424)	(0.341)	(0.340)	(0.264)

* Significant at $p < .05$; ** significant at $p < .01$; *** significant at $p < .001$.
na is not applicable.
Note: School fixed effects were included in the models, but results are not shown to conserve space. Numbers in parentheses are standard errors. This table includes only the state-funded preschool districts for which five or more students reported participating in state-funded preschool. The Alaska Developmental Profile is an observational assessment that teachers complete for all kindergarten students at school entry and submit to the Alaska Department of Education & Early Development (DEED). Students receive a 0 (does not demonstrate), 1 (demonstrates at least 50 percent of the time), or 2 (demonstrates consistently, or at least 80 percent of the time) in each of 13 goal areas. Students who receive a 2 in at least 11 of the 13 goal areas are said to be "demonstrating kindergarten readiness skills," according to DEED's definition. Sample sizes in Anchorage ranged from 3,476 to 3,688; sample sizes in districts excluding Anchorage ranged from 1,711 to 3,896.
Source: Authors' analysis of Alaska Department of Education & Early Development data.

Table C6. The relationship between participation in state-funded preschool in 2017/18 and kindergarten readiness (whether student scored a 2, indicating consistent demonstration of goal, in 11 of 13 Alaska Developmental Profile goals) in 2018/19 varied by student groups (odds ratios)

Independent variable	Alaska Native student interaction	English learner student interaction	Economically disadvantaged students interaction	Students with an IEP interaction
PEG = 0, Alaska Native = 0	1.821***	na	na	na
	(0.273)			
PEG = 1, Alaska Native = 0	2.945***	na	na	na
	(0.478)			
PEG = 1, Alaska Native = 1	1.720**	na	na	na
	(0.322)			
PEG = 0, English learner = 0	na	1.758***	na	na
		(0.258)		
PEG = 1, English learner = 0	na	2.650***	na	na
		(0.439)		
PEG = 1, English learner = 1	na	2.535***	na	na
		(0.656)		
PEG = 0, Economically disadvantaged = 0	na	na	1.977***	na
			(0.143)	
PEG = 1, Economically disadvantaged = 0	na	na	3.284***	na
			(0.470)	
PEG = 1, Economically disadvantaged = 1	na	na	1.622***	na
			(0.220)	
PEG = 0, IEP = 0	na	na	na	4.143***
				(0.591)
PEG = 1, IEP = 0	na	na	na	6.736***
				(1.126)
PEG = 1, IEP = 1	na	na	na	1.739
				(0.504)
Alaska Native	na	0.562***	0.557***	0.557***
		(0.0743)	(0.0739)	(0.0739)
American Indian	0.719	0.723	0.718	0.718
	(0.252)	(0.253)	(0.252)	(0.252)
Asian	1.187	1.197	1.186	1.187
	(0.196)	(0.198)	(0.196)	(0.196)
Black	0.959	0.959	0.959	0.960
	(0.174)	(0.176)	(0.173)	(0.174)
Latinx	0.808	0.814	0.808	0.809
	(0.0969)	(0.0981)	(0.0968)	(0.0967)
Native Hawaiian or other Pacific Islander	0.916	0.915	0.915	0.916
	(0.163)	(0.164)	(0.163)	(0.164)

Independent variable	Alaska Native student interaction	English learner student interaction	Economically disadvantaged students interaction	Students with an IEP interaction
Multiracial	0.798*	0.799*	0.797*	0.797*
	(0.0711)	(0.0712)	(0.0709)	(0.0711)
English learner	0.617***	na	0.617***	0.617***
	(0.0859)		(0.0857)	(0.0859)
Male	0.627***	0.627***	0.627***	0.627***
	(0.0333)	(0.0335)	(0.0333)	(0.0334)
Has an Individualized Education Program	0.244***	0.244***	0.244***	na
	(0.0304)	(0.0304)	(0.0303)	
Economically disadvantaged	0.504***	0.503***	na	0.504***
	(0.0336)	(0.0337)		(0.0337)
Age at kindergarten entry	2.498***	2.497***	2.498***	2.498***
	(0.253)	(0.253)	(0.253)	(0.254)
Head Start	1.104	1.115	1.103	1.102
	(0.154)	(0.155)	(0.153)	(0.153)
Constant	0.00197***	0.00204***	0.00181***	0.000865***
	(0.00115)	(0.00118)	(0.00103)	(0.000539)
Number of observations	7,092	7,092	7,092	7,092

* Significant at $p < .05$; ** significant at $p < .01$; *** significant at $p < .001$.

IEP is Individualized Education Program. na is not applicable. PEG is Pre-Elementary Grant.

Note: School fixed effects were included in the models, but results are not shown to conserve space. Numbers in parentheses are standard errors. This table includes only the state-funded preschool districts for which five or more students reported participating in state-funded preschool. The Alaska Developmental Profile is an observational assessment that teachers complete for all kindergarten students at school entry and submit to the Alaska Department of Education & Early Development (DEED). Students receive a 0 (does not demonstrate), 1 (demonstrates at least 50 percent of the time), or 2 (demonstrates consistently, or at least 80 percent of the time) in each of 13 goal areas. Students who receive a 2 in at least 11 of the 13 goal areas are said to be "demonstrating kindergarten readiness skills," according to DEED's definition.

Source: Authors' analysis of Alaska Department of Education & Early Development data.

Table C7. There was a positive relationship between participation in state-funded preschool and English language proficiency in kindergarten, no relationship in grade 1, and a positive relationship in grade 2, 2016/17–2018/19 kindergarten cohorts

Panel A: English language proficiency assessment score (Assessing Comprehension and Communication in English State-to-State [ACCESS] score) in given grade

	Kindergarten			Grade 1		Grade 2
Independent variable	2016/17 kindergarten cohort (2015/16 preschool)	2017/18 kindergarten cohort (2016/17 preschool)	2018/19 kindergarten cohort (2017/18 preschool)	2016/17 kindergarten cohort in year 2017/18 (2015/16 preschool)	2017/18 kindergarten cohort in year 2018/19 (2016/17 preschool)	2016/17 kindergarten cohort in year 2018/19 (2015/16 preschool)
State-funded preschool	0.257**	0.243*	0.297**	–0.0912	–0.0793	0.182***
	(0.0928)	(0.0976)	(0.102)	(0.0486)	(0.0629)	(0.0272)
Alaska Native	–0.618**	–0.431	–0.477*	–0.0729	–0.143	–0.293*
	(0.216)	(0.243)	(0.183)	(0.164)	(0.156)	(0.118)
American Indian	–0.698***	–0.365	0.878***	0.953***	0.0359	0.355***
	(0.195)	(0.278)	(0.179)	(0.117)	(0.125)	(0.0943)
Asian	–0.368	–0.207	–0.174	0.0276	–0.163	–0.123
	(0.192)	(0.197)	(0.168)	(0.121)	(0.101)	(0.0808)
Black	–0.256	–0.381	–0.127	0.0807	–0.103	–0.218
	(0.241)	(0.309)	(0.208)	(0.158)	(0.124)	(0.132)
Latinx	–0.213	–0.402*	–0.224	0.105	–0.199	–0.129
	(0.199)	(0.182)	(0.165)	(0.121)	(0.118)	(0.0894)
Native Hawaiian or other Pacific Islander	–0.459*	–0.407*	–0.440*	–0.116	–0.115	–0.206*
	(0.192)	(0.190)	(0.174)	(0.128)	(0.110)	(0.0849)
Multiracial	–0.105	–0.0452	0.0667	0.0424	–0.0836	–0.0161
	(0.210)	(0.229)	(0.198)	(0.130)	(0.116)	(0.0981)
Male	–0.0400	–0.0860	–0.124*	–0.113**	–0.122**	–0.0242
	(0.0700)	(0.0679)	(0.0554)	(0.0358)	(0.0459)	(0.0356)
Has an Individualized Education Program	–0.677***	–0.527***	–0.399***	–0.204**	–0.209***	–0.240***
	(0.107)	(0.115)	(0.0766)	(0.0695)	(0.0490)	(0.0579)

Independent variable	Kindergarten			Grade 1		Grade 2
	2016/17 kindergarten cohort (2015/16 preschool)	2017/18 kindergarten cohort (2016/17 preschool)	2018/19 kindergarten cohort (2017/18 preschool)	2016/17 kindergarten cohort in year 2017/18 (2015/16 preschool)	2017/18 kindergarten cohort in year 2018/19 (2016/17 preschool)	2016/17 kindergarten cohort in year 2018/19 (2015/16 preschool)
Economically disadvantaged	–0.363***	–0.373***	–0.164*	–0.0488	–0.113*	–0.134**
	(0.0768)	(0.0899)	(0.0822)	(0.0637)	(0.0553)	(0.0470)
Age at kindergarten entry	0.326**	0.514***	0.568***	0.0374	0.120	0.0187
	(0.0964)	(0.110)	(0.105)	(0.0757)	(0.0669)	(0.0608)
Head Start	na	0.219*	0.0485	na	0.0422	na
		(0.0958)	(0.108)		(0.0605)	
Overall ACCESS score in kindergarten	na	na	na	0.423***	0.411***	na
				(0.0330)	(0.0270)	
Overall ACCESS score in grade 1	na	na	na	na	na	0.644***
						(0.0247)
Constant	0.433	0.581	–0.612	2.430***	1.981***	1.758***
	(0.566)	(0.681)	(0.583)	(0.413)	(0.371)	(0.334)
Number of observations	1,020	1,036	1,031	906	908	878
R-squared	0.397	0.360	0.432	0.573	0.625	0.726

