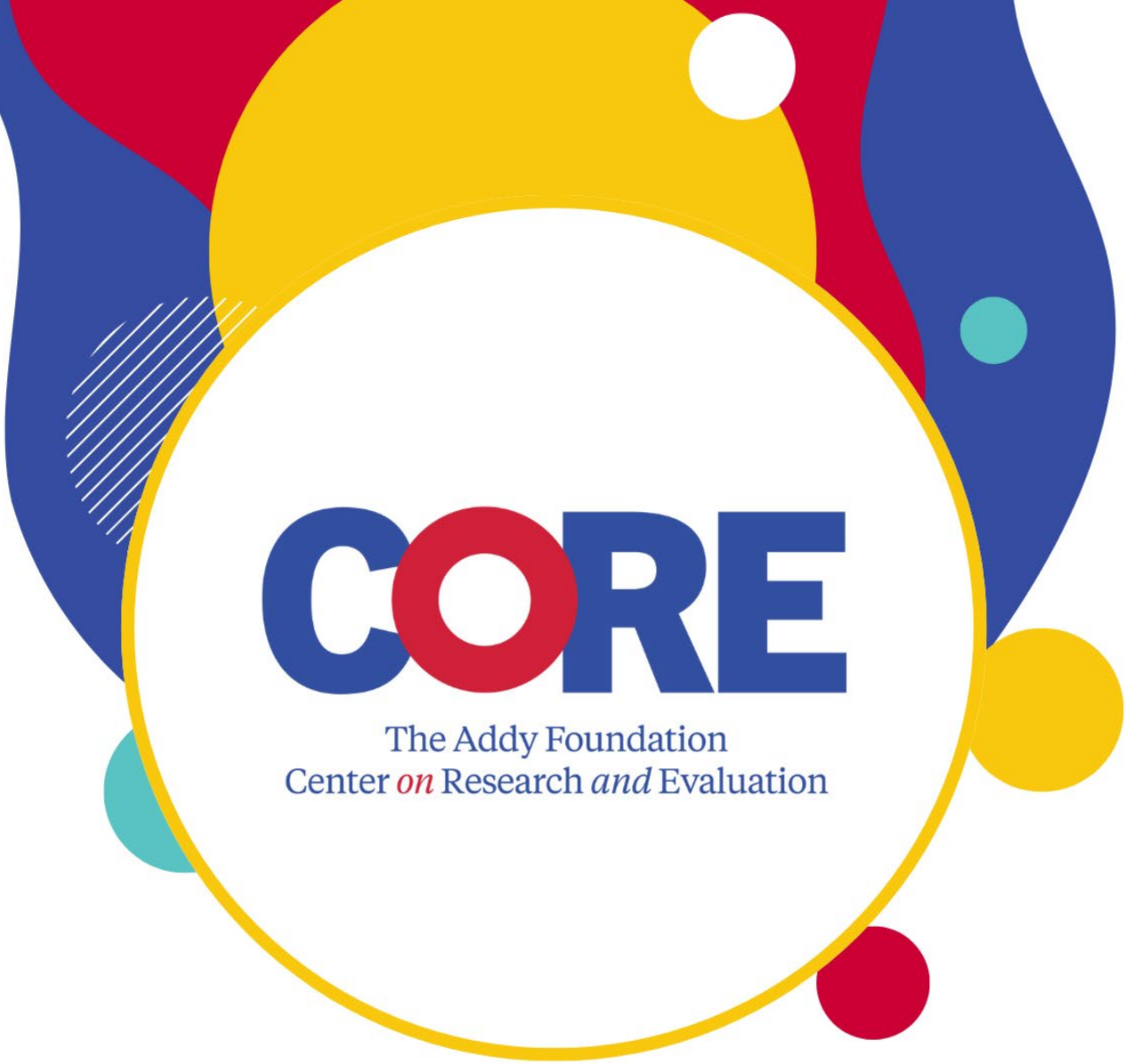

Dallas City of Learning

Longitudinal Analysis of Student Outcomes

July 2025

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Summary

This report summarizes a series of analyses designed to explore whether students with high dosage, more consistency, and more variety of summer learning engagement consistently outperform lower-engagement groups. We looked for differences in effects across grade levels and for different outcomes (e.g., school attendance, grades, test scores)

There are ***four dimensions*** we worked with for these analyses:

- **Groups of students**: 9 (Group A=highest engagement…down to no engagement)
- **Cohorts**: 3 (K-6th grade, 2nd-8th grade, 6th-12th grade)
- **Outcomes**: Attendance, course grades, standardized test scores
- **Time**: 7 school years

Overall, we found that summer program participation is linked to meaningful and age-specific benefits. Students who took part in more summer programs tended to do better than those who did less or none. For elementary and middle grade students, the greatest gains appear in academic achievement, particularly standardized test performance. By high school, the benefits shift toward improved daily engagement (attendance) cand stronger course outcomes (GPA and EOC exams). Together, these findings suggest that summer programs support both short-term learning and long-term success in school.

Big Picture Takeaways

- **Stronger Academics in Elementary and Middle School**
    - Students with higher summer engagement showed more consistent growth in reading and math scores and were more likely to reach state test mastery.
        - This finding is most true for middle school, with more mixed results in elementary.
    - Course grades in these years did not differ much across groups.
- **Improved School Success in High School**
    - Highly engaged students in high school had fewer absences and tardies.
    - They also earned consistently higher GPAs and had higher passing and mastery rates on EOC exams than their peers.
- **Attendance Patterns Shift with Age**
    - For younger students, attendance outcomes were mixed. Higher engaged students actually reported more tardies and absences by 6th grade.
    - By high school, however, highly engaged students had reliably better attendance than peers.

For the youngest students (tracked from Kindergarten through 6th grade):

- **Attendance** was mixed. While the most engaged group sometimes had more absences or tardies, this wasn't consistent across years with highly engaged students actually reporting more tardies and absences by 6th grade.
- **Course grades** looked about the same across all groups, regardless of summer engagement.

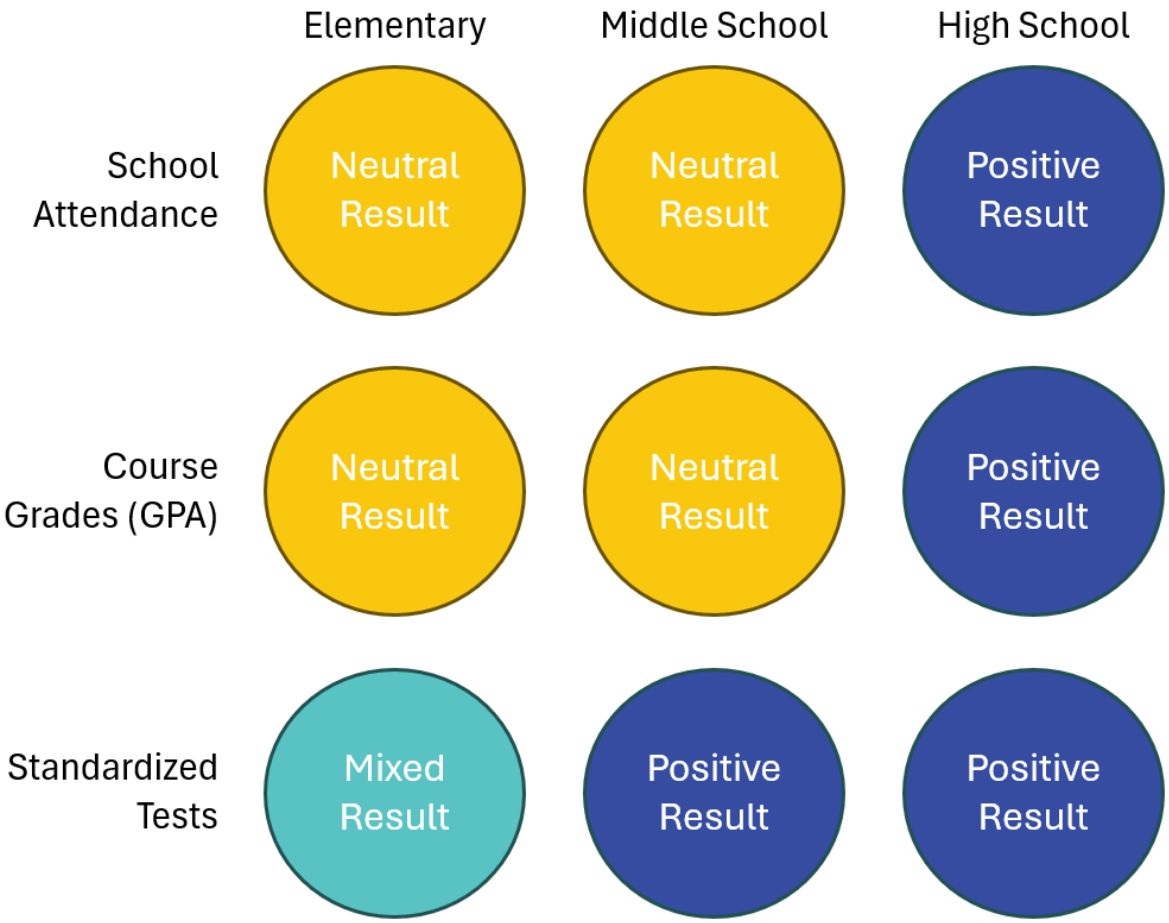
- **Standardized test scores (MAP and STAAR)** showed some benefits. Students in the more engaged groups were more likely to make gains in reading (STAAR) and math (MAP) and to reach mastery on state reading tests compared to their peers with little or no summer engagement.

For middle-grade students (tracked from 2nd through 8th grade):

- **Attendance** again showed mixed results, with some highly engaged students actually reporting more tardies.
- **Course grades** didn't differ much across groups.
- **Test scores** stood out: Group A (the most engaged students) was the only group to consistently improve in both reading and math over time, and they also had higher mastery rates on the STAAR exams by 6th grade.

For older students (tracked from 6th through 12th grade):

- **Attendance** was better among the highly engaged groups, who had fewer absences and tardies.
- **Grades** were also higher — students with strong summer engagement earned consistently better GPAs compared to peers.
- **Test scores** again stood out: Group A (the most engaged students) had higher passing and mastery rates on the STAAR EOC exams throughout high school.

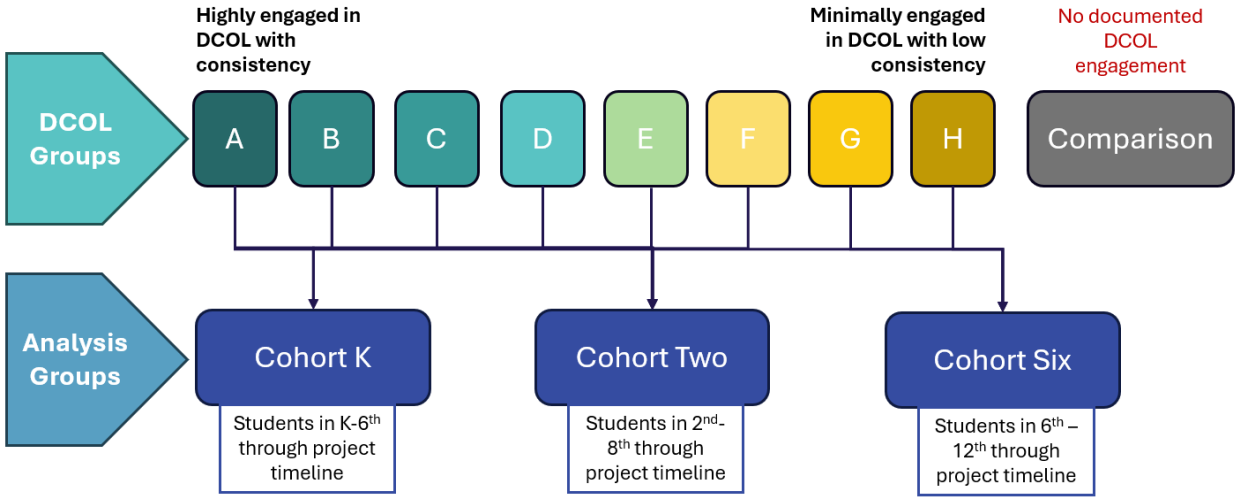


Introduction and Orientation to this Report

There are ***four dimensions*** we worked with for these analyses:

- **Groups of students**: 9 (Group A=highest engagement…down to no engagement)
- **Cohorts**: 3 (K-6th grade, 2nd-8th grade, 6th-12th grade)
- **Outcomes**: Attendance, course grades, standardized test scores (MAP & STAAR)
- **Time**: 7 school years (2017-18 through 2023-24)

First, the students included in this study are organized by two dimensions – DCOL grouping and grade-level cohorts.



Evaluation Questions

1. What are the patterns of program enrollment and attendance over the last 7 summers (2018 through 2024)?
    - What clusters of students emerge?
2. What are the patterns of student achievement and school attendance for groups of students over the 7 adjacent school years (2017-18 through 2023-24)? How does this vary between DCOL students and comparison students? How does this vary across the DCOL student enrollment/attendance groups?
    - Attendance patterns
    - Course grades
    - Test scores

Data Sources

These analyses utilized data from Big Thought's Dallas City of Learning platform that tracks student enrollment and attendance in summer programs across North Texas. This platform, supported by Big

Thought, has tracked data for thousands of Dallas students across hundreds of programs each summer since summer 2017. We used enrollment data for summer 2017 through summer 2023.

These analyses also utilize data from Dallas ISD. This data includes school attendance (attendance rates, tardies, absences), course grades, and standardized test scores (i.e., MAP and STAAR exams). We used school year data from the 2017-18 school year through the 2023-24 school year.

Development of DCOL Participant Groups

Our first task was to organize our summer enrollment data into variables that were consistent across students and also in-line with principles that define high quality engagement in summer learning. We began with data at the student level that detailed which programs students participated in across each of the seven summers.

With this data, **we were able to create a profile for each student that was defined by 7 key factors of enrollment patterns** over the 7 summers. These **7 factors are organized into 3 broad domains** of: diversity of programs, diversity of program types, and consistency and dosage.

First, each student received a score on each of the 7 factors based on their personal enrollment and attendance pattens.

> For example, the first domain is **Diversity of Programs.** This domain has 3 factors within it: organizational diversity, number of different programs, and number of summers in multiple programs. For # of programs, a student gets a score of 1, 2, 3, or 4. A high score of 4 means they were in many different programs, while a score of 1 means they were in only 1 program across the 7 years.

