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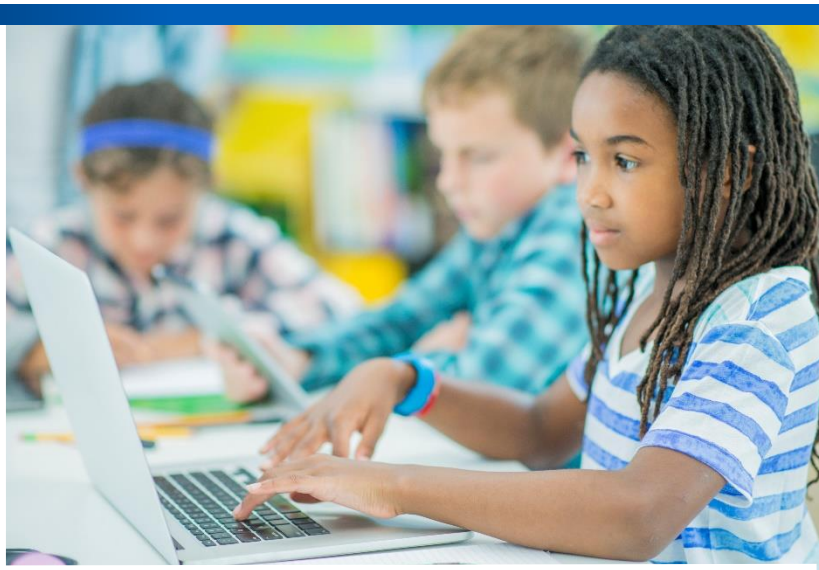
Personalizing Student Learning With Station Rotation

A Descriptive Study

JULY 2020



Acknowledgments

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Executive Summary

Personalized approaches to student learning may be one strategy to improving student learning. In a personalized learning approach, educators incorporate students' specific needs, talents, and strengths in their instruction. Personalized learning can be implemented in a variety of ways with different techniques, technological supports, and curricula. Although the research evidence about personalized learning is thin, some argue that personalizing student learning may improve student engagement and motivation, classroom management, and teacher job satisfaction and that it ultimately may lead to increased student achievement (Basham, Hall, Carter, & Stahl, 2016; Pane, 2018).

Station rotation is one approach to personalized learning. In station rotation classrooms, groups of students rotate among different types of learning modalities, such as computer-based instruction, group projects, individual tutoring, or paper-and-pencil assignments. This approach does not require large changes to the school day, schedule, or building infrastructure. Therefore, station rotation may be more feasible for some schools or districts to implement than other approaches to personalized learning that require more substantial departures from the traditional education model.

The Current Study

To learn more about station rotation, the American Institutes for Research (AIR) study team conducted a descriptive study. As part of this study, we reviewed the research literature on station rotation and personalized learning more generally and developed a theory of action that illustrates key features and hypothesized outcomes of station rotation. Building on this theory, we developed a definition of station rotation and used that to support our examination of station rotation implementation, principals' and teachers' perspectives of station rotation, and the association between station rotation and student outcomes.

We recruited five sites to participate in the study: three charter management organizations and two traditional school districts. In each participating site, we administered a teacher survey to all Grades 4–8 teachers. The survey enabled us to identify teachers who use station rotation (as defined by the study), understand aspects of implementation, and gauge teachers' perspectives of station rotation. We also conducted interviews with station rotation teachers and principals of schools using station rotation and administered a survey to students in select station rotation classrooms. Lastly, we analyzed student-level administrative data to examine student outcomes.

Results

We found that station rotation is more commonly implemented in elementary schools than in middle schools and is more commonly implemented by math teachers and teachers who teach multiple subjects compared to teachers who teach subjects other than math. When implementing station rotation, teachers often group students together with similar needs, use two or three stations, and ask students to spend 16 to 30 minutes at each station.

Compared to non-station rotation teachers, those who use station rotation reported higher levels of differentiated instruction, more availability of data to drive decision making, and a higher quality digital curriculum. Station rotation teachers also reported receiving more supports to provide personalized learning to students, while non-station rotation teachers reported more challenges.

The average cost of resources in station rotation classes was 9% more than the average cost of resources in non-station rotation classrooms. This higher average cost is attributable to station rotation teachers receiving more assistance from teaching assistants and special education teachers, spending more time on out-of-class activities, and having more instructional technology hardware and software relative to non-station rotation teachers.

Principals and station rotation teachers expressed favorable opinions about the advantages of station rotation. However, station rotation was not associated with significantly higher student achievement on standardized assessments or with increased student attendance.

Conclusion

This study highlights the promise of station rotation. Many teachers in the sites that participated in this study use some elements of station rotation in their classroom instruction, such as grouping students to work on activities and rotating them to different stations. Teachers using station rotation had positive perspectives of its efficacy as an instructional tool, and station rotation teachers reported higher levels of differentiated instruction compared to non-station rotation teachers. We did not find that station rotation was positively associated with student outcomes, although design limitations may have hampered our ability to detect significant differences in student outcomes.

Educators considering station rotation as an approach may consider some of the study highlights. The use of instructional technology in a station is a key hurdle that prevents some teachers from fully implementing station rotation, as defined by the study. Teachers also recognized that the use of station rotation can create classroom management challenges. Nonetheless, the findings from this study suggest that educators should consider station rotation as an approach to personalizing student learning given the relative ease of implementation, flexibility of the model, and positive perceptions of teachers, principals, and students who have used the model.

This study contributes to the small body of research about personalized learning and is one of the first studies to provide descriptive information about station rotation as an approach to personalizing student learning. While this study provides some descriptive evidence about the implementation of station rotation and associated outcomes, many questions remain. The field would benefit from continued research, drawing on multiple methodological approaches and research designs, to better understand the implementation and impact of station rotation as an approach to personalized learning, as well as to learn more about the key features of station rotation.

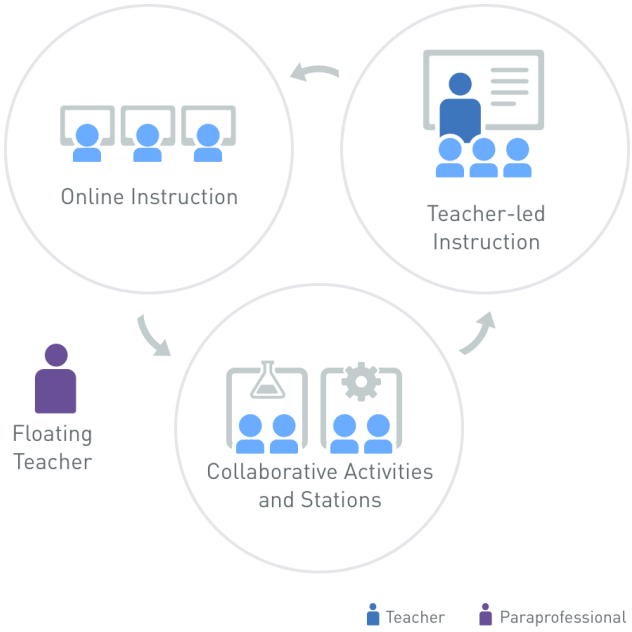
Introduction

The need for innovative and effective approaches to improving instruction for high-need students cannot be overstated. Results from the 2017 National Assessment of Educational Progress (NAEP), for example, show that students from low-income families and students of color continue to achieve at far lower rates than their fellow students and that both reading and mathematics achievement among our lowest performing fourth graders has declined in recent years (NAEP, 2018). The causes of these achievement gaps are many, and closing them requires innovative approaches to instruction that effectively help teachers who serve underperforming students implement better instruction every day.

Personalized approaches to student learning may be one strategy to improving student learning. In a personalized learning approach, educators incorporate students' specific needs, talents, and strengths in their instruction. Personalized learning can be implemented in a variety of ways with different techniques, technological supports, and curricula. Although the research evidence about personalized learning is thin, some argue that personalizing student learning may improve student engagement and motivation, ultimately leading to increased student achievement (Basham et al., 2016; Pane, 2018).

Station rotation is one approach to personalized learning. In station rotation classrooms, groups of students rotate among different types of learning modalities, such as computer-based instruction, group projects, individual tutoring, or paper-and-pencil assignments. Figure 0.1 depicts how station rotation might work in some classrooms. The approach does not require large changes to the school day, schedule, or building infrastructure. Thus, station rotation may be more feasible for some schools or districts to implement than other approaches to personalized learning that require more substantial departures from the traditional education model. Station rotation can be implemented in a single classroom or within a group of classrooms, and it is appropriate for a variety of grade levels.

Figure 0.1. Station Rotation Model



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Study Description

The American Institutes for Research (AIR) was commissioned by the Overdeck Family Foundation to conduct a descriptive study to learn more about the implementation of station rotation, the perspectives of educators and students regarding station rotation, and the effects of station rotation on student outcomes.

Using surveys of teacher and students, interviews of teachers and principals, and analysis of student-level administrative records, we examined the effects of station rotation through the following research questions (RQs):

1. How do teachers implement station rotation?
2. How does station rotation incorporate key elements of personalized learning?
3. What factors facilitate or impede the station rotation implementation?
4. What are the costs of implementing station rotation?
5. What are principals' and teachers' perspectives on station rotation?
6. To what extent are station rotation models associated with changes in student outcomes?[1]

Use of Station Rotation to Personalize Learning

We began the study with a review of the definitional and empirical research literature on personalized learning and station rotation.[2] The search did not yield any empirical research articles on station rotation. Because station rotation is one model of personalized learning, the literature review identified and described four essential elements of personalized learning (Education Elements, n.d.).[3] The results for each element are summarized as follows:

1. **Integrated digital content:** Literature suggests that it is important to integrate online and teacher-directed content and instruction to support school improvement (Murphy et al., 2014).
2. **Targeted and differentiated instruction:** Differentiated instruction and content that meets the needs of students may lead to increased learning. Differentiated and targeted instruction should be grounded in a standards-based curriculum.
3. **Student reflection and ownership:** Students with greater control and flexibility about where and when they learn can promote ownership and reflection on their learning, which may lead to improved student engagement.

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[1] RQ 6 originally comprised two separate questions about changes in student behavioral and affective outcomes, and student learning outcomes. We combined these separate questions into one RQ to encompass all student outcomes.

[2] The literature review included only those publications considered to be research articles as defined by the following criteria: Must be a study or literature review of existing studies that includes a student-level academic outcome, must use a quantitative research design, involves students in Grades 3–8, was published in 2008 or later, was written in English, and is in a peer reviewed publication.

[3] The four essential elements are included in the key components of personalized learning identified by Culatta and Fairchild (n.d.). In addition, the four essential elements are captured in definitions of personalized learning that have been proposed by some other groups, including the U.S. Department of Education, the Nellie Mae Education Foundation, the International Association for K–12 Online Learning, and the Bill & Melinda Gates Foundation.

4. **Data-driven decisions:** Formative assessments and other data on student learning help determine whether students have mastered learning standards and competencies before moving on to the next topic.

The absence of literature specific to station rotation also revealed the need for more research on station rotation (Pane, 2018). One key element missing in the literature is a commonly agreed-upon definition of the term *station rotation*. As such, it was necessary for us to define station rotation for the purposes of this descriptive study.

Using the literature review, other descriptive reports on station rotation, and conversations with subject-matter experts, we developed both a definition of *station rotation* for this study and a theory of action that explains how station rotation, as a form of personalized learning, can influence student and teacher outcomes.

We established six criteria to define *station rotation*:

- The class must be split into groups;
- Students must rotate through two or more stations during a class period;
- Station rotation must be done at least twice a week;
- At least one station must incorporate the use of digital instruction;
- Each rotation must last at least 10 minutes; and
- Stations and rotations must be within a single classroom under the same teacher.

Our theory of action incorporates the four essential elements of personalized learning (mentioned above) that must be in place. Specifically, there must be appropriate technological equipment; curriculum-aligned, digital learning materials that give students greater control; formative assessment data; and training to help teaching staff use these resources. These inputs are the foundation for a station rotation model, which is intended to drive positive outcomes. Short-term outcomes associated with station rotation include increased differentiated instruction that drives improved learning of content and skills. Mid-term outcomes include more motivated and engaged students, increased teacher satisfaction, and improved classroom management. The long-term outcomes of a successful station rotation model include an increase in student achievement and teacher retention, and a decrease in student behavioral problems. (The full theory of action is presented in Appendix A.)

Data and Methodology

As part of this study, we recruited five sites to participate: three charter management organizations and two traditional school districts. Education Elements, or others who work with schools, identified the sites as using station rotation during the 2018–19 school year. In each participating site, we administered a teacher survey to all Grades 4–8 teachers. The survey enabled us to identify teachers who use station rotation, understand aspects of implementation, and gauge teachers' perspectives of station rotation. We received 615 responses to the teacher survey (a response rate of 49%).

Using respondents' answers on the survey, we classified teachers as *station rotation teachers*, *partial station rotation teachers*, or *non-station rotation teachers*.[4] All six station rotation criteria listed above had to be met for a teacher or classroom to be classified as fully using station rotation for the purposes of this study. We identified 107 station rotation teachers (17% of teacher survey respondents). We also identified 152 partial implementers (25% of respondents) who indicated that they split their class into groups and students rotated through two or more stations, but who did not meet some of the additional criteria.[5] The remaining 493 teachers indicated that they did not split their class into groups or did not rotate groups through stations; we categorized these teachers as non-station rotation teachers.

Of the teachers identified as using station rotation, we interviewed 23 teachers and five principals to further understand aspects of station rotation implementation. In addition, we administered a student survey in 11 classrooms (seven of which were station rotation classrooms) from seven schools in three sites. A total of 261 students completed the survey. The student survey provided information on students' perspectives about differentiation of learning in their classes and their general perspectives about learning.

Finally, we collected administrative student achievement data for elementary and middle school students in math and English language arts (ELA) for the 2017–18 and 2018–19 school years from four sites. The data enabled us to analyze the association between the use of station rotation and student achievement. More details on the study data and methodology are provided in Appendix B.

Structure of the Report

In the remainder of this report, we first describe findings that address each RQ. Then we discuss implications for policymakers and practitioners. Finally, we outline the limitations of this study and ideas for future research. In presenting the results, we include comparisons only between station rotation and non-station rotation teachers. Additionally, the figures provided in the main report do not include more technical aspects, such as confidence intervals or statistical significance tests. We present additional figures and tables of findings relevant to the RQs in Appendix C. These additional figures and tables include results for partial implementers and an indication of statistical significance where appropriate.

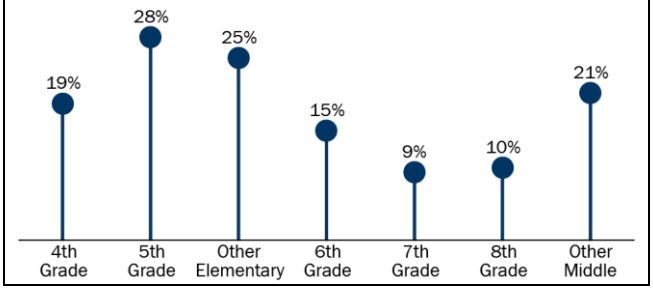
[4] Because we defined station rotation for the purposes of creating comparison groups of teachers for this descriptive study post hoc, teachers did not necessarily know they were doing station rotation. In this study, station rotation was not a clearly defined intervention that teachers opt into or not; rather, teachers implemented the features of station rotation (either fully or partially), which we then used to group teachers for analytical purposes.

[5] For the most part, the criterion not met by partial implementers was the use the of digital instruction.

RQ 1: How do teachers implement station rotation?