Panel B: Sensitivity analysis with Anchorage only and excluding Anchorage for English language proficiency assessment score (Assessing Comprehension and Communication in English State-to-State [ACCESS] score) in given grade

	Kindergarten			Grade 1		Grade 2
Independent variable	2016/17 kindergarten cohort (2015/16 preschool)	2017/18 kindergarten cohort (2016/17 preschool)	2018/19 kindergarten cohort (2017/18 preschool)	2016/17 kindergarten cohort in year 2017/18 (2015/16 preschool)	2017/18 kindergarten cohort in year 2018/19 (2016/17 preschool)	2016/17 kindergarten cohort in year 2018/19 (2015/16 preschool)
State-funded preschool, all	0.257**	0.243*	0.297**	–0.0912	-0.0793	0.182***
	(0.0928)	(0.0976)	(0.102)	(0.0486)	(0.0629)	(0.0272)
State-funded preschool, Anchorage only	0.274*	0.292**	0.333**	–0.0992	-0.0815	0.197***
	(0.120)	(0.109)	(0.123)	(0.0577)	(0.0639)	(0.0302)
State-funded preschool, excluding Anchorage	0.229	0.0408	0.225	na	-0.0929	na
	(0.135)	(0.251)	(0.154)		(0.202)	

* Significant at $p < .05$; ** significant at $p < .01$; *** significant at $p < .001$.
na is not applicable.
Note: School fixed effects were included in the models, but results are not shown to conserve space. Numbers in parentheses are standard errors. This table includes only the state-funded preschool districts for which five or more students reported participating in state-funded preschool. Sample sizes in Anchorage ranged from 641 to 758; sample sizes in districts excluding Anchorage ranged from 235 to 285.
Source: Authors' analysis of Alaska Department of Education & Early Development data.

Table C8. The relationship between participation in state-funded preschool and English language proficiency in kindergarten varied by student groups, 2018/19 kindergarten cohort (Assessing Comprehension and Communication in English State-to-State score)

Independent variable	Alaska Native student interaction	Economically disadvantaged students interaction	Students with an IEP interaction
PEG = 0, Alaska Native = 0	0.503**	na	na
	(0.184)		
PEG = 1, Alaska Native = 0	0.770***	na	na
	(0.180)		
PEG = 1, Alaska Native = 1	0.394*	na	na
	(0.176)		
PEG = 0, Economically disadvantaged = 0	na	0.169	na
		(0.0888)	
PEG = 1, Economically disadvantaged = 0	na	0.439*	na
		(0.189)	
PEG = 1, Economically disadvantaged = 1	na	0.304**	na
		(0.112)	
PEG = 0, IEP = 0	na	na	0.414***
			(0.0913)
PEG = 1, IEP = 0	na	na	0.700***
			(0.127)
PEG = 1, IEP = 1	na	na	0.389
			(0.261)
Alaska Native	na	–0.479*	–0.475*
		(0.183)	(0.184)
American Indian	0.867***	0.879***	0.877***
	(0.181)	(0.180)	(0.179)
Asian	–0.175	–0.174	–0.173
	(0.168)	(0.169)	(0.168)
Black	–0.128	–0.127	–0.126
	(0.207)	(0.208)	(0.208)
Latinx	–0.226	–0.224	–0.222
	(0.165)	(0.165)	(0.165)
Native Hawaiian or other Pacific Islander	–0.441*	–0.440*	–0.439*
	(0.174)	(0.174)	(0.173)
Multiracial	0.0666	0.0660	0.0691
	(0.198)	(0.198)	(0.197)
Male	–0.124*	–0.124*	–0.123*
	(0.0554)	(0.0551)	(0.0551)

Independent variable	Alaska Native student interaction	Economically disadvantaged students interaction	Students with an IEP interaction
Has an Individualized Education Program	–0.397***	–0.399***	na
	(0.0770)	(0.0770)	
Economically disadvantaged	–0.163*	na	–0.162
	(0.0820)		(0.0823)
Age at kindergarten entry	0.569***	0.568***	0.567***
	(0.104)	(0.105)	(0.105)
Head Start	0.0514	0.0484	0.0471
	(0.109)	(0.108)	(0.106)
Constant	–1.118	–0.778	–1.021
	(0.604)	(0.589)	(0.596)
Number of observations	1,031	1,031	1,031
R-squared	0.432	0.432	0.432

* Significant at $p < .05$; ** significant at $p < .01$; *** significant at $p < .001$.
IEP is Individualized Education Program. na is not applicable. PEG is Pre-Elementary Grant.
Note: School fixed effects were included in the models, but results are not shown to conserve space. Numbers in parentheses are standard errors. This table includes only the state-funded preschool districts for which five or more students reported participating in state-funded preschool.
Source: Authors' analysis of Alaska Department of Education & Early Development data.

Table C9. Participation in state-funded preschool was related to higher average annual kindergarten and grade 1 attendance rates for more recent cohorts of kindergarten students, but there was no clear relationship with grade 2 or 3 attendance rates, 2014/15–2018/19 kindergarten cohorts

Panel A. Attendance in kindergarten

Independent variable	2014/15 kindergarten cohort (2013/14 preschool)	2015/16 kindergarten cohort (2014/15 preschool)	2016/17 kindergarten cohort (2015/16 preschool)	2017/18 kindergarten cohort (2016/17 preschool)	2018/19 kindergarten cohort (2017/18 preschool)
State-funded preschool	0.00265	0.00439	0.0106**	0.0118**	0.0169***
	(0.00427)	(0.00297)	(0.00330)	(0.00374)	(0.00345)
Alaska Native	–0.0269***	–0.0184***	–0.0269***	–0.0175***	–0.0287***
	(0.00360)	(0.00436)	(0.00504)	(0.00333)	(0.00423)
American Indian	–0.00507	0.000155	–0.000510	–0.00585	–0.00298
	(0.00629)	(0.00630)	(0.00789)	(0.00724)	(0.00672)
Asian	0.00685	0.00406	0.00298	0.00662	0.00778
	(0.00511)	(0.00535)	(0.00501)	(0.00455)	(0.00478)
Black	0.00722*	–0.000682	0.00907	–0.00171	–9.95e-05
	(0.00365)	(0.00468)	(0.00622)	(0.00737)	(0.00526)
Latinx	–0.00524	–0.00159	–0.00368	–0.00211	–0.00908**
	(0.00429)	(0.00313)	(0.00340)	(0.00263)	(0.00327)
Native Hawaiian or other Pacific Islander	0.0402***	–0.0367***	–0.0396***	–0.0463***	–0.0494***
	(0.00804)	(0.00635)	(0.00713)	(0.00656)	(0.00584)
Multiracial	–0.00655*	–0.00935**	–0.00430	–0.00488*	–0.0116***
	(0.00262)	(0.00347)	(0.00326)	(0.00246)	(0.00269)
English learner	0.00368	–0.00292	0.00189	0.000678	0.00165
	(0.00441)	(0.00372)	(0.00305)	(0.00424)	(0.00452)
Male	–0.00291	–0.00333*	–0.000834	–0.000404	–0.00216
	(0.00193)	(0.00145)	(0.00178)	(0.00185)	(0.00194)
Has an Individualized Education Program	–0.00949**	–0.00529	–0.00894**	–0.00677**	–0.00948***
	(0.00328)	(0.00302)	(0.00332)	(0.00220)	(0.00283)
Economically disadvantaged	–0.0107***	–0.0103***	–0.0134***	–0.0175***	–0.0124***
	(0.00177)	(0.00204)	(0.00251)	(0.00181)	(0.00226)
Age at kindergarten entry	0.000446	0.00500	0.00300	0.00234	0.000512
	(0.00254)	(0.00315)	(0.00319)	(0.00280)	(0.00297)
Head Start	na	na	na	0.0138**	0.0168***
				(0.00453)	(0.00432)
Kindergarten attendance	na	na	na	na	na
Grade 1 attendance	na	na	na	na	na
Grade 2 attendance	na	na	na	na	na
Constant	0.941***	0.929***	0.930***	0.917***	0.930***
	(0.0138)	(0.0174)	(0.0177)	(0.0156)	(0.0169)
Number of observations	6,471	5,897	5,652	7,656	7,882
R-squared	0.223	0.198	0.159	0.222	0.254