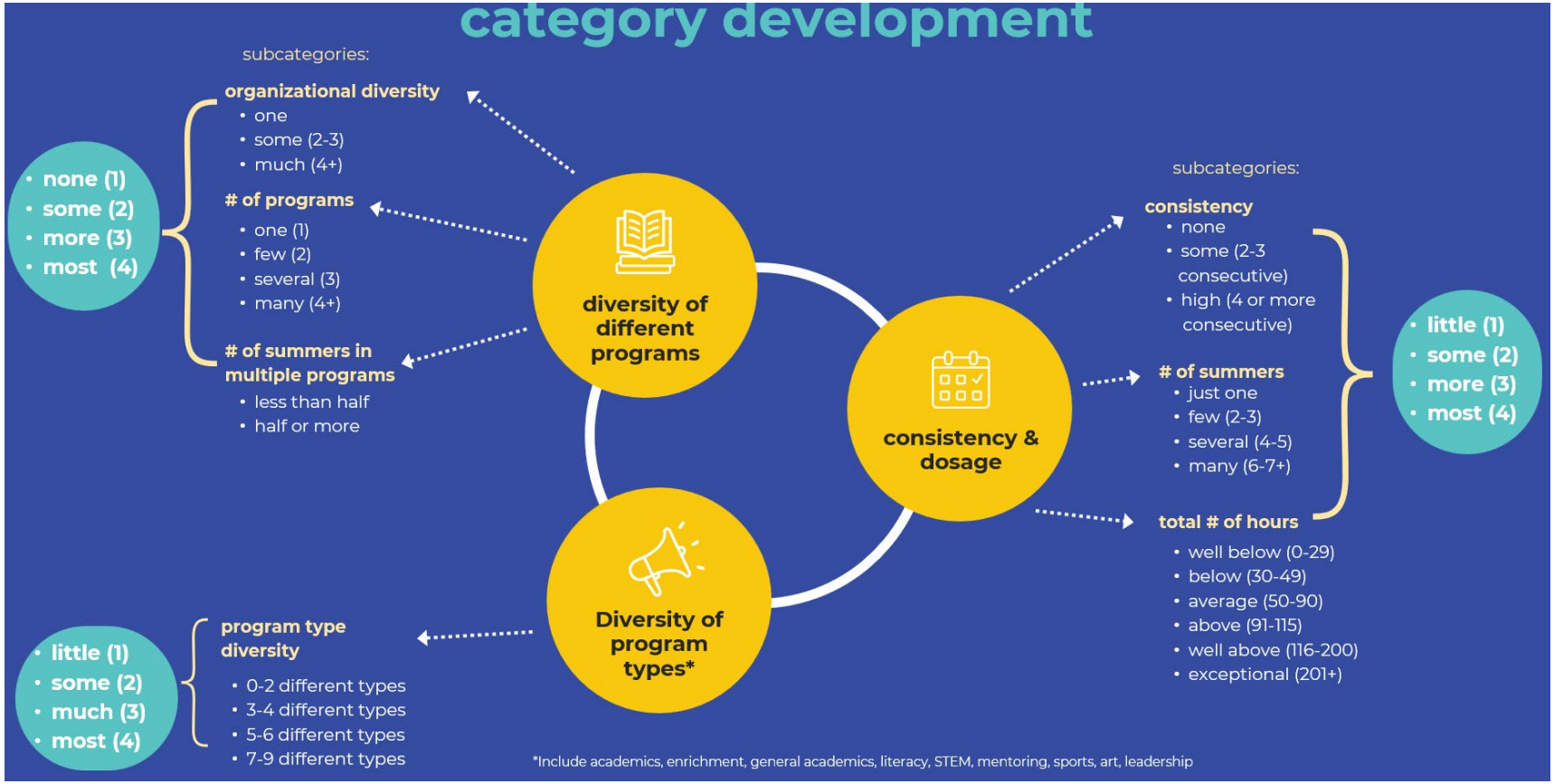
Then, each student received an overall score on each of the 3 domains based on their factor scores within that domain.

> For example, within **Diversity of Programs**, the maximum score a student could receive is a 9 (3 for organizational diversity, 4 for number of programs, and 2 for summers with multiple programs). The minimum score a student could receive is a 3 (scoring 1 on each of the 3 categories).
>
> - Students scoring 8-9 had the “most” program diversity and received a 4 for the overall domain.
> - Students scoring a 7 had “more” program diversity and received a 3 for the overall domain.
> - Students scoring 4-6 had “some” program diversity and received a 2 for the domain, and the students with a minimum score of 3 had “no” program diversity and received a 1 for the domain.

A summary of the scoring for the 7 factors and 3 broad domains is on the next page.

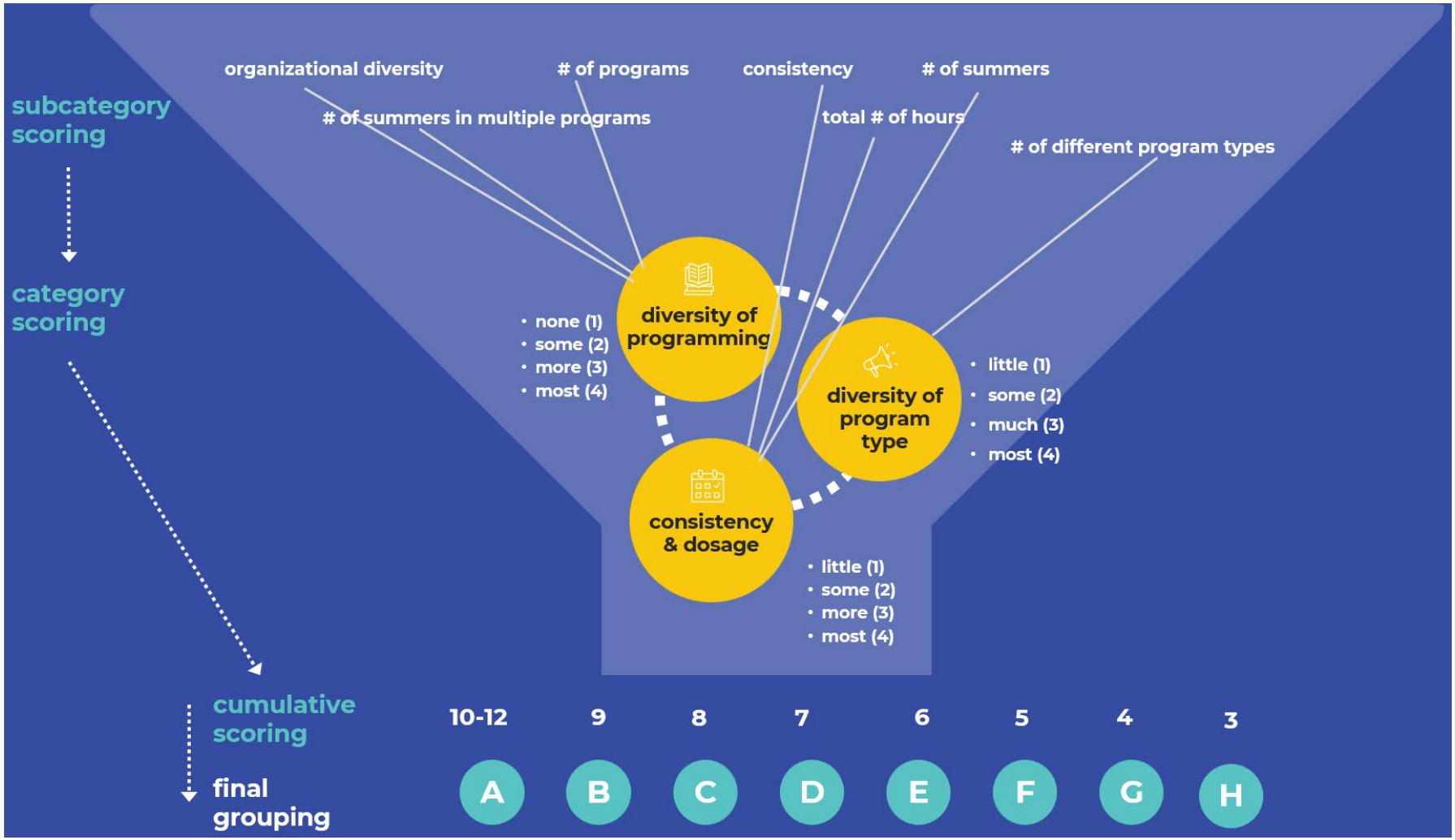
A detailed description of the grouping criteria is in **Appendix A.**

DCOL Engagement Factors and Scoring



DCOL Group Development

Finally, once students had been assigned scores for each of the 3 broad domains, they were given an overall sum score. This sum score resulted in a grouping of students into 8 DCOL engagement groups, A-H, which A being the most engaged and H being the least.



Description of Analysis Cohorts

Due to the complexity of the data set available for analysis, we decided to **focus on three cohorts of students based on grade level** in the first year of our timeline (2017-18). The cohorts are described below.

Cohort	Beginning Grade Level	Grade Level Progression	Description
K-6	Kindergarten	K – 6th	Follow through elementary school to the beginning of middle school.
2-8	2nd	2nd – 8th	Follow through elementary & completion of middle school.
6-12	6th	6th – 12th	Follow through middle school & completion of high school.

Because of the unique trajectory of these groups, the **outcome data that each cohort has available for analyses varies**. These variations, along with the years of available outcome data and years of available "pre-achievement" covariates, are the guiding factor for which analyses are applicable to each group. The data availability by year and by cohort is described below.

Cohort	Grades	2017-18	2018-19	2019-20*	2020-21	2021-22	2022-23	2023-24
K-6	K-6	Att	Att	Att, grades	Att, grades, MAP, R, M	Att, grades, MAP, R, M	Att, grades, MAP, R, M	Att, grades, R, M
2-8	2-8	Att, grades	Att, grades, R, M	Att, grades	Att, grades, MAP, R, M	Att, grades, MAP, R, M	Att, grades, MAP, R, M	Att, grades, A1, R, M
6-12	6-12	Att, grades, R, M	Att, grades, R, M	Att, grades	Att, grades, A1, E1, BIO	Att, grades	Att, grades, US HIST	Att, grades

Att=attendance, grades = grade point average from courses taken, MAP = MAP reading and math, R = STAAR Reading, M = STAAR Math, A1 = STAAR EOC Algebra 1, E1 = STAAR EOC English 1, BIO = STAAR EOC Biology, US HIST = STAAR EOC US History.
*MAP & STAAR were not administered and the end of the 2019-20 school year.

Approach to Analyses

A **similar series of analyses are used for examining each cohort of students, with variations in applicable outcomes by cohort based on grade levels** of the students. First, descriptive analyses unpack details about the group such as sample size, distribution among the DCOL participant groups, demographic indicators, and overall trends in the key outcome variables (e.g., attendance and test scores).

The main analysis approach used is Analysis of Covariance, or **ANCOVA**, which is a blend of Analysis of Variance (ANOVA) and regression. This approach is used when you want to **compare the means of**

different groups, such as a test score or attendance rate, while **controlling for the effects of one or more other variables** (called covariates). This approach works well with this study because we have a categorical independent variable (our DCOL participant groups), continuous dependent variables, and variables that we know influence the dependent variable ("pre-achievement" measures). ANCOVA help to adjust the outcome means of the groups based on the covariates, giving us a "cleaner" comparison between groups, and improves statistical power compared to standard means testing because it removes noise and influence caused by the covariate.

Findings

Cohort K-2

Cohort K-2 has 9,900 students who began kindergarten in 2017-18 and followed with a standard grade level progression through 6th grade in the 2023-24 school year. There are 5,426 students with data for all 7 school years. The rest are missing at least one year of data. Students with irregular grade level progressions were removed from the analysis to ensure that all students were measured on similar grade-level standards within each school year in the analysis. The table below describes how Cohort K is distributed across the DCOL participant groups, race, and gender.

	A	B	C	D	E	F	G	H	None	Overall
Overall	49	80	334	235	388	264	609	422	7,519	**9,900**
Male	17	44	165	109	181	132	309	213	3893	**5,063 (51.1%)**
Female	32	36	169	126	207	132	300	209	3626	**4,837 (48.9%)**
Black	22	30	112	77	83	75	135	83	1703	**2,320 (23.4%)**
Hispanic	20	40	199	138	272	167	424	304	5,014	**6,578 (66.4%)**
White	1	9	15	12	23	13	30	20	551	**674 (6.8%)**
Other Races	6	1	8	8	10	9	20	15	251	**328 (3.3%)**

Planned Analyses

The data available for this group is summarized in the table below.

	2017-18	2018-19	2019-20*	2020-21	2021-22	2022-23	2023-24
Grade Level	**K**	**1st**	**2nd**	**3rd**	**4th**	**5th**	**6th**
Attendance	✓	✓	✓	✓	✓	✓	✓
Course Grades			✓	✓	✓	✓	✓
MAP Reading & Math				✓	✓	✓	
STAAR Reading & Math				✓	✓	✓	✓

With the available data, we have completed these ANCOVA analyses:

- **Attendance**, across all 7 years, with 2023-24 as the outcome year and 2017-18 as the covariate year.
- **Course grades**, across 5 school years, with 2023-24 as the outcome year and 2021-22 as the covariate year (skipped 2019-20 and 2020-21 due to COVID).
- **MAP Reading** with 2022-23 as the outcome year and 2020-21 as the covariate year.
- **MAP Math** with 2022-23 as the outcome year and 2020-21 as the covariate year.
- **STAAR Reading** with 2023-24 as the outcome year and 2020-21 as the covariate year.
- **STAAR Math** with 2023-24 as the outcome year and 2020-21 as the covariate year.

Results

For the youngest students (tracked from Kindergarten through 6th grade):

- **Attendance** was mixed. While the most engaged group sometimes had more absences or tardies, this wasn't consistent across years with highly engaged students actually reporting more tardies and absences by 6th grade.
- **Course grades** looked about the same across all groups, regardless of summer engagement.
- **Standardized test scores (MAP and STAAR)** showed some benefits. Students in the more engaged groups were more likely to make gains in reading (STAAR) and math (MAP) and to reach mastery on state reading tests compared to their peers with little or no summer engagement.

