# Summer Learning Program Evaluation

Prepared for the Poudre School District Board of Education

POUDRE SCHOOL DISTRICT

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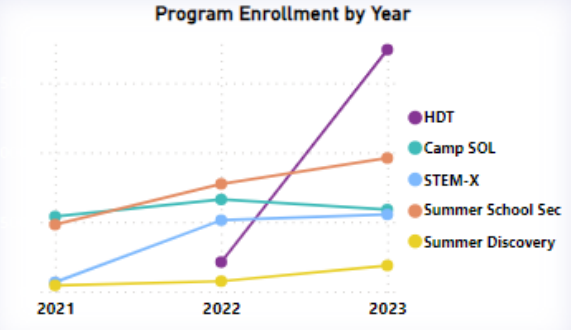
# Executive Summary

## INTRODUCTION

Poudre School District expanded summer opportunities for students during the summer of 2022 and again for students in 2023 to continue its ongoing response to nationwide and local impacts of COVID-era schooling. Programs were developed, and resources were allocated to provide a multitude of options for students to connect with others and progress academically during the summer months. As programs were expanded, designed, and implemented, special attention was given to social connection opportunities and academic programming. Student connection to others is an important contributor to mental health and well-being, which, in turn, are essential contributors to academic success. This report briefly describes key student summer learning opportunities during the two most recent summer sessions. It evaluates the academic gains realized by students who participated in these opportunities. Information presented in this report will be used to inform PSD's summer learning efforts in future summer program planning.

## KEY FINDINGS

- The **summer program enrollment** for most of the Summer School program, Summer Learning and Enrichment programs, and Summer Bridge program were significantly increased from 2021 – 2023:




  - *Summer High school enrollment* increased to 960 students, representing a 25% increase from prior summer enrollment. Six hundred thirty-nine courses were completed for credit (63% of courses taken), and 645 of the 791 completed courses resulted in a grade of B or higher (89.7%).
  - *High Dosage Tutoring* was provided to 1740 students, approximately 8.3 times the amount served in summer 2022 (212 students).
  - *Summer of Discovery:* Summer of 2023 enrollment represents a 153% increase over the 2022 summer enrollment (74 students) and a 68% increase over the 2021 summer enrollment (44 students).
  - *Stem-X* registered 554 students for the summer of 2023, a nearly 8% increase over the prior summer (513 students enrolled in 2022). The number of students enrolled in 2021 was 66.
  - *Camp SOL* registered 589 students for the summer of 2023, representing a 12% decrease from 2022 (662 students) but an 11% increase from the 2021 summer (539 students).
- **Academic gains** in reading and math were measured from the spring of 2022/23 to the fall of 2023/24 to monitor program effectiveness using Acadience and NWEA MAP assessments. The table below displays the effectiveness of programs by different assessments and grades. The red check mark represents the scores are higher than the matched group. When matched by demographic

characteristics (Gender, Grade, Ethnicity, FRM, and IEP status) and the prior academic performance,

| | Summer of Discovery | Stem-X | Camp SOL | HDT |
|---|---|---|---|---|
| **Acadience** | N/A | ✗ | ✓ | ✓ |
| **MAP Reading (3-5)** | N/A | -- | ✗ | ✓ |
| **Map Reading (6-8)** | ✓ | ✗ | N/A | ✗ |
| **Map Math (3-5)** | N/A | ✓ | ✓ | ✓ |
| **MAP Math (6-8)** | ✓ | ✓ | N/A | ✓ |

- Participants in the Camp SOL and HDT programs demonstrated **significantly higher** growth gains in *Acadience Reading (Grade 1-5)* than the matched comparison group, and their growth gains exceeded the PSD grade-level equivalent population.
- Participants in HDT showed **a higher growth gain** in *MAP Reading (Grade 3-5*) than the matched comparison group. Students in Stem-X made **similar growth gains** compared to the PSD grade-level equivalent population.
- Participants in Camp SOL, HDT, and Stem-X indicated **higher growth gains** in *MAP Math (Grade 3-5)* than the matched comparison group, but the growth gains did not exceed the PSD grade-level equivalent population.
- Only the participants in *Summer of Discovery* demonstrated a **higher growth gain** in *MAP Reading (Grade 6-8)* than the matched comparison group, and the growth gain exceeded the PSD grade-level equivalent population.
- Participants in HDT, Stem-X, and Summer of Discovery showed **higher growth gains** in *MAP Math (Grade 6-8)* than the matched comparison group, and their growth gains exceeded the PSD equivalent population.

- A total of 591 students provided feedback regarding their **attitude**s toward the various summer programs in which they participated. The main responses can be concluded as follows:
  - Student's responses to "The BEST THING" can be categorized into eight primary focuses: educational content (50), enjoyment and fun (38), practical experiences (29), personalized learning (19), social interaction (16), technology and platform ease (7), teaching quality (6) and other (404).
  - Students scored 3.96 out of 5 on "summer program is HELP or not." The high frequency of comments appreciating educational benefits and staff support correlates with the high ratings. In addition, social interaction and engagement appear to contribute positively to students' experiences.
  - Students rated 3.78 out of 5 on "the programs' impact on the next school year." A high rating appears in terms of academic preparation, social benefits, and skill development.
  - Suggestions for improvement focus on program structure and content, recommending more diverse activities and a balanced curriculum.

## CONCLUSION AND RECOMMENDATION:

PSD ensures that students who meet the priority criteria are able to engage in targeted summer programs that support student connections and academic growth. In summer 2023, 76% and 57% of the students across two subject areas (reading and math) had been identified as good candidates for "additional academic support" or "team awareness" in ELA/reading and math, respectively. Approximately 8.4% of the students participating in summer programs are supported with READ Plans, and 63% of all the students participating in the summer programs qualified for free or reduced lunch. Approximately 12% of PSD population is supported with READ Plan, and 30% of PSD's overall population is eligible for free or reduced meal prices. All these measures indicate that summer programming is effectively targeted to support the most vulnerable PSD students.

It is also notable that the enrollment of each summer program continues to increase from 2022 to 2023, except Camp SOL, which decreased 12% compared to last summer. Enrollment numbers in programs like Summer of Discovery and HDT experienced a substantial rise, with increases of 153% and over eight times their previous numbers, respectively. This trend suggests that the summer programs have effectively expanded to reach and support a larger number of students in need. However, it also highlights the ongoing efforts to address the gaps in academic achievements in PSD.

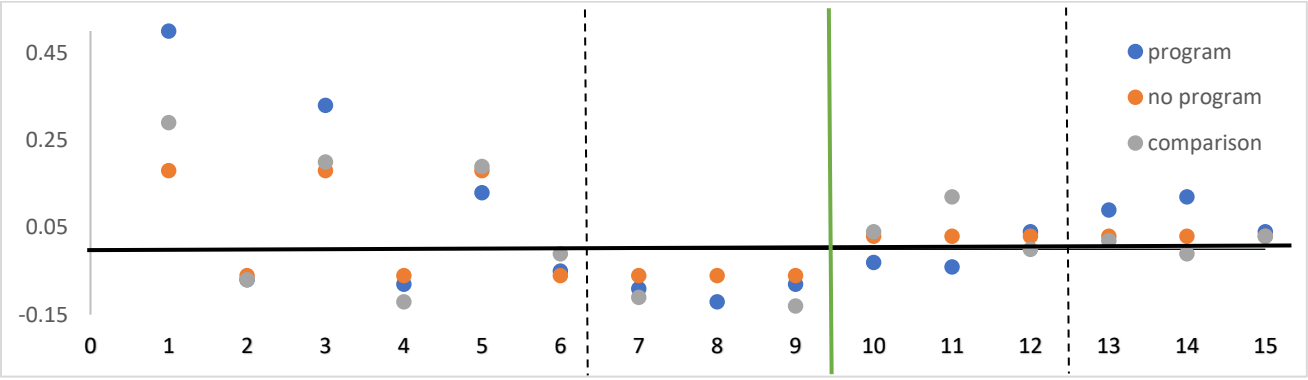
Academic gains in reading and math were measured from the spring of 2022/23 to the fall of 2023/24 to monitor program effectiveness using Acadience and NWEA MAP assessments. Outcomes of four different programming options (Camp SOL, High Dosage Tutoring, STEM-X, and Summer of Discovery) were explored regarding academic gain as measured by growth effect size. The reported growth effect size is the difference between spring and subsequent fall achievement levels in assessment standard deviation units. A growth effect size of zero (bold black line in the figure) indicates participants holding normative positions relative to national grade-level peers. A positive growth effect size indicates gaining ground on national grade-level peers, and a negative growth effect size suggests falling behind compared to these peers.

Overall, the growth effect sizes of **Acadience reading assessment** were significantly greater than the national grade level peers. On the other hand, the growth effect sizes of **MAP reading assessment** at the same level (Elementary) were slightly lower relative to the national peers. It indicates that in terms of reading skills assessed by Acadience, which are more likely to be the fundamental skills, students are advancing more rapidly than their peers nationally. However, the Camp SOL, HDT, and Stem-X programs made slower progress in terms of comprehensive reading skills that MAP assessed. Similar to MAP reading, students demonstrated lower growth effect sizes in **elementary MAP math** than their national peers, suggesting potential room for improvement. The students in Stem-X, HDT, and Camp SOL programs performed better than the comparison group but scored lower than the PSD grade-level equivalent population. It indicates that Stem-X, HDT, and Camp SOL programs enhance the academic achievements of PSD's prioritized students, who are initially performing below the 35th percentile.

At **the middle school** level, the **MAP math** growth effect sizes were slightly greater than the national peers, and the students in HDT, Stem-X, and Summer of Discovery programs outperformed both the comparison group of

students and the PSD grade-level equivalent population. It indicates that Stem-X, HDT, and Summer of Discovery programs enhance the academic achievements of PSD's prioritized students initially performing below the 35th percentile although the improvements are not statistically significant. Meanwhile, the **MAP reading** growth effect size was slightly greater than the national grade level peers. Summer of Discovery participants indicate a positive growth relative to comparison, and the academic gains slightly exceeded the PSD grade-level equivalent population. It suggests potential areas of strength or effective interventions that should be maintained. Conversely, the negative growth in MAP reading, especially within the HDT and Stem-X programs, underlines the necessity for these middle school programs to receive focused attention, potentially requiring a reassessment and improvement of their structure and content.

The following figure displays the growth effect sizes (2023 Spring to 2023 Fall) for each program by assessment and grade level. From left to right, 1 – 6 represents Elementary Level Reading skills, 7 – 9 represents Elementary level Math skills, 10 – 12 represents Middle School Level Reading skills, and 13 -15 represents Middle School Level Math skills.




Note: 1 = Camp SOL Acadience reading, 2 = Camp SOL elementary MAP reading, 3 = HDT Acadience reading, 4 = HDT Elementary MAP reading, 5 = Stem-X Acadience reading, 6 = Stem-X Elementary MAP reading, 7 = Camp SOL elementary MAP math, 8 = HDT elementary MAP math, 9 = Stem-X elementary MAP math, 10 = HDT middle school MAP reading, 11 = Stem-X middle school MAP reading, 12 = Summer of Discovery middle school MAP reading, 13 = HDT middle school MAP math, 14 = Stem-X middle school MAP math, 15 = Summer of Discovery middle school MAP math.