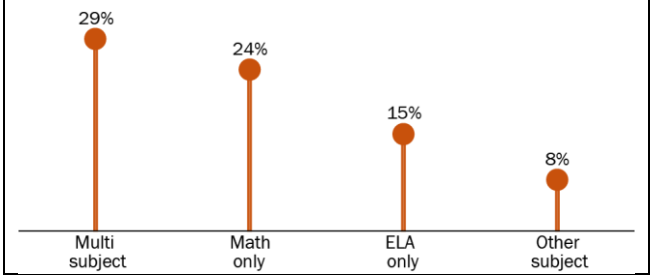
Station rotation was more commonly implemented in elementary grades compared to middle grades (Figure 1.1). While 19% of fourth-grade teachers, 28% of fifth-grade teachers, and 25% of other elementary teachers (who did not teach fourth or fifth grade or who taught multiple elementary grades) used station rotation, only 15% of sixth-grade, 9% of seventh-grade, and 10% of eighth-grade teachers used station rotation. (Other middle school teachers taught multiple middle school grades.)

Figure 1.1. Percentage of Teachers Using Station Rotation, by School Level



Multisubject and math teachers were more likely to report using station rotation compared to ELA teachers and those who taught other single subjects (e.g., science, social studies) (Figure 1.2). About 29% of teachers who taught multiple subjects and 24% of math teachers reported using station rotation. Only 15% of ELA teachers and 8% of other subject teachers used station rotation.

Figure 1.2. Percentage of Teachers Using Station Rotation, by Subject



The majority of station rotation teachers reported splitting their classes into groups for station rotation at least four times a week (Figure 1.3). Almost 40% of station rotation teachers indicated that they typically use station rotation five times a week. Station rotation teachers typically provided two or three stations for students to rotate through during station rotation lessons (Figure 1.4), with station rotations lasting 15 to 30 minutes.

When placing students into groups, more than 75% of station rotation teachers indicated that they group students with similar learning needs (known as *homogenous grouping*).

Figure 1.3. Percentage of Station Rotation Teachers, by Number of Times Station Rotation Is Used per Week

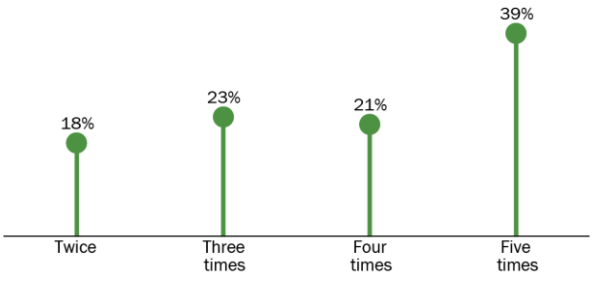
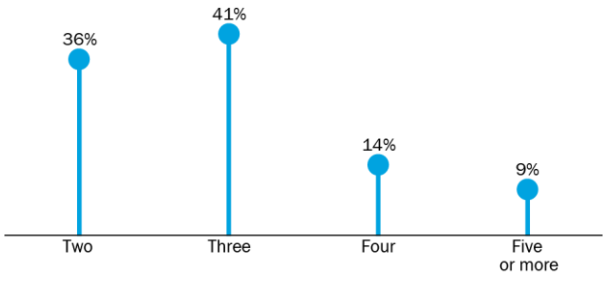


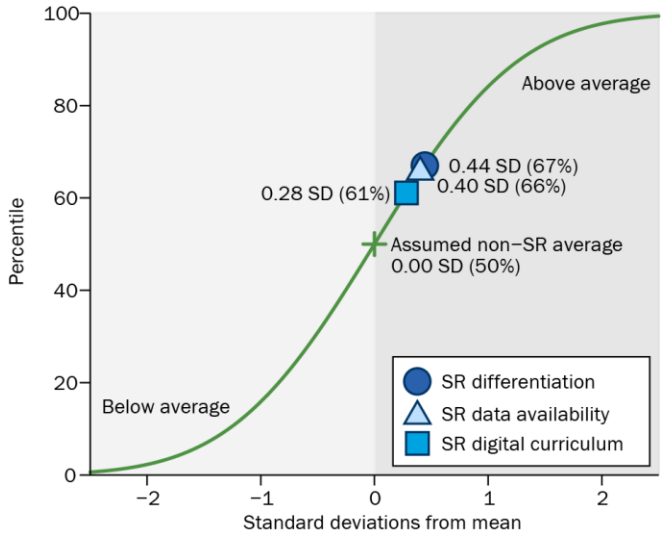
Figure 1.4. Percentage of Station Rotation Teachers, by Number of Stations Typically Available to Students



RQ 2: How does station rotation incorporate key elements of personalized learning?

Station rotation teachers' level of reported use of differentiated instruction was higher than that of non-station rotation teachers (by 0.44 standard deviations, or SDs). Assuming non-station rotation teachers represent average levels of differentiation (50th percentile), station rotation teachers, collectively, were at the 67th percentile (Figure 2.1).

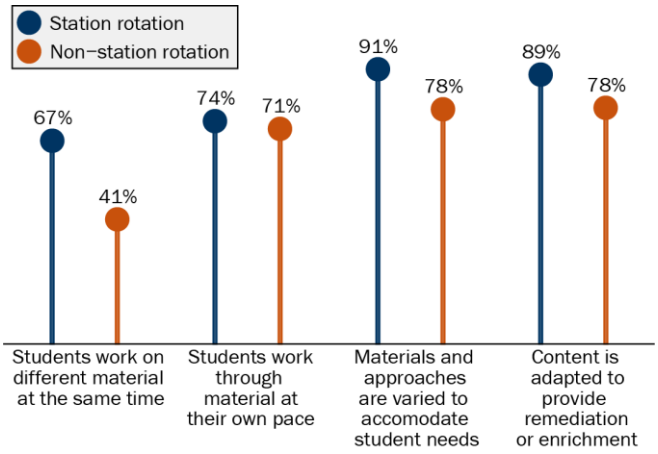
Figure 2.1. Personalized Learning Levels of Station Rotation Teachers Relative to Non-Station Rotation Teachers



Note. SR = station rotation.

Station rotation teachers also reported having more data available to guide differentiation of instruction (by 0.40 SDs) and a higher quality digital curriculum (by 0.28 SDs), putting station rotation teachers at the 66th and 61st percentiles, respectively, on these measures (Figure 2.1). Descriptions of how we calculated scores for differentiation, data availability, and curriculum quality are in Appendix B.

Figure 2.2. Percentage of Teachers Who Reported Using Various Types of Differentiation to a Moderate or Large Extent



Compared to non-station rotation teachers, station rotation teachers more frequently reported that they had different students work on different topics or skills at the same time, used a variety of materials and instructional approaches to accommodate student needs, and adapted content to provide remediation or enrichment activities based on student needs (Figure 2.2).

Station rotation teachers indicated that they used a variety of digital curriculum products to facilitate personalized learning. Thirty-six different technology platforms were mentioned by at least two teachers. The five most commonly used platforms were Zearn, IXL, Lexia, i-Ready, and ST Math.

> ***"I think [station rotation is] one of the biggest tools I use because it definitely allows me to have students focus on one particular topic or type of question or skill. Even if they're not working with me, I'll have them work on something at their station, and [it] allows me to switch it up, or change things as needed. [It is] probably one of my most used tools in differentiation." — Station Rotation Teacher***

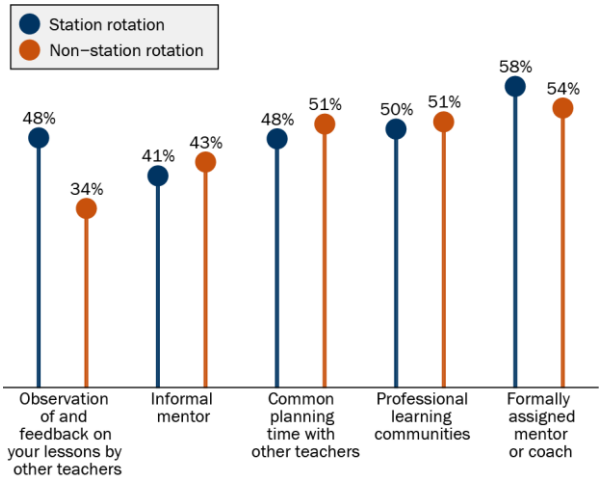
RQ 3: What factors facilitate or impede station rotation implementation?

Station rotation teachers were more likely than non-station rotation teachers to report having supports (such as observation and feedback by other teachers and formally assigned mentors or coaches) that help improve their capacity to implement station rotation and other personalized learning strategies (Figure 3.1). The support for station rotation most commonly cited by teachers and principals during interviews was mentoring or feedback from a coach.

When asked on the teacher survey about challenges to providing personalized learning in the classroom, station rotation teachers were less likely than non-station rotation teachers (35% vs. 52%) to identify class size as a challenge. Station rotation teachers were also less likely to say that lack of a high-quality technology platform was a challenge compared to non-station rotation teachers (24% vs. 37%).

In interviews, teachers and principals identified factors that impede teachers' ability to implement station rotation. Teachers discussed the lack of instructional skills needed for station rotation, such as classroom management and clear routines and the amount of preparation required for a class or lesson. Teachers also cited a lack of curricular resources suitable for station rotation. Further, teachers shared that keeping students on task and engaged during station rotation can be challenging, particularly for teachers without additional staff support. Among the challenges with implementing station rotation, principals identified the need for more implementation time, issues with technology, and the station rotation model sometimes leaving students independent for too long.

Figure 3.1. Percentage of Teachers Who Received Helpful Support for Personalized Learning From the Following Sources



> *"My coach told me about [station rotation], showed me it, and then observed me while I did the rotations and set it up, and then gave me feedback. For my first year, [my coach] did that a couple of times. Then my second year, I was able to set it up myself. Then third, and fourth, and then subsequent years, I was able to [run it] myself and keeping that same system going every subsequent year."*
>
> *— Station Rotation Teacher*

> *"I think sometimes, depending on the makeup of the class, it definitely can be a struggle with classroom management. If I'm stationary with a small group, the rest of the kids know that, and so depending on the student, there have been times where behaviors definitely flare up and that can be a challenge."*
>
> *— Station Rotation Teacher*

RQ 4: What are the costs of implementing station rotation?

The yearly average cost per pupil in non-station rotation classrooms was approximately $5,665. This is close to national estimates of instructional spending per pupil (Cornman, Zhou, Howell, & Young, 2018). The yearly cost per pupil in station rotation classrooms was $6,190 - $525, or 9.3% higher than the average per-pupil cost in non-station rotation classrooms (Figure 4.1).

Station rotation teachers, compared to non-station rotation teachers, reported receiving more hours of help from special education teachers and teaching assistants. On average, station rotation teachers reported receiving approximately 3 additional hours of help from teaching assistants and 2 additional hours of help per week from special education teachers compared to non-station rotation teachers. The reported additional hours of help from these two staff types amounted to added costs of $141 and $100, respectively, per student per year (Figure 4.2).

Station rotation teachers also reported spending more time outside of class developing curriculum and assessment materials, providing additional help to students, planning lessons, collaborating with other teachers, and grading. Collectively, these outside-of-class activities represent an additional cost of $236 per student in station rotation classes relative to non-station rotation classes.

Lastly, station rotation teachers reported having more access to computers and digital curriculum products. The cost of computers, software, and subscriptions represents an additional cost of $30 per student in station rotation classes relative to non-station rotation classes.

Figure 4.1. Cost per Pupil for Non-Station Rotation and Station Rotation Classrooms

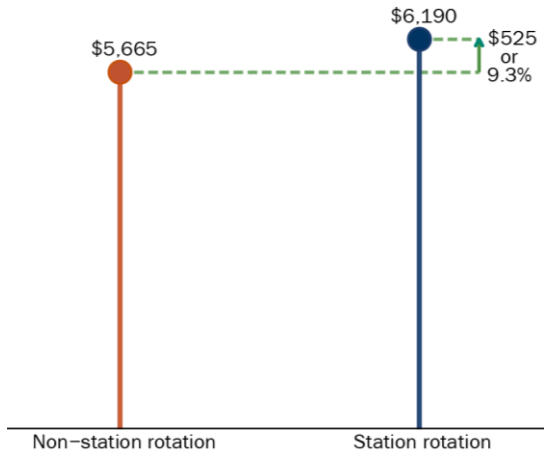
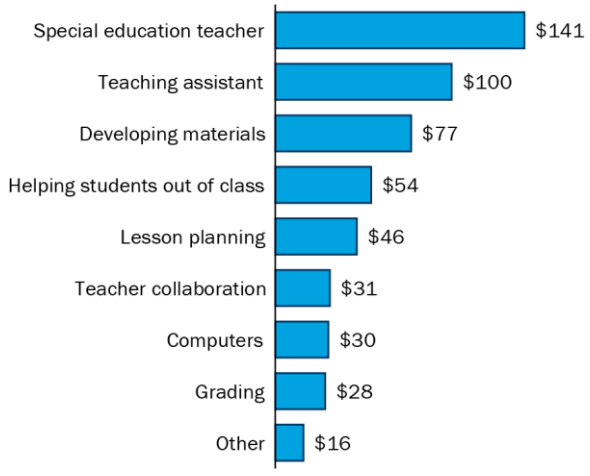


Figure 4.2. Average Yearly per Pupil Cost Difference Between Station Rotation and Non-Station Rotation Classes

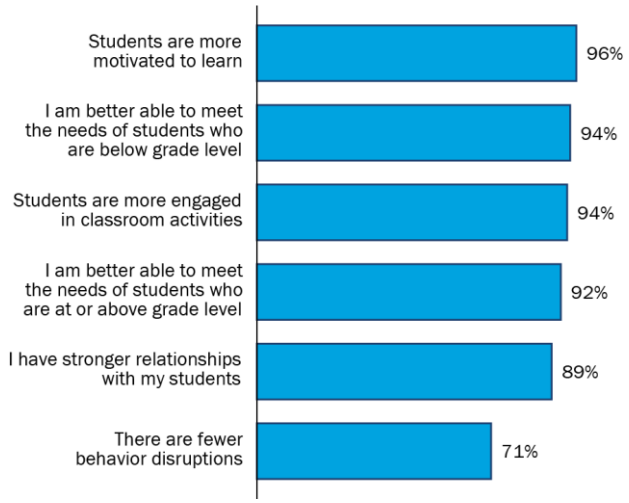


"I have a co-teacher . . . [who] manages those students through the stations, monitoring those that are working on the computer independently, making sure they're on-task. And then also she's usually stationed at that independent workstation so that she can field any questions or just make sure students are staying on task and that they are able to complete the assignment." — Station Rotation Teacher

RQ 5: What are principals' and teachers' perspectives on station rotation?

Among the station rotation teachers whom the we surveyed, a large majority believed that as a result of using station rotation, students were more motivated to learn (96%) and were more engaged in classroom activities (94%). The teachers also felt that they were better able to meet the needs of students below and above grade level (94% and 92%, respectively) and to develop stronger relationships with students (89%) (Figure 5.1). In the interviews, school leaders shared their belief that station rotation improved teachers' abilities to differentiate instruction and improved student outcomes.