Panel B. Attendance in grade 1

Independent variable	2014/15 kindergarten cohort in year 2015/16 (2013/14 preschool)	2015/16 kindergarten cohort in year 2016/17 (2014/15 preschool)	2016/17 kindergarten cohort in year 2017/18 (2015/16 preschool)	2017/18 kindergarten cohort in year 2018/19 (2016/17 preschool)
State-funded preschool	0.00198	0.00674**	0.00387	0.00471
	(0.00230)	(0.00234)	(0.00235)	(0.00314)
Alaska Native	0.00172	0.000340	–0.00823*	–0.00468
	(0.00263)	(0.00240)	(0.00323)	(0.00306)
American Indian	0.00349	–0.00396	0.000335	–0.00247
	(0.00507)	(0.00646)	(0.00653)	(0.00662)
Asian	0.0104**	0.00931**	0.00465	0.0106***
	(0.00318)	(0.00309)	(0.00301)	(0.00311)
Black	0.00281	0.00172	0.00560	0.00950*
	(0.00372)	(0.00351)	(0.00350)	(0.00433)
Latinx	0.00105	0.00442	–0.00169	–0.00315
	(0.00246)	(0.00278)	(0.00282)	(0.00265)
Native Hawaiian or other Pacific Islander	–0.00723	–0.0164***	–0.0164**	–0.00540
	(0.00468)	(0.00440)	(0.00573)	(0.00390)
Multiracial	0.00196	0.00106	0.00348	–0.000497
	(0.00197)	(0.00221)	(0.00256)	(0.00224)
English learner	0.000197	0.00149	0.00308	–0.000286
	(0.00258)	(0.00238)	(0.00257)	(0.00292)
Male	0.00103	0.00217	8.30e-05	–0.00114
	(0.00120)	(0.00126)	(0.00149)	(0.00148)
Has an Individualized Education Program	–0.00250	–0.00211	–0.00483*	0.000217
	(0.00230)	(0.00179)	(0.00231)	(0.00195)
Economically disadvantaged	–0.00674***	–0.00477***	–0.00596**	–0.00429*
	(0.00193)	(0.00128)	(0.00204)	(0.00198)
Age at kindergarten entry	0.00170	–0.00523*	–0.00123	–0.00184
	(0.00214)	(0.00250)	(0.00251)	(0.00234)
Head Start	na	na	na	–0.00204
				(0.00327)
Kindergarten attendance	0.468***	0.475***	0.525***	0.521***
	(0.0296)	(0.0242)	(0.0358)	(0.0293)
Grade 1 attendance	na	na	na	na
Grade 2 attendance	na	na	na	na
Constant	0.492***	0.510***	0.448***	0.469***
	(0.0318)	(0.0270)	(0.0362)	(0.0269)
Number of observations	5,898	5,359	5,168	6,898
R-squared	0.463	0.406	0.419	0.433

Panel C. Attendance in grades 2 and 3

Independent variable	2014/15 kindergarten cohort in year 2016/17 (2013/14 preschool)	2015/16 kindergarten cohort in year 2017/18 (2014/15 preschool)	2016/17 kindergarten cohort in year 2018/19 (2015/16 preschool)	2014/15 kindergarten cohort in year 2017/18 (2013/14 preschool)	2015/16 kindergarten cohort in year 2018/19 (2014/15 preschool)
State-funded preschool	0.00504*	–0.00350	0.000599	0.00330	0.00265
	(0.00204)	(0.00340)	(0.00222)	(0.00197)	(0.00237)
Alaska Native	–0.00120	–0.000978	–0.00427	–0.0107***	–0.000962
	(0.00284)	(0.00262)	(0.00282)	(0.00251)	(0.00258)
American Indian	–0.00599	–0.00580	–0.0103	0.000129	–0.00692
	(0.00516)	(0.00661)	(0.00836)	(0.00608)	(0.00611)
Asian	0.00178	0.00771*	0.00881**	0.00747*	0.00919*
	(0.00527)	(0.00342)	(0.00307)	(0.00356)	(0.00367)
Black	0.00423	0.00564	0.00759	–0.000678	–0.00566
	(0.00378)	(0.00354)	(0.00463)	(0.00381)	(0.00825)
Latinx	–0.00299	–0.000524	–7.91e-05	–0.00392	0.000635
	(0.00280)	(0.00255)	(0.00270)	(0.00263)	(0.00298)
Native Hawaiian or other Pacific Islander	–0.00888*	–0.00757	–0.00428	–0.0147*	–0.0129**
	(0.00388)	(0.00403)	(0.00433)	(0.00682)	(0.00472)
Multiracial	0.000586	–0.00433	–0.00409	0.00141	0.000639
	(0.00195)	(0.00232)	(0.00208)	(0.00215)	(0.00289)
English learner	–0.00241	–0.00256	2.23e-05	0.00400	0.00264
	(0.00247)	(0.00298)	(0.00230)	(0.00245)	(0.00249)
Male	0.00191	0.00395**	0.00300	0.000956	–0.00219
	(0.00129)	(0.00129)	(0.00159)	(0.00161)	(0.00143)
Has an Individualized Education Program	–0.00168	–0.00790**	–0.00475*	–0.00502**	–5.85e-05
	(0.00199)	(0.00292)	(0.00197)	(0.00181)	(0.00232)
Economically disadvantaged	–0.00247	–0.00104	–0.00489*	–0.00167	–0.00173
	(0.00154)	(0.00198)	(0.00226)	(0.00175)	(0.00187)
Age at kindergarten entry	–0.00150	–0.00602*	–0.00425	–0.00371	–0.00695*
	(0.00242)	(0.00240)	(0.00242)	(0.00245)	(0.00288)
Head Start	na	na	na	na	na
Kindergarten attendance	na	na	na	na	na
Grade 1 attendance	0.584***	0.579***	0.598***	na	na
	(0.0279)	(0.0232)	(0.0238)		
Grade 2 attendance	na	na	na	0.548***	0.527***
				(0.0353)	(0.0289)
Constant	0.397***	0.437***	0.404***	0.444***	0.485***
	(0.0290)	(0.0253)	(0.0270)	(0.0383)	(0.0326)
Observations	5,498	4,990	4,781	5,233	4,665
R-squared	0.421	0.377	0.449	0.396	0.384

Panel D. Sensitivity analysis for Anchorage only and excluding Anchorage for attendance in kindergarten

Independent variable	2014/15 kindergarten cohort (2013/14 preschool)	2015/16 kindergarten cohort (2014/15 preschool)	2016/17 kindergarten cohort (2015/16 preschool)	2017/18 kindergarten cohort (2016/17 preschool)	2018/19 kindergarten cohort (2017/18 preschool)
State-funded preschool, all	0.00265	0.00439	0.0106**	0.0118**	0.0169***
	(0.00427)	(0.00297)	(0.00330)	(0.00374)	(0.00345)
State-funded preschool, Anchorage only	0.00725	0.00532	0.00664	0.00880*	0.0196***
	(0.00588)	(0.00361)	(0.00391)	(0.00440)	(0.00368)
State-funded preschool, excluding Anchorage	–0.00284	0.00455	0.0181**	0.0164*	0.0145*
	(0.00611)	(0.00493)	(0.00616)	(0.00674)	(0.00556)

Panel E. Sensitivity analysis for Anchorage only and excluding Anchorage for attendance in grade 1

Independent variable	2014/15 kindergarten cohort in year 2015/16 (2013/14 preschool)	2015/16 kindergarten cohort in year 2016/17 (2014/15 preschool)	2016/17 kindergarten cohort in year 2017/18 (2015/16 preschool)	2017/18 kindergarten cohort in year 2018/19 (2016/17 preschool)
State-funded preschool, all	0.00198	0.00674**	0.00387	0.00471
	(0.00230)	(0.00234)	(0.00235)	(0.00314)
State-funded preschool, Anchorage only	0.00256	0.00832**	0.00799**	0.00467
	(0.00263)	(0.00295)	(0.00253)	(0.00342)
State-funded preschool, excluding Anchorage	0.00174	0.00449	–0.00155	0.00365
	(0.00376)	(0.00385)	(0.00439)	(0.00578)

Panel F. Sensitivity analysis for Anchorage only and excluding Anchorage for attendance in grades 2 and 3

	Attendance in grade 2			Attendance in grade 3	
Independent variable	2014/15 kindergarten cohort in year 2016/17 (2013/14 preschool)	2015/16 kindergarten cohort in year 2017/18 (2014/15 preschool)	2016/17 kindergarten cohort in year 2018/19 (2015/16 preschool)	2014/15 kindergarten cohort in year 2017/18 (2013/14 preschool)	2015/16 kindergarten cohort in year 2018/19 (2014/15 preschool)
State-funded preschool, all	0.00504*	–0.00350	0.000599	0.00330	0.00265
	(0.00204)	(0.00340)	(0.00222)	(0.00197)	(0.00237)
State-funded preschool, Anchorage only	0.00562	–0.00644	0.00455	0.00302	0.00257
	(0.00287)	(0.00492)	(0.00282)	(0.00249)	(0.00265)
State-funded preschool, excluding Anchorage	0.00474	0.000149	–0.00554	0.00353	0.00316
	(0.00295)	(0.00378)	(0.00308)	(0.00310)	(0.00438)

* Significant at $p < .05$; ** significant at $p < .01$; *** significant at $p < .001$.
na is not applicable.
Note: School fixed effects were included in the models, but results are not shown to conserve space. Numbers in parentheses are standard errors. This table includes only the state-funded preschool districts for which five or more students reported participating in state-funded preschool. Sample sizes in Anchorage ranged from 3,012 to 4,059; sample sizes in districts excluding Anchorage ranged from 1,653 to 4,169.
Source: Authors' analysis of Alaska Department of Education & Early Development data.