The following table summarizes the high levels of student growth realized by participating students. Green highlighted cells indicate evidence of summer academic growth that exceeds the PSD grade-level equivalent population (> No Programming) and/or exceeds the growth of a carefully selected matched-comparison group (> Comparison Group). Peach-highlighted cells indicate evidence of negative summer academic growth. The last column is shaded green, where summer participants' growth significantly exceeds that of the matched-comparison group, indicating the strongest level of effectiveness evidence.

| Level/Suject | Program by Assessment | N Count | >No Programming? | >Comparison Group? | program-comparison | Significant Gain? |
|---|---|---|---|---|---|---|
| ES/Literacy | Camp SOL (Acadience Reading 1st - 4th) | 294 | Yes (0.50 vs. 0.18) | Yes (0.50 vs. 0.29) | 0.21 | YES, $p$ = 0.001 |
| | Camp SOL (MAP Reading 3rd - 4th) | 274 | No (-0.07 vs. -0.06) | No (-0.07 vs. -0.07) | 0 | No |
| | HDT (Acadience Reading 1st - 5th) | 347 | Yes (0.33 vs. 0.18) | Yes (0.33 vs. 0.20) | 0.13 | YES $p$ = 0.003 |
| | HDT (MAP Reading 3rd - 5th) | 324 | No (-0.08 vs. -0.06) | Yes (-0.08 vs. -0.12) | 0.04 | No |
| | Stem-X (Acadience Reading 1st - 5th) | 120 | No (0.13 vs. 0.18) | No (0.13 vs 0.19) | -0.06 | No |
| | Stem-X (MAP Reading 4th - 5th) | 100 | Yes (-0.05 vs. -0.06) | No (-0.05 vs -0.01) | -0.04 | No |
| ES/Math | Camp SOL (MAP Math 3rd - 4th) | 316 | No (-0.09 vs. -0.06) | Yes (-0.09 vs. -0.11) | 0.02 | No |
| | HDT (MAP Math 3rd - 5th) | 153 | No (-0.12 vs. -0.06) | Yes (-0.12 vs -0.18) | 0.06 | No |
| | Stem-X (MAP Math 3rd - 5th) | 19 | No (-0.08 vs. -0.06) | Yes (-0.08 vs -0.13) | 0.05 | No |
| MS/Literarcy | HDT (MAP Reading 6th - 8th) | 116 | No (-0.03 vs. 0.03) | No (-0.03 vs. 0.04) | -0.07 | No |
| | Stem-X (MAP Reading 6th - 8th) | 33 | No (-0.04 vs. 0.03) | No (-0.04 vs. 0.12) | -0.16 | No |
| | Summer of Discovery (MAP Reading 6th - 8th) | 118 | Yes (0.04 vs. 0.03) | Yes (0.04 vs. 0.00) | 0.04 | No |
| MS/Math | HDT (MAP Math 6th - 8th) | 130 | Yes (0.09 vs. 0.03) | Yes (0.09 vs. 0.02) | 0.07 | No |
| | Stem-X (MAP Math 6th - 8th) | 17 | Yes (0.12 vs. 0.03) | Yes (0.12 vs. -0.01) | 0.13 | No |
| | Summer of Discovery (MAP Math 6th - 8th) | 122 | Yes (0.04 vs. 0.03) | Yes (0.04 vs. 0.03) | 0.01 | No |

Constantly evaluating and improving these initiatives is a crucial strategy for PSD that aims to ensure every interested student has access to these valuable learning experiences, which have proven effective in accelerating learning and fostering positive student engagement during the summer and beyond.

PSD would focus on boosting enrollment numbers while maintaining the high quality of the program. To achieve this goal, PSD would be strengthening the partnerships with community organizations and early planning for suitable program contents and structure, particularly in elementary-level MAP math and middle school-level MAP reading, along with recruiting and training competent staff to maintain the high quality of these programs.

Some summer programs, such as Stem-X, aim to help students develop skill sets and create confidence and competence in ALL students in ALL fields now and in the future. The immediate academic gains are not the primary goal of the program. Therefore, PSD will ensure that the program is tailored to meet students' diverse needs effectively. Beyond the programming opinions, other suggestions for improvement are as follows:

- Enhance Educational and Recreational Balance:
    - Continue to emphasize educational content while integrating more fun and engaging activities.
    - Explore ways to include hands-on learning experiences and personalized learning paths.
- Maintain and Improve Support and Engagement:
    - Sustain the quality of staff support and teaching.
    - Foster a social environment that encourages interaction and engagement among students.
- Diversify and Adjust Program Structure:
    - Introduce a broader range of activities to cater to different interests and learning styles.
    - Consider adjustments in curriculum and structure to keep a balance between academic and recreational elements.
- Focus on Physical and Communication Aspects:
    - Improve communication strategies, especially regarding program rules and expectations, to enhance clarity and student understanding.

# PSD Summer Programming Background

## The goal of PSD Summer Programming

Mitigate "summer slide" by ensuring students meeting priority criteria engage in targeted summer programs that support academic growth. Priority criteria used to guide the selection of student participants varied by specific programming offered. In general, priority criteria ensured students performing at low levels relative to grade-level peers or falling behind on high school credit accumulation were made aware of and supported in accessing the learning opportunities offered during the summer of 2023. PSD and Community Partner staff worked throughout the summer to ensure students who showed up for the experience were fully engaged and supported toward their optimal outcomes.

## Identifying Priority Needs

- Priority Group - Academic Need
    - Elementary: Starting the year behind the 35th percentile in reading or math and falling further behind by at least five percentile units during the school year
    - Middle school: same criteria as above + support of a READ Plan
    - High school: off-track to accrue graduation credits (grades 9-12)
- Priority Group students identified through the criteria listed above were analyzed further to target support, and lists were provided to schools in the Spring of 2023. Schools were asked to analyze their Priority Group lists and determine if the students would benefit from summer programming.
- Once the Priority Group was considered, schools could move to determine summer support for additional students. Summer programming opportunities were extended beyond Priority Group criteria to students showing additional academic support needs and/or connections or social-economical support needs.

## Description of Participates

- 2323 (76%) out of 3046 students across two subject areas (reading and math) had been identified as good candidates for "additional academic support" or "team awareness" in ELA/reading.
- 1741 out of 3046 students (57%) across two subject areas (reading and math) had been identified as good candidates for "additional academic support" or "team awareness" in Math.
- 63% of all the students participating in the summer programs are qualified for free or reduced lunch. Approximately 30% of PSD's overall population is eligible for free or reduced meal prices.
- Approximately 8.4% of the students participating in summer programs are supported with READ Plans. 12% of PSD students are eligible for Read Plan.

## Budget Update

Multiple funding sources were allocated to summer learning programs. Expenses at the time of this report show a total of $1,596,263.58.

Funding Sources (Please find the details in the table below)

- General Fund: General Education Portion of Camp Sol, Matthews House Learning Hub (Summer Only), and ESY
- ESSER III (Elementary and Secondary School Emergency Relief Funds):
    - PSD Secondary Summer School
    - Boys & Girls Club (Summer of Discovery)
    - Camp SOL
    - Summer nurses
- Title I Grant: Camp SOL
- 21st Century Grants: Camp SOL
- HeadStart: Early Childhood Summer
- State Grant: HDT (Summer Only)
- Non-PSD Funded: STEM-X

| 2023 Summer Program | Total Expenditures | Students Served |
|---|---|---|
| PSD Secondary Summer School | $290,867.18 | 960 |
| Matthews House Secondary Summer School with Mentor Supports | $28,263.68 | 27 |
| Boys & Girls Club (Summer of Discovery) | $150,000.00 | 187 |
| Camp Sol | $886,046.27 | 589 |
| HDT Summer Only | $90,029.17 | 960 |
| STEM-X | $120,946.61 | 554 |
| Other Summer Costs: Summer Nurses | $30,110.67 | |
| Total | $1,596,263.58 | |

*The COVID-Response Summer Learning Programs also required custodial services, food services, and technology support/services. These numbers are not included in the above expenditures.*

## Overview of Programs and Community Partnerships

### PSD Summer School - High School

PSD Summer School in 2023 consisted of online classes available at no charge. 8th – 12th grade students recover or accrue credits needed to meet graduation requirements. Some PSD students enrolling in summer school options may be off-track with graduation credits relative to their grade level. In contrast, others may wish to accrue credits during the summer to create additional flexibility in their school-year schedule. In summer, students may withdraw to protect their credit, grades, and transcripts.

Classes were available within three possible time windows April 3 - May 25 online only, June 1 - June 29 online, and June 29 - July 27 online only (the July Session is restricted to mentored students specifically at Matthews House or in HDT programs at their home schools). Students can complete multiple classes per session but are restricted to taking one class at a time. PSD utilized an online delivery platform, APEX, for the summer of 2023.

The 2023 enrollment of 960 students represents a 24% increase from the 2022 summer (774 students), a 61% increase from the 2021 summer (481 students), and a 49% increase from the 2020 summer (323 students enrolled in 2020). The number and percentage of PSD students taking and earning school credits toward graduation has increased dramatically in the past three years. Enrollment and course recovered details are shown below:

Enrollment:

- 960 students enrolled, with 563 completing courses for credit (58.3%) – an increase of 192 students over 22/23
- 1384 courses enrolled with 791 completed for credit (57.1%) – an increase of 369 courses over 22/23
- 645 of the completed 791 courses resulted in a grade of B or higher (89.7%) – an increase of 75 classes over 22/23

Couse of recovered:

| Subject | Credits and Courses Completed by Subject |
|---|---|
| Civics/Government | 195 credits |
| Economics | 285 credits |
| English/Language Arts | 490 credits |
| Fine & Applied Arts | 50 credits |
| Health Education | 455 credits |
| Social Studies | 255 credits |
| Mathematics | 350 credits |
| Personal Finance | 305 credits |
| Physical Education | 485 credits |
| Physical Science | 20 credits |
| Science | 495 credits |
| U.S. History | 340 credits |
| Humanities | 230 credits |
| **Grand Total** | **3955 credits** |

## The Mathews House Mentoring Supports in Conjunction with PSD Summer School - High School

In partnership with PSD, the Bohemian Foundation, and the City of Fort Collins, the Matthews House (TMH) provided in-person summer school support for 34 Poudre High School and Fort Collins High School students. TMH staff worked with both schools to identify which courses each student needed to recover over the summer and made an individualized recovery plan with each student.

In May, TMH staff worked with parents and/or guardians of the students to sign an agreement of expectations regarding engaging in the program for the summer, including transportation planning and hours students would be present. When needed, transportation was provided, though public transportation was encouraged when appropriate. TMH staff supported guardians in learning how to access the PSD ParentVue portal and register their children. This was very difficult for some guardians due to the lack of technology, a language barrier, and a lack of understanding of the system. TMH staff met with the guardian whenever possible and brought the resources (computers and hot spots) to support registration in partnership with the student/family.

Students attended classes Monday - Thursday, 9 am to 2 pm, and Friday by appointment, working in-person on their online classes at one of our Community Life Centers. Students were provided internet access, tutoring, accountability support, and daily breakfast and lunch from the Larimer County Food Bank to support in-person learning. Students worked daily with staff to set goals of completing at least 5% of a course each day to help ensure they stayed on track for course completion and met their agreement. Students were eligible to receive up to two $500 stipends by completing two courses, and this lowered the barrier to participation for students who would have had to maintain a summer job to support their families. Additionally, TMH provided an opportunity for a two-week course through TechCorps in partnership with Nordson Foundation, in which students earned a 5-credit course in Computer Science (the same credit category as math), a requirement for graduation. Students who completed this course received a $500 stipend.