Figure 5.1. Percentage of Station Rotation Teachers Who Responded Favorably About Station Rotation

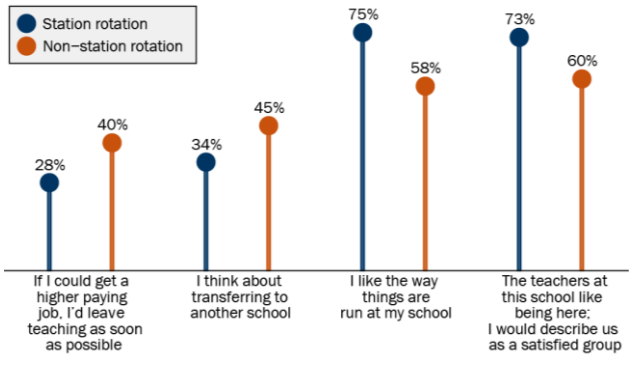


"When students enter our school in fifth grade, eight out of 10 are below grade level. . . . And because of that gap, we really felt that we needed to meet students at their individual needs. . . . [The] station rotation model allowed us to operationalize flex grouping." — Principal

About 71% of station rotation teachers indicated that the use of station rotation leads to fewer behavioral disruptions (Figure 5.1). However, a number of interviewed teachers identified classroom management as a challenge associated with station rotation. The percentage of teachers who indicated that station rotation leads to fewer behavioral disruptions is also far lower than the percentage of responses to any of the other survey items asking about teacher perceptions of station rotation.

On the survey, station rotation teachers also reported increased job satisfaction relative to non-station rotation teachers. For example, 75% of station rotation teachers reported that they like the way things are run at their school compared to 58% of non-station rotation teachers (Figure 5.2). During the interviews, teachers shared positive impacts of station rotation on their working conditions, such as improved classroom management, decreased stress levels, improved attitudes toward teaching, more variety in providing instruction, and opportunities to reflect with coteachers.

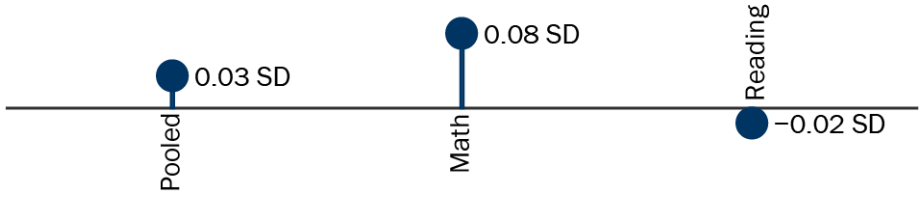
Figure 5.2. Percentage of Teachers Who Agree or Strongly Agree With Statements Relating to Job Satisfaction



RQ 6: To what extent are station rotation models associated with changes in student outcomes?

Despite the positive perspectives of teachers, the use of station rotation is not associated with significantly higher student achievement on standardized assessments. The average difference in achievement between students in station rotation and non-station rotation classes is small (0.03 SDs) and statistically nonsignificant. Differences by subject and grade level (elementary or middle school) are also small and nonsignificant (Figure 6.1).

Figure 6.1. Student Achievement in Station Rotation Classes Relative to Non-Station Rotation Classes



Similarly, attendance rates are not significantly different between students who had a station rotation teacher for math or English language arts and those who did not have a station rotation teacher for either subject. This is perhaps a function of universally high attendance rates among students in our study; regardless of whether students had a station rotation teacher or not, average attendance rates are around 96.7% (Figure 6.2).

Students in station rotation classes generally reported positive views of learning on a student survey. For example, 78% of students indicated that they liked the way they learn in their class, and 71% indicated that learning is enjoyable in their class (Figure 6.3).

Figure 6.2. Average Attendance Rates For Students Who Had and Did Not Have a Math or English Teacher Who Used Station Rotation

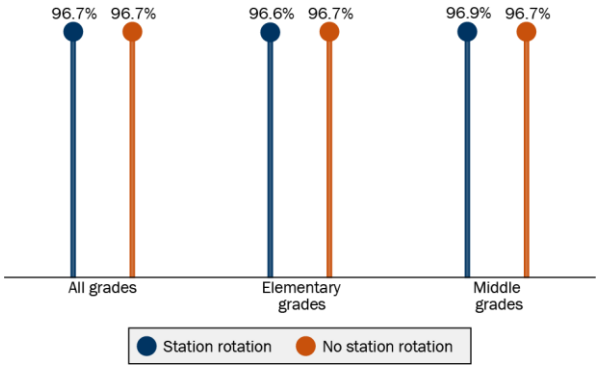
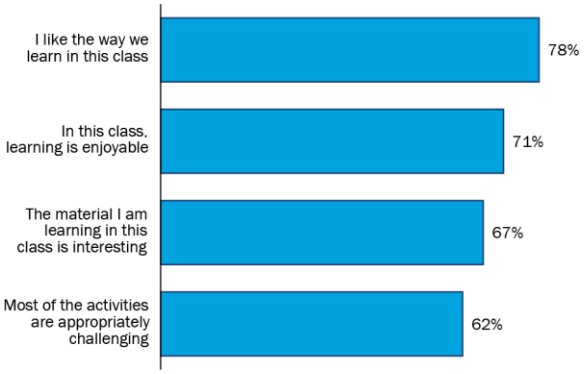


Figure 6.3. Percentage of Students Who Indicated That The Statements About Classroom Learning Were Mostly True or Very True



Discussion

This study compared teacher instructional practices, instructional costs, and student outcomes between station rotation teachers and teachers who did not implement station rotation.

We found that station rotation is more commonly implemented in elementary schools than in middle schools and is more commonly implemented by math teachers and teachers who teach multiple subjects than by teachers who teach subjects other than math and single subjects. When implementing station rotation, teachers often group together students with similar needs, use two or three stations, and ask students to spend 16 to 30 minutes working on the instructional material at each station.

Compared to non-station rotation teachers, those who use station rotation reported higher levels of differentiated instruction, more availability of data to drive decision making, and a higher quality digital curriculum. Station rotation teachers also reported receiving more supports to provide personalized learning to students, while non-station rotation teachers reported more challenges in providing personalized learning to students.

The average cost of resources in station rotation classes was 9% more than the average cost of resources in non-station rotation classrooms. This higher average cost is attributable to station rotation teachers receiving more assistance from teaching assistants and special education teachers, spending more time on out-of-class activities, and having more instructional technology hardware and software relative to non-station rotation teachers.

Principals and station rotation teachers expressed favorable opinions about the advantages of station rotation. However, station rotation was not associated with significantly higher student achievement on standardized assessments or with increased student attendance.

In addition to these findings that address the study's research questions, we discovered that teachers frequently decide to use the station rotation model independently of any district- or school-led initiatives. Teachers may implement station rotation to address the differing needs of their students or to implement a certain curriculum. Rarely did we observe teachers implementing station rotation because of district or school leadership requirements to use station rotation in their classroom. This is consistent with the notion that station rotation implementation does not require large changes to the school day, schedule, or building infrastructure.

Implications for Policy and Practice

Many teachers use some elements of station rotation in their classroom instruction, such as grouping students to work on activities and rotating them to different stations. This study highlights some key considerations for educators considering full station rotation implementation, defined as students rotating in groups through two or more stations for at least ten minutes each at least twice a week, with at minimum one station using digital learning. The use of instructional technology in a station is a key hurdle prohibiting some teachers from fully implementing station rotation. Teachers not only need access to this instructional technology but also need support on how best to implement digital learning.

To successfully manage the process of rotating students among different stations, it is essential that teachers have strong classroom management skills and clear routines for students. Teachers who use

station rotation often have additional staff support, which can be helpful when implementing station rotation but is not a necessity. In order to group students in a way that facilitates personalized learning, teachers need access to data to make effective decisions regarding instructional content and groups that will best meet students' needs.

District and school leaders may be interested in adopting station rotation as a strategy to support personalized learning and differentiated instruction in their schools. To support successful implementation, policymakers should consider providing resources such as access to technology, curriculum resources that are aligned to this approach, and professional development or coaching focused on station rotation. Although we estimate that station rotation requires a financial investment of approximately $525 per student, implementation of station rotation can begin in a single classroom or grade, because it does not require changes to a school's schedule or building structure.

Limitations of the Current Study and Possibilities for Future Research

This study included a convenience sample of sites that had some teachers who had implemented station rotation. Although the we undertook measures to account for both observed and unobserved differences between station rotation and non-station rotation teachers, the study design does not allow for strong causal inference. We can identify associations and relationships between the use of station rotation and various aspects of implementation and outcomes, but we cannot strongly assert that the use of station rotation led to any differences in classroom practices or student outcomes.

For example, station rotation teachers reported receiving more help from teaching assistants and special education teachers relative to non-station rotation teachers. However, it is not clear from our study design whether teachers received these extra staff supports explicitly to support station rotation implementation or whether having extra staff enables teachers to implement station rotation. Or perhaps, teachers who have extra support staff have differing class needs. For example, they might have more special education students or students who need remediation.

The study also relied on self-report survey data to identify station rotation, partial implementers, and non-station rotation teachers. By using the observed variation in teaching practices, we had the advantage of learning how teachers are naturally coordinating station rotation in their classrooms. This means, however, that there is a great deal of variation in how teachers implement station rotation. This variation likely dampened our ability to detect any significant differences between station rotation and non-station rotation teachers with respect to student outcomes.

Researchers should consider these limitations when designing future studies. For example, a stronger study design might randomly assign teachers or schools to implement station rotation and receive coaching or training on how to use the required technology to implement this instructional model with fidelity. Random assignment would support stronger causal inference while training on how to do station rotation may support more consistent implementation.

While a randomized controlled trial is the gold standard of research, this type of study is also quite expensive and can be difficult to implement, especially in the absence of a clear station rotation treatment. However, there is much we could learn about station rotation with additional financial resources, without going so far as doing a randomized controlled trial. For example, our current student

sample included only five sites, and the majority of participants were from charter operators. During our recruitment, several large, traditional public school districts expressed initial interest but did not follow through with a commitment to participating in the study. Having a larger pool of participants could have helped improve our ability to detect differences between station rotation and non-station rotation teachers. Furthermore, we had particularly small samples for the student survey, which limited our ability to understand student experiences with respect to station rotation. In addition, future studies could do more to help us understand station rotation implementation and student engagement in station rotation classrooms by including classroom observations.

In one of the first studies on the topic, this work highlights some of the promise of station rotation. Educators using station rotation had positive perspectives of its efficacy as an instructional tool, and station rotation teachers reported higher levels of differentiated instruction compared to non-station rotation teachers. This study also provides foundational information about station rotation, from which future research on implementation and impact can build. Although there is still more to learn about station rotation, educators should consider station rotation as an approach to personalizing student learning given the relative ease of implementation, flexibility of the model, and positive perceptions of teachers, principals, and students who have used the model.

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Appendix A: Theory of Action

Theory of Action: Station Rotation as a Mechanism for Personalized Student Learning

Inputs

- Standards-aligned curriculum
- Teacher training
- Equipment to use technology (e.g., laptops, tablets)
- Technology platform aligned to curriculum that provides formative assessment data
- Formative assessment data and student progress reports
- Flexible learning environments that allow for frequent changes to groups, modes, and content
- Maturity of model

Actions

- At least two stations, one of which uses an online platform
- Stations last at least 10 minutes
- Students rotate through at least two stations during each class period
- SR used at least two times a week
- Use formative assessment data to group students
- Self-contained model
- Fixed or adaptive schedule

Outputs

- Number and types of stations
- Duration of SR stations
- Frequency of SR lessons/week
- Method of grouping students
- Number of adults in room during SR lessons
- Formative assessment data*
- Platform user analytic data*

Short-Term Outcomes

- Instruction aligned to standards*
- Differentiated instruction*
- Instruction aligned to student needs*
- Students progress to new content/skills after demonstrating learning*

Long-Term Outcomes

- Engaged students
- Motivated students
- Classroom management improves*
- Teachers satisfied with job

Impact

- Increase in student achievement
- Decrease in student behavioral problems
- Increase in teacher retention*

Structural Supports: Supportive leadership, school/district culture that supports self-directed learning, ongoing job-embedded PD for teachers, ongoing IT support

* Denotes components of the theory that will be asked about on the survey but not analyzed as outputs and outcomes in Phase 1 of this study.

Notes. The station rotation flowchart graphic is reprinted with permission from the Clayton Christensen Institute © 2020.

Appendix B: Methodology Details and Limitations

Characteristics of Included Sites

Table B.1 shows the characteristics and student demographics of the five sites participating in the study. Two of the five sites—Geneva City School District and Franklin McKinley School District—are traditional school districts, and three of the sites—Aspire, IDEA, and KIPP Chicago—are charter management organizations (CMOs).

Table B.1. Site Characteristics

Site	State	Locale	Hispanic	Black	White	Asian or Asian/ Pacific Islander	Two or More Races	FRL
Geneva City (District)	NY	Town	28%	13%	47%	2%	10%	60%
Franklin McKinley (District)	CA	Urban	63%	2%	1%	33%	1%	71%
Aspire (CMO)	CA	Urban / Suburban	74%	10%	6%	4%	6%	81%
IDEA (CMO)	TX	Urban / Suburban	52%	13%	28%	4%	2%	–
KIPP Chicago (CMO)	IL	Urban	5%	95%	0%	0%	1%	96%

Notes. Based on the 2016–17 Common Core of Data. Because not all teachers responded to the survey, student demographic characteristics presented here will differ from the demographic characteristics for the student survey sample. All sites reported 0% for American Indian/Alaska Native students and Hawaiian Native/Pacific Islander students. FRL = free or reduced-price lunch. FRL information for IDEA is not publicly available.

The sites included in the study are geographically diverse and serve students who are racially diverse. The sites tend to serve more economically disadvantaged students than the nationwide average. In each of the four sites for which the we obtained FRL information, at least 60% of students were FRL eligible, compared to a nationwide average of 52% in 2016–17 (Snyder, de Brey, & Dillow, 2019). Table B.2 presents the number of schools, by site, in the sample.

Table B.2. Number of Schools, by Site

Site	Number of Schools
Geneva City (District)	2
Franklin McKinley (District)	2
Aspire (CMO)	35
IDEA (CMO)	78
KIPP Chicago (CMO)	2

Survey and Interview Sample Descriptions

We sent the teacher survey to all Grades 4–8 teachers in participating sites (*N* = 1,256). In total, 615 teachers (49%) responded.[6] Table B.3 presents the percentage and number of teachers who responded to the survey by site type (district or CMO), site, and grade level. The overall response rate varied from a low of 21% in Geneva City to a high of 71% in Franklin-McKinley, with balanced response rates across district and CMO sites and by grade level. By grade level, there was good representation from both elementary and middle school teachers, with 195 completed surveys from elementary schools, 341 from middle schools, and 79 from K–8 schools.

Table B.3. Teacher Survey Response Rate

Category	Response Rate (N)
Site Type	
District	47% (34)
CMO	49% (581)
Site	
Geneva City (District)	21% (7)
Franklin-McKinley (District)	71% (27)
Aspire (CMO)	52% (94)
IDEA (CMO)	48% (469)
KIPP Chicago (CMO)	58% (18)
Grade Level	
Elementary (K–5)	51% (195)
Middle (6–8)	47% (341)
K–8	53% (79)
Total	
Total	49% (615)

Notes. The response rate percentage represents the number of completed surveys divided by the total number of surveys sent.

Of the teachers who completed the survey, we identified 17% as fully implementing station rotation. To qualify as fully implementing station rotation and to be considered a "station rotation teacher" for the study, the teacher must have met the six criteria for rotation implementation developed for this study, as defined in the report introduction.

We also used the survey responses to identify teachers who implemented aspects of station rotation but did not fulfill all the station rotation criteria. These "partial implementers" indicated that they split their class into groups at least twice a week and that the groups rotate through stations, but they did not use

[6] Surveys were considered complete if the respondent answered all questions necessary to identify whether a teacher implemented station rotation and if there was evidence of progression through at least half of the survey.

online learning software, and/or stations lasted less than 10 minutes. Of teachers who completed the survey, we identified 25% as partial implementers.