Outcome	Summary
Attendance	No notable findings for attendance rates. Group A had a notable spike in number of absences in 6th grade, but the analyses of variance were not statistically significant. A similar but more notable trend was found for number of tardies, and Group A had significantly more tardies than all other groups and the comparison group by 6th grade.
Course Grades	All groups had similar trends in GPA, with no notable mean differences between any groups.
MAP Reading	Group G's MAP Reading national percentile was significantly lower than the comparison group. No other groups had significant differences.
MAP Math	Group E's MAP Math national percentile was significantly lower than the comparison group. No other groups had significant differences.
STAAR Reading	Groups A and B had higher "mastery" rates in 6th grade than the other DCOL Participant groups and the comparison group – a trend that was not as evident in 3rd grade. Groups C and G had significantly lower scale scores than the comparison group.
STAAR Math	Group B and F had higher "mastery" rates in 6th grade than the other DCOL Participant groups and the comparison group. There were no significant differences between groups' math scale scores in 6th grade.

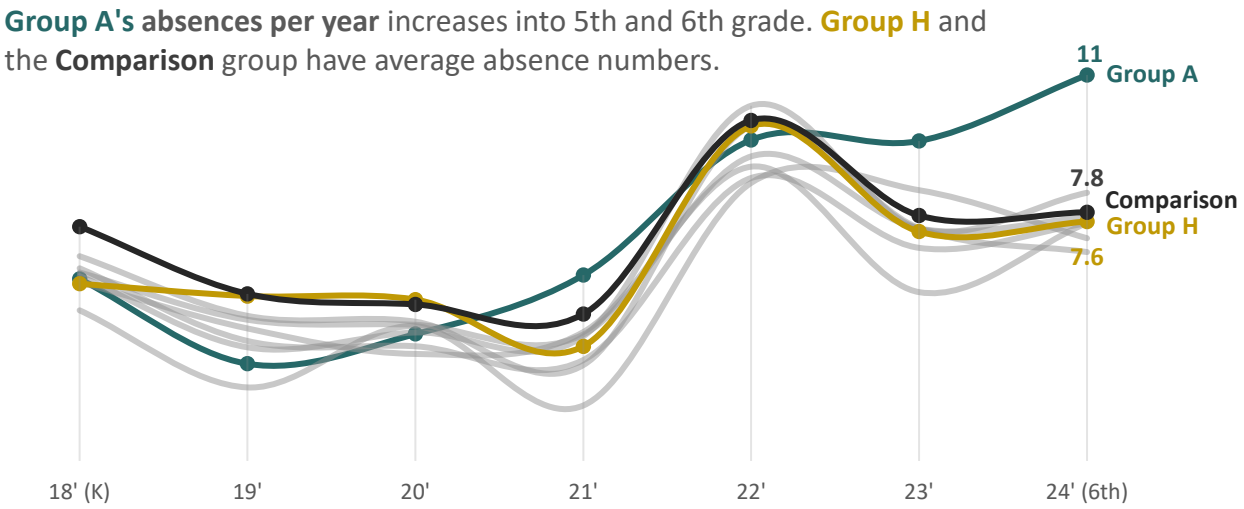
School Attendance

The school attendance analysis looks at **attendance rates**, across all 7 years, with 2023-24 as the outcome year and 2017-18 as the covariate year.

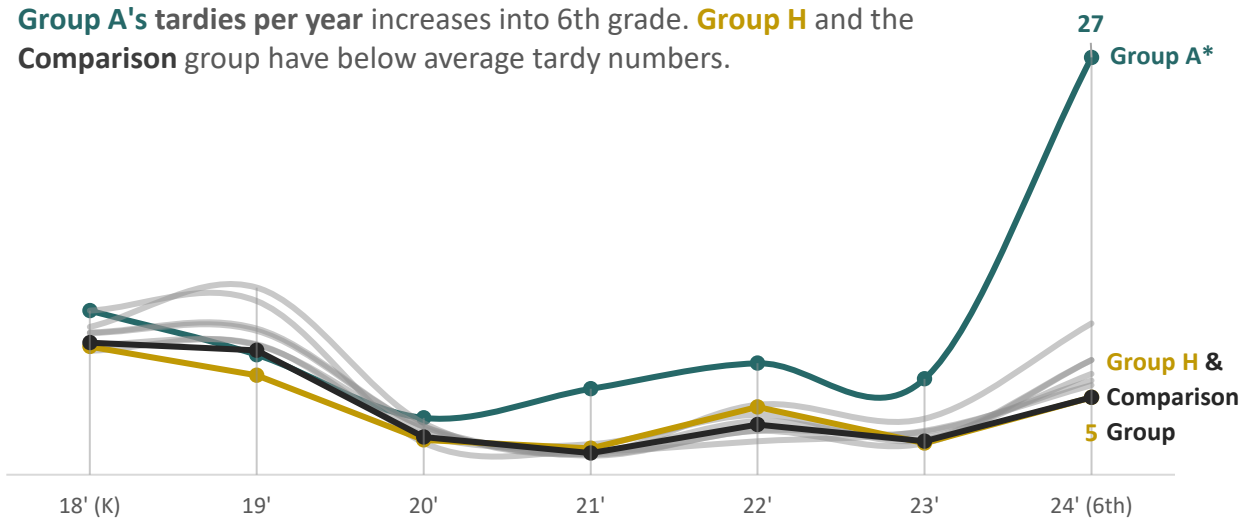
The ANCOVA analysis results were as follows:

- The DCOL Participant Group factor was *not statistically significant* (p=0.475), indicating that *the groups do no differ from each other on attendance rates after adjusting for the effect of earlier attendance rates.* In other words, there were no signicant differences between any of the groups' attendance rates.
- The covariate (earlier attendance rate) was statistically significant, indicating that it explains a significant portion of variance of later attendance rates (p<0.001) with a large effect.

As a follow-up, we examined **total number of absences** across each school year. **These analyses did not yield statisitically significant results, but descriptiely, it is notable that Group A has an ever-increasing absense rate while the other groups have similar trends.**



As a secondary follow-up, we examined **occurrence of tardies**. **This outcome showed a similar trend as number of absesense with an even more pronounced increase in the 6th grade year.**



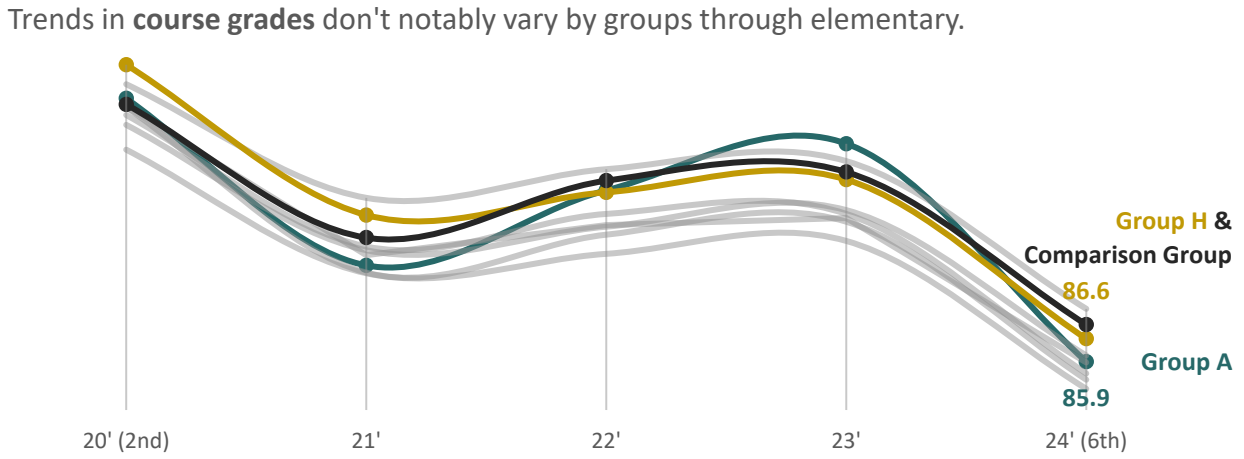
The ANCOVA analysis resutls were as follows:

- The DCOL Particpant Group factor *was statisically significant* ($p<0.001$), indicating that *the groups do differ significantly in number of tardies after adjusting for the effect of earlier tardies rates.*
    - Specifically, Group A's number of tardies by 6th grade was significantly larger than all of the other groups.
    - None of the other groups had any significant differences between each other.
- The covariate (earlier tardies rate) was statistically significant, indicating that it explains a significant portion of variance of later tardies rates ($p<0.001$) with a medium effect.

Course Grades

The course grades analysis looks at **average grade point average**, across the 5 most recent school years, with 2023-24 as the outcome year and 2021-22 as the covariate year. Note that these students did not begin receiving traditional course grades until their 2nd grade year (2019-20), and we omitted using 2019-20 and 2020-21 course grades in the analysis because of notable differences in how these grades were determined those school years due to COVID.

As seen in the figure, **all groups have relatively similar trends in grades, with a drop in grades from 2019-20 to 2020-21, a leveling through 2022-23 (5th grade), and a second drop in 2023-24 as they entered middle school.**



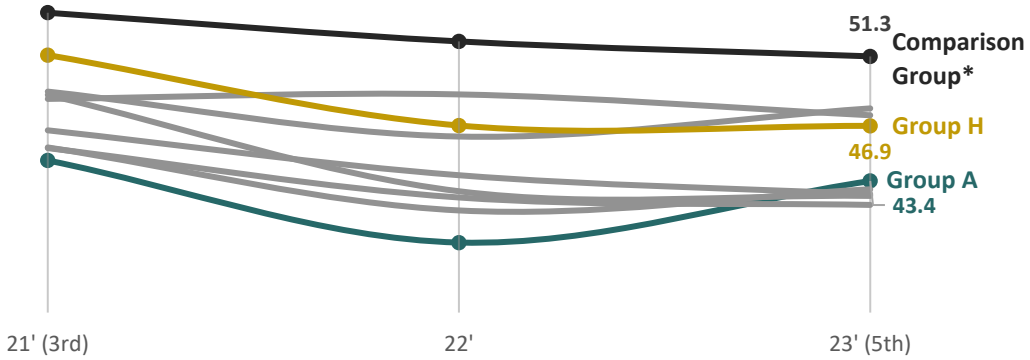
The ANCOVA analysis results were as follows:

- The DCOL Participant Group factor was *not statistically significant* (p=0.792), indicating that *the groups do not differ from each other on course grades after adjusting for the effect of earlier grades.* In other words, there were no signicant differences between any of the groups' course grades GPA.
- The covariate (earlier course grades) was statistically significant, indicating that it explains a significant portion of variance of later course grades (p<0.001) with a medium effect.

MAP Reading

The MAP Reading analysis examines group differences in MAP Reading national percentile scores across the 3 school years when MAP was administered. As seen in the figure, **trends vary slightly across the DCOL Participant Groups, with the comparison group scoring better overall (closer to average, 50th percentile, as expected). All DCOL groups trend below average.**

Summer programming did not have any positive effect on **MAP Reading in elementary**; all DCOL groups scored below average.



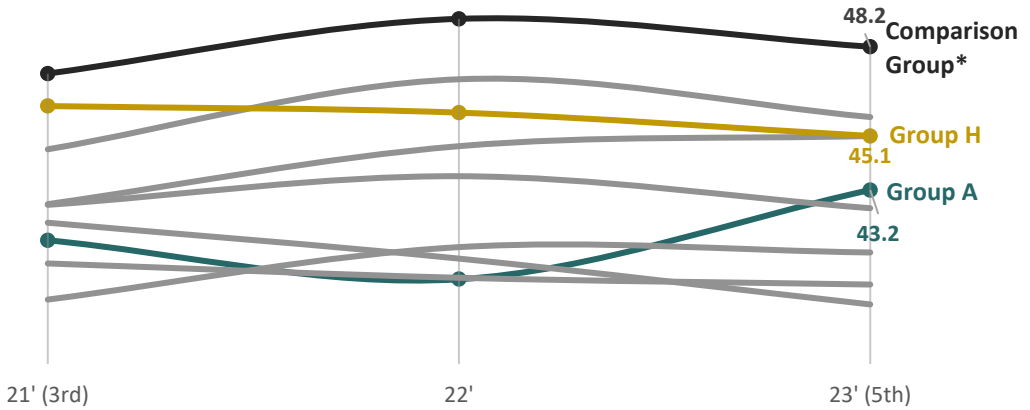
The ANCOVA analysis results were as follows:

- The DCOL Participant Group factor *was statistically significant* (p=0.001), indicating that *the groups do differ from each other on 5th grade MAP Reading after adjusting for the effect of earlier MAP Reading scores.*
    - Specifically, Group G's average MAP Reading National Percentile, adjusted to 42.97 by the model, was significantly lower than the comparison group adjusted mean of 53.47.
    - None of the other groups had any significant differences between each other.
- The covariate (earlier MAP Reading percentile) was statistically significant, indicating that it explains a significant portion of variance of later MAP Reading scores (p<0.001) with a medium effect.

MAP Math

The MAP Math analysis examines group difference in MAP Math national percentile scores across the 3 school years when MAP was administered. As seen in the figure, **trends vary across the DCOL Participant Groups, with the comparison group scoring better overall (closer to average, 50th percentile, as expected). All DCOL groups trend below average.**

Summer programming did not have any positive effect on **MAP Math in elementary**; all DCOL groups scored below average.



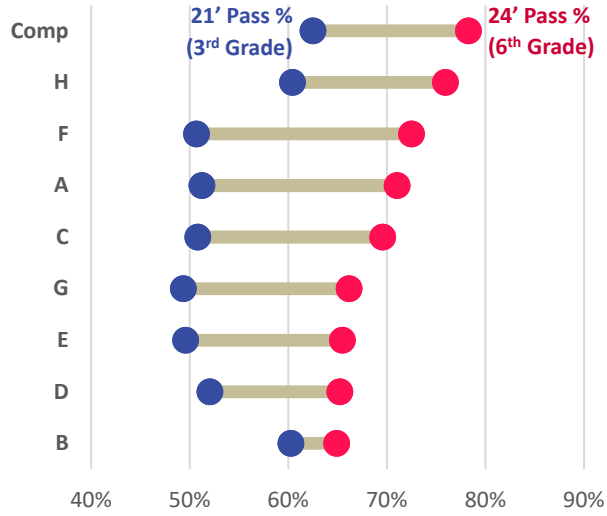
The ANCOVA analysis results were as follows:

- The DCOL Participant Group factor *was statistically significant* (p=0.009), indicating that *the groups do differ from each other on 5th grade MAP Math after adjusting for the effect of earlier MAP Math scores.*
    - Specifically, Group E's average MAP Math National Percentile, adjusted to 40.59 by the model, was significantly lower than the comparison group adjusted mean of 50.04.
    - None of the other groups had any significant differences between each other.
- The covariate (earlier MAP Math percentile) was statistically significant, indicating that it explains a significant portion of variance of later MAP Math scores (p<0.001) with a large effect.