Table C10. The relationship between participation in state-funded preschool and average annual kindergarten attendance rates varied by student group, 2018/19 kindergarten cohort

Independent variable	Alaska Native student interaction	English learner student interaction	Economically disadvantaged students interaction	Students with an IEP interaction
PEG = 0, Alaska Native = 0	0.0325***	na	na	na
	(0.00500)			
PEG = 1, Alaska Native = 0	0.0442***	na	na	na
	(0.00529)			
PEG = 1, Alaska Native = 1	0.0304***	na	na	na
	(0.00890)			
PEG = 0, English learner = 0	na	0.000232	na	na
		(0.00462)		
PEG = 1, English learner = 0	na	0.0147**	na	na
		(0.00550)		
PEG = 1, English learner = 1	na	0.0288***	na	na
		(0.00780)		
PEG = 0, Economically disadvantaged = 0	na	na	0.0129***	na
			(0.00223)	
PEG = 1, Economically disadvantaged = 0	na	na	0.0274***	na
			(0.00543)	
PEG = 1, Economically disadvantaged = 1	na	na	0.0186***	na
			(0.00506)	
PEG = 0, IEP = 0	na	na	na	0.00912**
				(0.00318)
PEG = 1, IEP = 0	na	na	na	0.0265***
				(0.00461)
PEG = 1, IEP = 1	na	na	na	0.0145*
				(0.00695)
Alaska Native	na	–0.0285***	–0.0286***	–0.0287***
		(0.00422)	(0.00423)	(0.00423)
American Indian	–0.00250	–0.00283	–0.00289	–0.00296
	(0.00678)	(0.00674)	(0.00670)	(0.00672)
Asian	0.00791	0.00790	0.00776	0.00778
	(0.00482)	(0.00475)	(0.00478)	(0.00478)
Black	–0.000114	–0.000106	–3.96e-05	–0.000120
	(0.00526)	(0.00528)	(0.00526)	(0.00526)
Latinx	–0.00902**	–0.00892**	–0.00905**	–0.00911**
	(0.00326)	(0.00328)	(0.00327)	(0.00327)
Native Hawaiian or other Pacific Islander	–0.0492***	–0.0494***	–0.0494***	–0.0494***
	(0.00582)	(0.00586)	(0.00585)	(0.00584)

Independent variable	Alaska Native student interaction	English learner student interaction	Economically disadvantaged students interaction	Students with an IEP interaction
Multiracial	–0.0114***	–0.0115***	–0.0116***	–0.0116***
	(0.00269)	(0.00270)	(0.00269)	(0.00269)
English learner	0.00154	na	0.00164	0.00163
	(0.00451)		(0.00453)	(0.00453)
Male	–0.00216	–0.00214	–0.00213	–0.00217
	(0.00195)	(0.00195)	(0.00194)	(0.00195)
Has an Individualized Education Program	–0.00911**	–0.00940**	–0.00944**	na
	(0.00284)	(0.00282)	(0.00283)	
Economically disadvantaged	–0.0123***	–0.0124***	na	–0.0124***
	(0.00227)	(0.00227)		(0.00225)
Age at kindergarten entry	0.000629	0.000494	0.000490	0.000507
	(0.00297)	(0.00296)	(0.00296)	(0.00297)
Head Start	0.0170***	0.0171***	0.0169***	0.0169***
	(0.00437)	(0.00434)	(0.00426)	(0.00430)
Constant	0.897***	0.930***	0.917***	0.921***
	(0.0183)	(0.0170)	(0.0165)	(0.0171)
Number of observations	7,882	7,882	7,882	7,882
R-squared	0.255	0.254	0.254	0.254

* Significant at $p < .05$; ** significant at $p < .01$; *** significant at $p < .001$.
IEP is Individualized Education Program. na is not applicable. PEG is Pre-Elementary Grant.
Note: School fixed effects were included in the models, but results are not shown to conserve space. Numbers in parentheses are standard errors. This table includes only the state-funded preschool districts for which five or more students reported participating in state-funded preschool.
Source: Authors' analysis of Alaska Department of Education & Early Development data.

Table C11. Participation in state-funded preschool was not related to standardized assessment scores in reading for the 2014/15 and 2015/16 kindergarten cohorts but was related to assessment scores in math for the 2015/16 cohort

Panel A. Standardized grade 3 assessment scores in given subject

	Math		Reading	
Independent variable	2014/15 kindergarten cohort in year 2017/18 (2013/14 preschool)	2015/16 kindergarten cohort in year 2018/19 (2014/15 preschool)	2014/15 kindergarten cohort in year 2017/18 (2013/14 preschool)	2015/16 kindergarten cohort in year 2018/19 (2014/15 preschool)
State-funded preschool	0.00335	0.147**	0.00631	0.0741
	(0.0376)	(0.0514)	(0.0405)	(0.0471)
Alaska Native	–0.269***	–0.275***	–0.346***	–0.379***
	(0.0446)	(0.0476)	(0.0475)	(0.0513)
American Indian	–0.370**	–0.223*	–0.388**	–0.0749
	(0.141)	(0.110)	(0.117)	(0.106)
Asian	0.0108	0.0254	0.0199	6.73e-05
	(0.0653)	(0.0573)	(0.0631)	(0.0594)
Black	–0.308***	–0.280**	–0.327***	–0.207**
	(0.0680)	(0.0909)	(0.0792)	(0.0712)
Latinx	–0.175**	–0.163**	–0.143*	–0.105*
	(0.0568)	(0.0509)	(0.0600)	(0.0501)
Native Hawaiian or other Pacific Islander	–0.392***	–0.310***	–0.430***	–0.289***
	(0.0588)	(0.0551)	(0.0519)	(0.0573)
Multiracial	–0.185***	–0.141***	–0.216***	–0.0906*
	(0.0425)	(0.0394)	(0.0425)	(0.0416)
English learner	–0.231***	–0.297***	–0.255***	–0.298***
	(0.0365)	(0.0412)	(0.0371)	(0.0362)
Male	0.186***	0.165***	–0.0841**	–0.126***
	(0.0236)	(0.0261)	(0.0254)	(0.0266)
Has an Individualized Education Program	–0.774***	–0.732***	–0.741***	–0.695***
	(0.0409)	(0.0410)	(0.0408)	(0.0390)
Economically disadvantaged	–0.299***	–0.263***	–0.300***	–0.250***
	(0.0311)	(0.0317)	(0.0315)	(0.0284)
Age at kindergarten entry	0.179***	0.235***	0.177***	0.230***
	(0.0388)	(0.0439)	(0.0377)	(0.0395)
Constant	–0.903***	–1.306***	–0.616**	–1.153***
	(0.216)	(0.236)	(0.208)	(0.216)
Number of observations	4,914	4,339	4,916	4,357
R-squared	0.356	0.326	0.380	0.349

Panel B. Sensitivity analysis for Anchorage only and excluding Anchorage for standardized grade 3 assessment scores in given subject

Independent variable	Math		Reading	
	2014/15 kindergarten cohort in year 2017/18 (2013/14 preschool)	2015/16 kindergarten cohort in year 2018/19 (2014/15 preschool)	2014/15 kindergarten cohort in year 2017/18 (2013/14 preschool)	2015/16 kindergarten cohort in year 2018/19 (2014/15 preschool)
State-funded preschool, all	0.00335	0.147**	0.00631	0.0741
	(0.0376)	(0.0514)	(0.0405)	(0.0471)
State-funded preschool, Anchorage only	0.0315	0.169*	0.0226	0.139*
	(0.0498)	(0.0657)	(0.0519)	(0.0595)
State-funded preschool, Excluding Anchorage	–0.0333	0.106	–0.00934	–0.0321
	(0.0580)	(0.0894)	(0.0631)	(0.0824)

* Significant at $p < .05$; ** significant at $p < .01$; *** significant at $p < .001$
na is not applicable.
Note: School fixed effects were included in the models, but results are not shown to conserve space. Numbers in parentheses are standard errors. This table includes only the state-funded preschool districts for which five or more students reported participating in state-funded preschool. Sample sizes in Anchorage ranged from 2,873 to 2,979; sample sizes in districts excluding Anchorage ranged from 1,466 to 1,940.
Source: Authors' analysis of Alaska Department of Education & Early Development data.