The percentage of station rotation teachers ranged from 12% in IDEA schools to 48% in Franklin-McKinley. Teacher responses from traditional districts make up 5% of completed surveys (34/615), and 15% of station rotation teachers (16/107) are from districts. The remaining completed surveys and station rotation teachers are from CMOs, with the most responses from IDEA teachers (469/615). Table B.4 presents the percentage and number of teachers by their station rotation implementation, site type, site, and grade level.

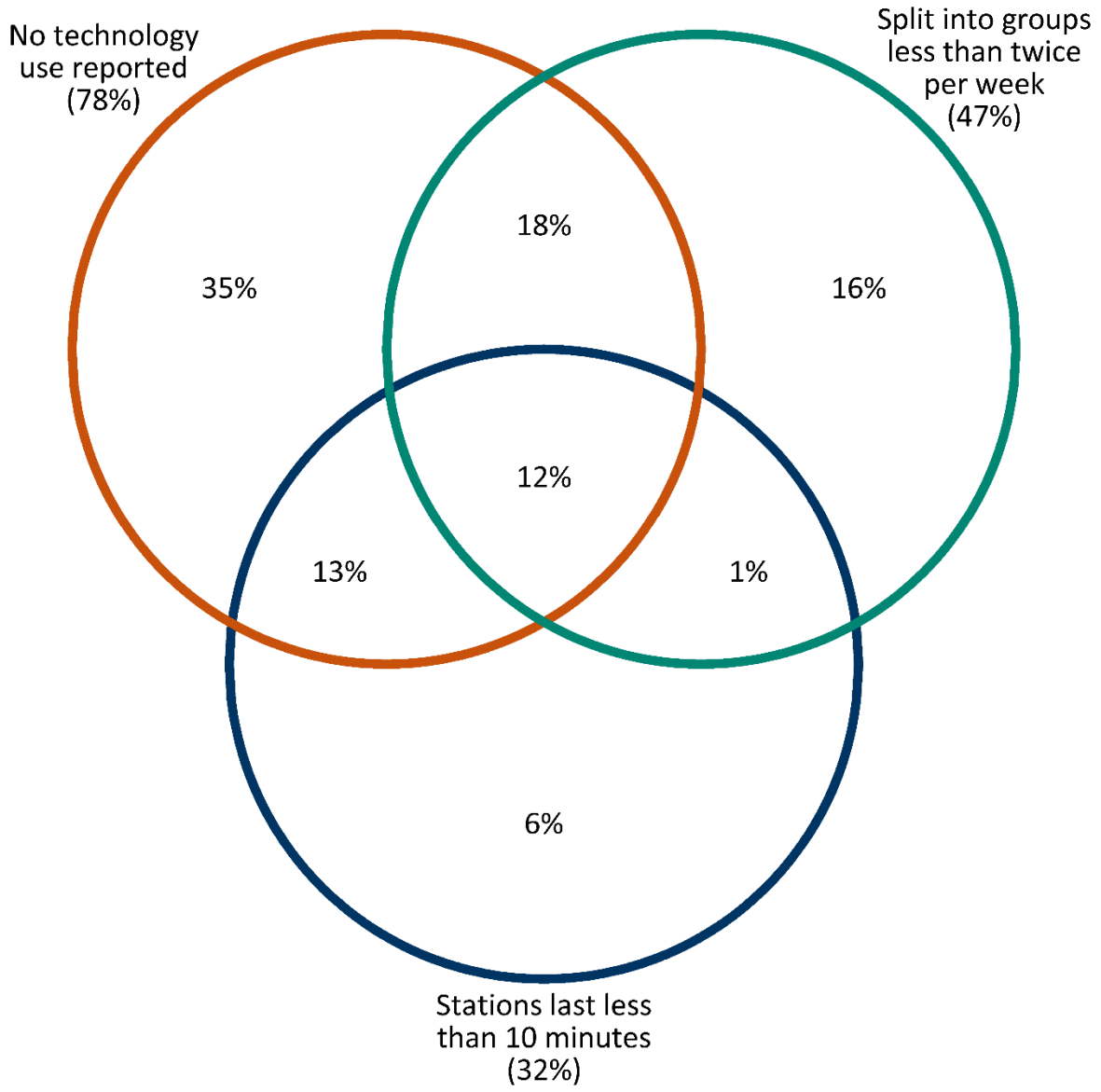
Table B.4. Percentage of Teachers Implementing Station Rotation

Category	Station Rotation Teachers (N)	Partial Implementation Teachers (N)	Non-Station Rotation Teachers (N)
Site Type			
District	47% (16)	12% (4)	41% (14)
CMO	17% (99)	24% (140)	59% (342)
Site			
Geneva City (District)	43% (3)	14% (1)	43% (3)
Franklin-McKinley (District)	48% (13)	11% (3)	41% (11)
Aspire (CMO)	42% (39)	19% (18)	39% (37)
IDEA (CMO)	12% (56)	26% (120)	63% (293)
KIPP Chicago (CMO)	22% (4)	11% (2)	67% (12)
Grade Level			
Elementary (K–5)	27% (52)	21% (40)	53% (103)
Middle (6–8)	10% (33)	27% (92)	63% (216)
K–8	38% (30)	15% (12)	47% (37)
Total			
Total	19% (115)	23% (144)	58% (356)

Notes. The percentages of station rotation teachers and partial implementation teachers represent the number of teachers in those categories divided by the number of completed teacher survey responses.

We also examined the reasons for which partial implementers did not meet the definition of station rotation used in the study (Figure B.1). Of partial implementers, 78% did not use instructional technology as part of station rotation, 47% indicated that they split into groups less than twice per week, and 32% indicated that stations typically last less than 10 minutes.

Figure B.1. Reasons Partial Implementers Did Not Meet Station Rotation Definition



Using the results from the survey to identify station rotation teachers, we invited those teachers and their principals to participate in interviews. Twenty-three station rotation teachers and principals with station rotation teachers from five schools agreed to be interviewed (as shown in Table B.5).

In addition, we invited station rotation teachers to administer a student survey. A total of 261 students completed the survey in three sites and seven schools.[7] This sample of students represented 11 different teachers: seven station rotation teachers (164 students), two partial station rotation teachers (40 students), and two non-station rotation teachers (57 students). The analysis of the student survey focused only on the students of the seven station rotation teachers.

[7] Student surveys were administered in IDEA, KIPP Chicago, and Franklin-McKinley at two elementary schools, two middle schools, and three K–8 schools.

Table B.5. Interview Participants

CMO/District	Number of Station Rotation Teachers	Number of Principals
Geneva	0**	0**
Franklin-McKinley	4	3
Aspire	7	0*
IDEA	10	1
KIPP Chicago	2	1
Total	**23**	**5**

*Aspire did not allow principal interviews.
**Geneva teachers and principals were invited to be interviewed but declined to participate.

Teacher Survey and Cost Analytical Approach

We used a statistical modeling approach for the analysis of the teacher survey and cost data. More specifically, we used multiple regression to control for factors that could lead to different responses in station rotation and non-station rotation teachers—factors that are not directly related to the use of station rotation. For example, if more experienced teachers are more likely to use station rotation, then it may be years of experience, rather than the use of station rotation, that is influencing teacher survey responses. The modeling approach enables us to account for these confounding factors to better identify the role of station rotation.

In addition to teacher experience, the factors that we controlled for in the regression models analyzing teacher survey responses and costs included the study site (district or CMO), the school level (elementary, middle, or K–8), and the subject taught (mathematics, English, other, or multiple subjects).

Analyses of teacher survey data also included survey weights to account for potential nonresponse bias across schools. Survey weights for respondents were constructed as the inverse probability of responding by school. For example, if eight teachers were sampled in a school and two teachers responded, the probability of responding in the school is 0.25 and the inverse of the probability is 4.0. Therefore, the two respondents in that school each received a weight of 4.0. After weighting, the sum of weights across responding teachers equals the total number of teachers sampled.

Several alternative approaches to modeling were considered, including the balancing of covariates through the generation of analytical weights and matching. Both of these approaches rely on having station rotation and non-station rotation teachers with similar characteristics within study sites. So, for example, if there were an elementary school math station rotation teacher with 5 years of experience in a given site, there would need to be an elementary school math non-station rotation teacher with approximately similar experience in the same site. Given the small number of teacher survey respondents in certain sites, matching or generating analytical weights did not seem feasible for all study sites.

However, we did compare the modeling approach to matching and the use of analytical weights in IDEA, which was the site with the most survey respondents. Using these alternative approaches, we examined teacher perceptions of the key elements of station rotation and found that the three different approaches

generated similar results. Thus, we were confident that the modeling approach did not produce results that were less valid that alternative approaches. The modeling approach also has the advantage of using all survey respondents. Both the matching approach and the development of analytical weights requires dropping survey respondents for whom there is not an appropriate match.

Generating Factor Scores

For the teacher survey, we engaged in a data reduction process known as *factor analysis* to combine answers across multiple items relating to a given construct into a single measure. We did this for five constructs on the teacher survey: support, job satisfaction, differentiated instruction, digital curriculum quality, and data availability. For each construct, the measures generated indicate each teacher's distance (in standard deviations) above or below the average teacher in the survey sample. Table B.6 includes the items used in the generation of factor scores for each construct. We also list the reliability coefficient (alpha) beside each construct.

Table B.6. Survey Items Used to Generate Factor Scores for Each Construct and Reliability Coefficients of the Collection of Items Used for Each Construct

Differentiation (Reliability coefficient = 0.86):
Item 26 stem: This year, to what extent have you used student achievement/mastery data for each of the following purposes?
Tailoring the pace of instruction to individual students' needs
Tailoring the content of instruction to individual students' needs
Developing recommendations for tutoring or other educational support services for particular students
Assigning or reassigning students to groups within my class(es)
Identifying topics requiring more or less emphasis in instruction
Item 27 stem: Please indicate the extent to which you engage in each of the following practices related to curriculum or instruction.
I adapt course content to meet students' needs by providing additional assignments, resources, and activities for remediation or enrichment.
I provide a variety of materials or instructional approaches to accommodate individual needs and interests.
I give students a chance to work through instructional material at a faster or slower pace than other students in the class.
Data Availability (Reliability coefficient = 0.86):
Item 24 stem: How frequently do you receive the following types of information about performance of your students?
Information about students' performance on specific concepts or skills
Identification of specific students who need extra assistance
Identification of specific students who have achieved mastery
Non-achievement outcomes (for example, student behavior, attitudes, or motivation)
Item 25 stem: Please indicate your level of agreement with each of the following statements.

I have access to high-quality assessment data that help me adapt the pace or content of instruction to meet students' needs.
Our schools' data system provides real-time data that is actionable.
Our school's data system provides information at a level of detail that helps me inform my instruction (e.g., breakdowns for specific skills or topics)
I can use the school's data system to easily produce the views or reports I need.
Digital Curriculum Quality (Reliability coefficient = 0.94):
Item 28 stem: I have adequate access to technology-based curriculum materials that…
… are of high quality.
… address the learning needs of all of my students.
… are easy for me to use in the classroom.
… support anytime/anywhere learning by being accessible at other times and in other places.
… aligns to non-technology-based curriculum materials
Support (Reliability coefficient = 0.73):
Item 15 stem: Please indicate whether, in the current school year, you received each of the following kinds of supports specifically about personalized learning, and the extent to which you found each support helpful for improving your capacity to personalize learning.
Formally assigned mentor or coach
Informal mentor
Release time to observe other teachers
Observation of and feedback on your lessons by other teachers
Common planning time (formally or informally) with other teachers
Access to professional learning communities where you can discuss concerns or engage in instructional planning with other teachers
Job Satisfaction (Reliability coefficient = 0.79):
Item 30 stem: Please indicate your level of agreement with the following statements.
The stress and disappointments involved in teaching at this school aren't really worth it
The teachers at this school like being here, I would describe us as a satisfied group
I like the way things are run at my school
If I could get a higher paying job, I'd leave teaching as soon as possible
I think about transferring to another school

Estimating Costs

Before we compared costs across different types of classrooms, we first had to estimate costs. To do so, we applied national average prices to the types and quantities of resources specified in the teacher survey using a resource cost model. The result was an estimated yearly cost for each teacher across all classes of a given teacher. We then assumed an average class size of 25 students. To calculate an average cost per student, we divided the cost per teacher by 25.

Analytical Approach for Student Outcomes

We took a statistical modeling approach to examine the association between the use of station rotation and student outcomes. To examine math and English Language Arts (ELA) achievement, we used a multilevel model wherein students are nested within teachers, then nested within schools, which are nested within site regions.[8] The model incorporated teacher and school random effects, and region fixed effects. Our model included prior-year test scores, indicators of student race, English learner status, special education status, and grade as student-level variables; and teacher experience as a teacher-level variable. The main variable of interest was the teacher-level station rotation indicator, which identified whether a teacher was a station rotation teacher, a partial implementer, or a non-station rotation teacher. The model is specified as follows:

$$Score_{itsr} = \beta_0 + \beta_1 PreScore_{itsr} + \sum_{j=1}^{6} \beta_{1+j} RaceEth_{jitsr} + \sum_{g=1}^{5} \beta_{7+g} Grade_{gitsr} + \beta_{13} ELL_{itsr}$$
$$+ \beta_{14} SPED_{itsr} + \sum_{a=1}^{5} \beta_{14+a} TchExp_{atsr} + \sum_{b=1}^{3} \beta_{19+b} SR_{bstr} + \gamma_t + \delta_s + \partial_r + \varepsilon$$

where $Score_{itsr}$ is the test score for student *i* of teacher *t* of school s and region *r*; $PreScore_{itsr}$ is the prior year's test score for the same student; $RaceEth_{jitsr}$ is an indicator for whether a student is in race/ethnicity category *j*; $Grade_{gitsr}$ is an indicator for whether a student is in grade category g; ELL_{itsr} is an indicator of ELL status; $SPED_{itsr}$ is an indicator of special education status; $TchExp_{aitsr}$ is an indicator for whether a teacher of a given student is in teacher experience category *a*; SR_{bstr} is an indicator of whether the teacher of a given student is in the station rotation category *b*; γ_t is a teacher-level random intercept; δ_s is a school-level random intercept; ∂_r is a region fixed effect where regions are groups of schools within a given site; and ε is the residual error term.

We ran a pooled model incorporating both math and ELA outcomes and ran separate models for math and ELA. The pooled model across subjects also included an indicator variable that identified whether the subject was math or ELA. Because individual students can be represented more than once in the pooled model (once for math and once for ELA), we also included a student-level random intercept. We ran models across all grades and separately for elementary grades (fourth and fifth grades) and middle grades (sixth, seventh, and eighth grades). Table B.7 shows the average characteristics of students in the

[8] Because our sample includes several large charter school operators, which operate charter schools in several different metropolitan areas within states, we included regions as more narrowly defined clusters of schools that are in the same general geographic area. For example, Aspire schools operates charter schools across California. Aspire regions include Los Angeles, the San Francisco Bay Area, and Central Valley. Both Aspire and IDEA included region definitions in the data provided to us.

student outcome analysis sample. Table B.8 shows the number of observations and clusters for the pooled model and subject-specific models.