Several students completed three or four courses this summer. Students were invited to stay after 2 pm daily to engage in other experiential education activities. These included rock climbing, backpacking trips, music lessons, band jam sessions, music production, Power through Choices (teen sexual health), and Dungeons and Dragons. Thirty-six additional credits, beyond those listed below, were earned through these Experiential Learning opportunities, and student engagement was increased.

## Summer of Discovery (Boys and Girls Club) - Middle School

In partnership with the Boys & Girls Clubs of Larimer County (BGC), 187 middle school students had the opportunity to partake in the “Summer of Discovery” workforce learning program. Summer of 2023 enrollment represents a 153% increase over the 2022 summer enrollment (74 students) and a 68% increase over the 2021 summer enrollment (44 students). The full-day summer experience explored different industries each week through experiential learning, including an interdisciplinary approach to literacy and math.

BGC staff partnered with PSD to identify and prioritize student participants who would benefit from a full day and summer in a safe and connective environment given socio-economic factors like McKinney-Vento status and students identified as good candidates for additional academic support based on recent assessment trajectories. The workforce learning program was operating June 5 - July 28 for 1$^{st}$ – 5$^{th}$ grades, and June 5 – August. 4 for 6$^{th}$ – 9$^{th}$ grades, Monday-Friday, 7:30 am - 5:30 pm. The summer program was offered in the Fort Collins Boys &

Girls Club (1608 Lancer) and the Sage Homes Boys & Girls Club (Wellington). Boys & Girls Club staff coordinated and facilitated the workforce learning program.

The camp included a financial reward for any students who graduated the program with at least 75% attendance, resulting in 107 students receiving a graduation financial reward. A generous Boys & Girls Club donor provided the graduation reward. Through a partnership with PSD and Canvas Credit Union, it also included Personal Financial Literacy credits for all highly attending students entering 9th grade, resulting in 14 9th grade students receiving the Personal Financial Literacy credits.

### HDT – Summer Only

High Dosage Tutoring (HDT) is an additional layer within a Multi-Tiered System of Supports. HDT is research-based, intentionally scaffolded tutoring delivered in "high doses" with specific features in place meant to build students' knowledge and skill base. HDT utilizes highly trained tutors and licensed educators, is embedded in the school day, outside the school day, or summer session, serves four or fewer students per session, and tutoring occurs a minimum of 3 times a week, 45-60 minutes for 6-week cycles. Literacy and Mathematics are the areas of focus for HDT. Tutors collaborate with teachers on student goals and content. During the summer of 2023, HDT was provided to 1740 students, approximately 8.2 times the amount served in summer 2022 (212 students). Some students were tutored in mathematics and literacy, while others were supported in only one subject or the other.

Students needing additional support in K-8 Literacy and Mathematics and credit recovery at the high school level are prioritized for HDT support. Priority - Academic Need has been defined as starting the year behind the 35th percentile in reading or math and falling further behind by at least a five percentile (grades K-8); off-track to accrue graduation credits (grades 9-12). Schools identify additional students that may benefit from high dosage tutoring.

Cycles of HDT delivery are determined by school staff, and services/supports are delivered at individual school sites and some partnering organizations such as The Matthews House.

### Camp SOL - Elementary School

Camp SOL is a summer bridge program designed for K-4 students needing additional support in Literacy and Math during the summer months. Camp SOL offers a full-day, full-summer experience for students, including experiential learning, in-house field trips, and connections with positive, engaging adults. Camp SOL registered 589 students for the summer of 2023, representing a 12% decrease from 2022 (662 students) but an 11% increase from the 2021 summer (539 students).

Students are recommended for participation in Camp SOL by PSD staff, where priority is given to students with demonstrated academic need, students who benefit from the support of an IEP and are not attending Extended School Year (ESY), emerging bilingual students, and students that benefit from a full day and entire summer safe and connective environment given socio-economic factors like McKinney-Vento status.

Camp SOL operated Monday - Thursday; June 5 - July 20; 8:30 am-12:30 pm (no programs July 5-9) and provided Wrap-Around Services: 12:30 pm - 4:30 pm and Fridays 8:30 am - 4:30 pm at Beattie, Laurel, Linton,

and Putnam elementary schools. AlphaBest was a partner in delivering services. Staff and administration used various instructional materials and strategies to meet the needs of the students being served.

### STEM-X Poudre School District

STEM-X registered 554 students for the summer of 2023, a nearly 8% increase over the prior summer (513 students enrolled in 2022). This represents a consistent return to the historically large numbers of students who engage in this learning opportunity. Due to COVID-19, in the summer of 2021, only 66 students were enrolled in STEM-X.

Students had a fun, engaging summer experience with STEM-X, held June 5 – 9 and June 12 – 16 in Preston Middle and Poudre High School. Students engage in classes such as Imagination Exploration, Intro. to VR, Mechanized Magic, Flight Simulator, Rocket Science, Code your Own Adventure, Chem Chaos, Lego Landmarks, Origami Science, and the Science of Harry Potter.

The immediate benefit of STEM-X is that students stay engaged over the summer months, reduce summer learning loss, and have the opportunity to apply the knowledge they've gained over the school year. With respect to the long-term gain, STEM-X aims to help students develop skill sets to thrive in any field, but in particular, to give them opportunities to learn more about and build a sense of belonging in STEM fields. Our overarching mission is to create confidence and competence in ALL students in ALL fields. However, more specifically, one of our primary goals is to reduce any detrimental gaps to broaden all students' academic and professional opportunities in STEM fields.

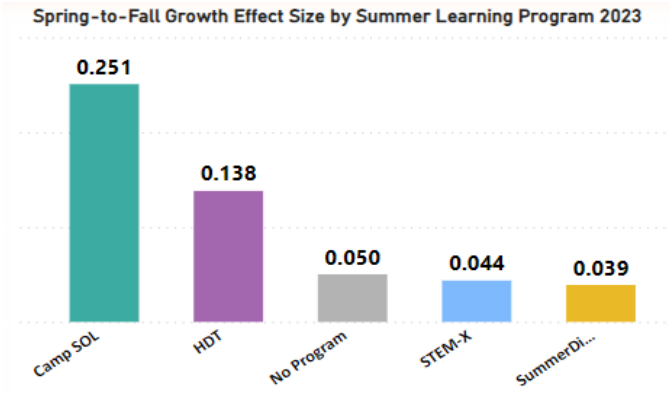
### Early Childhood Extended School Year

Each year, ECE offers an extended school year program, rather than a summer enrichment, required by the Office of Head Start. Our four-day instructional week at 19 of our sites does not allow for enough hours during the school year to meet the full-day hours requirement, so Head Start students have access to the additional days per year to meet the minimum number of hours required by the Head Start Grant. Students attending five days per week program meet the instructional hour requirement for Head Start during the school year at Eyestone and are not required to attend an extended school year. The extended school year program serves 128 students in 8 licensed pre-K classrooms each summer. Students who qualify for full-day Head Start funding are required to attend the program first. If all slots are not filled, we then offer to full-day students who have a head start as a part of their funding.

## Analyses of Outcomes

The body of evidence presented in the report indicates that there are some successes associated with PSD Summer of 2023 learning opportunities. Intended to positively impact students in the areas of academic progress and social-emotional well-being. The following illustrations and tables make visible students' academic progress and associated well-being outcomes that persist into the fall of 2023. To assess the attainment of summer academic growth that exceeds expected growth had no summer programming been offered, a quantitative analysis of student growth for summer programming participants and matched comparison groups are provided, and significant gains are identified.

Academic outcomes of primary interest in gauging the success of Camp SOL, the Summer of Discovery, High Dosage Tutoring (HDT), and STEM-X include the academic gains of the participating students attained in each service delivery model. Spring-to-fall growth outcomes are measured relative to non-participating PSD peers and to carefully selected matched-comparison groups of PSD peers selected to closely resemble the associated participant group's demographic characteristics and prior-achievement levels.



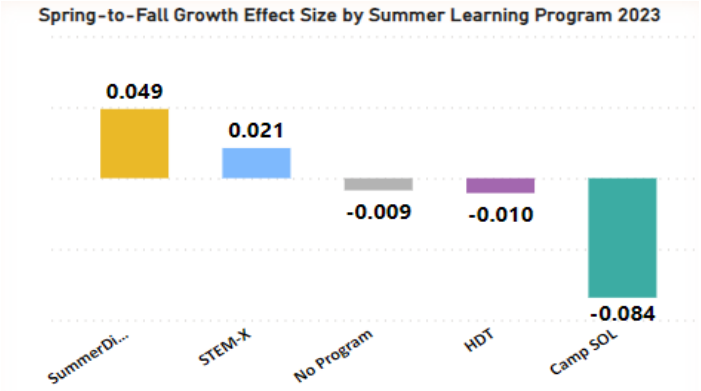

| Summer 2023 Program | Summer Zgain | Spring 2023 Avg. Z | Fall 2023 Avg. Z | Student Count |
|---|---|---|---|---|
| **No Program** | **0.05** | **0.21** | **0.25** | **19995** |
| **HDT** | **0.14** | **-0.67** | **-0.53** | **986** |
| **Camp SOL** | **0.25** | **-0.88** | **-0.63** | **794** |
| **STEM-X** | **0.04** | **0.86** | **0.90** | **317** |
| **SummerDiscovery23** | **0.04** | **-0.23** | **-0.19** | **139** |

Involvement in PSD summer learning opportunities is associated with increased academic growth in **reading** measured between the end of the 2023 spring semester and the beginning of the 2023 fall semester. The measurement of summer growth is available to PSD via the Acadience assessment of early literacy (grades 1-5) and the NWEA MAP assessment (grades 3-8 for reading and math). Accelerated growth across the PSD summer learning opportunities can be seen relative to national peers in the reading growth effect sizes for MAP and Acadience assessment programs considered collectively across all programs (0.12, N=2236) grades 3-8.

The growth effect size is the average difference between Spring 2022/23 and Fall 2023/24 achievement effect sizes. Growth effect sizes tell us how many standard deviation units PSD students have moved their achievement outcomes relative to national academic peers on average. A growth effect size of zero indicates PSD students held their relative positions in the assessment outcome normal curve distribution from one test occasion to the next. A positive growth effect size reflects gaining ground on academic peers nationwide. A negative growth effect size indicates sliding back in the distribution (i.e., losing ground).

To put the 0.04 reading growth effect size realized by Summer of Discovery participants (grades 6-8 in fall 2023) into perspective, we can convert the growth effect size into an equivalent “Percent of School-Year Expected Growth" and several "additional weeks of instruction" during the regular school year. The Summer of Discovery

growth effect size of 0.04 indicates that participant reading gains, measured by the NWEA MAP assessment, are approximately 14% of typical nationwide pre-COVID school-year growth. Assuming a linear relationship between school-year days of instruction (approximately 180 days) and fall-to-spring learning gains, the 0.04 growth effect size realized by Summer of Discovery participants is approximately equivalent to 5 weeks of additional school-year instruction.




| Summer 2023 Program | Summer Zgain | Spring 2023 Avg. Z | Fall 2023 Avg. Z | Student Count |
|---|---|---|---|---|
| **No Program** | **-0.01** | **0.16** | **0.16** | **14454** |
| **Camp SOL** | **-0.08** | **-0.93** | **-1.01** | **318** |
| **HDT** | **-0.01** | **-0.63** | **-0.64** | **308** |
| **SummerDiscovery23** | **0.05** | **-0.25** | **-0.20** | **146** |
| **STEM-X** | **0.02** | **0.62** | **0.65** | **38** |

Involvement in PSD summer learning opportunities is associated with increased academic growth in **math** measured between the end of the 2023 spring semester and the beginning of the 2023 fall semester with the MAP assessment for four summer programs in this analysis. Note that growth across the PSD summer learning opportunities taken collectively (-0.01, N=810) in grades 3-8 are similar to the outcome for same-grade level PSD peers that did not participate in summer programming (-0.01, N=14454). In order to get a more detailed view of each program's associated growth effect sizes, this report will provide views organized by specific assessment programs and levels of our elementary and middle schools.