Table C12. In the 2015/16 kindergarten cohort participation in state-funded preschool was positively related to standardized assessment scores in grade 3 math for Alaska Native and economically disadvantaged students but was not related to assessment scores in grade 3 math for English learner students or with assessment scores in grade 3 reading for any of the student groups

	Math				Reading			
Independent variable	Alaska Native student interaction	English learner student interaction	Economically disadvantaged students interaction	Students with an IEP interaction	Alaska Native student interaction	English learner student interaction	Economically disadvantaged students interaction	Students with an IEP interaction
PEG = 0, Alaska Native = 0	0.298***	na	na	na	0.389***	na	na	na
	(0.0481)				(0.0521)			
PEG = 1, Alaska Native = 0	0.407***	na	na	na	0.447***	na	na	na
	(0.0753)				(0.0828)			
PEG = 1, Alaska Native = 1	0.268***	na	na	na	0.124	na	na	na
	(0.0717)				(0.0760)			
PEG = 0, English learner = 0	na	0.273***	na	na	na	0.288***	na	na
		(0.0411)				(0.0362)		
PEG = 1, English learner = 0	na	0.464***	na	na	na	0.381***	na	na
		(0.0771)				(0.0662)		
PEG = 1, English learner = 1	na	0.0335	na	na	na	0.0236	na	na
		(0.0660)				(0.0620)		
PEG = 0, Economically disadvantaged = 0	na	na	0.255***	na	na	na	0.247***	na
			(0.0328)				(0.0307)	
PEG = 1, Economically disadvantaged = 0	na	na	0.461***	na	na	na	0.346***	na
			(0.0960)				(0.0736)	
PEG = 1, Economically disadvantaged = 1	na	na	0.121*	na	na	na	0.0633	na
			(0.0533)				(0.0536)	
PEG = 0, IEP = 0	na	na	na	0.739***	na	na	na	0.699***
				(0.0429)				(0.0405)
PEG = 1, IEP = 0	na	na	na	0.876***	na	na	na	0.767***
				(0.0662)				(0.0636)
PEG = 1, IEP = 1	na	na	na	0.194	na	na	na	0.103

Independent variable	Math				Reading			
	Alaska Native student interaction	English learner student interaction	Economically disadvantaged students interaction	Students with an IEP interaction	Alaska Native student interaction	English learner student interaction	Economically disadvantaged students interaction	Students with an IEP interaction
				(0.102)				(0.0761)
Alaska Native	na	–0.275***	–0.275***	–0.275***	na	–0.379***	–0.379***	–0.380***
		(0.0474)	(0.0477)	(0.0473)		(0.0514)	(0.0513)	(0.0511)
American Indian	–0.223*	–0.222*	–0.222*	–0.224*	–0.0750	–0.0743	–0.0745	–0.0758
	(0.111)	(0.110)	(0.110)	(0.111)	(0.106)	(0.106)	(0.106)	(0.106)
Asian	0.0270	0.0203	0.0258	0.0252	0.000739	–0.00221	0.000232	–4.17e-05
	(0.0575)	(0.0577)	(0.0575)	(0.0574)	(0.0595)	(0.0599)	(0.0594)	(0.0594)
Black	–0.279**	–0.284**	–0.279**	–0.280**	–0.206**	–0.208**	–0.206**	–0.207**
	(0.0908)	(0.0913)	(0.0910)	(0.0909)	(0.0713)	(0.0717)	(0.0713)	(0.0712)
Latinx	–0.162**	–0.165**	–0.163**	–0.163**	–0.105*	–0.106*	–0.105*	–0.105*
	(0.0508)	(0.0506)	(0.0509)	(0.0510)	(0.0502)	(0.0501)	(0.0501)	(0.0501)
Native Hawaiian or other Pacific Islander	–0.308***	–0.308***	–0.309***	–0.310***	–0.288***	–0.288***	–0.289***	–0.289***
	(0.0548)	(0.0549)	(0.0552)	(0.0550)	(0.0572)	(0.0573)	(0.0574)	(0.0572)
Multiracial	–0.141***	–0.141***	–0.142***	–0.141***	–0.0906*	–0.0908*	–0.0909*	–0.0906*
	(0.0393)	(0.0395)	(0.0395)	(0.0395)	(0.0416)	(0.0416)	(0.0417)	(0.0416)
English learner	–0.299***	na	–0.296***	–0.297***	–0.299***	na	–0.298***	–0.298***
	(0.0412)		(0.0412)	(0.0412)	(0.0364)		(0.0362)	(0.0363)
Male	0.166***	0.165***	0.165***	0.165***	–0.125***	–0.126***	–0.126***	–0.126***
	(0.0262)	(0.0261)	(0.0262)	(0.0261)	(0.0267)	(0.0266)	(0.0266)	(0.0266)
Has an Individualized Education Program	–0.733***	–0.734***	–0.733***	na	–0.695***	–0.696***	–0.696***	na
	(0.0408)	(0.0410)	(0.0411)		(0.0390)	(0.0391)	(0.0391)	
Economically disadvantaged	–0.261***	–0.264***	na	–0.263***	–0.250***	–0.251***	na	–0.250***
	(0.0319)	(0.0318)		(0.0318)	(0.0285)	(0.0284)		(0.0284)
Age at kindergarten entry	0.235***	0.236***	0.236***	0.235***	0.230***	0.231***	0.231***	0.230***
	(0.0439)	(0.0441)	(0.0440)	(0.0440)	(0.0394)	(0.0394)	(0.0396)	(0.0395)

Independent variable	Math				Reading			
	Alaska Native student interaction	English learner student interaction	Economically disadvantaged students interaction	Students with an IEP interaction	Alaska Native student interaction	English learner student interaction	Economically disadvantaged students interaction	Students with an IEP interaction
Head Start	na	na	na	na	na	na	na	na
Constant	–1.599***	–1.588***	–1.568***	–2.042***	–1.540***	–1.445***	–1.404***	–1.851***
	(0.251)	(0.241)	(0.239)	(0.237)	(0.221)	(0.220)	(0.214)	(0.221)
Number of observations	4,339	4,339	4,339	4,339	4,357	4,357	4,357	4,357
R-squared	0.326	0.326	0.326	0.326	0.349	0.349	0.349	0.349

* Significant at p < .05; ** significant at p < .01; *** significant at p < .001.
na is not applicable. IEP is Individualized Education Program. PEG is Pre-Elementary Grant.
Note: School fixed effects were included in the models, but results are not shown to conserve space. Numbers in parentheses are standard errors. This table includes only the state-funded preschool districts for which five or more students reported participating in state-funded preschool.
Source: Authors' analysis of Alaska Department of Education & Early Development data.

Appendix D. Interview and document analysis

This appendix includes a more detailed description of the interview and document analyses.

Interview analysis

The analysis of the interviews with nine Pre-Elementary Grant (PEG) program directors examined preschool program structures, staff supports, engagement practices, challenges, and successes. No distinct differences or patterns in reported implementation by district characteristics or outcomes were found for the nine districts whose PEG directors participated in interviews. All nine of the districts blended or braided their PEG funding with other grants and funding sources to support their preschool programs. However, it was challenging for interview participants to describe precisely what was funded directly by the grant because single components of a preschool program were often funded by multiple sources.

Pre-Elementary Grant (PEG) funds provided PEG districts with the flexibility to test different preschool options. PEG funds allowed PEG districts to implement and experiment with a variety of preschool options to find the most effective solutions for their local community. The options included summer bridge programs, home outreach programs, new partnerships, multigrade and single-grade classrooms, changes in staff roles, and innovative staff training. According to one interviewed PEG program director, "One of the biggest changes with the PEG grant is having strategic thinking about planning and leadership and training. ... I mean, I've never seen a grant that has allowed such flexibility in developing and has really enabled us to try out some different things, using a certified teacher, half-day models, combined models."

Most of the programs maintained classrooms at multiple sites. Eight of the interviewed PEG program directors reported that the district supported classrooms at more than one location, while one PEG program director reported that the district supported one classroom in a single location. The PEG districts operating programs with multiple locations did not always use PEG funds to support all their classroom locations. For example, five of the districts used PEG funds to support more than one classroom location, while three districts used PEG funds to support only one of their multiple classroom locations. Seven of the interviewed PEG directors said that their programs were located in elementary schools exclusively. Due to small enrollment numbers, two of the seven programs operated at least one multigrade classroom that combined preschool students with other elementary school students.

Kindergarten preparation was a focus of the parent engagement efforts in about half the programs. Four of the interviewed PEG district directors noted explicit efforts to help parents of enrolled children engage with their children and prepare them for kindergarten. Three of the four districts offered books and materials to help parents prepare their children for kindergarten and to engage with them effectively at home. Another district sent a teacher to conduct annual home visits with parents of enrolled children. Two districts offered training to parents of enrolled young children to help them learn parenting skills.