Table B.7. Average Characteristics of the Student Outcome Analysis Sample

	Pooled Model			Math			ELA		
Variable	**All**	**Non-SR**	**SR**	**All**	**Non-SR**	**SR**	**All**	**Non-SR**	**SR**
Pre Score	0.07	0.06	0.05	0.05	0.05	0.05	0.09	0.08	0.06
Race/Ethnicity									
White	1.9%	1.3%	3.6%	1.5%	0.6%	3.3%	2.3%	2.1%	4.0%
Black	8.7%	9.8%	7.7%	10.6%	11.3%	9.5%	6.8%	8.3%	4.5%
Hispanic	84.0%	84.6%	79.7%	82.9%	84.8%	78.6%	85.0%	84.4%	81.7%
Asian	3.1%	2.1%	6.1%	2.8%	1.5%	5.5%	3.3%	2.7%	7.0%
ELL	23.3%	24.6%	24.5%	24.5%	25.0%	25.8%	22.3%	24.1%	22.2%
Special education	4.0%	3.4%	5.2%	3.9%	2.9%	5.2%	4.0%	3.9%	5.1%
Grade									
4	23.8%	23.0%	35.6%	25.4%	21.8%	32.8%	22.2%	24.2%	40.3%
5	24.4%	21.4%	37.2%	31.1%	27.8%	38.6%	17.9%	15.1%	34.9%
6	16.4%	17.1%	9.4%	15.4%	15.6%	13.5%	17.3%	18.5%	2.6%
7	18.9%	21.6%	10.1%	15.9%	19.4%	6.2%	21.7%	23.7%	16.7%
8	16.6%	17.0%	7.7%	12.2%	15.4%	8.9%	20.9%	18.5%	5.6%
Teacher Experience									
Missing	23.8%	31.4%	12.2%	21.8%	25.0%	15.7%	25.6%	37.7%	6.3%
0 to 1 years	5.6%	6.1%	4.4%	4.0%	7.0%	1.0%	7.1%	5.3%	10.3%
2 to 3 years	23.9%	22.9%	16.2%	19.9%	26.0%	13.2%	27.7%	19.9%	21.4%
4 to 6 years	23.7%	20.8%	38.6%	25.3%	18.7%	37.9%	22.1%	22.8%	39.8%
7 or more years	23.0%	18.8%	28.6%	28.9%	23.3%	32.2%	17.4%	14.3%	22.3%
N	12,942	6,991	3,508	6,278	3,509	2,109	6,664	3,482	1,399

Because different sites used different tests with different scales, and because scores at different grade levels have different interpretations, student achievement scale scores were standardized within site, grade, and school year for both math and ELA. Therefore, a standardized score of 0 meant that the student performed at the average performance level within the site and grade attended by the student.

Table B.8. Number of Observations and Clusters for Student Achievement Models

	Pooled Model	Math	ELA
Number of student-by-subject observations (N)	12,942	6,278	6,664

	Pooled Model	Math	ELA
Number of student clusters	11,785	–	–
Number of teacher clusters	202	121	129
Number of school clusters	87	70	71
Number of region clusters	9	9	9

Notes. In the pooled model, there are 11,785 unique students out of the 12,942 student-by-subject observations. This means that 10,628 students (90% of the unique students) are represented only once in the pooled model, while the remaining 1,157 (10% of the unique students) are represented twice. The schools included in the study represented 10 total regions. One of the regions consisted of a single school. This school did not provide data on prior student achievement and is therefore not represented in the analysis of student achievement.

To examine the effect of having a math or ELA teacher who used station rotation on attendance, we created a station rotation indicator that was 1 if a student had either a math or English teacher who used station rotation and was 0 if neither math nor English teacher used station rotation. We then used a multilevel model where students were nested within schools and regions by including school random effects and region fixed effects. The attendance model included students' prior attendance rates, student race, English learner status, special education status, and grade as student level covariates. We ran a model for all grades and then ran separate models for elementary and middle grades. Table B.9 shows the number of observations and clusters for the models examining student attendance as an outcome.

Table B.9. Number of Observations and Clusters for Student Attendance Models

	All Grades	Elementary	Middle
Number of students (*N*)	6,978	3,087	3,891
Number of school clusters	86	50	43
Number of region clusters	10	9	10

Notes. The schools included in the study represented 10 total regions. One of the regions consisted of a single middle school and therefore is not reflected in the elementary school analysis.

Appendix C: Additional Results by Research Question

Note: All results in this appendix are from the teacher survey.

RQ 1: How do teachers implement station rotation?

Table C.1. Time Typically Spent on Each Activity Before Moving to Another Station

Time	Station Rotation Teachers
Less than 10 minutes	0%
10–15 minutes	32%
16–30 minutes	55%
More than 30 minutes	13%

Table C.2. Frequency of Changing Groups' Composition Based on Students' Progress

	Station Rotation Teachers
Daily or almost daily	3%
About weekly	32%
Once or twice a month	35%
A few times a year	21%
Never; students remain in the same groups for the entire school year	9%

Table C.3. Percentage of Groups Typically Comprising Similar Versus Different Learning Needs

	SR
Similar learning needs (homogeneous)	76%
Different learning needs (non-homogeneous)	24%

Table C.4. Types of Learning Materials With Which Students Engage When Split Into Groups

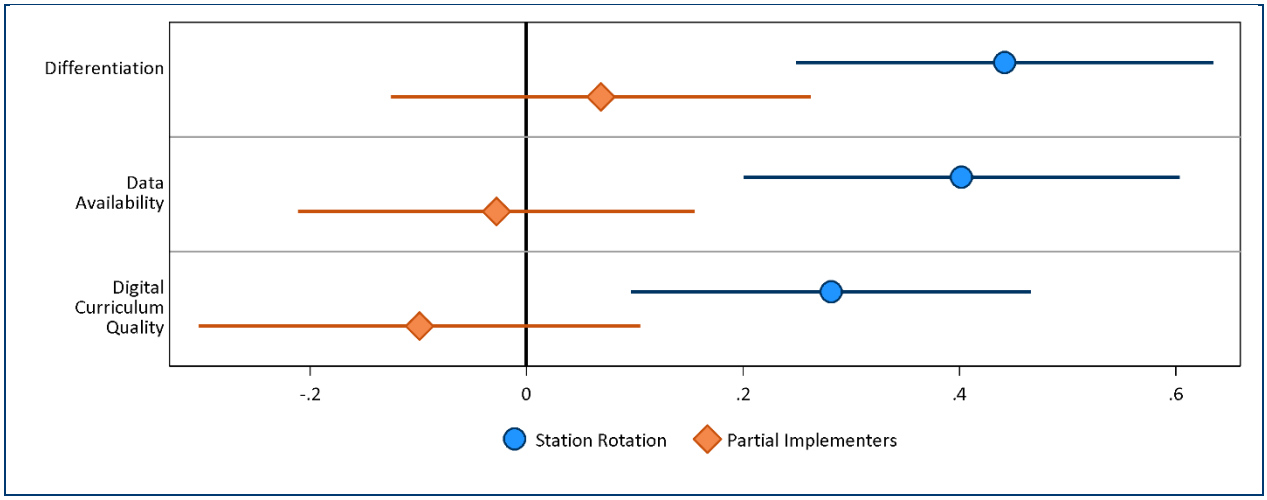
	Station Rotation Teachers
Grade-level (only)	37%
Remedial (only)	14%
Extension (only)	5%
Varied (including grade-level, remedial, and extension materials)	44%

Table C.5. Grades That Teachers Reported Using Station Rotation

Grade	Percentage
4th grade	34%
5th grade	38%
6th grade	24%
7th grade	15%
8th grade	13%
Our school does not use grade levels.	5%

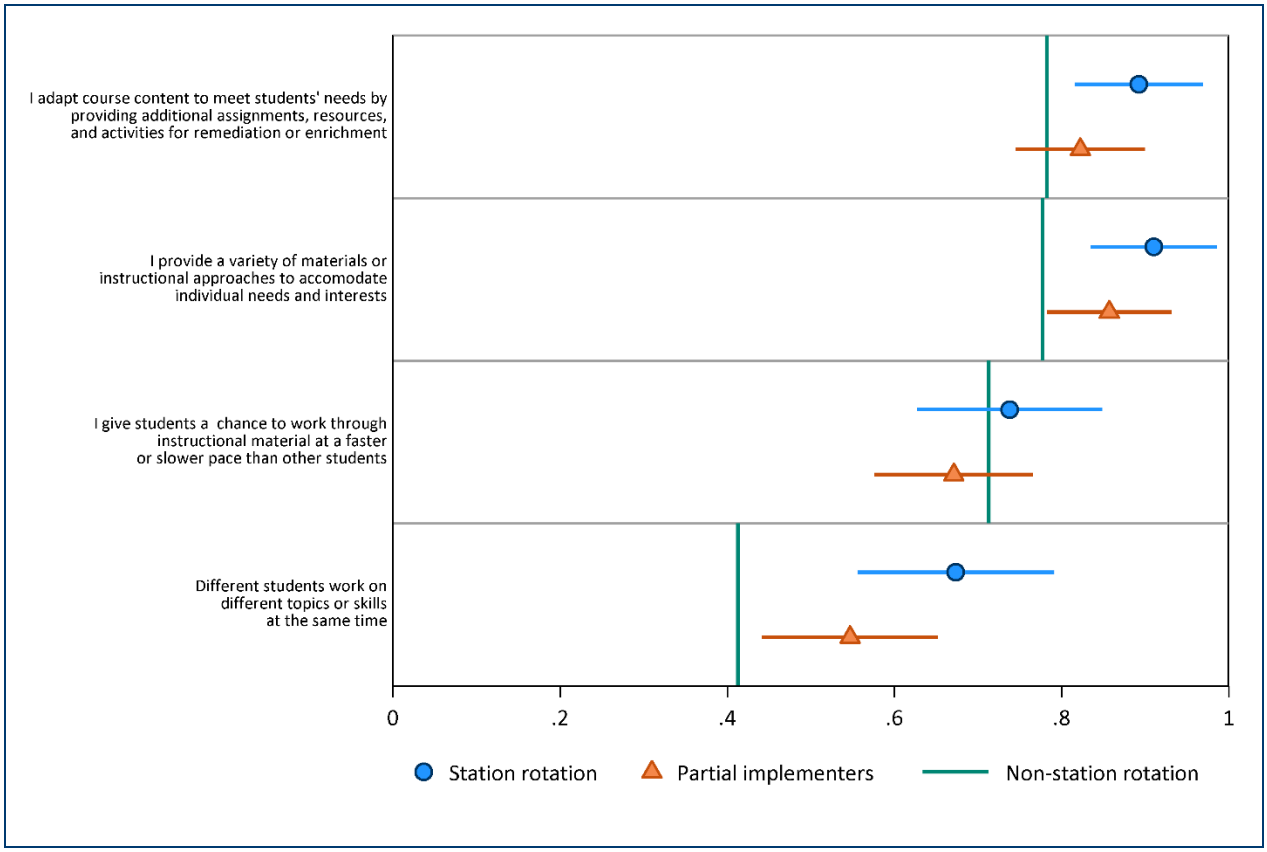
RQ 2: How does station rotation incorporate elements of personalized learning?

Figure C.1. Differences Between Station Rotation Teachers, Partial Implementers, and Non-Station Rotation Teachers Across Key Elements



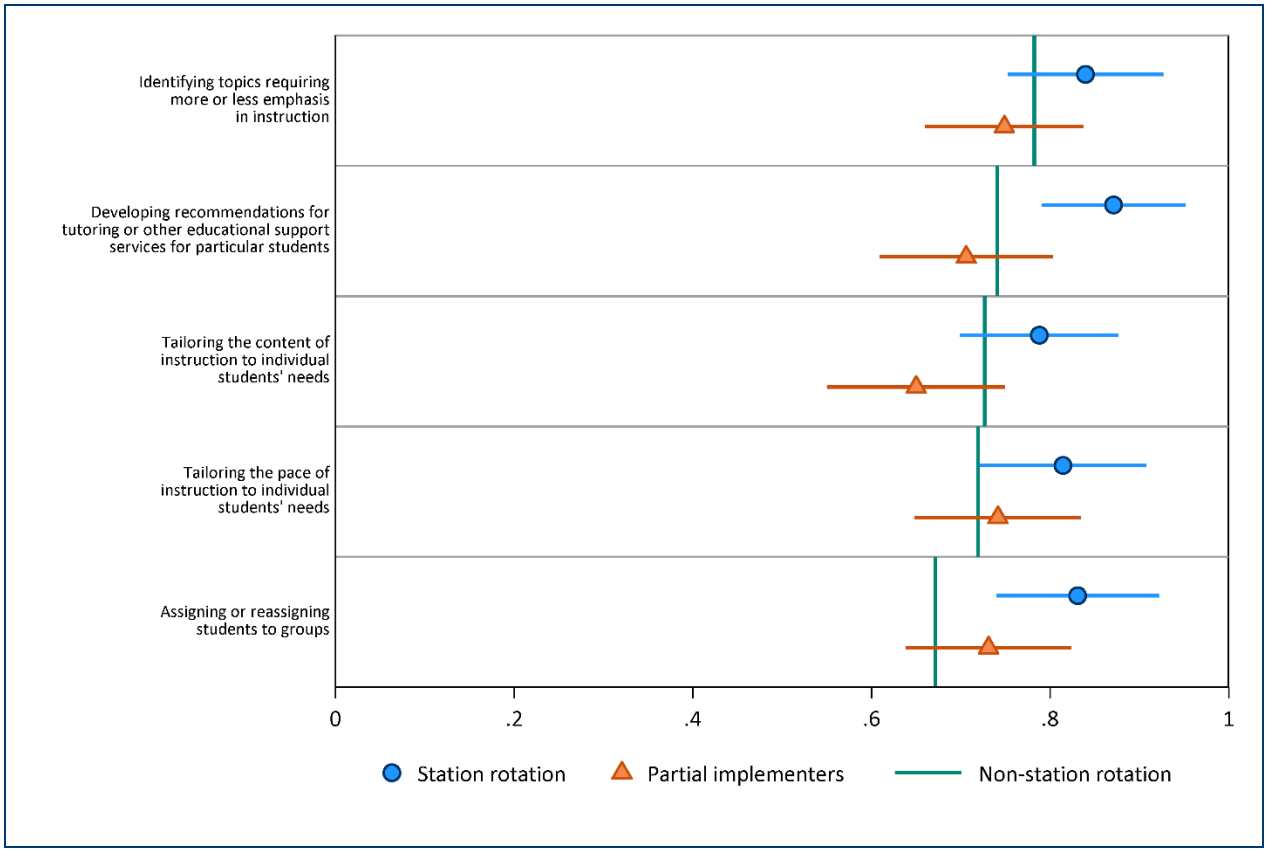
Notes. Differences are measured in standard deviations. The zero line represents no difference from non-station rotation teachers. Horizontal lines around the point estimates for station rotation teachers and partial implementers are 95% confidence intervals.

Figure C.2. Proportion of Teachers Who Indicated They Engaged in the Following Practices Related to Differentiated Instruction (To a Moderate or Great Extent)



Notes. The vertical green line represents the point estimate of the proportion of non-station rotation teachers who indicated that they engaged in each practice a moderate or great extent. The circle and triangle represent the point estimates for station rotation teachers and partial implementers, respectively. The horizontal lines through the station rotation teacher and partial implementer point estimates represent the 95% confidence interval around the difference from non-station rotation teachers. If the 95% confidence interval does not cross over the non-station rotation teacher point estimate, the difference is statistically significant.

Figure C.3. Proportion of Teachers Who Indicated They Used Student Achievement/Mastery Data For Each of the Following Purposes Related to Differentiation of Instruction (Used to a Moderate or Large Extent)



Notes. The vertical green line represents the point estimate of the proportion of non-station rotation teachers who indicated that they used student achievement or mastery data for each purpose to a moderate or large extent. The circle and triangle represent the point estimates for station rotation teachers and partial implementers, respectively. The horizontal lines through the station rotation teacher and partial implementer point estimates represent the 95% confidence interval around the difference from non-station rotation teachers. If the 95% confidence interval does not cross over the non-station rotation teacher point estimate, the difference is statistically significant.