To put the 0.05 math growth effect size realized by Summer of Discovery participants (grades 6-8 in fall 2023) into perspective, we can convert the growth effect size into an equivalent “Percent of School-Year Expected Growth" and into a number of "additional weeks of instruction" during the regular school year. The Summer of Discovery growth effect size of 0.05 indicates that participant math gains, measured by the NWEA MAP assessment, are approximately 14% of typical nationwide pre-COVID school-year growth. Assuming a linear relationship between school-year days of instruction (approximately 180 days) and fall-to-spring learning gains, the 0.05 growth effect size realized by Summer of Discovery participants is equivalent to 5 weeks of additional school-year instruction. The following tabled data was utilized to carry out the Summer of Discovery growth Effect Sizes conversions into equivalent weeks of fall-to-spring instruction.

MAP READ 6-8

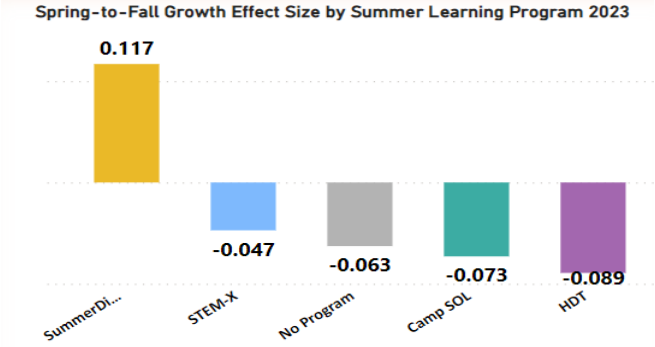
| Grade | N | Weight | Natl F Std Dev | Natl F-to-S RIT Change |
|---|---|---|---|---|
| 6 | 22 | 0.4889 | 16.46 | 5.19 |
| 7 | 14 | 0.3111 | 16.51 | 4.19 |
| 8 | 9 | 0.2000 | 17.04 | 3.65 |
| Weighted Means | 45 | 1 | 16.6 | 4.6 |

MAP Math 6-8

| Grade | N | Weight | Natl F Std Dev | Natl F-to-S RIT Change |
|---|---|---|---|---|
| 6 | 4 | 0.1481 | 16.2 | 8.13 |
| 7 | 14 | 0.5185 | 17.41 | 6.52 |
| 8 | 9 | 0.3333 | 18.94 | 5.38 |
| Weighted Means | 27 | 1 | 17.7 | 6.38 |

## Spring-to-Fall 2023 NWEA MAP Reading Growth Effect Sizes

Figure 1: MAP Reading Assessments for **Grades 3- 5**




| Summer 2023 Program | Summer Zgain | Spring 2023 Avg. Z | Fall 2023 Avg. Z | Student Count |
|---|---|---|---|---|
| No Program | -0.06 | 0.24 | 0.18 | 5199 |
| HDT | -0.09 | -0.69 | -0.78 | 347 |
| Camp SOL | -0.07 | -1.08 | -1.15 | 304 |
| STEM-X | -0.05 | 1.27 | 1.23 | 106 |
| SummerDiscovery23 | 0.12 | 0.53 | 0.64 | 11 |

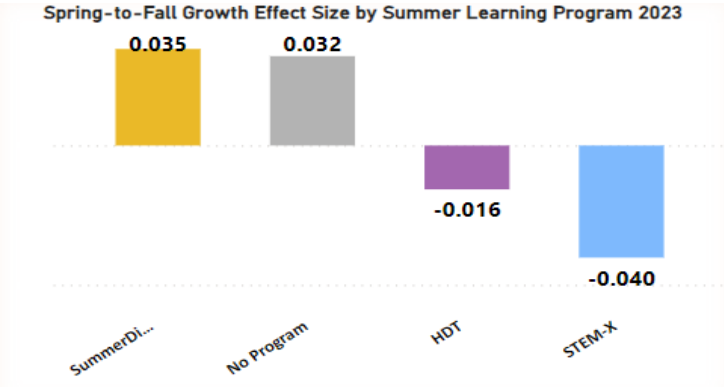
Based on NWEA MAP reading assessments for 2023/24 at **grade levels 3-5**, academic gains are most strongly associated with Summer of Discovery (growth effect size = 0.12, N=11).

Note that the participants in this summer program made academic gains relative to national grade-level peers.

Figure 2: MAP Reading Assessments for **Grades 6-8**

Based on NWEA MAP reading assessments for 2023/24 at **grade levels 6-8**, academic gains are associated with Summer of Discovery (growth effect size = 0.04, N=122).

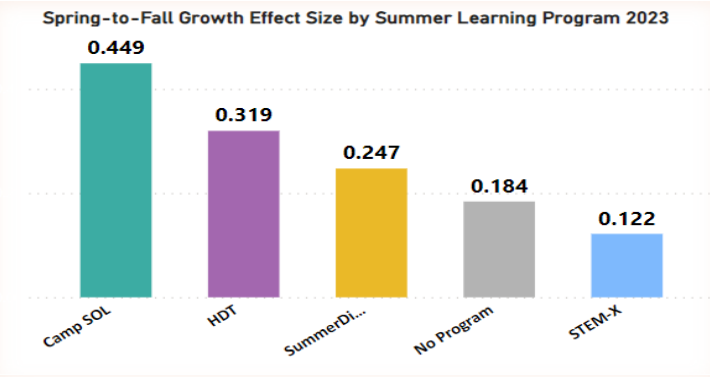
Also, PSD students NOT enrolled in a summer learning experience are associated with a slightly smaller positive growth effect size (growth effect size = 0.03, N=5523).




| Summer 2023 Program | Summer Zgain | Spring 2023 Avg. Z | Fall 2023 Avg. Z | Student Count |
|---|---|---|---|---|
| No Program | 0.03 | 0.26 | 0.29 | 5523 |
| SummerDiscovery23 | 0.03 | -0.26 | -0.23 | 122 |
| HDT | -0.02 | -0.62 | -0.63 | 120 |
| STEM-X | -0.04 | 0.61 | 0.57 | 36 |

## Spring-to-Fall 2023 Acadience Reading Growth Effect Sizes

Figure 3: Acadience Reading Assessments for **Grades 1-5**



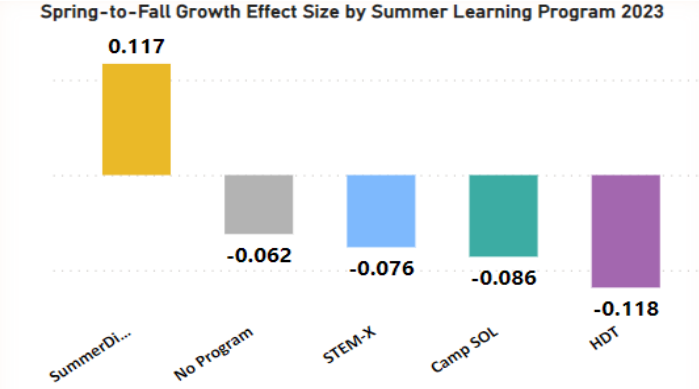

| Summer 2023 Program | Summer Zgain | Spring 2023 Avg. Z | Fall 2023 Avg. Z | Student Count |
|---|---|---|---|---|
| No Program | 0.18 | 0.20 | 0.37 | 5136 |
| HDT | 0.32 | -0.68 | -0.36 | 517 |
| Camp SOL | 0.45 | -0.77 | -0.32 | 488 |
| STEM-X | 0.12 | 0.67 | 0.79 | 166 |
| SummerDiscovery23 | 0.25 | -0.54 | -0.30 | 3 |

Based on Acadience reading assessments for 2023/24 at **grade levels 1-5**, academic gains are associated with STEM-X (growth effect size = 0.12, N=166), Camp SOL (growth effect size = 0.45, N=488), and High Dosage Tutoring (growth effect size = 0.32, N=517).

PSD students grades 1-5 NOT enrolled in a summer learning experience (growth effect size = 0.18, N=5136) did not experience a summer slide. Instead, students' overall reading gains positively increased by 0.21 effect size compared to the prior summer (growth effect size was -0.02 in summer 2022)

## Spring-to-Fall 2023 NWEA MAP Math Growth Effect Sizes

Figure 4: MAP Math Assessments for **Grades 3-5**

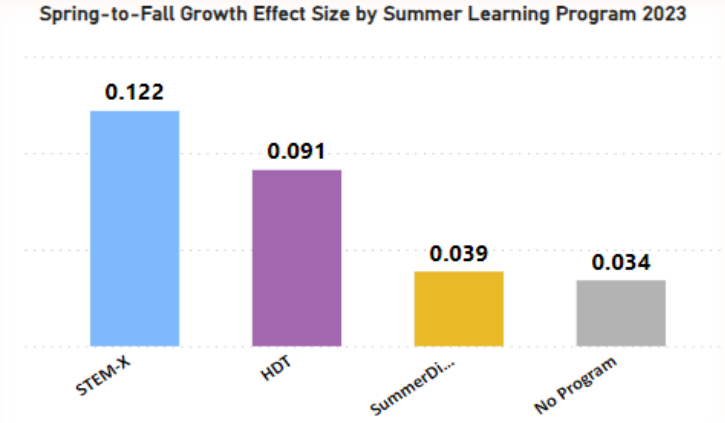



| Summer 2023 Program | Summer Zgain | Spring 2023 Avg. Z | Fall 2023 Avg. Z | Student Count |
|---|---|---|---|---|
| No Program | -0.06 | 0.14 | 0.08 | 5389 |
| Camp SOL | -0.09 | -0.93 | -1.01 | 317 |
| HDT | -0.12 | -0.66 | -0.78 | 153 |
| STEM-X | -0.08 | 0.77 | 0.69 | 19 |
| SummerDiscovery23 | 0.12 | 0.52 | 0.64 | 11 |

Based on NWEA MAP math assessments for 2023/24 at **grade levels 3-5**, academic gains are associated with Summer of Discovery (growth effect size = 0.12, N=11), but there is a very small number of students enrolled at the elementary level. High Dosage Tutoring (growth effect size = -0.12, N=153) has the lowest growth outcome, followed by Camp SOL (growth effect size = -0.09, N=317) and STEM-X (growth effect size = -0.08, N=19) respectively.

PSD students NOT enrolled in a summer learning experience negative growth outcome (growth effect size = -0.06, N=5389).