Most districts supported a combination of staff compensation, professional development, and nonpersonnel resources. Several of the districts provided support for existing preschools by funding staff positions, professional development, and materials. Including the two districts that offered summer programs, six of the districts offered funding for certified teachers and classified aides or instructors—and in one case, a family engagement specialist—to provide more staffing and support for the preschool program. All but one of the interviewed PEG program directors indicated that they offered professional development for selected staff members to attend early childhood conferences or receive other early childhood training. In addition, one of PEG districts provided school supplies for enrolled children, and another district provided lesson planning support for staff members, child screenings and assessments, curriculum materials, and supplies directly for the classroom.

All nine districts aimed to improve program quality or improve student preparation for kindergarten. Every one of the PEG district program directors interviewed for this study mentioned the goal of increasing program quality or improving children's preparation for kindergarten, and one PEG district program director reported both goals. There is a clear relationship between the two goals, as improving program quality can lead to improvements in the kindergarten readiness of enrolled children. Interview participants in six PEG districts reported that increasing capacity or providing additional preschool options for families was a key goal of their preschool program. Two of the six interviewed PEG directors focused on serving children with Individualized Education Programs (IEPs) and children without IEPs together in an inclusive setting. One of the districts included students with an IEP in classrooms with their peers who did not have an IEP. A special education teacher was on site to provide support in the inclusive classrooms, and students with IEPs were pulled out of class only for specific occupational or physical therapy sessions. The other district expanded its special education-only preschool program to all age-eligible students in inclusive settings.

Nearly all districts offered staff professional development, but its type, quantity, and content varied. Eight of the nine interviewed PEG program directors reported offering some type of training or professional development to staff members. However, the type and amount of professional development varied greatly by district. Professional development included funding for staff members to attend conferences such as the annual conference of the Anchorage Association for the Education of Young Children (the largest early childhood conference in the state). Other common offerings included participation in district professional development with other elementary school teachers, common planning time with other preschool or elementary school teachers, and specific training to improve instruction in a particular area. One PEG district program director reported providing 30 minutes a day of paid time for collaboration, three hours of extended collaboration time per week, specific training in areas such as behavior support, and financial support for preschool teachers to obtain a master's degree. In another district the only professional development reported was four hours of annual training in curriculum.

The content of professional development also varied substantially across the interviewed districts. Multiple district PEG directors reported providing targeted training on specific curricula, behavior support, and special education. For example, two districts offered substantial teacher professional development in behavior support that included strategies for how to deal with challenging behavior, encourage positive behavior, offer visual support for behavior problems, support students on the autism spectrum, or use small-group instruction to improve behavior. In another district a remote special education teacher collaborated with teachers online to design interventions that the on-site teachers then implemented. While one PEG district allowed its staff members to choose their own professional development focus, other districts provided the same training opportunities to all staff members. In some cases professional development was provided through coaching and customized for the needs of the individual staff person.

Most of the interview participants reported similar daily activities in their classrooms. The most common activities included circle or welcome time with individual child check-ins, structured play, free play, outdoor time, literacy/reading time, math time, center time (rotations through different activities in small groups), and a time for focusing on motor skill development. There were variations on many of the activities and on the order in which they were carried out, both across PEG programs and across classrooms within a program. Notably, programs approached technology quite differently. For example, two programs emphasized the importance of technology by providing regular time for students to work on tablets, while another specifically limited children's time spent on technology to help them focus more on interactions.

A few of the interviewed PEG directors reported that their program offered some additional activities. For example, one program took children on daily trips into the community to places such as a gym or local science

center. This program also emphasized the importance of time spent outdoors. Another program reported that children worked regularly with a counselor to improve their social skills.

Seven of the interviewed PEG program directors indicated that their district used established curricula as the foundation for activities. The other two districts used a curriculum that had been adapted to meet their needs. For example, one of the districts used the local Head Start program's curriculum as a foundation and adapted it to be more play-based. Among the seven interviewed PEG directors whose districts used established curricula, three used Creative Curriculum, two used Handwriting without Tears, and two used Waterford Upstart. Three of the districts facilitated social-emotional development using Second Step.

Supporting English learner students was an explicit focus in five of the districts. In two of the districts practitioners used the Language for Learning curriculum to support students. Two other districts offered regular Alaska Native language instruction to all children regardless of their home language. The remaining district supported English learner students through its student services department. Three other interviewed PEG program directors reported that their district did not often serve English learner students, highlighting differences in demographics across PEG sites.

Special education supports for preschool students typically focused on supports required by a student's IEP, such as one-to-one instruction or assistance, pull-out instruction for behavior support, and speech services. Directors reported that special education teachers were either in the classrooms with the students who had an IEP or were available on site as needed. In one district some remote locations did not have a special education teacher on site but had one available to advise the on-site teacher and to visit several times a year.

Pre-Elementary Grant programs engaged the community through trusted advisors and direct outreach. Interview respondents reported two common types of community engagement. First, it was relatively common for districts to have an advisory group to provide input to the program. According to respondents, trusted advisors were particularly important during the creation of the preschool programs. Advisors included tribal elders or council members, other community preschool providers, health care providers, and a variety of others. Second, many of the respondents discussed the role of community partners in referring children to their program, through sources such as Child Find. Other child referrals came from pediatricians, elementary schools, and other preschool providers.

Advertising and outreach from the preschool programs to families in the community were a major focus of community engagement, even in small communities where most families were already aware of the preschool program. The preschool directors discussed their program on the radio, hosted family nights, participated in fairs, advertised through social media, sent out flyers, posted signs, and otherwise tried to engage families with eligible children.

Less common ways of engaging the community included collecting data from families through surveys or focus groups to better understand their needs. One district invited tribal elders to share meals or visit with the children, a practice that helped establish a deep relationship between the tribe and the preschool program.

Pre-Elementary Grant programs used parent nights and other strategies to engage families. Seven of the nine respondents reported that their district offered parent nights during the school year when families could visit the site, talk with the teachers, and tour the classrooms. The frequency of parent nights varied by district, from monthly to biannually. Two of the districts offered a preschool orientation night at the beginning of the school year to help parents become more comfortable with the preschool. In addition, two of the districts offered preschool nights focused on content such as literacy and science. Individual parent–teacher conferences were another common method of engaging with families. Five PEG districts offered conferences, with a frequency range of monthly to biannually. Preschool programs in three of the districts provided parents with kits or backpacks that

included books, workbooks, information on skills needed to ready children for kindergarten, and information on how families could support their children at home. Another three districts sent home regular newsletters to provide this type of information.

Less common strategies to engage parents included collecting data from parents through surveys, selecting a parent representative, or forming a parent engagement group to identify concerns about the preschool. A preschool that supported limits on technology in preschool classrooms provided training for parents to help them engage in effective play with their children at home. One preschool program hired a family engagement specialist to develop and implement strategies. Although all respondents aimed to engage families and make them feel welcome, only two explicitly mentioned that they encouraged parents to observe and volunteer in the classrooms.

Many family engagement activities centered on kindergarten readiness. Six of the districts engaged parents specifically on kindergarten preparation. Most of the activities took the form of kindergarten readiness nights, during which families were invited to the preschool or kindergarten to hear about expectations, meet the teachers, and help parents with paperwork. Three of the districts offered individual family conferences to help the family understand the child's progress toward kindergarten readiness. Finally, two districts provided materials that parents could use to further prepare their children for kindergarten outside preschool hours.

Funding and recruitment/retention were the most common challenges for Pre-Elementary Grant programs. Among the PEG directors who were interviewed, the most commonly noted challenge to implementing a preschool program was funding. Respondents from eight districts voiced concerns about funding their preschool program. PEG program directors in seven districts mentioned the financial uncertainty each year and said that they would be unable to continue operating their preschool program if existing funding decreased or was no longer available. The PEG program directors that were the most uncertain about funding reported that they could not advertise their preschool program, recruit children, or hire teachers until they received notice about funding approvals. Another concern specific to PEG funding was the timing of the release of funds. Three PEG directors noted that the relatively late PEG funding awards made it difficult to hire high-quality teachers, as teacher candidates would have already found employment elsewhere by the time the awards were announced. Finally, one director reported that the June 30 PEG funding expiration made it challenging to fund summer programs.

Hiring and retaining highly qualified staff members were also relatively common implementation challenges. Six school districts with PEG programs struggled to hire and retain staff members that met their district qualifications. In one location a preschool classroom closed when a staff member left midyear and could not be replaced. Two of the districts, unable to fill a lead teacher position with a qualified individual, reported that they filled the position by training aides to serve in the lead teacher role. Another implementation challenge related to qualified staffing was the difficulty of providing adequate training for staff members due to long travel distances.

Finally, in three districts that partnered with other organizations to offer their PEG program, managing the unique requirements of each organization was challenging. One PEG district worked with both the local tribal government and Head Start. The partnership struggled to combine the district's special education–focused early childhood program with the culturally responsive ideas from the tribal government and the regulations and evidence-based approach of Head Start. The PEG director reported that honest communication was key to working through the challenges to comply with regulations and effectively meet student needs.