Figure C.4. Students' Perceptions of Differentiated Learning in Station Rotation Classes

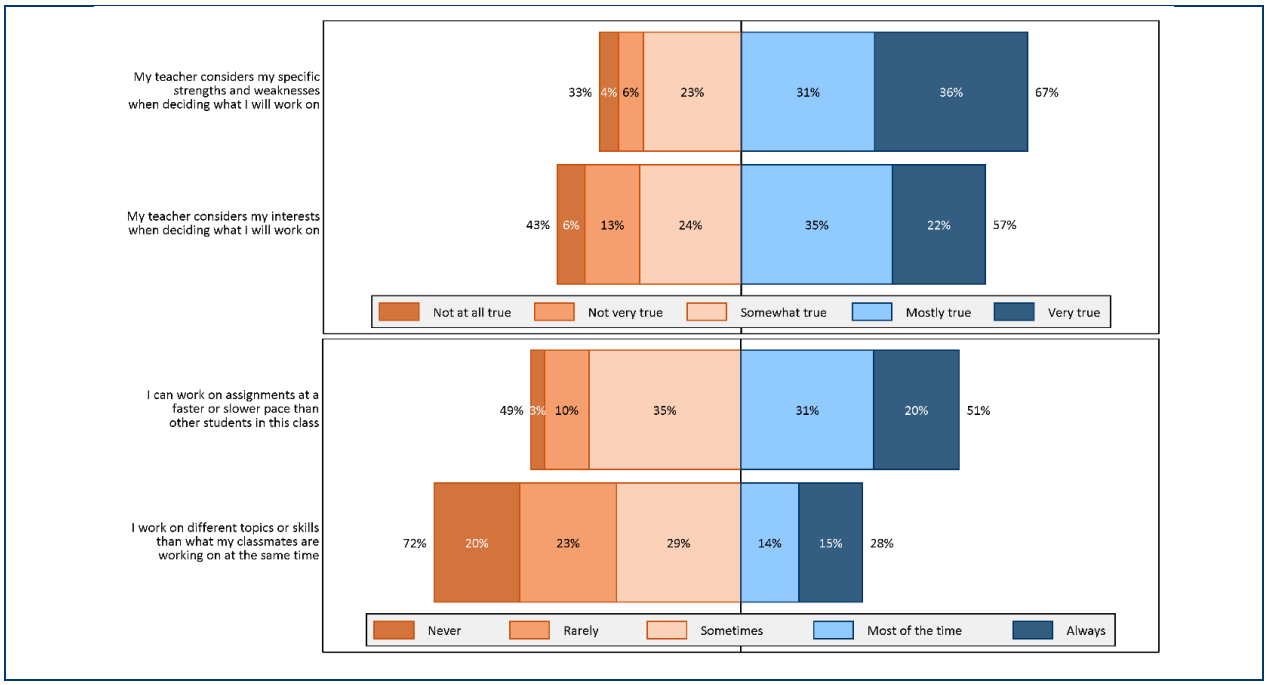
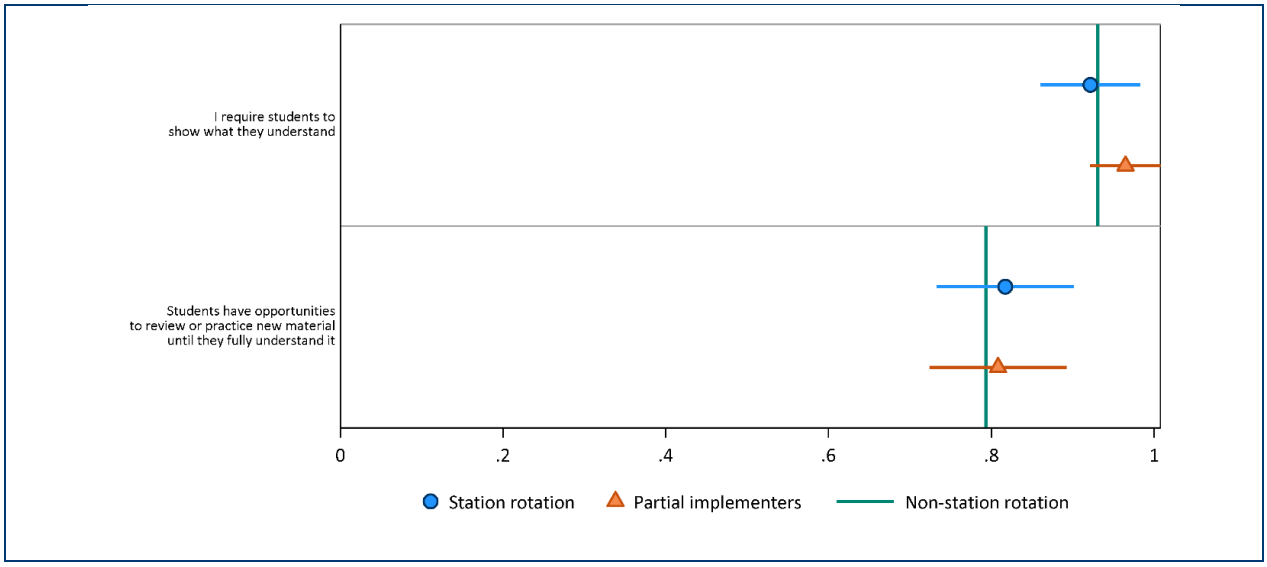


Figure C.5. Proportion of Teachers Who Indicated They Engaged in the Following Practices Related to Mastery-Based Learning (to a Moderate or Great Extent)



Notes. The vertical green line represents the point estimate of the proportion of non-station rotation teachers who indicated that they engaged in each practice a moderate or great extent. The circle and triangle represent the point estimates for station rotation teachers and partial implementers, respectively. The horizontal lines through the station rotation teacher and partial implementer point estimates represent the 95% confidence interval around the difference from non-station rotation teachers. If the 95% confidence interval does not cross over the non-station rotation teacher point estimate, the difference is statistically significant.

Figure C.6. Students' Perceptions of Mastery of Material in Station Rotation Classes

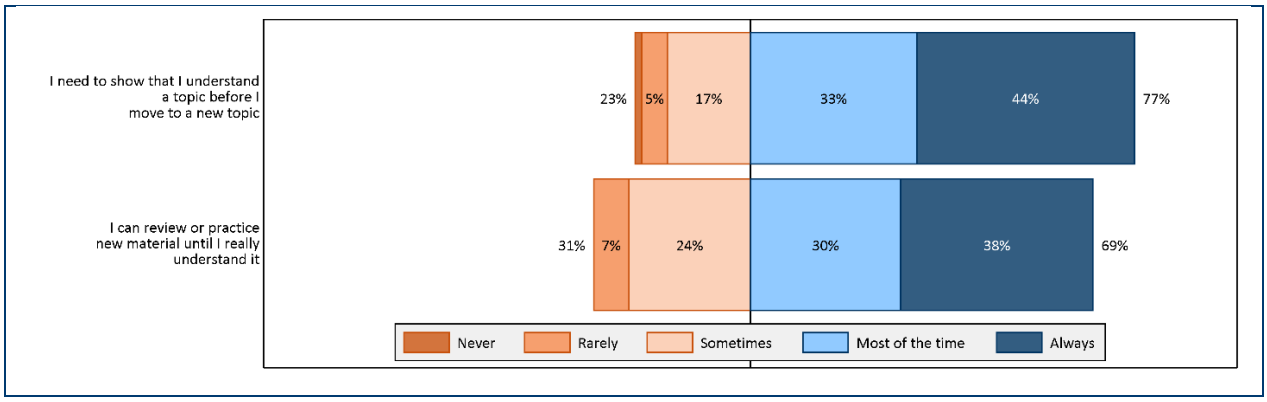
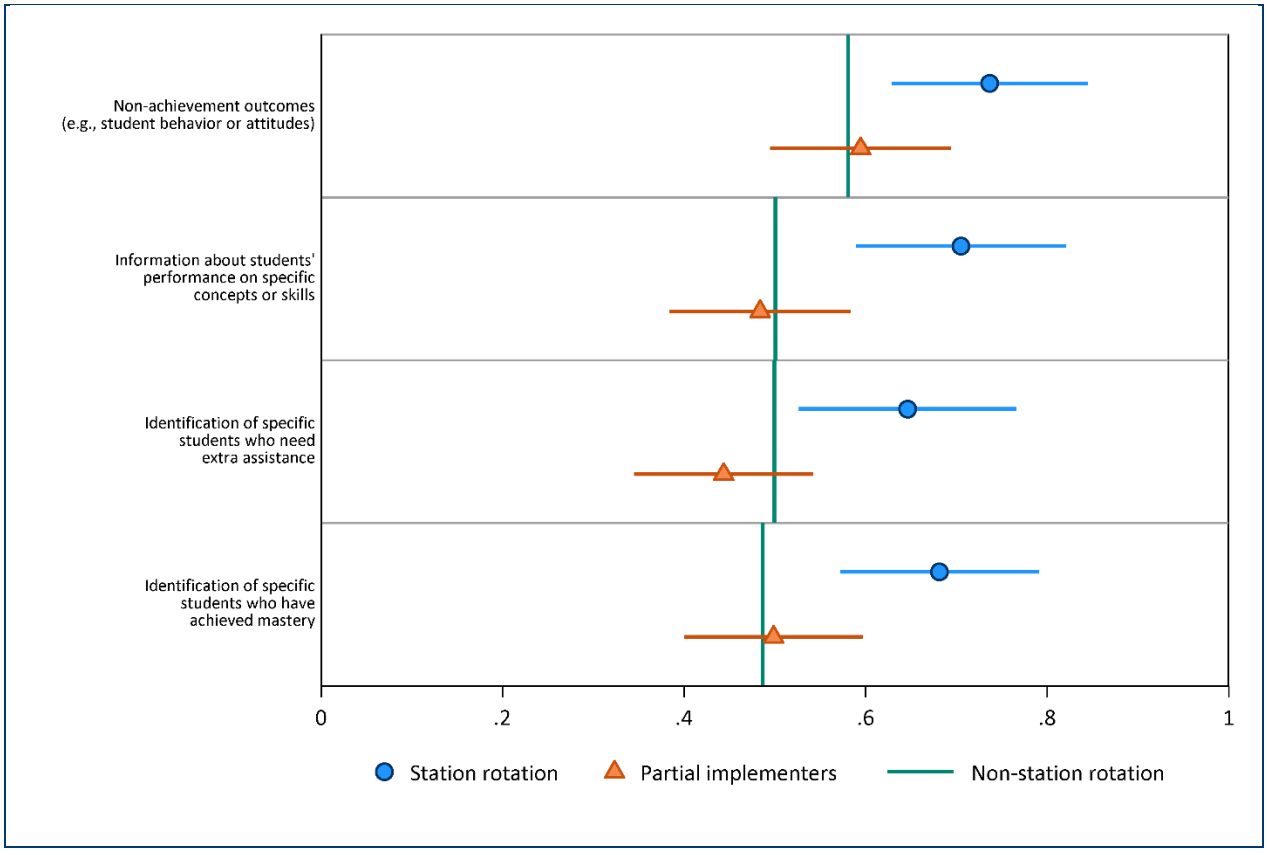
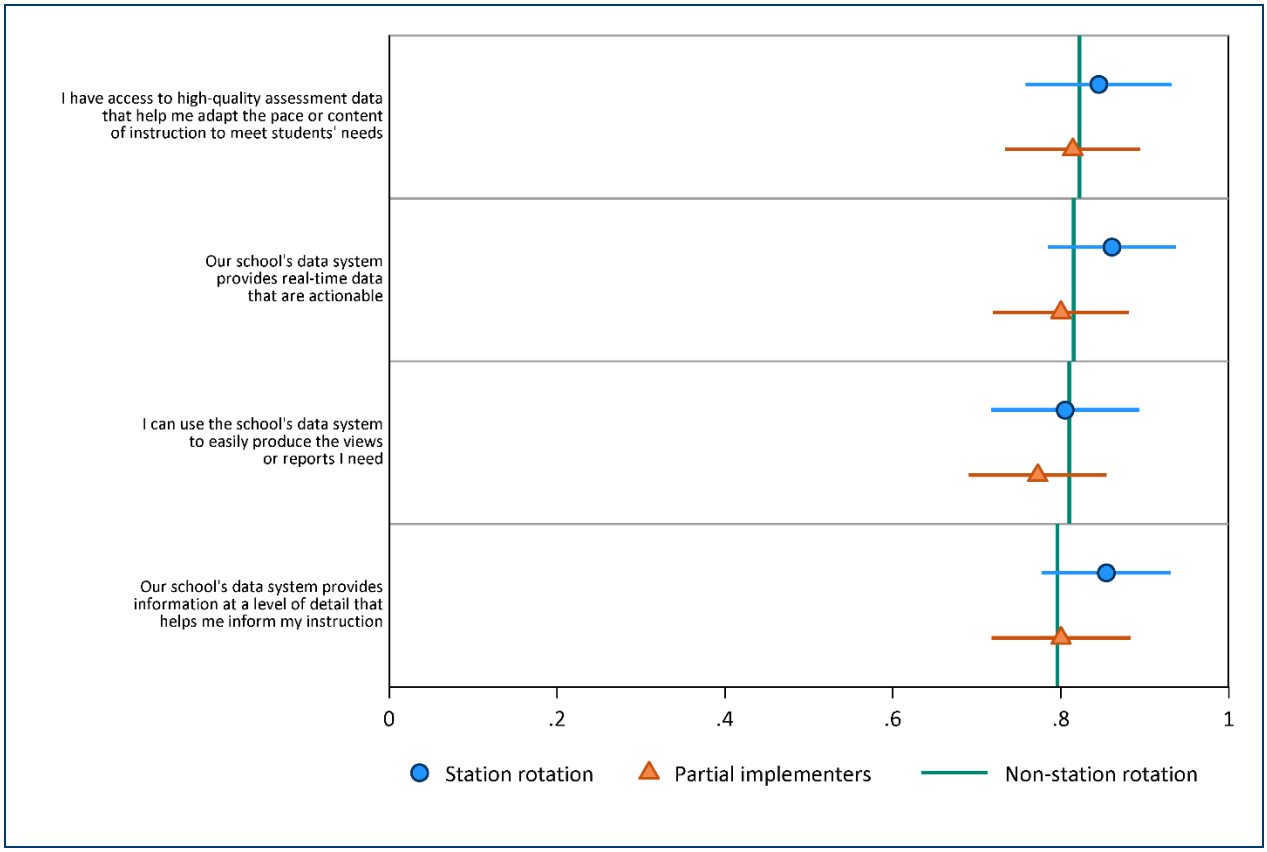


Figure C.7. Proportion of Teachers Who Indicated They Received the Following Types of Information at Least Weekly