Figure 5: MAP Math Assessments for **Grades 6-8**




| Summer 2023 Program | Summer Zgain | Spring 2023 Avg. Z | Fall 2023 Avg. Z | Student Count |
|---|---|---|---|---|
| No Program | 0.03 | 0.24 | 0.28 | 5657 |
| HDT | 0.09 | -0.64 | -0.55 | 131 |
| SummerDiscovery23 | 0.04 | -0.28 | -0.24 | 125 |
| STEM-X | 0.12 | 0.46 | 0.58 | 17 |

Based on NWEA MAP math assessments for 2023/24 at **grade levels 6-8**, academic gains are associated with High Dosage Tutoring (growth effect size = 0.09, N=131), STEM-X (growth effect size = 0.12, N= 17) and Summer of Discovery (growth effect size = 0.04, N=125).

Also, PSD students NOT enrolled in a summer learning experience are associated with relative growth (growth effect size = 0.03, N=5657).

## Matched Comparison Groups and Significant Growth Effect Sizes

The question we are most interested in is whether participants of summer learning experiences grew more than would have been expected without participation in their respective programs and whether the level of growth realized is unlikely to have occurred by chance alone (i.e., statistically significant). A growth effect size of zero represents students holding normative positions from spring to fall compared to national grade-level peers. Positive growth-effect-sizes associated with the various service delivery models indicate that participants realized above-average summer learning gains relative to national grade-level peers. Estimating gains relative to local academic peers that are matched on multiple student characteristics requires carefully constructing matched comparison groups. In other words, comparing participants to like students defined across multiple characteristics, not just grade level, provides a better counterfactual estimate of program effectiveness.

Generating a matched comparison group from the PSD population of non-participants and then conducting hypotheses tests on mean growth outcomes of program participants versus the matched comparison group helps us identify service delivery models associated with significant learning gains. Significance in the current context, refers to outcomes that are not likely to have occurred by "chance alone". Matched comparison groups were formed for each service delivery model (i.e., summer program) based on student grade, gender, ethnicity, free/reduced meal status, IEP status, and prior achievement levels.

### *STEM-X Elementary Acadience Reading Evidence*

To investigate the growth effect size associated with **STEM-X** based on **Acadience reading** assessments **grades 1-5** (growth effect size = 0.13, N=120), a matched comparison group of 120 PSD students that display similar characteristics to the participant group was selected. The following is a snapshot of student characteristics for the participant and comparison groups selected to investigate the meaning of the observed STEM-X growth effect size. Note that 120 students who participated in the elementary-level summer program with the prior-spring and the post-fall Acadience scores are needed to calculate the summer growth effect size. Likewise, there were exactly 120 PSD students in the comparison group.

Conducting a hypothesis test regarding the equivalence of means for the participant and matched-comparison groups is one way of gaining insight into the likely meaning of the observed differences. The following two-tailed hypothesis test compared the Acadience growth effect sizes between elementary STEM-X and the matched comparison group outcome using a one-way ANOVA analysis. Significance was tested at the alpha equal to 0.05 level. A one-way ANOVA indicated the difference between the matched comparison group growth effect size (0.188) and the STEM-X growth effect size (0.127) **was NOT statistically significant** (*p*=0.367)

Zgain_Summer

| SummerProgram | Mean | N | Std. Deviation |
|---|---|---|---|
| Comparison | .1878 | 120 | .5743 |
| STEM-X | .1271 | 120 | .4611 |
| Total | .1574 | 240 | .5206 |

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| | Between Groups | .221 | 1 | .221 | .816 | .367 |
| | Within Groups | 64.544 | 238 | .271 | | |
| | Total | 64.765 | 239 | | | |

This *p*-value (0.367) indicated that we would expect a result like the one we observed approximately 36.7% of the time by chance alone if we repeated this process multiple times. The result we observed was common, and it did not provide strong evidence of a systematic difference between program participants and matched comparison group growth effect size outcomes.

*STEM-X Elementary MAP Reading Evidence*

To investigate the growth effect size associated with **STEM-X** based on **MAP reading** assessments **grades 3-5** (growth effect size = -0.05, N=100), a matched comparison group of 100 PSD students that display similar characteristics to the participant group was selected. The following is a snapshot of student characteristics for the participant and comparison groups selected to investigate the meaning of the observed STEM-X growth effect size. Note that 100 students who participated in the elementary-level summer program with both the prior-spring and the post-fall MAP scores needed to calculate the summer growth effect size. Likewise, there were exactly 100 PSD students in the comparison group.

Conducting a hypothesis test regarding the equivalence of means for the participant and matched-comparison groups is one way of gaining insight into the likely meaning of the observed differences. The following two-tailed hypothesis test compared the MAP growth effect sizes between elementary STEM-X and the matched comparison group outcome using a one-way ANOVA analysis. Significance was tested at the alpha equal to 0.05 level. A one-way ANOVA indicated the difference between the matched comparison group growth effect size (-0.013) and the STEM-X growth effect size (-0.046) **was NOT statistically significant** (*p*=0.549).


Zgain_Summer

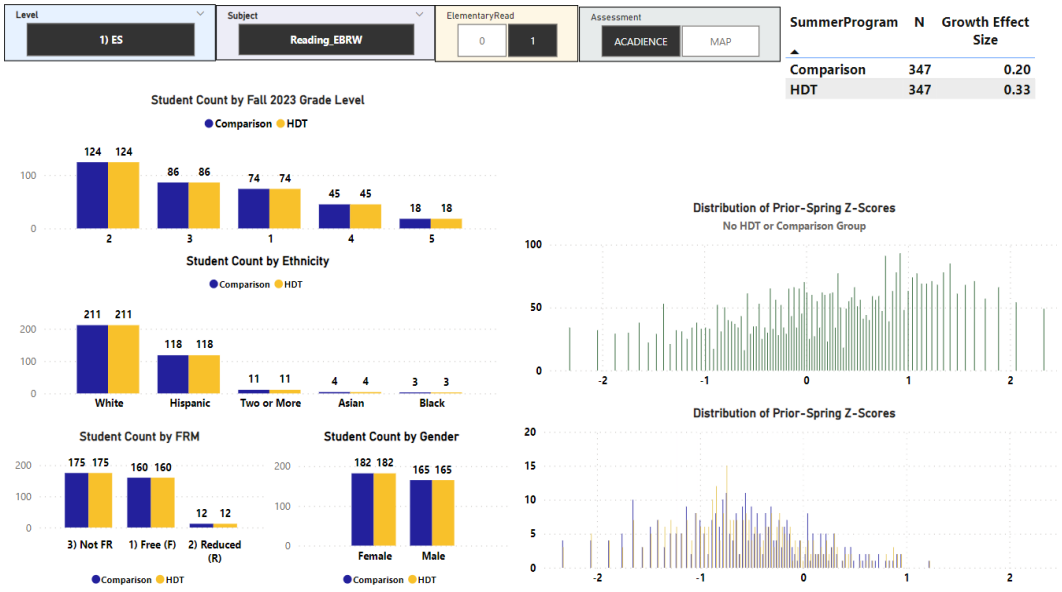
| SummerProgram | Mean | N | Std. Deviation |
|---|---|---|---|
| Comparison | -.0127 | 100 | .3934 |
| STEM-X | -.0464 | 100 | .3998 |
| Total | -.0295 | 200 | .3960 |

| | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | .057 | 1 | .057 | .360 | .549 |
| Within Groups | 31.149 | 198 | .157 | | |
| Total | 31.206 | 199 | | | |

This *p*-value (0.549) indicates that we expect to get a result like the one we observed approximately 54.9% of the time by chance alone. The result we observed is common and so it does not provide strong evidence of a systematic difference between program participants and matched comparison group growth effect size outcomes.

*HDT Elementary Acadience Reading Evidence*

To investigate the growth effect size associated with **HDT** based on **Acadience reading** assessments **grades 1-5** (growth effect size = 0.33, N=347), a matched comparison group of 347 PSD students that display similar characteristics to the participant group was selected. The following is a snapshot of student characteristics for the participant group and the comparison group selected to investigate the meaning of the observed HDT growth effect size. Note that 347 students who participated in the elementary-level summer program with the prior-spring and the post-fall Acadience scores are needed to calculate the summer growth effect size. Likewise, there were exactly 347 PSD students in the comparison group.




Conducting a hypothesis test regarding the equivalence of means for the participant and matched-comparison groups is one way of gaining insight into the likely meaning of the observed differences. The following one-tailed hypothesis test compared the Acadience growth effect sizes between elementary HDT and the matched comparison group outcome using a one-way ANOVA analysis. The test was one-tailed because we sought evidence that the summer growth effect size for HDT participants exceeds that of the comparison group. Significance was tested at the alpha equal to 0.05 level. A one-way ANOVA indicated the difference between the matched comparison group growth effect size (0.204) and the HDT growth effect size (0.326) **was statistically significant** ($p$<0.001). Note that the $p$-value reported in the table below is for a two-tailed test.

Zgain_Summer

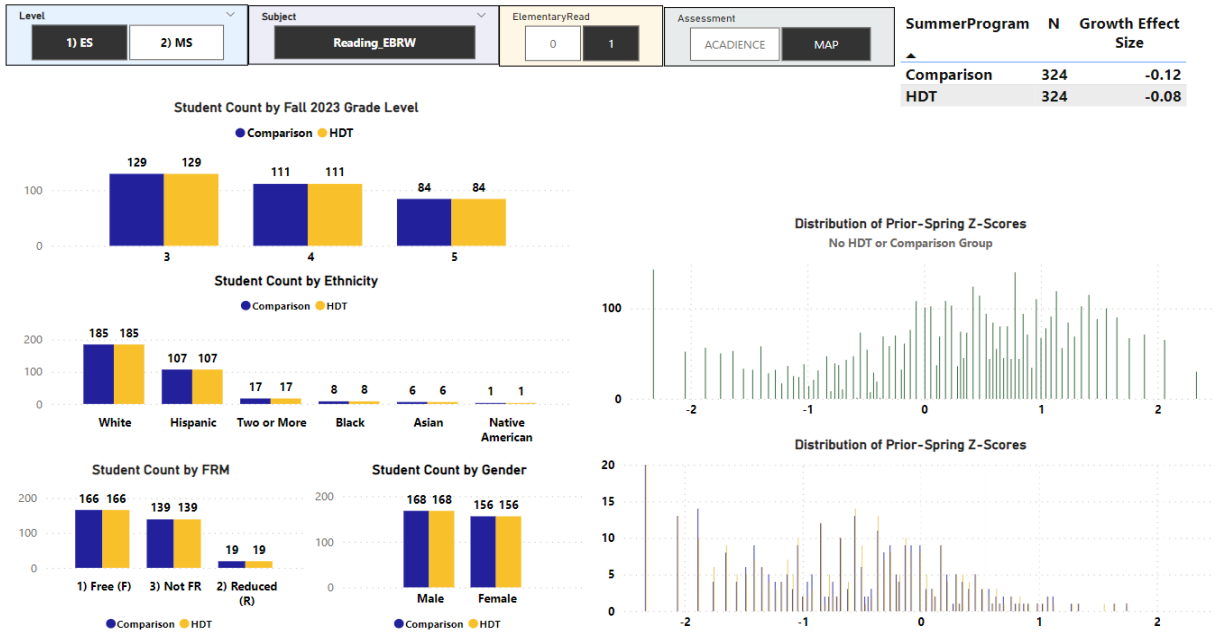
| SummerProgram | Mean | N | Std. Deviation |
|---|---|---|---|
| Comparison | .2044 | 347 | .5932 |
| HDT | .3256 | 347 | .4861 |
| Total | .2650 | 694 | .5453 |

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| Between Groups | | 2.548 | 1 | 2.548 | 8.665 | .003 |
| Within Groups | | 203.496 | 692 | .294 | | |
| Total | | 206.045 | 693 | | | |

This $p$-value (<.001) indicates that we would expect a result like the one we observed approximately less than 0.01% (less than 5%) of the time by chance alone if we repeated this process multiple times. The result we observed is unusual, providing some evidence that a non-random (systematic) difference exists in growth effect sizes between program participants and the counterfactual outcomes provided via the matched comparison group. In other words, a difference in growth outcomes as large as the one we have observed is unlikely to have occurred by chance alone. This calculation and determination of significance consider the sample size and the underlying variability inherent in the specific assessment being used.