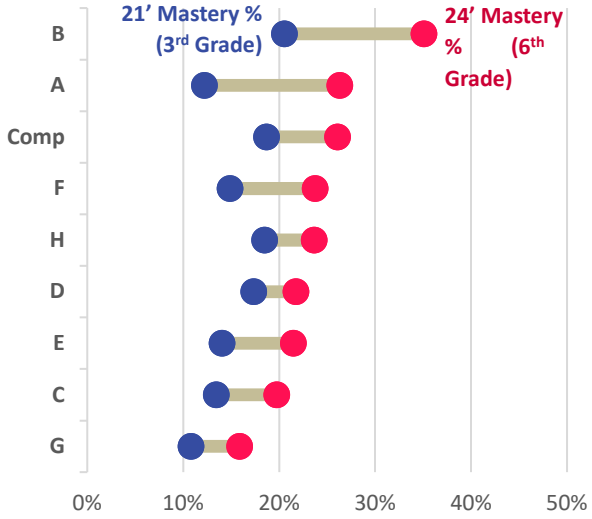
STAAR Reading

The STAAR Reading analysis examines group difference in STAAR Reading scale scores in 6th grade. The figure below describes the % of students that passed and mastered STAAR by DCOL Participant Group for the 2023-24 school year and the 2020-21 school year, which was the 3rd grade year for this cohort. **Overall, the Cohort K students had better STAAR Reading passing rates by 6th grade compared to 3rd grade, and in both years, the comparison group had slightly higher passing rates than the DCOL Participant Groups. However, it is notable that Groups A and B had higher "mastery" rates in 6th grade than the other DCOL Participant groups and the comparison group – a trend that was not as evident in 3rd grade.**

All groups have better **STAAR Reading Passing** rates by 6th grade. The comparison group had higher passing rates than the DCOL Groups.



Groups A and B had the best STAAR Reading Mastery rates in 6th grade, a trend that was not as evident in 3rd grade**.**



The ANCOVA analyses required use of the Reading scale score as the method requires a continous oucome vaiable and passng/not passing is categorical. The ANCOVA analysis results were as follows:

- The DCOL Participant Group factor *was statistically significant* (p=0.003), indicating that *the groups do differ from each other on 6th grade STAAR Reading after adjusting for the effect of earlier STAAR Reading scale scores.*

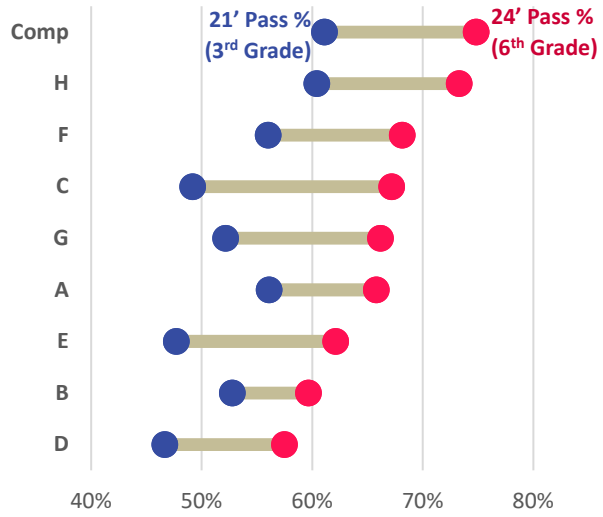
- Specifically, Group C and Group G's average STAAR Reading scale scores were significantly lower than the comparison group.
- None of the other groups had any significant differences between each other.

- The covariate (earlier STAAR Reading scale score) was statistically significant, indicating that it explains a significant portion of variance of later STAAR Reading scores ($p<0.001$) with a small effect.

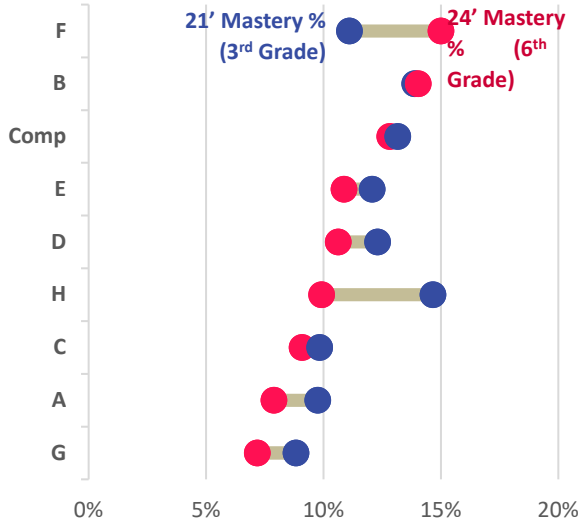
STAAR Math

The STAAR Math analysis examines group difference in STAAR Math scale scores in 6th grade. The figure below describes the % of students that passed and mastered STAAR by DCOL Participant Group for the 2023-24 school year and the 2020-21 school year, which was the 3rd grade year for this cohort. **Overall, the Cohort K students had better STAAR Math passing rates by 6th grade compared to 3rd grade, and in both years, the comparison group had slightly higher passing rates than the DCOL Participant Groups. However, it is notable that Group B and F had higher "mastery" rates in 6th grade than the other DCOL Participant groups and the comparison group – a trend that was not as evident in 3rd grade.**

All groups have better **STAAR Math Passing** rates by 6th grade. The comparison group had higher passing rates than the DCOL Groups.



Only Groups B & F had higher **STAAR Math Passing** rates by 6th grade.



The ANCOVA analyses required use of the STAAR Math scale score as the method requires a continous oucome vaiable and passng/not passing is categorical. The ANCOVA analysis results were as follows:

- The DCOL Participant Group factor *was not statistically significant* ($p=0.05$), indicating that *the groups do not differ from each other on 6th grade STAAR Math after adjusting for the effect of earlier STAAR Math scale scores.*
- The covariate (earlier STAAR Math scale score) was statistically significant, indicating that it explains a significant portion of variance of later STAAR Math scores ($p<0.001$) with a medium effect.

Cohort Two

For middle-grade students (tracked from 2nd through 8th grade):

- **Attendance** again showed mixed results, with some highly engaged students actually reporting more tardies.
- **Course grades** didn't differ much across groups.
- **Test scores** stood out: Group A (the most engaged students) was the only group to consistently improve in both reading and math over time, and they also had higher mastery rates on the STAAR exams by 6th grade.

Cohort Two has 10,399 students who began 2nd grade in 2017-18 and followed with a standard grade level progression through 8th grade in the 2023-24 school year. There are 6,335 students with data for all 7 school years. The rest are missing at least one year of data. Students with irregular grade level progressions were removed from the analysis to ensure that all students were measured on similar grade-level standards within each school year in the analysis. The table below describes how Cohort Two is distributed across the DCOL participant groups, race, and gender.

	A	B	C	D	E	F	G	H	None	Overall
Overall	61	103	266	385	598	349	1126	433	7078	**10,399**
Male	30	57	131	182	309	185	587	213	3621	**5,315 (51.1%)**
Female	31	46	135	203	289	164	539	220	3457	**5,084 (48.9%)**
Black	29	37	84	103	123	100	233	112	1536	**2,357 (22.7%)**
Hispanic	28	62	158	255	446	227	827	294	4863	**7,160 (68.9%)**
White	1	2	14	16	22	10	45	19	494	**623 (6.0%)**
Other Races	3	2	10	11	7	12	21	8	185	**259 (2.5%)**

Planned Analyses

The data available for this group is summarized in the table below.

	2017-18	2018-19	2019-20*	2020-21	2021-22	2022-23	2023-24
Grade Level	2nd	3rd	4th	5th	6th	7th	8th
Attendance	✓	✓	✓	✓	✓	✓	✓
Course Grades	✓	✓	✓	✓	✓	✓	✓
MAP Reading & Math				✓	✓	✓	
STAAR Reading & Math		✓		✓	✓	✓	✓
STAAR EOC Algebra 1							✓

With the available data, we have completed the ANCOVA analyses stated below:

- **Attendance**, across all 7 years, with 2023-24 as the outcome year and 2017-18 as the covariate year.
- **Course grades**, across all 7 school years, with 2023-24 as the outcome year and 2017-18 as the covariate year.
- **MAP Reading** with 2022-23 as the outcome year and 2020-21 as the covariate year.
- **MAP Math** with 2022-23 as the outcome year and 2020-21 as the covariate year.
- **STAAR Reading** with 2023-24 as the outcome year and 2018-19 as the covariate year.
- **STAAR Math** with 2023-24 as the outcome year and 2018-19 as the covariate year.
- **STAAR EOC Algebra 1** with 2023-24 as the outcome year and 3rd grade STAAR Math in 2018-29 as the covariate.

Results

Outcome	Summary
Attendance	No notable findings for attendance rates or number of absences. Group A had a notable increase in relative number of tardies throughout middle school compared to the other DCOL groups and the comparison group. Group A's number of tardies by 8th grade was significantly larger groups F & G and the comparison group.
Course Grades	All groups have relatively similar trends in grades, with a drop in grades from 2019-20 to 2020-21 followed by a steady decline through the middle school grades. Group C had a significantly higher GPA than groups D, E and F.
MAP Reading	All groups, with the exception of Group A, have a similar trend of a sharp decrease of average national percentile from 5th to 6th grade, with a less pronounced but continued decrease to 7th grade. However, Group A is the only group with an increase in average national percentile score from 5th to 6th grade. All DCOL groups average lower than the comparison group. Group G's average MAP Reading National Percentile, adjusted to 29.6 by the model, was significantly lower than the comparison group adjusted mean of 40.9. The same between group difference was notable for Cohort K's 5th grade MAP reading scores.
MAP Math	All groups, with the exception of Group A, have a similar trend of a decrease in average national percentile from 5th to 6th grade, with a rebound in scores in 7th grade. However, Group A is the only group with an increase in average national percentile score from 5th to 6th grade with a slight decline going to 7th grade. All DCOL groups average lower than the comparison group. There were no significant between group differences.
STAAR Reading	Overall, the Cohort Two students had better STAAR Reading passing rates by 8th grade compared to 3rd grade, and in both years, the comparison group had higher passing rates than the DCOL Participant Groups. This same trend was observed for Cohort K. However, it is notable that Groups A had higher "mastery" rates in 8th grade than

	the other DCOL Participant groups and the comparison group – a trend that was not as evident in 3rd grade and is also similar to what was observed with Cohort K. The comaprison group had significantly higher scale score than Group D, Group E, Group F, and Group G.
STAAR Math	Overall, the Cohort Two students had lower STAAR Math passing rates by 8th grade compared to 3rd grade. In 3rd grade, the comparison group had higher passing and mastery rates than all of the DCOL groups. However, by 8th grade, Groups A and B had higher passing rates than the other DCOL groups and the comparison group. It is also notable that Group A had higher "mastery" rates in 8th grade than the other DCOL Participant groups and the comparison group. There were no significant between group differences.
STAAR EOC Algebra 1	Overall, the Cohort Two students had similar trends in passing and mastery for 3rd grade math and 8th grade algebra 1, with the comparison group having slightly higher passing rates than the DCOL groups in both school years. However, Group A did have a higher mastery rate than all other DCOL groups in both years but did not have a higher mastery rate than the comparison group in either year. There were no significant between group differences.

School Attendance

The school attendance analysis looks at **attendance rates**, across all 7 years, with 2023-24 as the outcome year and 2017-18 as the covariate year. The adjusted average 8th grade attendance rate for each group is described in the table below. The table is in lieu of a visual graph due to the small variation.

"Adjusted" mean is each group's "fair" mean score after leveling the playing field. In other words, it's the mean we would expect for each group if all groups were equal on initial 2nd grade attendance. This is the adjustment the ANCVOA analysis makes.

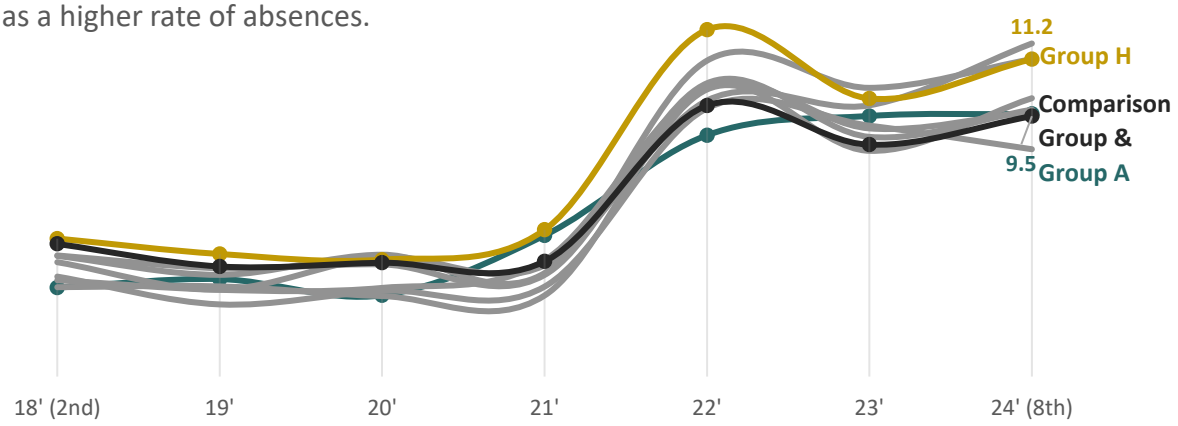
Group	# Students	Adjusted Mean 8th Grade Attendance Rate
A	21	93.721
B	13	94.877
C	32	93.315
D	42	94.004
E	78	93.003
F	69	92.634
G	215	93.413
H	75	92.972
Comp	4157	93.856

The ANCOVA analysis results were as follows:

- The DCOL Participant Group factor was *not statistically significant* (p=0.074), indicating that *the groups do no differ from each other on attendance rates after adjusting for the effect of earlier attendance rates.* In other words, there were no signicant differences between any of the groups' attendance rates.
- The covariate (earlier attendance rate) was statistically significant, indicating that it explains a significant portion of variance of later attendance rates (p<0.001) with a small effect.