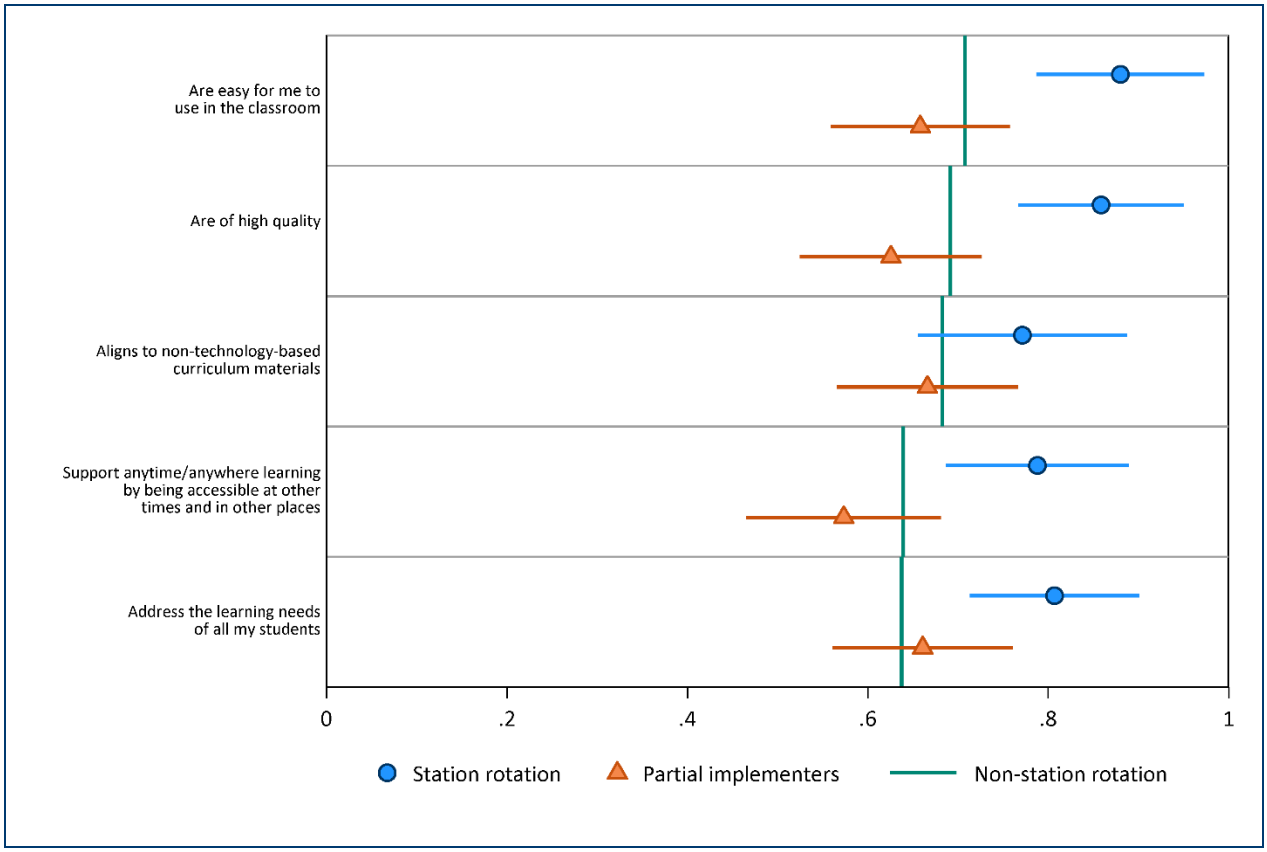
Notes. The vertical green line represents the point estimate of the proportion of non-station rotation teachers who indicated that they received each type of information at least weekly. The circle and triangle represent the point estimates for station rotation teachers and partial implementers, respectively. The horizontal lines through the station rotation teacher and partial implementer point estimates represent the 95% confidence interval around the difference from non-station rotation teachers. If the 95% confidence interval does not cross over the non-station rotation teacher point estimate, the difference is statistically significant.

Figure C.8. Proportion of Teachers Who Agreed or Strongly Agreed With the Following Statements About Quality of School Data Systems



Notes. The vertical green line represents the point estimate of the proportion of non-station rotation teachers who indicated that they agreed or strongly agreed with each statement. The circle and triangle represent the point estimates for station rotation teachers and partial implementers, respectively. The horizontal lines through the station rotation teacher and partial implementer point estimates represent the 95% confidence interval around the difference from non-station rotation teachers. If the 95% confidence interval does not cross over the non-station rotation teacher point estimate, the difference is statistically significant.

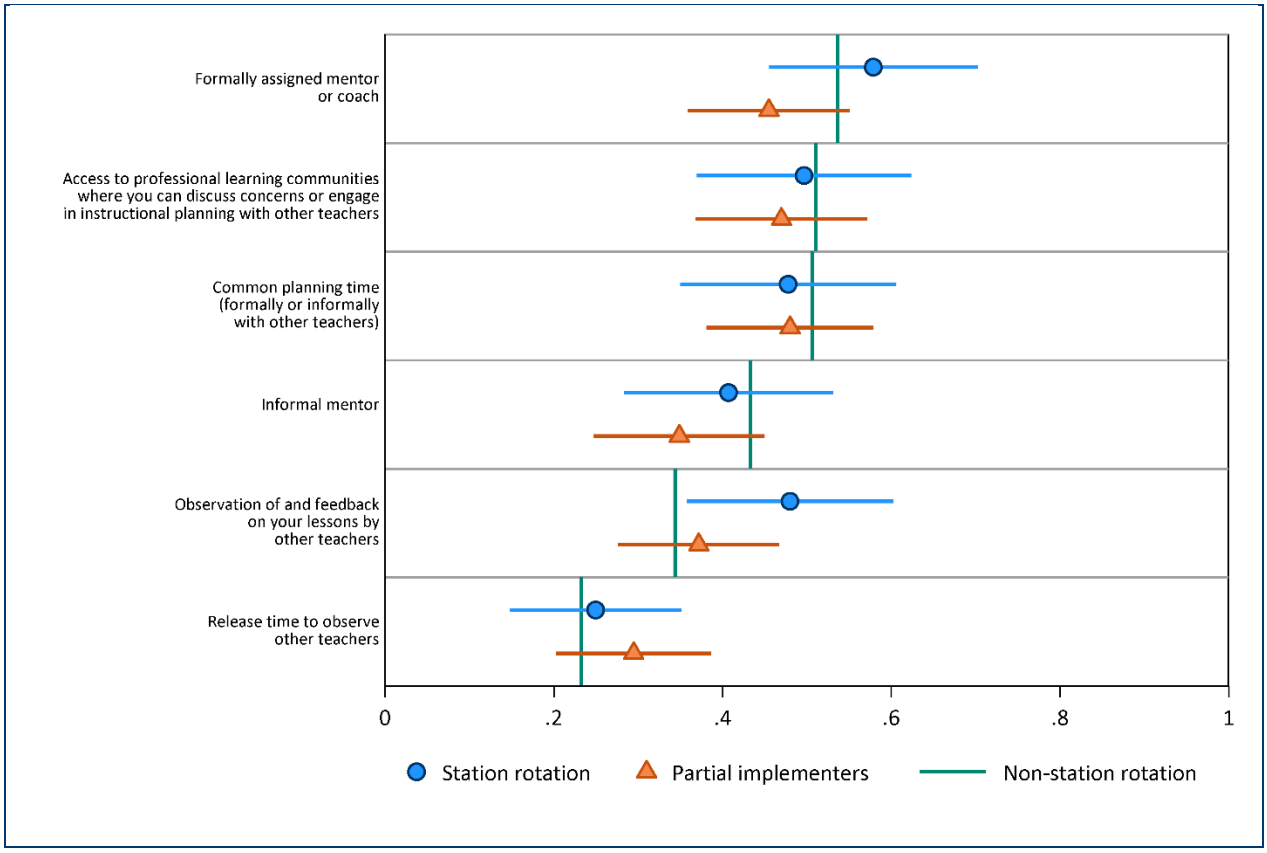
Figure C.9. Proportion of Teachers Who Agreed or Strongly Agreed With the Following Statements About Quality of Digital Curriculum Materials



Notes. The vertical green line represents the point estimate of the proportion of non-station rotation teachers who indicated that they agreed or strongly agreed with each statement. The circle and triangle represent the point estimates for station rotation teachers and partial implementers, respectively. The horizontal lines through the station rotation teacher and partial implementer point estimates represent the 95% confidence interval around the difference from non-station rotation teachers. If the 95% confidence interval does not cross over the non-station rotation teacher point estimate, the difference is statistically significant.

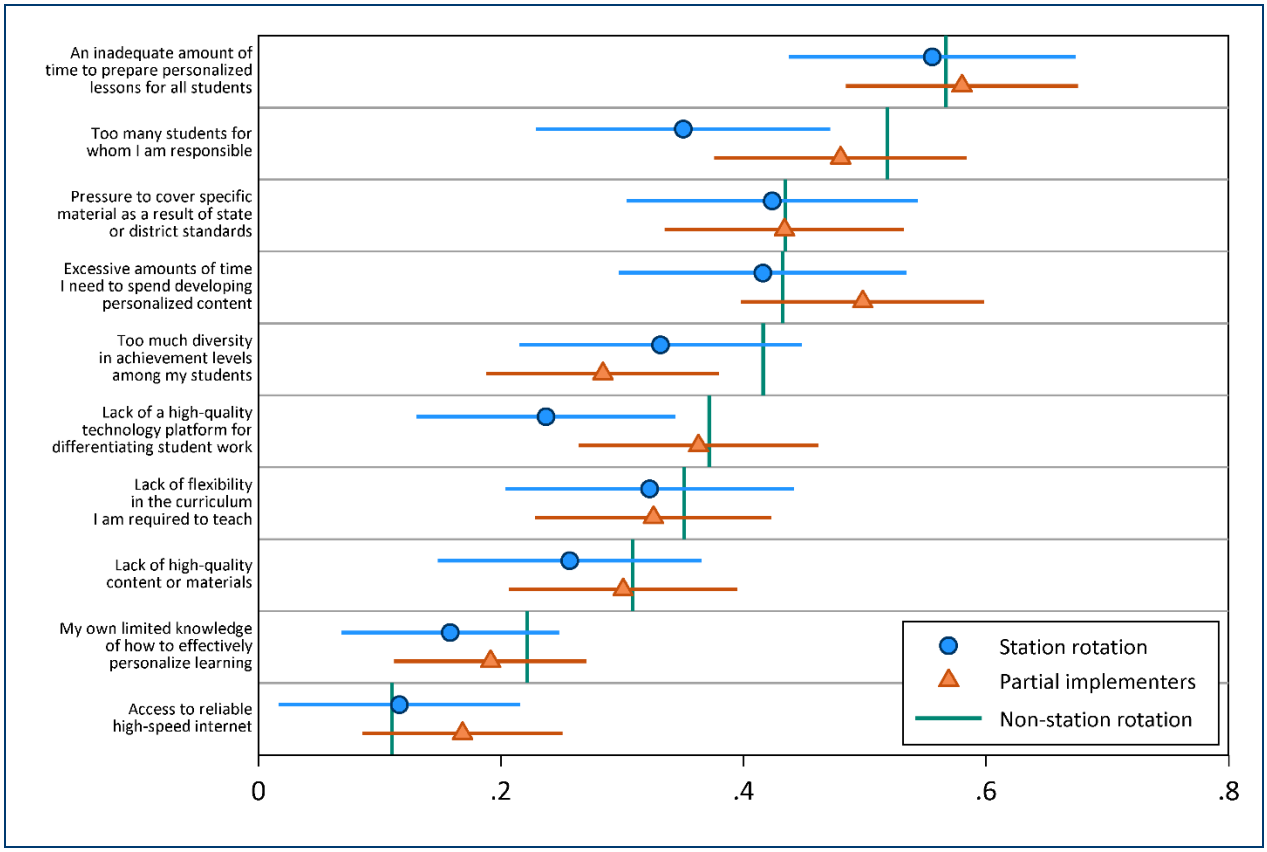
RQ 3: What factors facilitate or impede station rotation implementation?

Figure C.10. Proportion of Teachers Who Indicated They Received Moderately Helpful or Very Helpful Support About Personalized Learning From Each of the Following Sources of Support



Notes. The vertical green line represents the point estimate of the proportion of non-station rotation teachers who indicated that they received moderately helpful or very helpful support from a given source of support. The circle and triangle represent the point estimates for station rotation teachers and partial implementers, respectively. The horizontal lines through the station rotation teacher and partial implementer point estimates represent the 95% confidence interval around the difference from non-station rotation teachers. If the 95% confidence interval does not cross over the non-station rotation teacher point estimate, the difference is statistically significant.

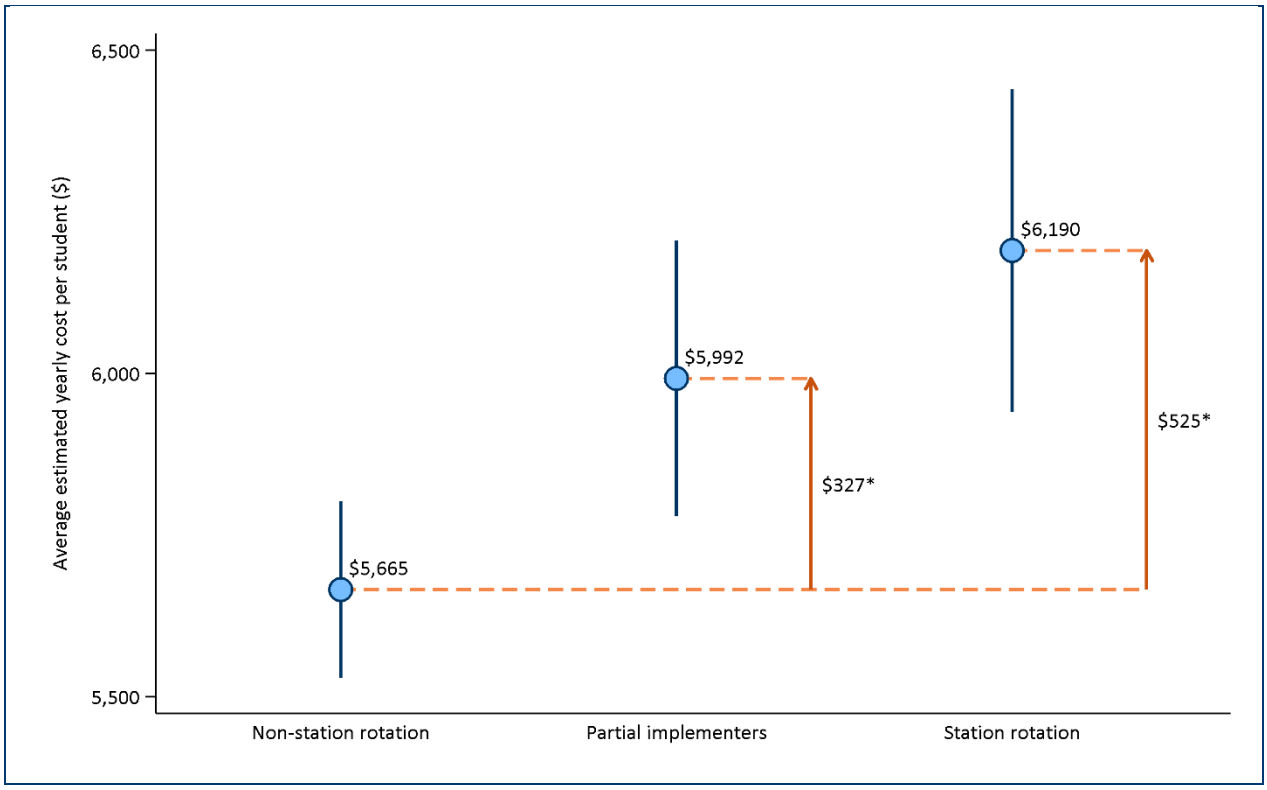
Figure C.11. Estimated Proportion of Teachers Who Identified Each Statement as a Moderate or Major Obstacle to Their Efforts to Promote Personalized Learning for Students



Notes. The vertical green line represents the point estimate of the proportion of non-station rotation teachers who indicated that they identified each statement as a moderate or major obstacle. The circle and triangle represent the point estimates for station rotation teachers and partial implementers, respectively. The horizontal lines through the station rotation teacher and partial implementer point estimates represent the 95% confidence interval around the difference from non-station rotation teachers. If the 95% confidence interval does not cross over the non-station rotation teacher point estimate, the difference is statistically significant.