*HDT Elementary MAP Reading Evidence*

To investigate the growth effect size associated with **HDT** based on **MAP reading** assessments **grades 3-5** (growth effect size = -0.08, N=324), a matched comparison group of 324 PSD students that display similar characteristics to the participant group was selected. The following is a snapshot of student characteristics for the participant group and the comparison group selected to investigate the meaning of the observed HDT growth effect size. Note that 324 students who participated in the elementary-level summer program with both the prior-spring and the post-fall MAP scores needed to calculate the summer growth effect size. Likewise, there were exactly 324 PSD students in the comparison group.




Conducting a hypothesis test regarding the equivalence of means for the participant and matched-comparison groups is one way of gaining insight into the likely meaning of the observed differences. The following one-tailed hypothesis test compared the MAP growth effect sizes between elementary HDT and the matched comparison group outcome using a one-way ANOVA analysis. The test was one-tailed because we sought evidence that the summer growth effect size for HDT participants exceeds that of the comparison group. Significance was tested at the alpha equal to 0.05 level. A one-way ANOVA indicated the difference between the matched comparison group growth effect size (-0.012) and the HDT growth effect size (-0.081) **was NOT statistically significant** (*p*=0.129). Note that the *p*-value reported in the table below is for a two-tailed test.

Zgain_Summer

| SummerProgram | Mean | N | Std. Deviation |
|---|---|---|---|
| Comparison | -.1231 | 324 | .4665 |
| HDT | -.0814 | 324 | .4718 |
| Total | -.1023 | 648 | .4693 |

| | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | .283 | 1 | .283 | 1.284 | .257 |
| Within Groups | 142.187 | 646 | .220 | | |
| Total | 142.469 | 647 | | | |

This *p*-value (0.129) indicates that we expect to get a result like the one we observed approximately 12.9% of the time by chance alone. The result we observed is common, so it does not provide strong evidence of a systematic difference between program participants and matched comparison group growth effect size outcomes.

*Camp SOL Elementary Acadience Reading Evidence*

In order to investigate the growth effect size associated with **Camp SOL** based on **Acadience reading** assessments **grades 1-5** (growth effect size = 0.50, N=294), a matched comparison group of 294 PSD students with similar characteristics to the participant group was selected. The following is a snapshot of student characteristics for the participant group and the comparison group selected to investigate the meaning of the observed Camp SOL growth effect size. Note that 294 students who participated in the elementary-level summer program with both the prior-spring and the post-fall Acadience scores are needed to calculate the summer growth effect size. Likewise, there were exactly 294 PSD students in the comparison group.


Conducting a hypothesis test regarding the equivalence of means for the participant and matched-comparison groups is one way of gaining insight into the likely meaning of the observed differences. The following one-tailed hypothesis test compared the Acadience growth effect sizes between elementary Camp SOL and the matched comparison group outcome using a one-way ANOVA analysis. The test was one-tailed because we sought evidence that the summer growth effect size for Camp SOL participants exceeds that of the comparison group. Significance was tested at the alpha equal to 0.05 level. A one-way ANOVA indicated the difference between the matched comparison group growth effect size (0.286) and the Camp SOL growth effect size (0.496) **was statistically significant** ($p<0.001$). Note that the *p*-value reported in the table below is for a two-tailed test.

Zgain_Summer

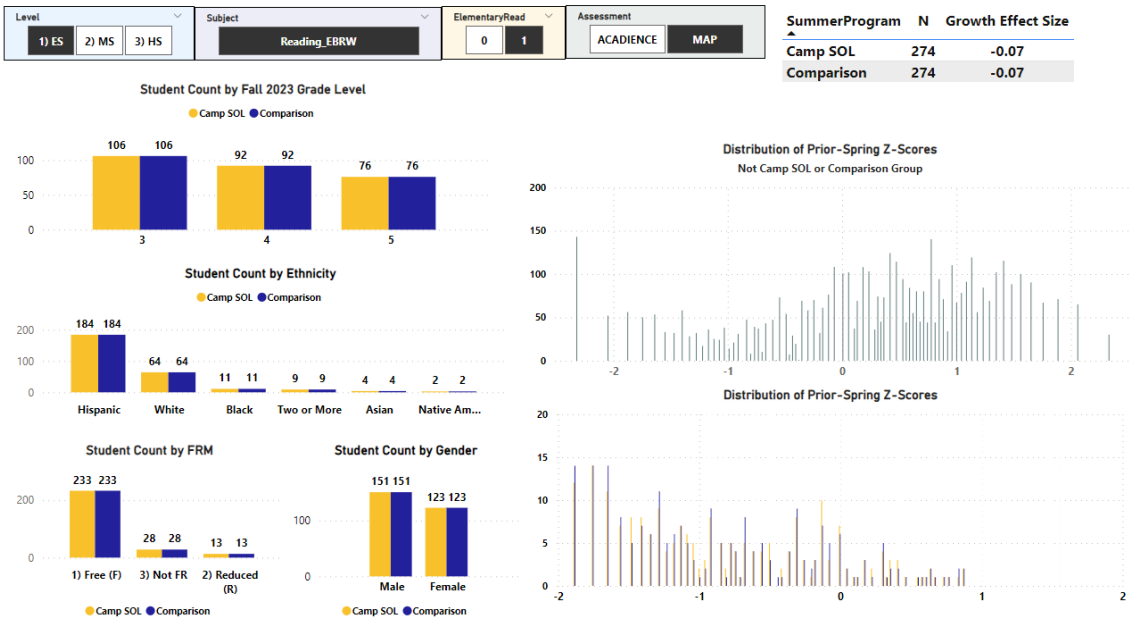
| SummerProgram | Mean | N | Std. Deviation |
|---|---|---|---|
| Camp SOL | .4964 | 294 | .5311 |
| Comparison | .2857 | 294 | .6107 |
| Total | .3911 | 588 | .5814 |

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| Between Groups | | 6.529 | 1 | 6.529 | 19.936 | <.001 |
| Within Groups | | 191.925 | 586 | .328 | | |
| Total | | 198.455 | 587 | | | |

This *p*-value (<.001) indicates that we would expect to get a result like the one we observed approximately zero percent (less than 5%) of the time by chance alone if we repeated this process multiple times. The result we observed is unusual, and so it does provide some evidence that a non-random (systematic) difference exists in growth effect sizes between program participants and the counterfactual outcomes provided via the use of the matched comparison group. In other words, a difference in growth outcomes as large as the one we have observed is unlikely to have occurred by chance alone. This calculation and determination of significance take into account the sample size and the underlying variability inherent in the specific assessment being used.

*Camp SOL Elementary MAP Reading Evidence*

To investigate the growth effect size associated with **Camp SOL** based on **MAP reading** assessments **grades 3-5** (growth effect size = -0.07, N=274), a matched comparison group of 274 PSD students that display similar characteristics to the participant group was selected. The following is a snapshot of student characteristics for the participant group and the comparison group selected to investigate the meaning of the observed Camp SOL growth effect size. Note that 274 students participated in the summer program at the elementary level and have both the prior-spring and the post-fall MAP scores needed to calculate the summer growth effect size. Likewise, there were exactly 274 PSD students in the comparison group.



Conducting a hypothesis test regarding the equivalence of means for the participant and matched-comparison groups is one way of gaining insight into the likely meaning of the observed differences. The following one-tailed hypothesis test compared the MAP growth effect sizes between Camp SOL and the matched comparison group outcome using a one-way ANOVA analysis. The test was one-tailed because we sought evidence that the summer growth effect size for Camp SOL participants exceeds that of the comparison group. Significance was tested at the alpha equal to 0.05 level. A one-way ANOVA indicated the difference between the matched comparison group growth effect size (-0.066) and the Camp SOL growth effect size (-0.066) **was NOT statistically significant** (*p*=0.494). Note that the *p*-value reported in the table below is for a two-tailed test.

Zgain_Summer

| SummerProgram | Mean | N | Std. Deviation |
|---|---|---|---|
| Camp SOL | -.0664 | 274 | .5307 |
| Comparison | -.0657 | 274 | .4980 |
| Total | -.0661 | 548 | .5141 |

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| Between Groups | | .000 | 1 | .000 | .000 | .987 |
| Within Groups | | 144.592 | 546 | .265 | | |
| Total | | 144.592 | 547 | | | |

This *p*-value (0.494) indicates that we expect to get a result like the one we observed approximately 49.4% of the time by chance alone. The result we observed is common, so it does not provide strong evidence of a systematic difference between program participants and matched comparison group growth effect size outcomes.

*STEM-X Elementary MAP Math Evidence*

To investigate the growth effect size associated with **STEM-X** based on **MAP math** assessments for **grades 3-5** (growth effect size = -0.08, N=19), a matched comparison group of 18 PSD students with similar characteristics to the participant group was selected. The following is a snapshot of student characteristics for the participant and comparison groups selected to investigate the meaning of the observed STEM-X growth effect size. Note that 19 students who participated in the elementary-level summer program with both the prior-spring and the post-fall MAP scores needed to calculate the summer growth effect size. Likewise, there were 18 PSD students in the comparison group.

Conducting a hypothesis test regarding the equivalence of means for the participant and matched-comparison groups is one way of gaining insight into the likely meaning of the observed differences. This investigation is conducted because the STEM-X growth effect size exceeded the growth effect size of the matched comparison group. We are interested in determining if the observed difference is statistically significant (not likely due to chance alone).


The following one-tailed hypothesis test compares the MAP growth effect sizes between elementary STEM-X and the matched comparison group outcome using a one-way ANOVA analysis. The test was one-tailed because we sought evidence that the summer growth effect size for STEM-X participants exceeds that of the comparison group. Significance was tested at the alpha equal to 0.05 level. A one-way ANOVA indicated the difference between the matched comparison group growth effect size (-0.125) and the STEM-X growth effect size (-0.037) **was NOT statistically significant** (*p*=0.234). Note that the p-value reported in the table below is for a two-tailed test.

Zgain_Summer

| SummerProgram | Mean | N | Std. Deviation |
|---|---|---|---|
| STEM-X | -.0370 | 18 | .2844 |
| Comparison | -.1254 | 18 | .4226 |
| Total | -.0812 | 36 | .3578 |

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| Between Groups | | .070 | 1 | .070 | .542 | .467 |
| Within Groups | | 4.411 | 34 | .130 | | |
| Total | | 4.481 | 35 | | | |

This *p*-value (0.234) indicates that we expect to get a result like the one we observed approximately 23.4% of the time by chance alone. The result we observed is somewhat unusual, but it does not meet our criteria of occurring 5% or less of the time by chance alone, so it does not provide adequate evidence of a systematic difference between program participants and matched comparison group growth effect size outcomes to be identified as statistically significant.