Easily the most common success reported by Pre-Elementary Grant program directors during interviews was improvement in child outcomes. All nine PEG district program directors who participated in the interviews reported improvements in children's skills or preparation for kindergarten and beyond. One director attributed high grade 3 assessment scores to the preschool program. Other PEG directors mentioned improvements in

language, literacy, math, peer interactions, and the ability of children to play as benefits that children in their district had experienced due to PEG.

In addition to improvements in child outcomes, interview participants reported other benefits from their PEG programs. Three directors noted improvements in their program's ability to engage families and the community. One director reported that the PEG provided the district with the financial flexibility to pilot different delivery models and practices and determine which ones were most effective. This director noted that the grant enabled the district to try such practices as hiring a certified teacher, implementing half-day models, and offering tuition-based care. As the director noted, "Some of them, we have not succeeded at, but then others we succeeded wildly at." Another director indicated that the program was able to provide more culturally responsive and relevant instruction to children because they had connected with parents through home visits and employed associate teachers from the community. One director proudly reported, "We are able to provide culturally relevant and responsive experiences to our students in a way we just couldn't before. When you walk into our classrooms, they are warm loving places, and each classroom feels like a family."

Document analysis

Documents submitted by PEG districts to the Alaska Department of Education & Early Development (DEED) indicated that PEG districts planned to use grant funds to implement a wide array of PEG program structures. All 24 of the 2018/19 PEG districts submitted at least one document to DEED describing their actual or potential PEG program. The documents included strategic plans from 12 districts, budgets from 22 districts, and grant applications from all districts between 2016/17 and 2018/19. Across PEG districts, PEG program structures included personnel and nonpersonnel components, professional development, partnerships, home outreach and support, and summer programs. However, the combination of the structures varied across districts.

The differences between and within programs were numerous. Each PEG district used the flexibility provided by the grant to design its own preschool program. This led to substantial variation across programs. However, within the PEG districts the preschools that received PEG support shared some characteristics. All operated four or five days a week, and most programs operated for at least the duration of the school year. Every preschool program included in the analysis targeted 4- to 5-year-old children, although some also served children of other ages. Twenty districts used the PEG funding to support both staffing and nonstaffing components.

Pre-Elementary Grant programs faced challenges in serving the at-risk student population and in a lack of community infrastructure for preschool. Many of the PEG districts served families and children in challenging circumstances. Eleven PEG districts described communities and schools with relatively low family incomes, high poverty rates, low parent education levels, and high unemployment. Seven districts noted the high rates of children with Individualized Education Programs, English learner students, migrant children, and transient families within their schools. Several grant applications contended that these populations have a great need for high-quality preschool.

Geographic factors made it difficult to offer a cohesive preschool program in some locations. Eleven grant districts cited geographic factors that made it more difficult to train staff, transport supplies for the preschools, or simply get children to preschool locations that were far from their homes. Expansive geographic areas, geographic isolation of districts or towns within the district, and natural barriers that limit access between communities were all challenges that PEG districts faced in delivering preschool services.

One of the most common community challenges faced by PEG districts was insufficient preschool infrastructure to serve eligible children. Twelve of the PEG districts mentioned that they could not serve all the children in the community because there were not sufficient enrollment slots or facility space to accommodate all the children

in the community. Grant applications described a lack of preschool options of any type in some communities. Two urban PEG districts noted that the high cost of preschool in the community was a challenge.

Staffing, funding, enrollment, and preschool infrastructure were key challenges for many Pre-Elementary Grant programs. Employing qualified staff members to fill preschool positions was a consistent challenge. Six PEG districts noted the difficulty of recruiting and retaining teachers and other staff members in preschools. A tight labor market in urban locales made it more challenging to recruit staff members and contributed to high teacher turnover. It was also challenging to recruit staff members to some remote locations. According to one district, high teacher turnover led to the need to train new teachers frequently. Training costs were often high due to the need for teachers to travel long distances or across geographic barriers to attain training.

A lack of sustainable funding made planning a challenge. Seven PEG districts reported that the lack of sustainable and reliable funding made it difficult to budget for appropriate staffing levels and facility space—two of the major expenses associated with operating a preschool program. Two PEG districts reported that funding cuts were a problem and, in one case, had forced the program to make significant staffing changes.

Preschool programs located in low-population areas sometimes struggled with enrollment and regular attendance. Seven PEG districts, including five rural districts, found it challenging to recruit families or to get children to attend regularly. The challenges appeared to be based at least partly on transportation difficulties. Some parents lacked access to transportation to get their children to and from preschool. Poor weather discouraged regular attendance during certain times of the year. A few of the documents indicated that some parents in the communities simply did not wish to enroll their children in preschool. When enrollment was low and attendance was irregular, this made it difficult to justify funding for the program.

The lack of early education infrastructure was a barrier to operating preschool programs. When there were few preschool options in a community, several districts reported that it was challenging to find transportation between sites or partners who could provide services such as extended-day care (care that extends the hours of care provided by existing child care or preschool). Three PEG districts reported that finding facility space in elementary schools or in privately-owned buildings in the community was problematic.

The purpose of Pre-Elementary Grants (PEGs) is to develop and expand local preschool options across the state, and each district receiving PEG funding worked toward this goal in its own way. Eight districts relied heavily on partnerships to provide critical services. Each of these districts partnered with Head Start, local tribes/tribal organizations, or private child care providers/preschools for the services. Of the eight programs three operated out of Head Start facilities, and the remaining programs used district facilities. Two of the districts provided preschool services for part of the day, and their partners provided child care, education, and wraparound services for other parts of the day. One of the two districts partnered with Head Start, and the other district partnered with a local child care provider to support its limited hours of operation.

Three PEG districts operated summer bridge programs that aimed to prepare children for kindergarten. The summer bridge program was the primary focus for one of the three PEG districts, while it was only one component of a more comprehensive program for the other two districts.

Five districts provided outreach and support to families as part of their preschool program. The districts provided funding or supports for families to improve care and instruction for children in their homes and offered home outreach (training, curriculum, and support to enable families to provide or supplement preschool education within their home).

Eight districts provided no evidence of funding permanent teaching staff.[2] Instead, the districts focused on supporting and expanding preschool programs and used grant funds for extended-duty contracts for staff members to conduct program design, outreach, and training. For example, one of the programs delivered training to parents to help them support their children at home. Another program provided funding for travel, child screenings, and textbooks and materials, but not staffing. Among the districts that funded permanent teaching staff, 14 explicitly used grant funds to offer benefits for at least some staff members.

Finally, 20 PEG districts used funding to support both personnel and nonpersonnel components. Support for personnel varied among districts but included salary for some combination of the following staff positions: full- and part-time teachers, aides, specialists, and noncertificated staff. Funding for nonstaffing services and activities also varied but included components such as travel, supplies, materials, professional development, curriculum, technology, furniture, and indirect expenses. Nineteen districts used PEG funding to support professional development for teachers and staff members. Table D1 presents an overview of the ways PEG districts used or planned to use their grant funds.

Table D1. Uses or planned uses of Pre-Elementary Grant, 2016/17–2018/19

Pre-Elementary Grant district	Structural partnership type	Summer bridge program	Home outreach services	Professional development	Permanent teaching staff	Both personnel and nonpersonnel components
1	—	—	X	X	X	X
2	—	—	—	—	X	X
3	Head Start	—	—	—	X	X
4	—	—	—	X	X	X
5	—	—	X	X	X	X
6	—	X	X	X	X	X
7	Head Start	X	—	X	X	X
8	—	—	X	X	X	—
9	—	—	X	—	X	—
10	—	X	—	X	—	X
11	—	—	—	X	—	X
12	—	—	—	X	—	X
13	—	—	—	—	—	X
14	—	—	—	X	—	X
15	—	—	—	—	—	X
16	—	—	—	X	—	X
17	—	—	—	X	X	X
18	—	—	—	X	—	—
19	Private center	—	—	X	X	X
20	Head Start, Local tribe	—	—	X	X	X
21	Head Start	—	—	X	X	X
22	Head Start, Local tribe	—	—	X	X	X
23	Head Start	—	—	X	X	X
24	Head Start	—	—	X	X	—

X indicates district used or planned to use grant funds in that manner; — indicates no evidence in grant plan material that district used or planned to use grant funds in that manner.
Source: Authors' analysis of the materials Pre-Elementary Grant school districts submitted to the Alaska Department of Education & Early Development, supplemented by interviews with nine grantee districts.

[2] Due to the lack of budget information, it is unclear whether three other school districts funded permanent teaching positions.

Most Pre-Elementary Grant programs built their program around existing preschool infrastructure. Three-quarters of the preschool programs had key elements of the program in place prior to receiving PEG funds. Eighteen PEG districts had at least a preschool program framework in place at the time that they wrote their grant application. The other six PEG districts had to build a program framework. This included negotiating new partnerships, hiring and training staff members, and purchasing materials and supplies.