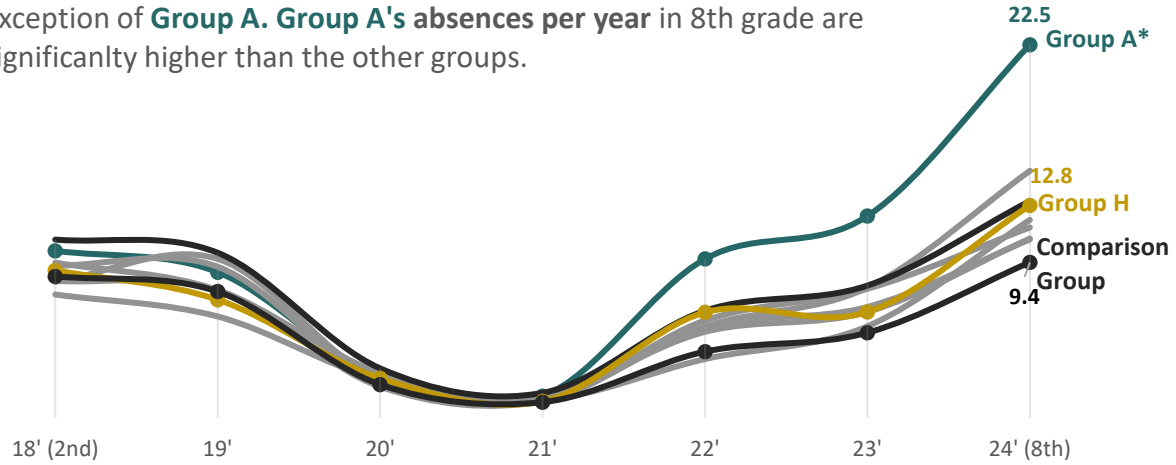
As a follow-up, we examined **total number of absences** across each school year. These analyses did not yield statisitically significant results. It is notable that a**ll groups have a trend of steady absense numbers across elementary school with an increase through the middle school grades**.

All groups have similar absence trends across the middle years. **Group A's absences per year** in 8th grade align with the **Comparison** group. **Group H** has a higher rate of absences.



As a secondary follow-up, we examined **occurrence of tardies**. This outcome showed a similar trend as Cohort K, with **group A showing an increase in relative number of tardies throughout middle school compared to the other DCOL groups and the comparison group**.

All groups have **similar absence trends** across the middle years, with the exception of **Group A. Group A's absences per year** in 8th grade are significanlty higher than the other groups.



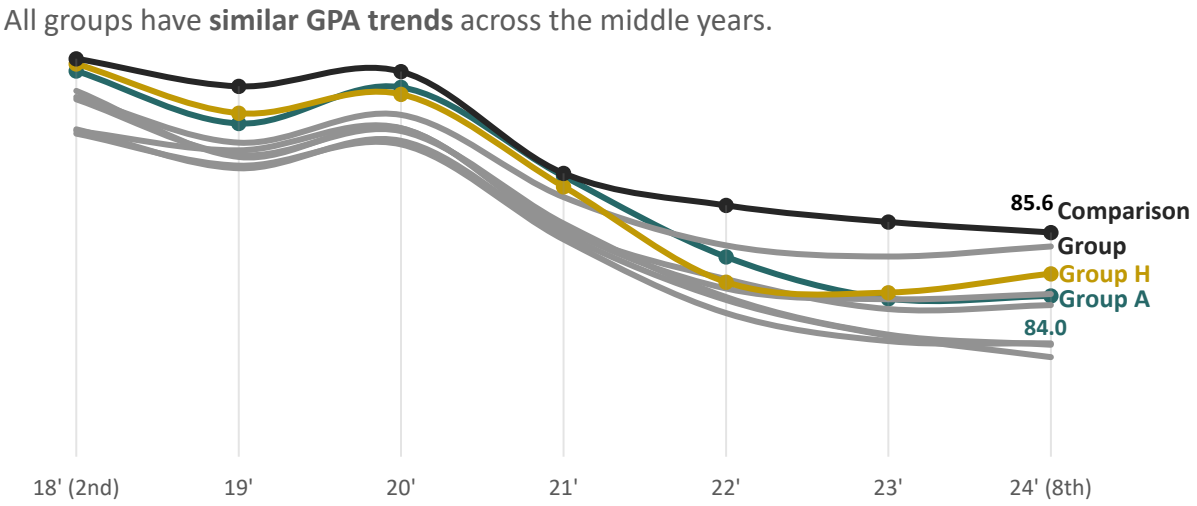
The ANCOVA analysis results for tardies are:

- The DCOL Particpant Group factor *was statisically significant* (p=0.002), indicating that *the groups do differ significantly in number of tardies after adjusting for the effect of earlier tardies rates.*
    - Specifically, Group A's number of tardies by 8th grade was significantly larger groups F & G and the comparison group (p=0.03, 0.01, 0.006 respectively). Additionally, group E's numbe of tardies in 8th grade was significantly larger than the comparison group (p=0.048)
    - None of the other groups had any significant differences between each other.
- The covariate (earlier tardies rate) was statistically significant, indicating that it explains a significant portion of variance of later tardies rates (p<0.001) with a small effect.

Course Grades

The course grades analysis looks at **average grade point average**, across all 7 school years, with 2023-24 as the outcome year and 2017-18 as the covariate year.

As seen in the figure, **all groups have relatively similar trends in grades, with a drop in grades from 2019-20 to 2020-21 followed by a steady decline through the middle school grades**.



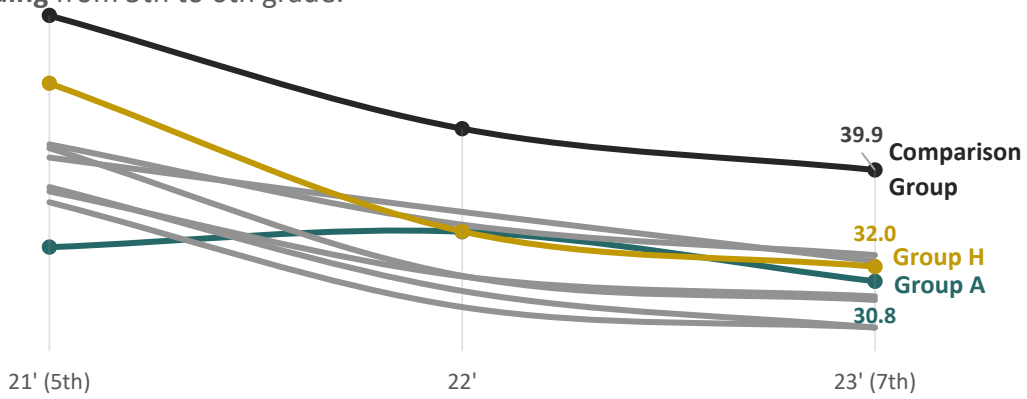
The ANCOVA analysis results for GPA are:

- The DCOL Participant Group factor was *statistically significant* (p<0.001), indicating that *the groups do differ from each other on course grades after adjusting for the effect of earlier grades.*
    - Specifically, Group C had a higher GPA than groups D, E and F (p=0.04, p<0.001, p=0.001, respectively).
    - The comparison group has a higher GPA than group D (p=0.04), group E (p<0.001) and group F (p<0.001).
- The covariate (earlier course grades) was statistically significant, indicating that it explains a significant portion of variance of later course grades (p<0.001) with a medium effect.

MAP Reading

The MAP Reading analysis examines group difference in MAP Reading national percentile scores across the 3 school years when MAP was administered, with 2022-23 as the outcome year and 2020-21 as the covariate year. **All groups, with the exception of Group A, have a similar trend of a sharp decrease of average national percentile from 5th to 6th grade, with a less pronounced but continued decrease to 7th grade. However, Group A is the only group with an increase in average national percentile score from 5th to 6th grade. All DCOL groups average lower than the comparison group.**

Most groups have similar trend of MAP Reading, with decreases from 5th through 7th grade. However, **Group A is the only group with an increase in MAP Reading** from 5th to 6th grade.



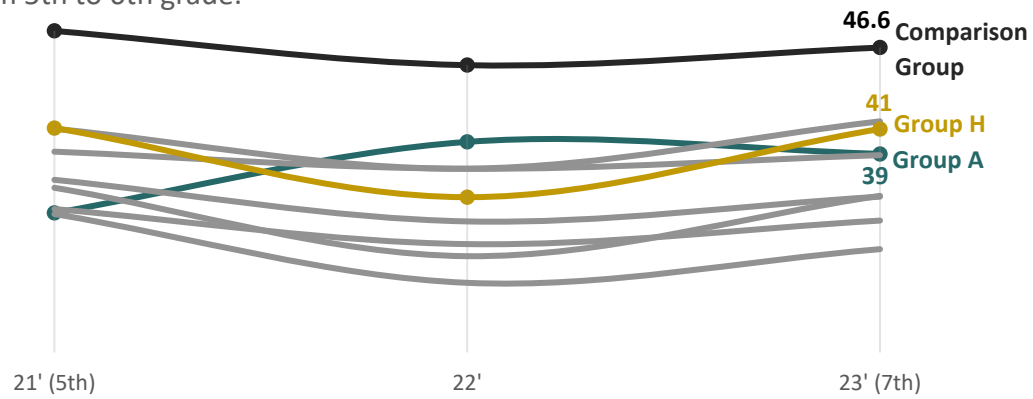
The ANCOVA analysis results were as follows:

- The DCOL Participant Group factor *was statistically significant* (p=0.001), indicating that *the groups do differ from each other on 8th grade MAP Reading after adjusting for the effect of earlier MAP Reading scores.*
    - Specifically, Group G's average MAP Reading National Percentile, adjusted to 29.6 by the model, was significantly lower than the comparison group adjusted mean of 40.9. The same between group difference was notable for Cohort K's 5th grade MAP reading scores.
    - None of the other groups had any significant differences between each other.
- The covariate (earlier MAP Reading percentile) was statistically significant, indicating that it explains a significant portion of variance of later MAP Reading scores (p<0.001) with a large effect.

MAP Math

The MAP Math analysis examines group difference in MAP Math national percentile scores across the 3 school years when MAP was administered. **All groups, with the exception of Group A, have a similar trend of a decrease in average national percentile from 5th to 6th grade, with a rebound in scores in 7th grade. However, Group A is the only group with an increase in average national percentile score from 5th to 6th grade with a slight decline going to 7th grade. All DCOL groups average lower than the comparison group.**

Most groups have similar trend of MAP Math, with decreases from 5th through 7th grade. **Group A is the only group with an increase in MAP Math** from 5th to 6th grade.



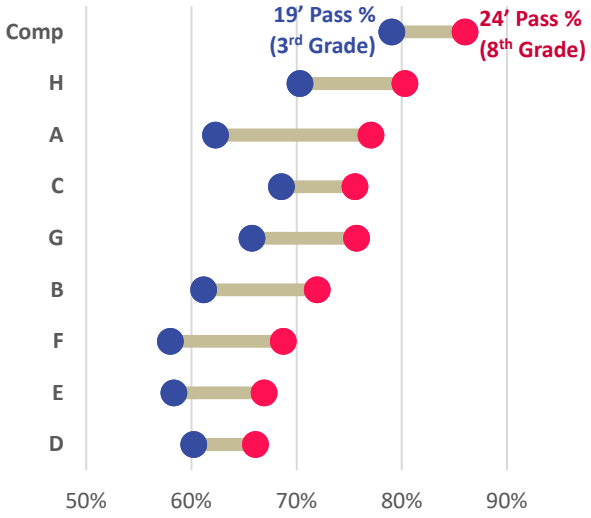
The ANCOVA analysis results were as follows:

- The DCOL Participant Group factor *was not statistically significant* (p=0.204), indicating that *the groups do not differ from each other on 8th grade MAP Math after adjusting for the effect of earlier MAP Math scores.*
- The covariate (earlier MAP Math percentile) was statistically significant, indicating that it explains a significant portion of variance of later MAP Math scores (p<0.001) with a large effect.

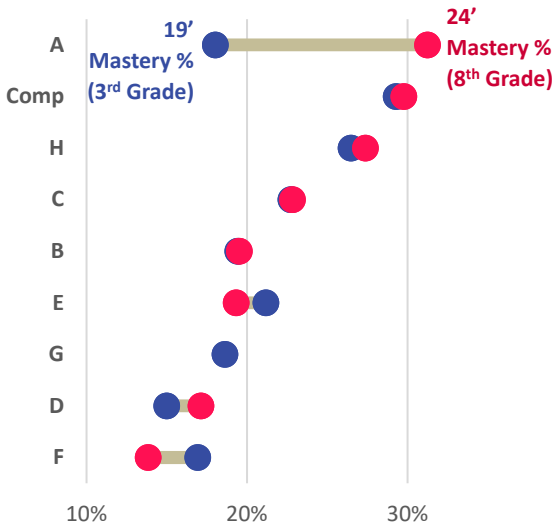
STAAR Reading

The STAAR Reading analysis examines group difference in STAAR Reading scale scores in 8th grade. The figure below describes the % of students that passed and mastered STAAR by DCOL Participant Group for the 2023-24 school year and the 2018-19 school year, which was the 3rd grade year for this cohort. **Overall, the Cohort Two students had better STAAR Reading passing rates by 8th grade compared to 3rd grade, and in both years, the comparison group had higher passing rates than the DCOL Participant Groups. This same trend was observed for Cohort K. However, it is notable that Groups A had higher "mastery" rates in 8th grade than the other DCOL Participant groups and the comparison group – a trend that was not as evident in 3rd grade and is also similar to what was observed with Cohort K.**

All groups have better **STAAR Reading Passing** rates by 8th grade. **Group A had the most growth** in STAAR Reading passing rates.



Group A had the most growth in **STAAR Reading mastery** rates and the highest mastery rate of all groups by 8th grade.