*HDT Elementary MAP Math Evidence*

To investigate the growth effect size associated with **HDT** based on **MAP math** assessments for **grades 3-5** (growth effect size = -0.12, N=153), a matched comparison group of 153 PSD students that display similar characteristics to the participant group was selected. The following is a snapshot of student characteristics for the participant group and the comparison group selected to investigate the meaning of the observed HDT growth effect size. Note that 153 students who participated in the elementary-level summer program with both the prior-spring and the post-fall MAP scores needed to calculate the summer growth effect size. Likewise, there were 153 PSD students in the comparison group.


Conducting a hypothesis test regarding the equivalence of means for the participant and matched-comparison groups is one way of gaining insight into the likely meaning of the observed differences. This investigation was conducted because the HDT growth effect size exceeded the growth effect size of the matched comparison group. We are interested in determining if the observed difference is statistically significant (not likely due to chance alone).

The following one-tailed hypothesis test compared the MAP growth effect sizes between elementary HDT and the matched comparison group outcome using a one-way ANOVA analysis. The test was one-tailed because we sought evidence that the summer growth effect size for HDT participants exceeds that of the comparison group. Significance was tested at the alpha equal to 0.05 level. A one-way ANOVA indicated the difference between the matched comparison group growth effect size (-0.177) and the HDT growth effect size (-0.118) **was NOT statistically significant** (*p*=0.138). Note that the p-value reported in the table below is for a two-tailed test.

Zgain_Summer

| SummerProgram | Mean | N | Std. Deviation |
|---|---|---|---|
| Comparison | -.1772 | 153 | .4894 |
| HDT | -.1182 | 153 | .4532 |
| Total | -.1477 | 306 | .4718 |

| | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | .266 | 1 | .266 | 1.195 | .275 |
| Within Groups | 67.622 | 304 | .222 | | |
| Total | 67.888 | 305 | | | |

This p-value (0.138) indicates that we expect to get a result like the one we observed approximately 13.8% of the time by chance alone. The result we observed is somewhat unusual, but it does not meet our criteria of occurring 5% or less of the time by chance alone, so it does not provide adequate evidence of a systematic difference between program participants and matched comparison group growth effect size outcomes to be identified as statistically significant.

*Camp SOL Elementary MAP Math Evidence*

To investigate the growth effect size associated with **Camp SOL** based on **MAP math** assessments **grades 3 and 4** (growth effect size = -0.09, N=316), a matched comparison group of 316 PSD students that display similar characteristics to the participant group was selected. The following is a snapshot of student characteristics for the participant group and the comparison group selected to investigate the meaning of the observed Camp SOL growth effect size. Note that 316 students participated in the summer program at the elementary level and have both the prior-spring and the post-fall MAP scores needed to calculate the summer growth effect size. Likewise, there were exactly 316 PSD students in the comparison group.


Conducting a hypothesis test regarding the equivalence of means for the participant and matched-comparison groups is one way of gaining insight into the likely meaning of the observed differences. This investigation is conducted because the Camp SOL growth effect size exceeded the growth effect size of the matched comparison group. We are interested in determining if the observed difference is statistically significant (not likely due to chance alone).

The following one-tailed hypothesis test compared the MAP growth effect sizes between Camp SOL and the matched comparison group outcome using a one-way ANOVA analysis. Significance was tested at the alpha

equal to 0.05 level. A one-way ANOVA indicated the difference between the matched comparison group growth effect size (-0.109) and the Camp SOL growth effect size (0.084) **was NOT statistically significant** (*p*=0.280).

Zgain_Summer

| SummerProgram | Mean | N | Std. Deviation |
|---|---|---|---|
| Camp SOL | -.0840 | 317 | .5611 |
| Comparison | -.1086 | 317 | .5019 |
| Total | -.0963 | 634 | .5321 |

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| Between Groups | | .096 | 1 | .096 | .340 | .560 |
| Within Groups | | 179.109 | 632 | .283 | | |
| Total | | 179.205 | 633 | | | |

This p-value (0.280) indicates that we expect to get a result like the one we observed approximately 28% of the time by chance alone. The result we observed is common, and it does not meet our criteria of occurring 5% or less of the time by chance alone, so it does not provide evidence of a systematic difference between program participants and matched comparison group growth effect size outcomes.

*STEM-X Middle School MAP Reading Evidence*

To investigate the growth effect size associated with **STEM-X** based on **MAP reading** assessments **grades 6-8** (growth effect size = -0.04, N=33), a matched comparison group of 33 PSD students with similar characteristics to the participant group was selected. The following is a snapshot of student characteristics for the participant and comparison groups selected to investigate the meaning of the observed STEM-X growth effect size. Note that 33 students who participated in the middle school summer program with both the prior-spring and the post-fall MAP scores needed to calculate the summer growth effect size. Likewise, there were exactly 33 PSD students in the comparison group.


The following two-tailed hypothesis test compared the MAP reading growth effect sizes between middle school STEM-X and the matched comparison group outcome using a one-way ANOVA analysis. Significance was tested at the alpha equal to 0.05 level. A one-way ANOVA indicated the difference between the matched comparison

group growth effect size (0.125) and the STEM-X growth effect size (-0.402) **was NOT statistically significant** (*p*=0.101).

Zgain_Summer

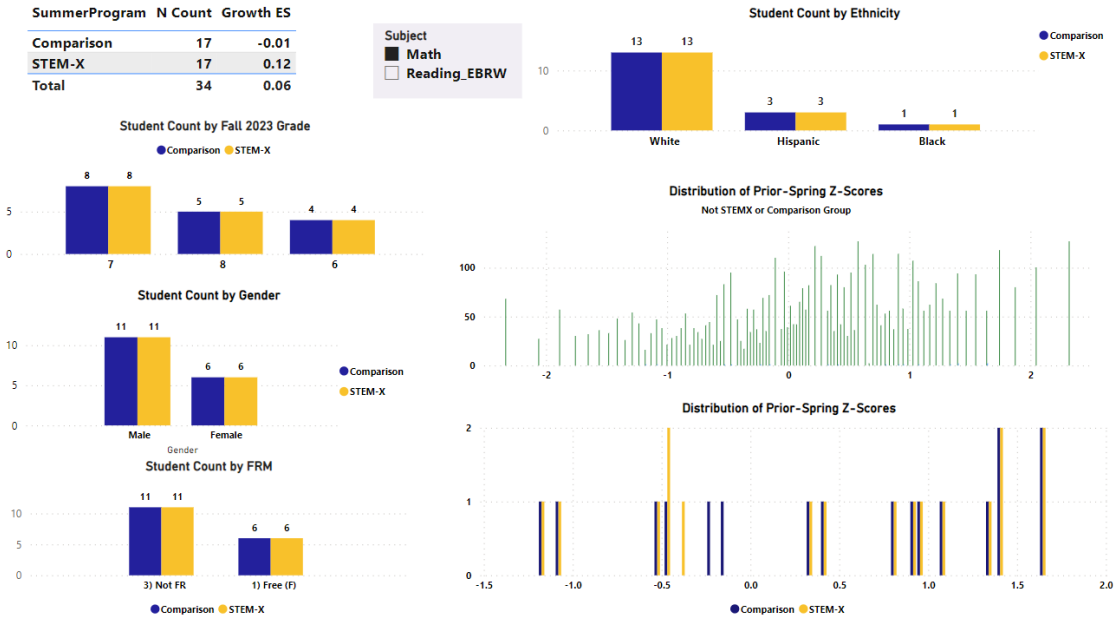
| SummerProgram | Mean | N | Std. Deviation |
|---|---|---|---|
| STEM-X | -.0402 | 33 | .3493 |
| Comparison | .1249 | 33 | .4515 |
| Total | .0424 | 66 | .4091 |

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| Between Groups | | .450 | 1 | .450 | 2.761 | .101 |
| Within Groups | | 10.427 | 64 | .163 | | |
| Total | | 10.877 | 65 | | | |

This *p*-value (0.101) indicates that we would expect a result like the one we observed approximately 10.1% of the time by chance alone if we repeated this process multiple times. The result we observed is common, so it does not provide strong evidence of a systematic difference between program participants and matched comparison group growth effect size outcomes.

*STEM-X Middle School MAP Math Evidence*

To investigate the growth effect size associated with **STEM-X** based on **MAP math** assessments **grades 6-8** (growth effect size = 0.12, N=17), a matched comparison group of 17 PSD students that display similar characteristics to the participant group was selected. The following is a snapshot of student characteristics for the participant and comparison groups selected to investigate the meaning of the observed STEM-X growth effect size. Note that 17 students who participated in the middle school summer program with both the prior-spring and the post-fall MAP scores needed to calculate the summer growth effect size. Likewise, there were exactly 17 PSD students in the comparison group.



The number of student participants in STEM-X at the middle school level is small. This weakens our ability to make valid inferences regarding the effectiveness of the programming and how likely outcomes may be generalized to the general population of future potential cohorts. Conducting a hypothesis test regarding the equivalence of means for the participant and matched-comparison groups is one way of gaining insight into the likely meaning of observed differences.

The following two-tailed hypothesis test compared the MAP math growth effect sizes between middle school STEM-X and the matched comparison group outcome using a one-way ANOVA analysis. Significance was tested at the alpha equal to 0.05 level. A one-way ANOVA indicates the difference between the matched comparison group growth effect size (-0.097) and the STEM-X growth effect size (0.122) **was NOT statistically significant** (*p*=0.344).

Zgain_Summer

| SummerProgram | Mean | N | Std. Deviation |
|---|---|---|---|
| STEM-X | .1218 | 17 | .3983 |
| Comparison | -.0097 | 17 | .4008 |
| Total | .0561 | 34 | .3991 |

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| | Between Groups | .147 | 1 | .147 | .921 | .344 |
| | Within Groups | 5.108 | 32 | .160 | | |
| | Total | 5.255 | 33 | | | |

This *p*-value (0.344) indicates that we expect to get a result like the one we observed approximately 34.4% of the time by chance alone. The result we observed is common, and it does not meet our criteria of occurring 5% or less of the time by chance alone, so it does not provide evidence of a systematic difference between program participants and matched comparison group growth effect size outcomes.

*Middle School HDT Middle School MAP Reading Evidence*

To investigate the impressive growth effect size associated with middle school **HDT Literacy** based on **MAP reading** assessments **grades 6-8** (growth effect size = -0.03, N=116), a matched comparison group of 116 PSD students that display similar characteristics to the participant group was selected. The following is a data visualization snapshot of student characteristics for the participant group and the comparison group selected to investigate the meaning of the observed HDT growth effect size of -0.03. Note that 116 students participated in the summer program at the middle school level and have both the prior-spring and the post-fall NWEA MAP scores needed to calculate the summer growth effect size. Likewise, there were exactly 116 PSD students in the comparison group.

The following two-tailed hypothesis test compared the growth effect sizes between middle school HDT Literacy and the matched comparison group outcome using a one-way ANOVA analysis. Significance was tested at the alpha equal to 0.05 level. A one-way ANOVA indicated the difference between the matched comparison group growth effect size (0.035) and the HDT Literacy growth effect size (-0.030) **was NOT statistically significant** (*p*=0.306).


| SummerProgram | N | Growth Effect Size |
|---|---|---|
| HDT | 116 | -0.03 |
| Comparison | 116 | 0.04 |

Zgain_Summer

| SummerProgram | Mean | N | Std. Deviation |
|---|---|---|---|
| HDT | -.030310 | 116 | .4966694 |
| Comparison | .035294 | 116 | .4769448 |
| Total | .002492 | 232 | .4869628 |

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| Between Groups | | .250 | 1 | .250 | 1.053 | .306 |
| Within Groups | | 54.528 | 230 | .237 | | |
| Total | | 54.778 | 231 | | | |

This *p*-value (0.306) indicates that we would expect a result like the one we observed approximately 30.6% of the time by chance alone if we repeated this process multiple times. The result we observed is common and so it does not provide strong evidence of a systematic difference between program participants and matched comparison group growth effect size outcomes.