More than half of Pre-Elementary Grant programs supported preschool at more than one location. Most of the PEG districts provided services or support to multiple preschool sites. Sixteen PEG districts operated or supported preschool classrooms at more than one facility, and 12 of the 16 offered preschool exclusively in elementary schools. The multisite programs also included two PEG districts offering services at Head Start sites and one district that supported programs in several types of settings. The number of preschool sites supported by the multisite programs ranged from 2 to 12.

Eight PEG districts used the grant to support a preschool program located at a single site. Two of these single-site programs were in urban fringe locales, while the rest were in rural hub/fringe or rural remote locales. The eight PEG programs included seven preschool programs located in elementary schools and one in a Head Start facility.

The number of children targeted in grant applications varied considerably, but all programs targeted children in the two or three years prior to kindergarten. All districts targeted children ages 4–5. A few districts offered services to younger children as well. Most of the districts did not explicitly target particular demographic groups, although a few prioritized children from families that were high-risk, low-income, or in underserved communities.

In aggregate, the PEG districts aspired to serve a total of 1,277 children. The average district planned to serve 59 children. The number of children targeted in the grants ranged from 9 to 174.

Nearly all Pre-Elementary Grant programs offered preschool on a part-day schedule for four to five days a week. Of the 24 districts in 2018/19, 1 district reported offering full-day preschool (defined as six or more hours a day) at their only site. Two other districts supported full-day preschool at one but not all of their multiple program sites. Each of the preschool programs offered preschool four or five days a week (except for home outreach and support services, which occurred less frequently). Preschool in half of the districts was provided on a calendar that aligned with the elementary school year, whereas two programs were offered for less than the whole school year. There were three programs that included a summer bridge.

Most Pre-Elementary Grant districts aimed to improve preschool quality, prepare students for kindergarten, and improve access to preschool in the community. Primary goals of PEG programs included improving preschool quality and preparing children for kindergarten. Eighteen PEG districts explicitly reported the goal of improving preschool quality and improving kindergarten preparation.

Other goals involved increasing preschool capacity and improving access to preschool. Sixteen PEG districts expressed the goal of increasing enrollment in preschool by offering more options to families and by reducing barriers to preschool enrollment. The documents discussed the need to increase the number of preschool classrooms by expanding space within existing facilities and by expanding the number of facilities. PEG districts also suggested that increasing hours and providing transportation would increase preschool enrollment.

Offering or supporting a preschool program that could meet diverse community needs was a priority for some districts. Specifically, six PEG districts identified the need for inclusive or culturally responsive preschools to address community needs. Three of the districts reported the goal of increasing preschool access overall.

A majority of Pre-Elementary Grant districts reported using multiple funding sources for their preschool program. Eight of the PEG districts receiving PEG funds had previously received funding for early learning from the *Moore*

v. Alaska settlement. The *Moore* funding provided $8.9 million in early learning grants to 10 PEG districts across the state, 8 of which later received a PEG between 2016/17 and 2018/19 (Pierson et al., 2018).

Most PEG districts documented other recent sources of funding for their early learning program. The strategic plan form requested information about nine recent funding streams available for early learning in the district. All districts with available strategic plans reported at least one source of recent funding (including the *Moore* settlement). Fifteen districts reported additional funding streams other than PEG for early education in their district. The most common funding stream reported in program documents was the Alaska Native Equity grants (four districts). Seven districts received support from local organizations in their district. Ten districts reported more than one source of non-PEG funding, although it was not always clear from available documents what the source of funding was or how much funding was available.

Most Pre-Elementary Grant programs supported professional development for staff members. Nineteen PEG districts documented using the grant funds to provide professional development activities. There was substantial variation in the delivery method, the focus, and the detail in which the professional development was described in the available documentation.

Coaching and conferences were the most common methods of providing professional development to staff members. Seven PEG districts sent staff to conferences, and five of the districts mentioned the annual Anchorage Association for the Education of Young Children conference, the largest early education conference in the state. A distinct set of seven districts provided on-site coaching or mentoring for teachers using grant funds.

Among the 16 districts that discussed the content of professional development, the most common areas of focus were assessment and curriculum. Four districts reported providing professional development for staff members on assessments in general, while six reported providing training on Teaching Strategies (TS) GOLD and two reported that they provided training on the Classroom Assessment Scoring System (CLASS). Six districts reported providing curriculum training that ranged from specific training on Creative Curriculum to training on curricular techniques.

Most Pre-Elementary Grant programs offered activities to improve kindergarten preparation. Most districts described multiple kindergarten transition activities as part of their grant-funded programs. Kindergarten transition activities were designed to prepare children for kindergarten and make the transition easier for both children and families. The activities were directed toward children, parents, and teachers and typically took place on site at the preschool program, in the kindergarten classrooms, or both.

The most common kindergarten transition activities funded by the grant were tours and other activities to help children feel more comfortable with the transition to kindergarten. Fourteen PEG districts offered these types of activities. Preschools located within an elementary school sometimes allowed the preschoolers to sit in on kindergarten classes and to participate in elementary school events. One preschool practiced kindergarten routines with preschoolers, such as helping them learn to ride the bus or visit the library.

Providing information about kindergarten and assistance to parents about the transition to kindergarten was a key goal for some PEG districts. Kindergarten information nights at the preschool or elementary school were the most common method documented in grant materials for educating parents about kindergarten. Five PEG districts provided summer preparation kits or written information on kindergarten. Less common but notable practices included assistance with kindergarten registration and parenting classes (through home outreach and support).

Many kindergarten transition activities focused on improving teachers' ability to prepare children for kindergarten. Specifically, six PEG districts used grant funds to provide opportunities for preschool and kindergarten teachers and staff members to collaborate and share data and information on children. Another set

of six PEG districts worked to align curriculum and standards to ensure a seamless transition in knowledge and skills for children as they moved from preschool to kindergarten.

Family and community engagement activities were a key part of Pre-Elementary Grant activities. PEG districts implemented and planned to implement a variety of activities to engage families of preschoolers. Half of the PEG districts offered family engagement nights to provide general information to parents, help them better understand how to support their children's math or literacy efforts, or simply bring parents together. Six PEG districts reported holding parent–teacher conferences to inform parents of their child's knowledge and skills. Another six districts used family surveys and other methods to gather information on family needs or engage families in planning efforts. To keep parents informed between events, four PEG districts sent regular newsletters to families. Five districts conducted home visits or outreach to meet with families.

Community relations were a key part of most grant programs. Twenty-two of the PEG districts reported that they engaged with local organizations and individuals for both support and input on their PEG program. Many individuals and organizations were involved with planning preschool expansion or improvement through regular meetings and participation in leadership committees. In some cases these individuals and organizations were the primary liaisons with the community. In addition to local relationships, five districts reported gathering data from the community using surveys or other needs assessments.

More than half of Pre-Elementary Grant programs reported setting minimum staff qualifications, and 10 required lead teachers to have the equivalent of a bachelor's degree. Fifteen PEG districts set minimum qualification standards for lead and assistant preschool teachers. Many of the districts described plans to increase the minimum requirements. Ten PEG districts required their lead preschool teachers to have a current state teaching certification (which requires having a bachelor's degree). Two of the ten districts required an early childhood endorsement on the teaching certification. Eight districts required assistant teachers to have a high school diploma or equivalent. Regardless of whether districts required assistant teachers to have a diploma, four districts required assistant teachers to have some experience in early education, and two required specific training (such as TS GOLD® training).

Most Pre-Elementary Grant districts used or planned to use the Teaching Strategies GOLD assessment. The Alaska PEG request for applications required applicant school districts to document how they would use an observational assessment tool and a measurement tool for the quality of teacher–child interactions. By far the most common observational assessment used and planned for was the Teaching Strategies assessment (Alaska Department of Education & Early Development, 2020). Fourteen of the PEG districts planned to implement either My Teaching Strategies or TS GOLD. Districts also implemented a variety of other assessments such as Dynamic Indicators of Basic Early Literacy Skills; Developmental Indicators for the Assessment of Learning, fourth edition (DIAL-4); Peabody Picture Vocabulary Test; and others. No more than three districts implemented any one of the options. No single measure of teacher–child interactions was implemented by more than a few districts. Only three districts implemented CLASS. Three others planned to implement CLASS or were currently implementing elements of CLASS. Two districts reported using the similar Danielson framework to assess teacher–child interactions.

Pre-Elementary Grant districts implemented a wide array of curricula. Of the 16 PEG districts that reported an overall curriculum, 6 districts reported using Creative Curriculum. Document analysis revealed substantial variation in the use of specific literacy and math curricula, with only two PEG districts using the same ones (Reading Street for literacy and High Scope for math). There was considerably more agreement on a social-emotional development curriculum, with eight districts reporting use of Second Step. Three districts reported having a culturally responsive curriculum.

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