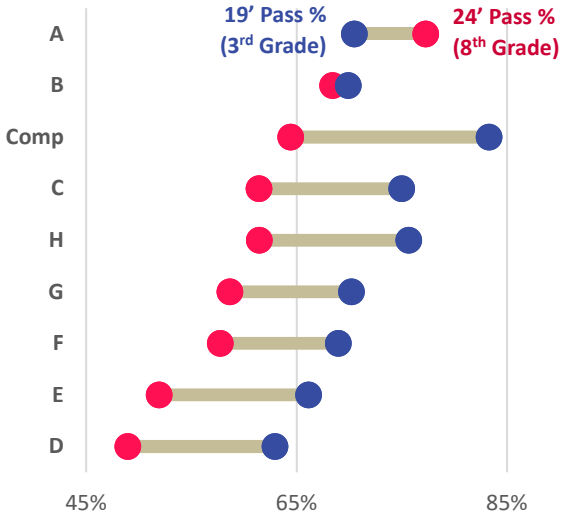
The ANCOVA analyses required use of the Reading scale score as the method requires a continous oucome vaiable and passng/not passing is categorical. The ANCOVA analysis results were as follows:

- The DCOL Participant Group factor *was statistically significant* (p<0.001), indicating that *the groups do differ from each other on 8th grade STAAR Reading after adjusting for the effect of earlier STAAR Reading scale scores.*
    - Specifically, the comaprison group had higher scale score than Group D (p=0.01), Group E (p=0.004), Group F (p<0.001), and Group G (p=0.01).
    - None of the other groups had any significant differences between each other.
- The covariate (earlier STAAR Reading scale score) was statistically significant, indicating that it explains a significant portion of variance of later STAAR Reading scores (p<0.001) with a large effect.

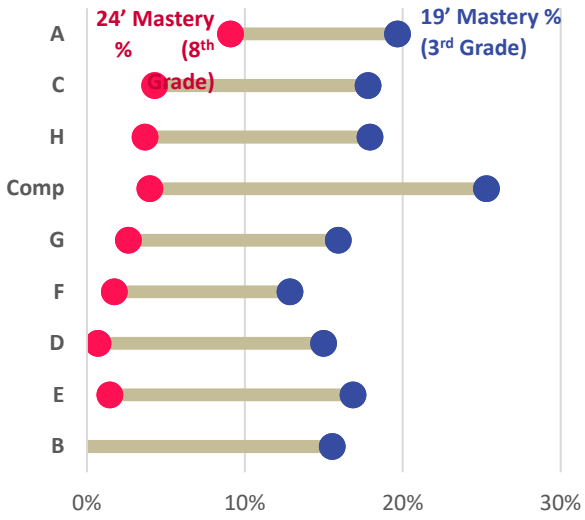
STAAR Math

The STAAR Math analysis examines group difference in STAAR Math scale scores in 8th grade. The figure below describes the % of students that passed and mastered STAAR by DCOL Participant Group for the 2023-24 school year and the 2018-19 school year, which was the 3rd grade year for this cohort. **Overall, the Cohort Two students had lower STAAR Math passing rates by 8th grade compared to 3rd grade. In 3rd grade, the comparison group had higher passing and mastery rates than all of the DCOL groups. However, by 8th grade, Groups A and B had higher passing rates than the other DCOL groups and the comparison group. Group A was also the only group with positive gains in passing rates. It is also notable that Group A had higher "mastery" rates in 8th grade than the other DCOL Participant groups and the comparison group – a trend that was not evident in 3rd grade. This is similar to what was observed with STAAR Reading.**

Group A is the only group with positive gains in STAAR Math passing rates. Groups A & B have the highest passing rates by 8th grade.



All groups declined in STAAR Math mastery rates. Groups A had the least decline & the highest mastery rates by 8th grade.



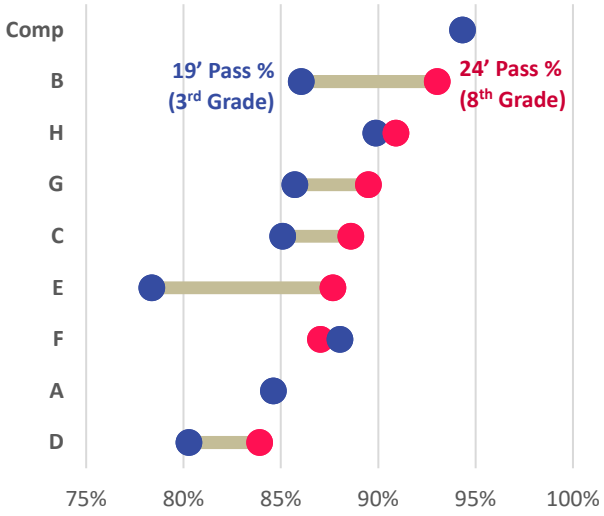
The ANCOVA analyses required use of the STAAR Math scale score as the method requires a continous oucome vaiable and passng/not passing is categorical. The ANCOVA analysis results were as follows:

- The DCOL Participant Group factor *was not statistically significant* (p=0.25), indicating that *the groups do not differ from each other on 8th grade STAAR Math after adjusting for the effect of earlier STAAR Math scale scores.*
- The covariate (earlier STAAR Math scale score) was statistically significant, indicating that it explains a significant portion of variance of later STAAR Math scores (p<0.001) with a medium effect.

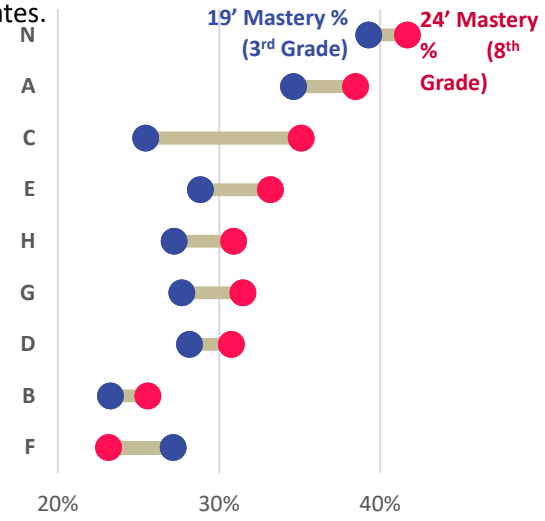
STAAR EOC Algebra 1

The STAAR EOC Algebra 1 analysis examines group difference in STAAR Algebra 1 scale scores in 8th grade. Note that only students on a pre-AP track will take Algebra 1 in 8th grade, so this analysis represents a unique subset of the overall student group (e.g, the third grade STAAR Math scores from 2018-19 only include those students who took the Algebra 1 exam in 8th grade). The figure below describes the % of students that passed and mastered STAAR EOC Algebra 1 by DCOL Participant Group for the 2023-24 school year and STAAR Math the 2018-19 school year, which was the 3rd grade year for this cohort. **Overall, the Cohort Two students had similar trends in passing and mastery for 3rd grade math and 8th grade algebra 1, with the comparison group having slightly higher passing rates than the DCOL groups in both school years. However, Group A did have a higher mastery rate than all other DCOL groups in both years but did not have a higher mastery rate than the comparison group in either year.**

The **comparison group has better Algebra 1 passing** rates than the DCOL groups in both 3rd grade and 8th grade.



Group A has the higest Algebra 1 mastery rates of all DCOL groups in both 3rd and 8th grade. The comparison group has the best mastery rates.



The ANCOVA analyses required use of the STAAR Algebra 1 scale score as the method requires a continous oucome vaiable and passng/not passing is categorical. The ANCOVA analysis results were as follows:

- The DCOL Participant Group factor *was not statistically significant* (p=0.3), indicating that *the groups do not differ from each other on 8th grade STAAR Algebra 1 after adjusting for the effect of earlier STAAR Math scale scores.*
- The covariate (earlier STAAR Math scale score) was statistically significant, indicating that it explains a significant portion of variance of later STAAR Math scores (p<0.001) with a medium effect.

Cohort Six-Twelve

For older students (tracked from 6th through 12th grade):

- **Attendance** was better among the highly engaged groups, who had fewer absences and tardies.
- **Grades** were also higher — students with strong summer engagement earned consistently better GPAs compared to peers.
- **Test scores** again stood out: Group A (the most engaged students) had higher passing and mastery rates on the STAAR EOC exams throughout high school.

Cohort Six-Twelve has 7,852 students who began sixth grade in 2017-18 and followed with a standard grade level progression through 12th grade in the 2023-24 school year. There are 5,014 students with data for all 7 school years. The rest are missing at least one year of data. Students with irregular grade level progressions were removed from the analysis to ensure that all students were measured on similar grade-level standards within each school year in the analysis. The table below describes how Cohort 6-through-12 is distributed across the DCOL participant groups, race, and gender.

	A	B	C	D	E	F	G	H	None	Overall
Overall	26	15	47	66	131	118	405	115	6,929	**7,852**
Male	7	10	14	30	80	63	221	57	3341	**3,823 (48.7%)**
Female	19	5	33	36	51	55	184	58	3588	**4,029 (51.3%)**
Black	10	7	29	44	52	42	116	27	1381	**1,708 (21.8%)**
Hispanic	1	5	14	18	69	71	264	78	5045	**5,565 (70.9%)**
White	0	1	0	1	4	1	19	8	357	**391 (5%)**
Other Races	15	2	4	3	6	4	6	2	146	**188 (2.4%)**

Planned Analyses

The data available for this group is summarized in the table below.

	2017-18	2018-19	2019-20*	2020-21	2021-22	2022-23	2023-24
Grade Level	6th	7th	8th	9th	10th	11th	12th
Attendance	✓	✓	✓	✓	✓	✓	✓
Course Grades	✓	✓	✓	✓	✓	✓	✓
STAAR EOC Algebra 1				✓			
STAAR EOC Biology				✓			
STAAR EOC English 1				✓			
STAAR EOC US History						✓	

*most outcome data unavailable for 2019-2020

With the available data, we have completed the ANCOVA analyses stated below:

- **Attendance**, across all 7 years, with 2023-24 as the outcome year and 2017-18 as the covariate year.

- **Course grades**, across 7 school years, with 2023-24 as the outcome year and 2021-22 as the covariate year (skipped 2019-20 and 2020-21 due to COVID).
- **STAAR EOC Algebra 1,** for the 9th grade year only (2020-2021) with 6th grade course grades as the covariate.
- **STAAR EOC Biology,** for the 9th grade year with 6th grade course grades as the covariate.
- **STAAR EOC English 1,** for the 9th grade year with 6th grade course grades as the covariate.
- **STAAR EOC US History,** for the 11th and 12th grade year with 6th grade course grades as the covariate.

Results

Outcome	Summary
Attendance	The groups do not have meaningful differences in attendance rates by 12th grade. We did observe that groups A & B and a lower number of absences in 12th grade than the other groups, and that groups A had a notably lower number of tardies in 12th grade.
Course Grades	All groups have relatively similar overall trends in grades, with a steady increase in GPA through the high school years. However, it is notable with this group that Group A students have consistently higher GPAs than their peers. However, the finding was not statistically significant.
STAAR EOC Algebra 1	The Cohort A students had a higher passing rate on 9th grade Algebra 1 STAAR EOC compared to their peers in the other groups and the comparison group. All other groups had similar passing rates. However, the finding was not statistically significant.
STAAR EOC Biology	There is a steady decline in passing rates from groups A to E, with a slight increase for groups F and H. Group A does have a higher passing rate than the comparison group. More notable is the mastery rates. Group A has a 50% mastery rate compared to 20% for the comparison group. However, we did not find a significant difference in scale scores.
STAAR EOC English 1	Group A had a higher passing rate than all of the other DCOL groups and the comparison group, with a steady decline then increase as groups are examined A through H. Again, more notable are the mastery rates. Group A has an 18% mastery rate compared to 8% for the comparison group. However, we did not find a significant difference in scale scores.
STAAR EOC US History	Group A had higher passing and mastery rates than all of the DCOL groups and the comparison group. However, we did not find a significant difference in scale scores.

School Attendance

The school attendance analysis looks at **attendance rates**, across all 7 years, with 2023-24 as the outcome year and 2017-18 as the covariate year. The table below describes the adjusted mean attendance rate for each group for the 12th grade year (adjusted based on the model that corrects for influence of 6th grade attendance rate).

Group	# Students	Adjusted Mean 12th Grade Attendance Rate
A	21	93.881
B	13	94.515
C	32	92.744
D	42	89.44
E	78	91.401
F	69	91.796
G	215	92.084
H	75	93.021
Comp	4157	91.478

The ANCOVA analysis results were as follows:

- The DCOL Participant Group factor was *not statistically significant* (p=0.4), indicating that *the groups do no differ from each other on attendance rates after adjusting for the effect of earlier attendance rates.* In other words, there were no signicant differences between any of the groups' attendance rates.
- The covariate (earlier attendance rate) was statistically significant, indicating that it explains a significant portion of variance of later attendance rates (p<0.001) with a small effect.

As a follow-up, we examined **total number of absences acrosss each school year**. The average absenses by year for each group is described in the next table. **Each group has a steady increase in number of absenses year over year, and groups A & B have fewer absenses by 12th grade than the other groups.** These analyses did not yield statisitically significant results.

Average # of absences across school years

	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
A	2.8	3.6	3.1	7.1	11.1	6.1	**10.3**
B	3.2	4.5	5.4	11.8	13.8	12.7	**9.4**
C	2.8	4.2	3.1	14.0	15.6	10.9	12.1
D	4.8	4.8	4.3	12.3	18.1	14.0	16.7
E	8.8	8.5	8.6	14.5	17.5	14.6	13.5
F	5.5	6.5	5.5	13.3	11.2	9.0	13.8
G	8.4	7.7	6.7	14.3	16.0	13.5	13.8
H	4.6	5.4	4.4	8.3	10.7	10.5	11.6
Comp	5.4	5.2	4.8	11.7	13.3	13.1	14.2

As a secondary follow-up, we examined **occurrence of tardies**. With the exception of 2019-20 and 2020-21, when tardies were not counted as they typically are, a similar trend of an increase year over year is observed. These analyses did not yield statisitically significant results.