*Middle School HDT Middle School MAP Math Evidence*

To investigate the growth effect size associated with middle school **HDT Math** based on **MAP math** assessments **grades 6-8** (growth effect size = 0.09, N=130), a matched comparison group of 130 PSD students with similar characteristics to the participant group was selected. The following is a data visualization snapshot of participant and comparison group characteristics.

A one-way ANOVA indicated the difference between the matched comparison group growth effect size (0.019) and the HDT Math growth effect size (0.093) was **NOT statistically significant** (*p*=0.079) based on a one-tailed test.


Zgain_Summer

| SummerProgram | Mean | N | Std. Deviation |
|---|---|---|---|
| HDT | .0928 | 130 | .4117 |
| Comparison | .0191 | 130 | .4264 |
| Total | .0559 | 260 | .4199 |

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| Between Groups | | .352 | 1 | .352 | 2.006 | .158 |
| Within Groups | | 45.318 | 258 | .176 | | |
| Total | | 45.671 | 259 | | | |

This *p*-value (0.079) indicates that we expect to get a result like the one we observed approximately 7.9% of the time by chance alone. The result we observed is common, and it does not meet our criteria of occurring 5% or less of the time by chance alone, so it does not provide evidence of a systematic difference between program participants and matched comparison group growth effect size outcomes.

*Boys and Girls Clubs Summer of Discovery Middle School MAP Reading Evidence*

To investigate the growth effect size associated with middle school **Summer of Discovery** based on **MAP reading** assessments **grades 6-8** (growth effect size = 0.04, N=118), a matched comparison group of 118 PSD students that displayed similar characteristics to the participant group was selected. The following is a data visualization snapshot of participant and comparison group characteristics.

The following one-tailed hypothesis test compared the reading growth effect sizes between middle school Summer of Discovery (0.040, N=118) and the matched comparison (-0.004, N=118) outcomes using a one-way ANOVA analysis. The test was one-tailed because we sought evidence that the summer growth effect size for the Summer of Discovery participants exceeds that of the comparison group. Significance is tested at the alpha equal to 0.05 level. A one-way ANOVA indicated the difference between the matched comparison group growth effect

size (-0.004) and the Summer of Discovery growth effect size (0.040) was **NOT statistically significant** (*p*=0.203). Note that the p-value reported in the table below is for a two-tailed test.


Zgain_Summer

| SummerProgram | Mean | N | Std. Deviation |
|---|---|---|---|
| Comparison | -.004 | 118 | .400 |
| SummerDiscovery23 | .040 | 118 | .414 |
| Total | .018 | 236 | .407 |

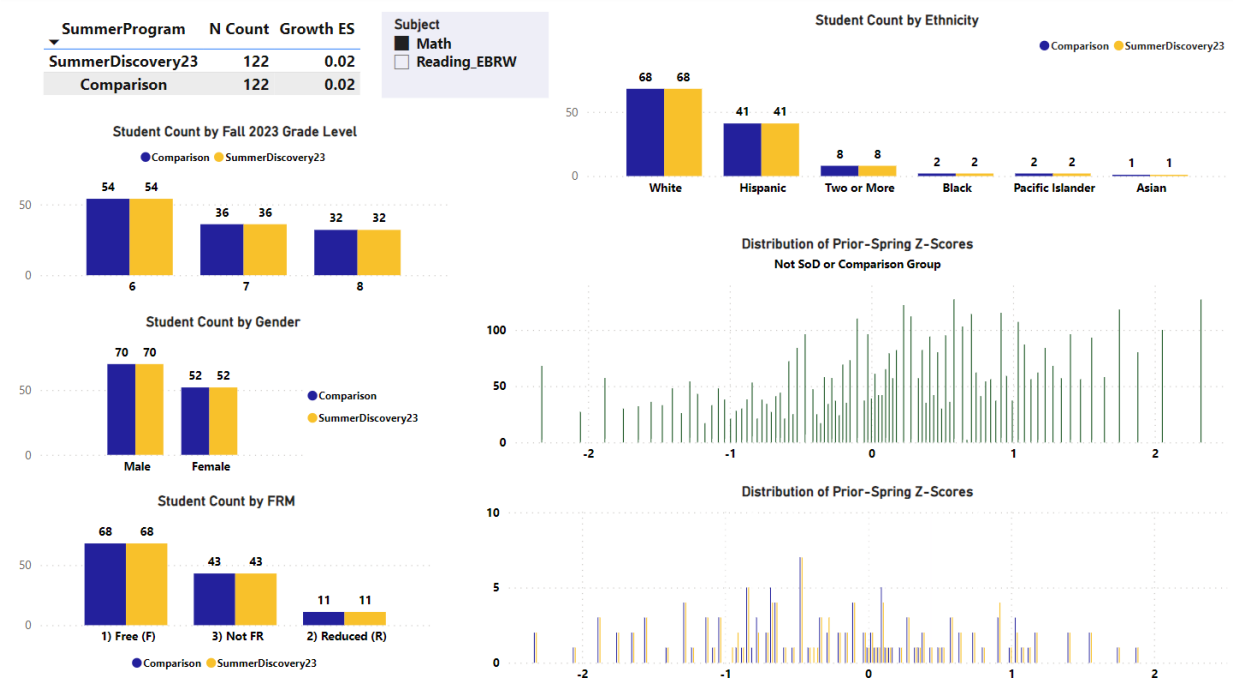
**ANOVA Table**

| | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | .115 | 1 | .115 | .694 | .406 |
| Within Groups | 38.800 | 234 | .166 | | |
| Total | 38.915 | 235 | | | |

This *p*-value (0.203) indicates that we expect to get a result like the one we observed approximately 20.3% of the time by chance alone. The result we observed is common, and it does not meet our criteria of occurring 5% or less of the time by chance alone, so it does not provide evidence of a systematic difference between program participants and matched comparison group growth effect size outcomes.

*Boys and Girls Clubs Summer of Discovery Middle School MAP Math Evidence*

To investigate the growth effect size associated with middle school **Summer of Discovery** based on **MAP math** assessments **grades 6-8** (growth effect size = 0.04, N=122), a matched comparison group of 122 PSD students that displayed similar characteristics to the participant group was selected. The following is a data visualization snapshot of participant and comparison group characteristics.




The following one-tailed hypothesis test compared the math growth effect sizes between middle school Summer of Discovery (0.042, N=122) and the matched comparison group (0.028, N=122) outcomes using a one-way ANOVA analysis. The test was one-tailed because we sought evidence that the summer growth effect size for the Summer of Discovery participants exceeds that of the comparison group. Significance was tested at the alpha equal to 0.05 level. A one-way ANOVA indicated the difference between the matched comparison group growth effect size (0.028) and the Summer of Discovery growth effect size (0.042) was **NOT statistically significant** (*p*=0.400). Note that the *p*-value reported in the table below is for a two-tailed test.

Zgain_Summer

| SummerProgram | Mean | N | Std. Deviation |
|---|---|---|---|
| Comparison | .028 | 122 | .413 |
| SummerDiscovery23 | .042 | 122 | .408 |
| Total | .035 | 244 | .410 |

**ANOVA Table**

| | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | .011 | 1 | .011 | .065 | .799 |
| Within Groups | 40.816 | 242 | .169 | | |
| Total | 40.827 | 243 | | | |

This *p*-value (0.400) indicates that we expect to get a result like the one we observed approximately 40% of the time by chance alone. The result we observed is somewhat unusual, but it does not meet our criteria of occurring 5% or less of the time by chance alone, so it does not provide adequate evidence of a systematic difference between program participants and matched comparison group growth effect size outcomes to be identified as statistically significant.

## Analyses of Attitude Outcomes

A total of 591 students provided valuable feedback about the various summer programs they participated in. Among them, eight students gave their feedback in Spanish. By breaking down the participation, 71 students were involved in the Boys and Girls Club (Summer of Discovery), with 12 in elementary and 59 in middle school. There were 21 students in Camp SOL, and 223 students took part in the STEM-X program. Summer school had 111 student participants, while the Matthews House program had four. Additionally, 107 students enrolled in the summer Music program, four were part of a PE program, and five took part in Genius Week. Please be aware that some students may have participated in more than one program, and in such cases, they were counted individually for each program.

Student's responses to "The BEST THING" can be categorized into eight primary focuses: educational content (50), enjoyment and fun (38), practical experiences (29), personalized learning (19), social interaction (16), technology and platform ease (7), teaching quality (6) and other (404). The analysis suggests that while educational content and learning opportunities were highly valued, aspects like enjoyment, practical experiences, and personalized learning also played significant roles in the students' summer program experiences.

Students scored 3.96, on average, on the question "HELP or not," indicating overall positive perceptions of the programs' helpfulness. Specifically, the high frequency of comments appreciating educational benefits and staff support correlates with the high ratings. In addition, social interaction and engagement contribute positively to students' experiences.

The average impact rating is approximately 3.78, indicating an overall positive expectation of the program's impact on the next school year. The analysis reveals a positive expectation among students regarding the impact of summer programs on their upcoming school year, particularly in terms of academic preparation, social benefits, and skill development.

Suggestions received from students are significant positive feedback, which indicates that many aspects of the programs are well-received. Maintaining these strengths is crucial. Suggestions for improvement focus on program structure and content, recommending more diverse activities and a balanced curriculum. Tailoring physical activities and enhancing communication were also suggested for better engagement and understanding. Suggestions for future programs:

1. Enhance Educational and Recreational Balance:
    - Continue to emphasize educational content while integrating more fun and engaging activities.
    - Explore ways to include hands-on learning experiences and personalized learning paths.
2. Maintain and Improve Support and Engagement:
    - Sustain the quality of staff support and teaching.
    - Foster a social environment that encourages interaction and engagement among students.
3. Diversify and Adjust Program Structure:
    - Introduce a broader range of activities to cater to different interests and learning styles.
    - Consider adjustments in curriculum and structure to keep a balance between academic and recreational elements.
4. Focus on Physical and Communication Aspects:
    - Improve communication strategies, especially regarding program rules and expectations, to enhance clarity and student understanding.

## Limitations of Report

As summer learning programs were expanded, designed, and implemented, special attention was given to limiting the amount of additional staff workload as the school year ended. Design elements of the programs focused on creating flexible models for students, families, and staff while minimizing the introduction of additional assessments or surveys. This report is not intended to share future summer programming plans or outline resource needs to continue programming. This report is not comprehensive for programming available to students and families. It does not include all PSD enrichment or co-curricular camps (music, athletics), unique PSD school-based programming (Early Childhood Head Start Summer Program, Integrated Services Extended School Year), or private provider programming.

This report does not provide details of the collective design approach between PSD and community partners that led to the expansion and creation of summer learning programs. It also does not fully describe community partners' and businesses' multiple and varied contributions within individual programs. The collaborative design approach included many partners, some of whom are the following: Alpha Best, Bohemian Foundation, Boys & Girls Club, City of Fort Collins, Fort Collins Museum of Discovery, CSU, and Matthews House.