Average # of tardies across school years

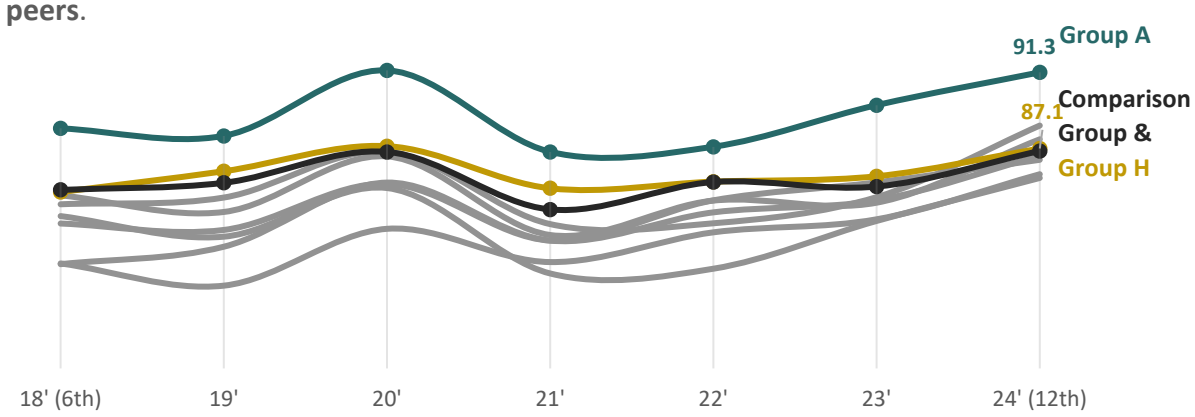
	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24

A	1.3	6.6	3.7	0.6	9.4	11.3	**8.5**
B	2.5	6.8	5.5	0.5	13.5	9.2	16.3
C	2.1	18.6	3.2	0.8	9.5	5.8	9.6
D	2.4	11.4	4.5	0.7	17.2	8.5	17.0
E	3.9	16.5	7.3	0.5	11.1	12.6	13.5
F	3.1	14.6	6.8	0.5	10.4	9.5	16.1
G	5.8	13.5	5.7	0.7	12.8	10.6	16.1
H	3.0	8.2	3.7	0.5	9.9	9.0	12.5
Comp	3.4	10.1	5.0	0.6	11.4	11.2	13.4

Course Grades

The course grades analysis looks at **average grade point average**, across the 7 school years, with 2023-24 as the outcome year and 2017-18 as the covariate year. Note that the 2019-20 and 2020-21 courses grades should be interpreted with caution because of notable differences in how these grades were determined those school years due to COVID.

As seen in the figure, **all groups have relatively similar overall trends in grades, with a steady increase in GPA through the high school years. However, it is notable with this group that Group A students have consistently higher GPAs than their peers.**

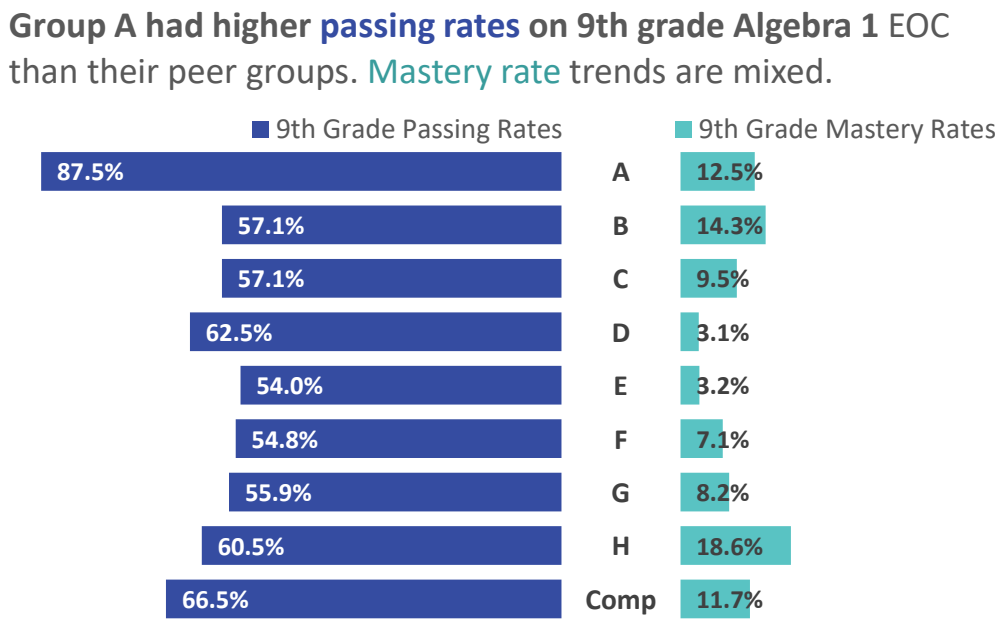


The ANCOVA analysis results were as follows:

- The DCOL Participant Group factor was *not statistically significant* (p=0.152), indicating that *the groups do not differ from each other on course grades after adjusting for the effect of earlier grades.* In other words, there were no signicant differences between any of the groups' course grades GPA.
- The covariate (earlier course grades) was statistically significant, indicating that it explains a significant portion of variance of later course grades (p<0.001) with a medium effect.

STAAR EOC Algebra 1

The STAAR EOC Algebra 1 analysis examines group difference in STAAR Algebra 1 scale scores in 9th grade. The figure below describes the % of students that passed and mastered STAAR by DCOL Participant Group. **The Cohort A students had a higher passing rate on 9th grade Algebra 1 STAAR EOC compared to their peers in the other groups and the comparison group. All other groups had similar passing rates.**



The ANCOVA analyses required use of the Algebra 1 scale score as the method requires a continous oucome vaiable and passng/not passing is categorical. The ANCOVA analysis results were as follows:

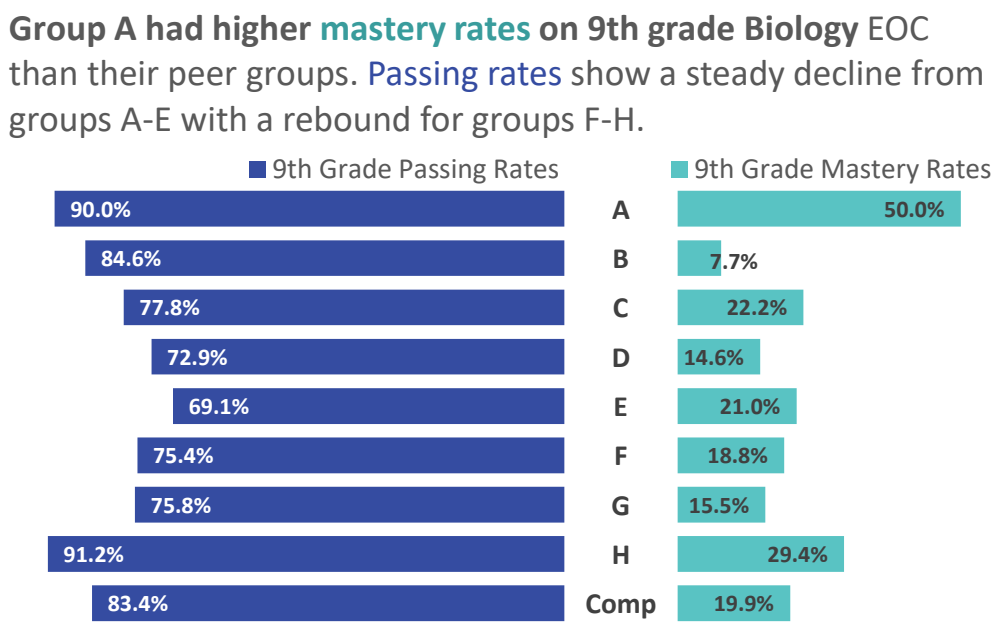
- The DCOL Participant Group factor *was not statistically significant* (p=0.789), indicating that *the groups do no differ from each other on 9th grade STAAR EOC Algebra 1 after adjusting for the effect of 6th grade course grades.*
- The covariate (6th grade GPA) was statistically significant, indicating that it explains a significant portion of variance of later STAAR EOC Algebra 1scores (p<0.001) with a small effect.

A general ANOVA (without any covariate control) was also performed to test for simple between group differences in mean scale scores. This analysis did not yield significant results (p=.06), indicating that there were not significant differences between the scales scores of any of the groups.

STAAR EOC Biology

The STAAR EOC Biology analysis examines group difference in STAAR Biology scale scores in 9th grade. 10th grade Biology scores were not analyzed because only 118 students in the DCOL treatment groups took EOC Biology in their 10th grade year, with several treatment groups having zero students (compared to 538 in the DCOL groups during the 9th grade year). The figure below describes the % of students that passed and mastered STAAR Biology by DCOL Participant Group. **With the exception of group H, which are the students with very minimal DCOL participation, there is a steady decline in passing rates from groups A to E, with a slight increase for groups F and H. Group A does have a higher passing rate than the**

comparison group. More notable is the mastery rates. Group A has a 50% mastery rate compared to 20% for the comparison group.



The ANCOVA analyses required use of the Biology scale score as the method requires a continous oucome variable and passng/not passing is categorical. The ANCOVA analysis results were as follows:

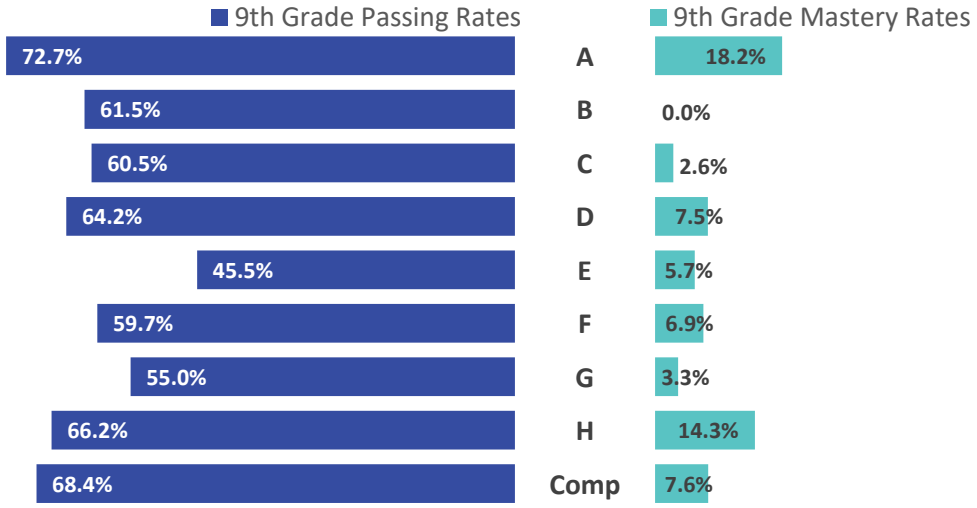
- The DCOL Participant Group factor *was not statistically significant* (p=0.06), indicating that *the groups do no differ from each other on 9th grade STAAR EOC Biology after adjusting for the effect of 6th grade course grades.*
- The covariate (6th grade GPA) was statistically significant, indicating that it explains a significant portion of variance of later STAAR EOC Biology scores (p<0.001) with a medium effect.

A general ANOVA (without any covariate control) was also performed to test for simple between group differences in mean scale scores. This analysis did yield significant results (p=.0002). However, there was only one significant between group significant difference and it was between groups G and H, with group H outscoring group G. This is likely due to high sample size in those two groups (i.e., Group A outscored group G by 539 points and Group H outscored Group G by 358 points, but the sample size for group G is 219 and Group H is 68, while the sample size for Group A is 20.)

STAAR EOC English 1

The STAAR EOC English 1 analysis examines group difference in STAAR English 1 scale scores in 9th grade. The figure below describes the % of students that passed and mastered STAAR English by DCOL Participant Group. A similar trend was observed as with Biology. **Group A had a higher passing rate than all of the other DCOL groups and the comparison group, with a steady decline then increase as groups are examined A through H. Again, more notable are the mastery rates. Group A has an 18% mastery rate compared to 8% for the comparison group.**

Group A had **higher passing rates** and **mastery rates** on **9th grade English 1 EOC.**



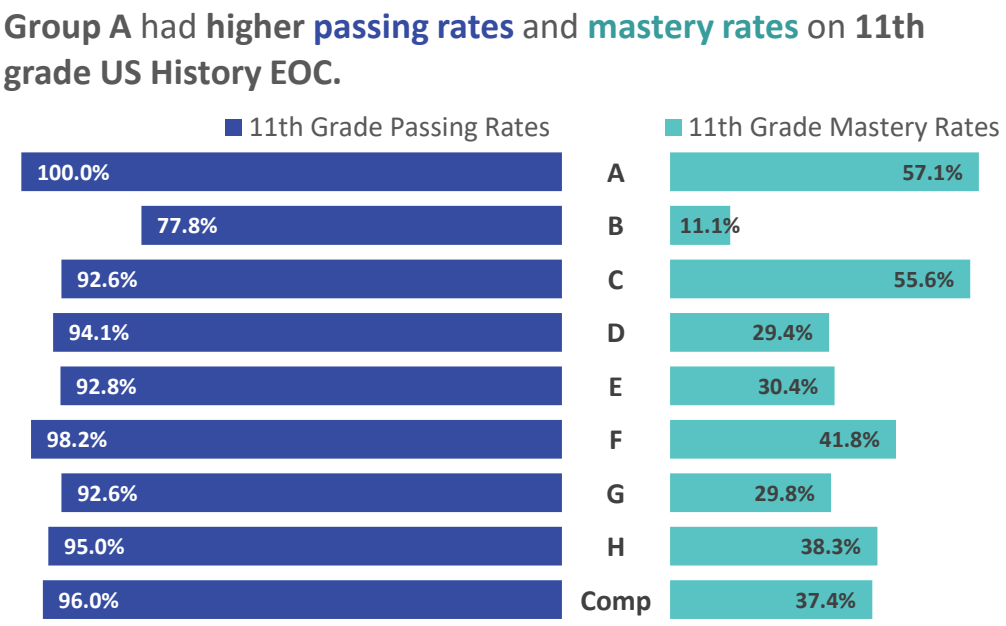
The ANCOVA analyses required use of the English1 scale score as the method requires a continous oucome variable and passng/not passing is categorical. The ANCOVA analysis results were as follows:

- The DCOL Participant Group factor *was not statistically significant* (p=0.0911), indicating that *the groups do not differ from each other on 9th grade STAAR EOC English 1 after adjusting for the effect of 6th grade course grades.*
- The covariate (6th grade GPA) was statistically significant, indicating that it explains a significant portion of variance of later STAAR EOC English 1 scores (p<0.001) with a medium effect.

A general ANOVA (without any covariate control) was also performed to test for simple between group differences in mean scale scores. This analysis did yield significant results (p<.001). However, there were only two significant between group significant difference and it was between groups E and the comparison group and Group G and the comparison group, with the comparison group scoring significantly higher on average compared to students in Groups E and G.

STAAR EOC US History

The STAAR EOC US History analysis examines group difference in STAAR US History scale scores in 11th grade. The figure below describes the % of students that passed and mastered STAAR US History by DCOL Participant Group. **Overall, passing rates on this exam were relatively high, as it typically expected with this EOC exam. Group A had higher passing and mastery rates than all of the DCOL groups and the comparison group.**



The ANCOVA analyses required use of the US History scale score as the method requires a continous oucome variable and passng/not passing is categorical. The ANCOVA analysis results were as follows:

- The DCOL Participant Group factor *was not statistically significant* (p=0.858), indicating that *the groups do not differ from each other on 11th grade STAAR EOC US History after adjusting for the effect of 6th grade course grades.*
- The covariate (6th grade GPA) was statistically significant, indicating that it explains a significant portion of variance of later STAAR EOC US History scores (p<0.001) with a medium effect.

A general ANOVA (without any covariate control) was also performed to test for simple between group differences in mean scale scores. This analysis did not yield any significant between group differences in average scale scores.

Appendix A. Development of DCOL Groups Detail

Criteria for creating categorical data that defines DCOL engagement and conversion of categories to ordinal numeric scores.

CATEGORY	VARIABLE	DEFINTION	SCORE ASSIGNED
diversity of organizations across summers	ORGDIVERSITY_NONE	no organization diversity - only attended one org	1
diversity of organizations across summers	ORGDIVERSITY_SOME	attended 2-3 different organizations	2
diversity of organizations across summers	ORGDIVERSITY_MUCH	attended 4+ organizations (max was 7)	3
diversity of programs across summers	TOTALPROGS_ONE	total number of programs was one	1
diversity of programs across summers	TOTALPROGS_FEW	total number of programs was 2-4	2
diversity of programs across summers	TOTALPROGS_SEVERAL	total number of programs was 5-9	3
diversity of programs across summers	TOTALPROGS_MANY	total number of programs was 10+	4
proportion of summers in more than one program	SUMMERS_MULTPROG_BELOWHALF	less than half of summers enrolled had just 1 program	1
proportion of summers in more than one program	SUMMERS_MULTPROG_HALFORMORE	half of or more summers enrolled had more than 1 program	2
consistency of enrollment across adjacent summers	SUMMERSCONS_NONE	enrolled no consistent summers in a row	1
consistency of enrollment across adjacent summers	SUMMERSCONS_SOME	enrolled 2-3 summers in a row	2
consistency of enrollment across adjacent summers	SUMMERSCONS_HIGH	enrolled 4 or more summers in a row	3
number of summers	SUMMERSCOUNT_6PLUS	enrolled in 6 or more summers	1
number of summers	SUMMERSCOUNT_SEVERAL	enrolled in 4 or 5 summers	2
number of summers	SUMMERSCOUNT_FEW	enrolled in 2 or 3 summers	3
number of summers	SUMMERSCOUNT_ONE	enrolled in one summer	4
total hours of programming across summers	HOURS_WELLBELOWAVG	total hours of programming was well below the group average (0-29)	1
total hours of programming across summers	HOURS_BELOWAVERAGE	total hours of programming was below the group average (30-49)	2
total hours of programming across summers	HOURS_AVERAGE	total hours of programming was within the group average (50-90)	3
total hours of programming across summers	HOURS_ABOVEAVG	total hours of programming was above the group average (91-115)	4
total hours of programming across summers	HOURS_WELLABOVEAVG	total hours of programming was well above the group average (116-200)	5
total hours of programming across summers	HOURS_EXCEPTIONAL	total hours of programming was exceptionally above the group average (201+)	6
Diversity of Program Focus	FOCUS_DIVERSITY_LITTLE	attended programs of 0-2 different types	1
Diversity of Program Focus	FOCUS_DIVERSITY_SOME	attended programs of 3-4 different types	2
Diversity of Program Focus	FOCUS_DIVERSITY_MUCH	attended programs of 5-6 different types	3
Diversity of Program Focus	FOCUS_DIVERSITY_MOST	attended programs of 7-9 different types	4

Diversity Clusters

The three diversity categories were clustered together by student. There were 19 possible clusters based on the combinations of options across the 3 sub-categories. Each cluster corresponded to a series of 3 numeric scores according to which sub-categories were included. Then, those three scores were summed into an overall score for that category and an overall grouping for that category.

CLUSTER	COUNT	FIRST	SECOND	THIRD	SUM	CAT
MUCH-MANY-HALFORMORE	44	3	4	2	9	MOST
MUCH-SEVERAL-HALFORMORE	117	3	3	2	8	MOST
SOME-MANY-HALFORMORE	56	2	4	2	8	MOST
MUCH-MANY-LESSTHANHALF	3	3	4	1	8	MOST
MUCH-FEW-HALFORMORE	29	3	2	2	7	MORE
NONE-MANY-HALFORMORE	10	1	4	2	7	MORE
SOME-SEVERAL-HALFORMORE	529	2	3	2	7	MORE
MUCH-SEVERAL-LESSTHANHALF	44	3	3	1	7	MORE
SOME-MANY-LESSTHANHALF	13	2	4	1	7	MORE
NONE-SEVERAL-HALFORMORE	141	1	3	2	6	SOME
SOME-FEW-HALFORMORE	2805	2	2	2	6	SOME
MUCH-FEW-LESSTHANHALF	8	3	2	1	6	SOME
NONE-MANY-LESSTHANHALF	23	1	4	1	6	SOME
SOME-SEVERAL-LESSTHANHALF	407	2	3	1	6	SOME
NONE-FEW-HALFORMORE	5099	1	2	2	5	SOME
NONE-SEVERAL-LESSTHANHALF	111	1	3	1	5	SOME
SOME-FEW-LESSTHANHALF	2481	2	2	1	5	SOME
NONE-FEW-LESSTHANHALF	7603	1	2	1	4	SOME
NONE-ONE-LESSTHANHALF	36355	1	1	1	3	NONE

Dosage Clusters

The three dosage categories were clustered together by student. There were 49 possible clusters based on the combinations of options across the 3 sub-categories. Each cluster corresponded to a series of 3 numeric scores according to which sub-categories were included. Then, those three scores were summed into an overall score for that category and an overall grouping for that category.

Row Labels	COUNT	FIRST	SECOND	THIRD	SUM	CAT
HIGH-SIXPLUS-EXCEPTIONAL	24	3	4	6	13	MOST
HIGH-SEVERAL-EXCEPTIONAL	54	3	3	6	12	MOST
HIGH-SIXPLUS-WELLABOVEAVG	4	3	4	5	12	MOST
SOME-SIXPLUS-EXCEPTIONAL	11	2	4	6	12	MOST
HIGH-SEVERAL-WELLABOVEAVG	23	3	3	5	11	MOST
HIGH-SIXPLUS-ABOVEAVG	1	3	4	4	11	MOST
NONE-SIXPLUS-EXCEPTIONAL	31	1	4	6	11	MOST
SOME-SEVERAL-EXCEPTIONAL	136	2	3	6	11	MOST
SOME-SIXPLUS-WELLABOVEAVG	1	2	4	5	11	MOST
HIGH-SEVERAL-ABOVEAVG	2	3	3	4	10	MORE
HIGH-SIXPLUS-AVERAGE	3	3	4	3	10	MORE
NONE-SEVERAL-EXCEPTIONAL	224	1	3	6	10	MORE
NONE-SIXPLUS-WELLABOVEAVG	8	1	4	5	10	MORE
SOME-FEW-EXCEPTIONAL	1316	2	2	6	10	MORE
SOME-SEVERAL-WELLABOVEAVG	30	2	3	5	10	MORE
HIGH-SEVERAL-AVERAGE	5	3	3	3	9	MORE
NONE-FEW-EXCEPTIONAL	1705	1	2	6	9	MORE
NONE-SEVERAL-WELLABOVEAVG	79	1	3	5	9	MORE
NONE-SIXPLUS-ABOVEAVG	3	1	4	4	9	MORE
SOME-FEW-WELLABOVEAVG	722	2	2	5	9	MORE
SOME-SEVERAL-ABOVEAVG	7	2	3	4	9	MORE
HIGH-SEVERAL-BELOWAVG	6	3	3	2	8	MORE
HIGH-SIXPLUS-WELLBELOWAVG	1	3	4	1	8	MORE
NONE-FEW-WELLABOVEAVG	2594	1	2	5	8	MORE
NONE-ONE-EXCEPTIONAL	775	1	1	6	8	MORE
NONE-SEVERAL-ABOVEAVG	23	1	3	4	8	MORE
NONE-SIXPLUS-AVERAGE	5	1	4	3	8	MORE
SOME-FEW-ABOVEAVG	241	2	2	4	8	MORE
SOME-SEVERAL-AVERAGE	9	2	3	3	8	MORE
SOME-SIXPLUS-BELOWAVG	1	2	4	2	8	MORE
HIGH-SEVERAL-WELLBELOWAVG	12	3	3	1	7	SOME
NONE-FEW-ABOVEAVG	1070	1	2	4	7	SOME
NONE-ONE-WELLABOVEAVG	5127	1	1	5	7	SOME
NONE-SEVERAL-AVERAGE	44	1	3	3	7	SOME
NONE-SIXPLUS-BELOWAVG	2	1	4	2	7	SOME
SOME-FEW-AVERAGE	1003	2	2	3	7	SOME
NONE-FEW-AVERAGE	982	1	2	3	6	SOME
NONE-ONE-ABOVEAVG	6571	1	1	4	6	SOME
NONE-SEVERAL-BELOWAVG	24	1	3	2	6	SOME
NONE-SIXPLUS-WELLBELOWAVG	11	1	4	1	6	SOME
SOME-FEW-BELOWAVG	1936	2	2	2	6	SOME
SOME-SEVERAL-WELLBELOWAVG	5	2	3	1	6	SOME
NONE-FEW-BELOWAVG	469	1	2	2	5	LITTLE
NONE-ONE-AVERAGE	9181	1	1	3	5	LITTLE
NONE-SEVERAL-WELLBELOWAVG	74	1	3	1	5	LITTLE
SOME-FEW-WELLBELOWAVG	845	2	2	1	5	LITTLE
NONE-FEW-WELLBELOWAVG	550	1	2	1	4	LITTLE
NONE-ONE-BELOWAVG	13321	1	1	2	4	LITTLE
NONE-ONE-WELLBELOWAVG	6607	1	1	1	3	LITTLE

Overall Clusters

Once each student had a cluster assignment for each of the three categories: Diversity, Dosage, Variety of Program Focus, each student was assigned a corresponding overall cluster. There were 46 possible overall clusters based on the combinations of options across the 3 categories. Each cluster corresponded to a series of 3 numeric scores according to which categories were included in that cluster. Then, those three scores were summed into an overall score for that student and an overall grouping.

CLUSTER	COUNT	DIVERSITY	DOSAGE	FOCUS	SUM	GROUP
MOST-MOST-MOST	57	4	4	4	12	A
MORE-MOST-MOST	34	3	4	4	11	A
MOST-MORE-MOST	102	4	3	4	11	A
MOST-MOST-MUCH	2	4	4	3	11	A
MORE-MORE-MOST	160	3	3	4	10	A
MORE-MOST-MUCH	16	3	4	3	10	A
MOST-MORE-MUCH	25	4	3	3	10	A
MOST-SOME-MOST	15	4	2	4	10	A
SOME-MOST-MOST	62	2	4	4	10	A
MORE-MORE-MUCH	194	3	3	3	9	B
MORE-SOME-MOST	27	3	2	4	9	B
MOST-LITTLE-MOST	4	4	1	4	9	B
MOST-MORE-SOME	4	4	3	2	9	B
MOST-SOME-MUCH	3	4	2	3	9	B
SOME-MORE-MOST	511	2	3	4	9	B
SOME-MOST-MUCH	92	2	4	3	9	B
MORE-LITTLE-MOST	24	3	1	4	8	C
MORE-MORE-SOME	56	3	3	2	8	C
MORE-SOME-MUCH	37	3	2	3	8	C
MOST-LITTLE-MUCH	3	4	1	3	8	C
MOST-SOME-SOME	5	4	2	2	8	C
SOME-MORE-MUCH	2845	2	3	3	8	C
SOME-MOST-SOME	21	2	4	2	8	C
SOME-SOME-MOST	130	2	2	4	8	C
MORE-LITTLE-MUCH	37	3	1	3	7	D
MORE-SOME-SOME	30	3	2	2	7	D
NONE-MORE-MUCH	42	1	3	3	7	D
SOME-LITTLE-MOST	190	2	1	4	7	D
SOME-MORE-SOME	2063	2	3	2	7	D
SOME-MOST-LITTLE	1	2	4	1	7	D
SOME-SOME-MUCH	1274	2	2	3	7	D
MORE-LITTLE-SOME	10	3	1	2	6	E
NONE-MORE-SOME	207	1	3	2	6	E
NONE-SOME-MUCH	108	1	2	3	6	E
SOME-LITTLE-MUCH	1332	2	1	3	6	E
SOME-MORE-LITTLE	1459	2	3	1	6	E
SOME-SOME-SOME	3631	2	2	2	6	E
NONE-LITTLE-MUCH	519	1	1	3	5	F
NONE-MORE-LITTLE	91	1	3	1	5	F
NONE-SOME-SOME	640	1	2	2	5	F
SOME-LITTLE-SOME	3691	2	1	2	5	F
SOME-SOME-LITTLE	963	2	2	1	5	F
NONE-LITTLE-SOME	14424	1	1	2	4	G
NONE-SOME-LITTLE	9924	1	2	1	4	G
SOME-LITTLE-LITTLE	413	2	1	1	4	G
NONE-LITTLE-LITTLE	10400	1	1	1	3	H

GROUP	# of students
A	473
B	835
C	3121
D	3637
E	6747
F	5904
G	24761
H	10400

FOCUS							DOSAGE
	MOST	A	A	A		MOST	
	MUCH	A	A	B			
	SOME			C			
	LITTLE			D			
	MOST	A	A	B		MORE	
	MUCH	A	B	C	D		
	SOME	B	C	D	E		
	LITTLE			E	F		
	MOST	A	B	C		SOME	
	MUCH	B	C	D	E		
	SOME	C	D	E	F		
	LITTLE			F	G		
	MOST	B	C	D		LITTLE	
	MUCH	C	D	E	F		
	SOME		E	F	G		
	LITTLE			G	H		
		MOST	MORE	SOME	NONE		
		DIVERSITY					

IMPACT in EDUCATION