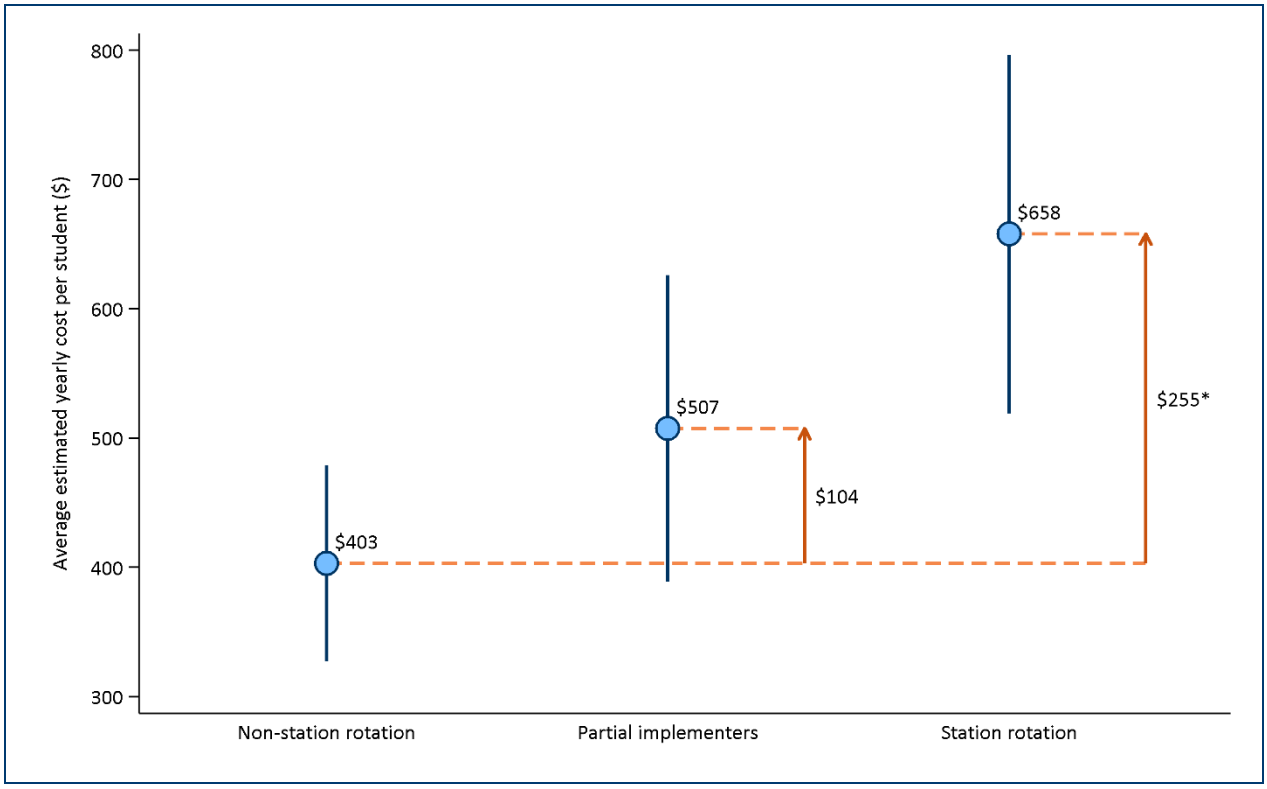
RQ 4: What are the costs of implementing station rotation?

Figure C.12. Average Overall Cost and Differences in Average Overall Cost per Student Between Non-Station Rotation, Partial Implementation, and Station Rotation Classrooms



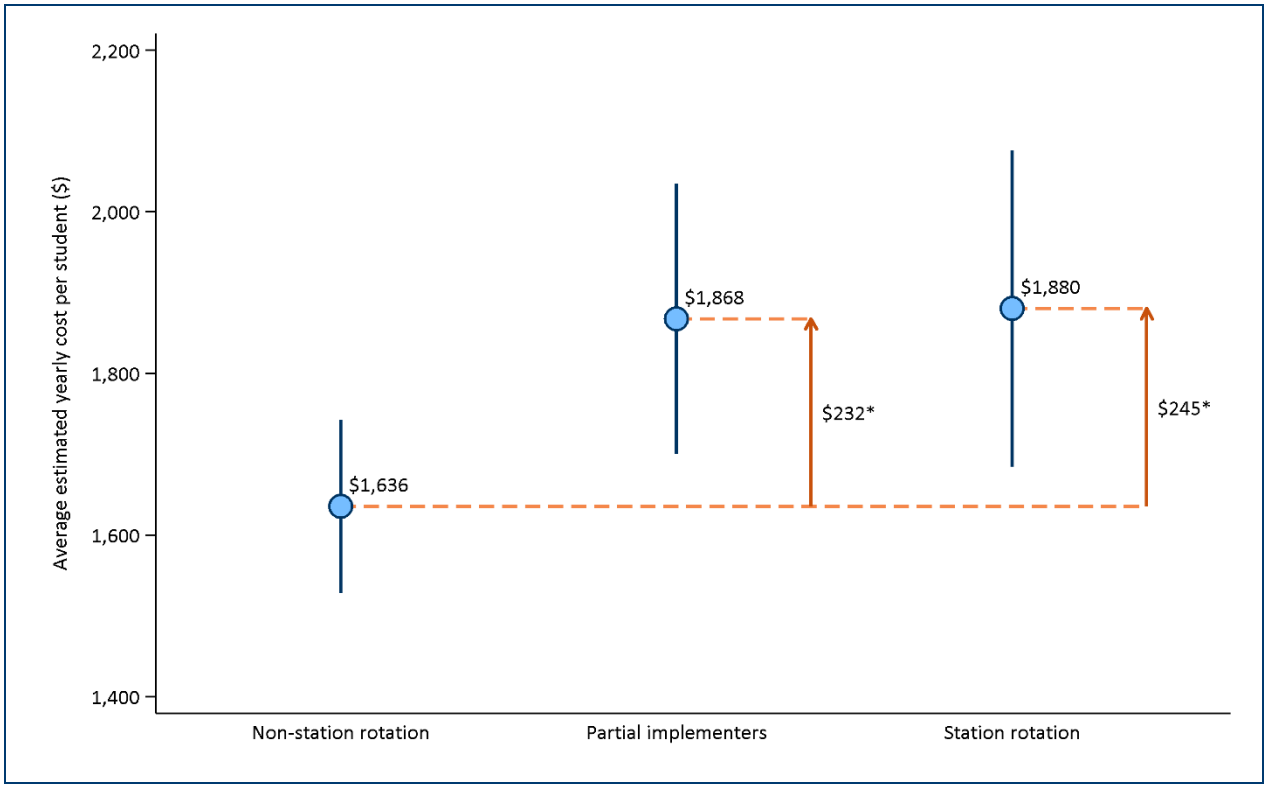
Notes: Vertical blue range lines through the point estimates represent 95% confidence intervals. Orange vertical arrows represent the difference in cost per student from non-station rotation classrooms. *$p < .05$.

Figure C.13. Average Cost and Differences in Average Overall Cost of Non-Teacher Staff per Student Among Non-Station Rotation, Partial Implementation, and Station Rotation Classrooms



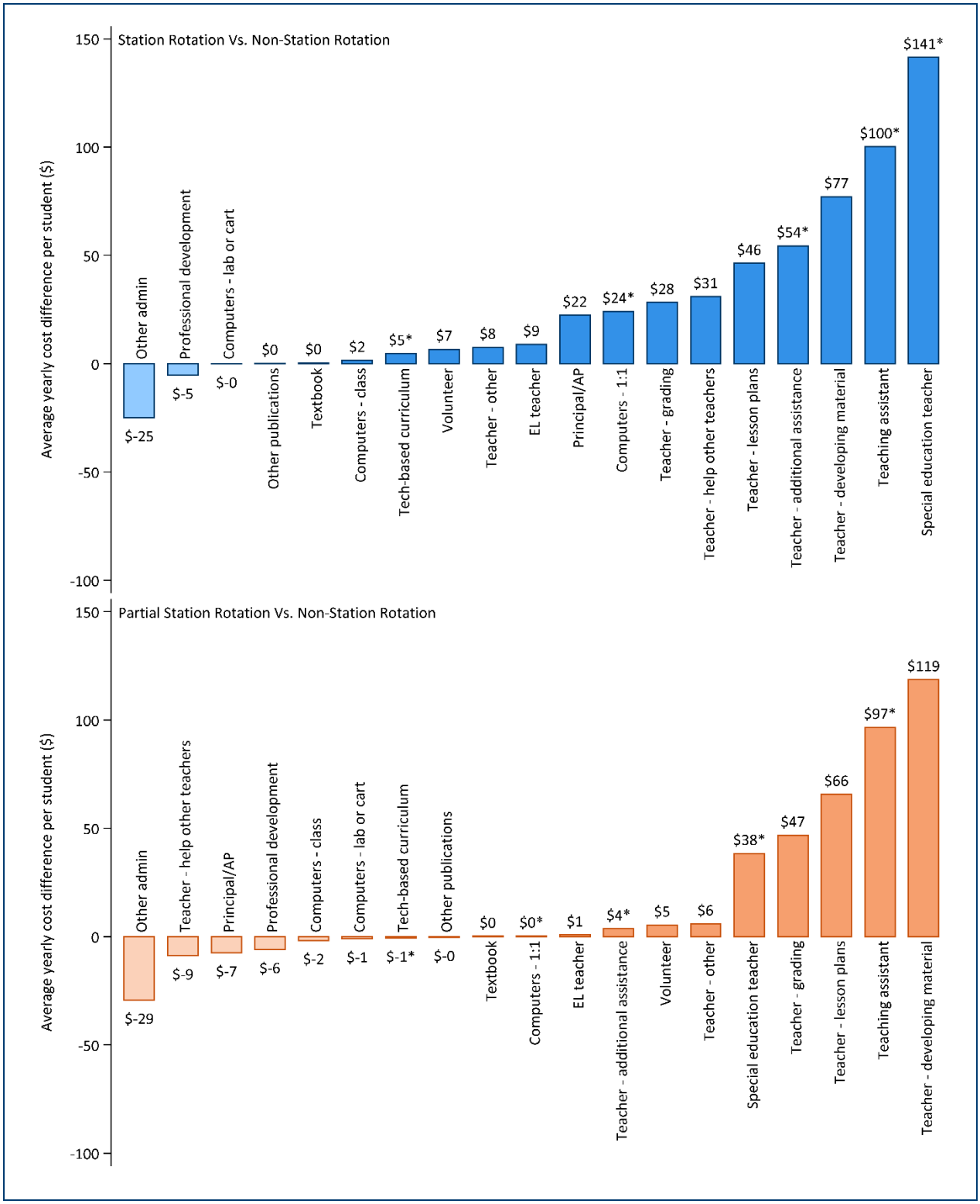
Notes. Vertical blue range lines through the point estimates represent 95% confidence intervals. Orange vertical arrows represent the difference in cost per student from non-station rotation classrooms. *$p < .05$.

Figure C.14. Average Cost and Differences in Average Overall Cost of Teacher Time Outside of Class per Student Among Non-Station Rotation, Partial Implementation, and Station Rotation Classrooms



Notes. Vertical blue range lines through the point estimates represent 95% confidence intervals. Orange vertical arrows represent the difference in cost per student from non-station rotation classrooms. *$p < .05$.

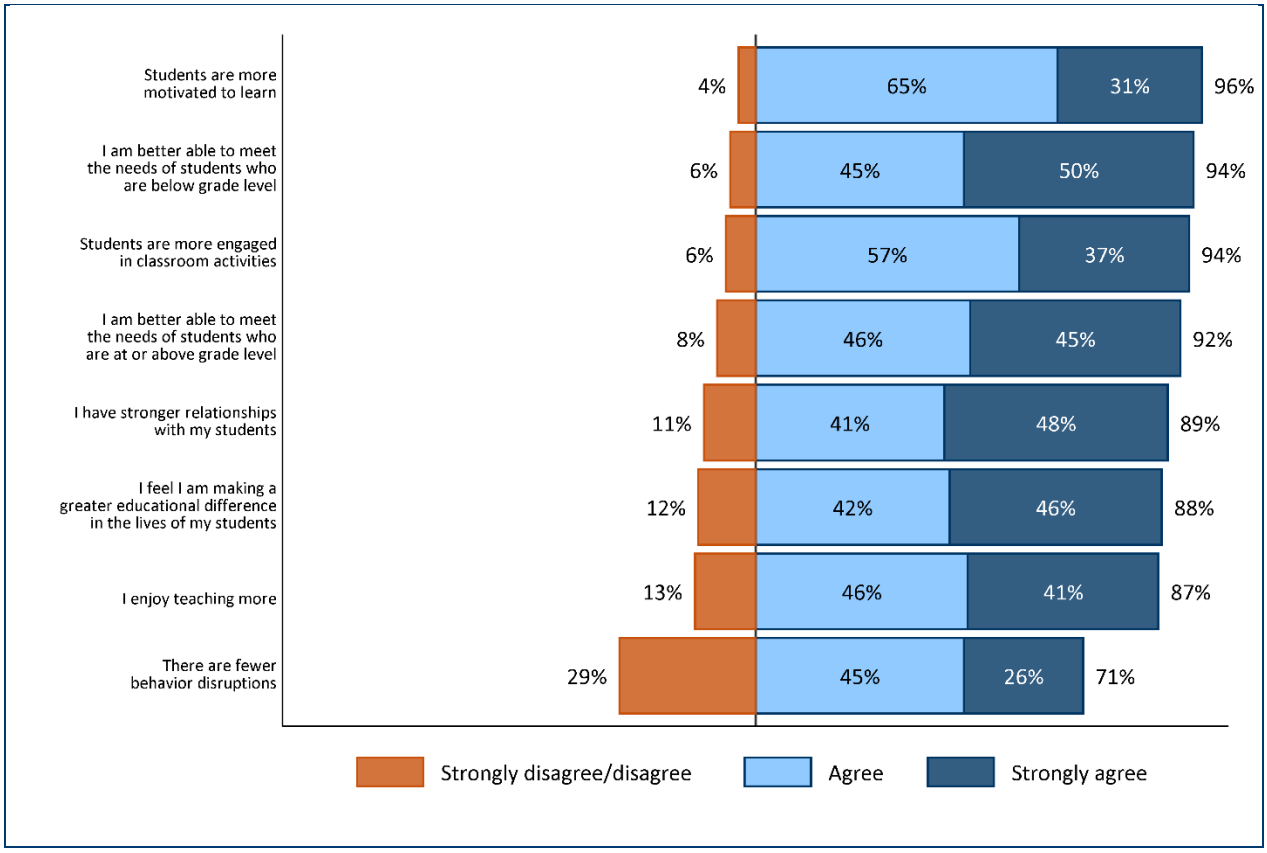
Figure C.15. Differences in Average Cost per Student Among Non-Station Rotation, Partial Implementation, and Station Rotation Classrooms, by Detailed Cost Category



*$p < .05$.

RQ 5: What are principals' and teacher's perspectives on station rotation?

Figure C.16. Percentage of Station Rotation Teachers Who Strongly Disagreed/Disagreed, Agreed, or Strongly Agreed With Each Statement About Their Perceptions of Station Rotation



Notes. On the survey, each statement began with, "When I use station rotation, ..."

Figure C.17. Students' Perceptions of Feedback From Teachers and Ownership of Learning in Station Rotation Classes

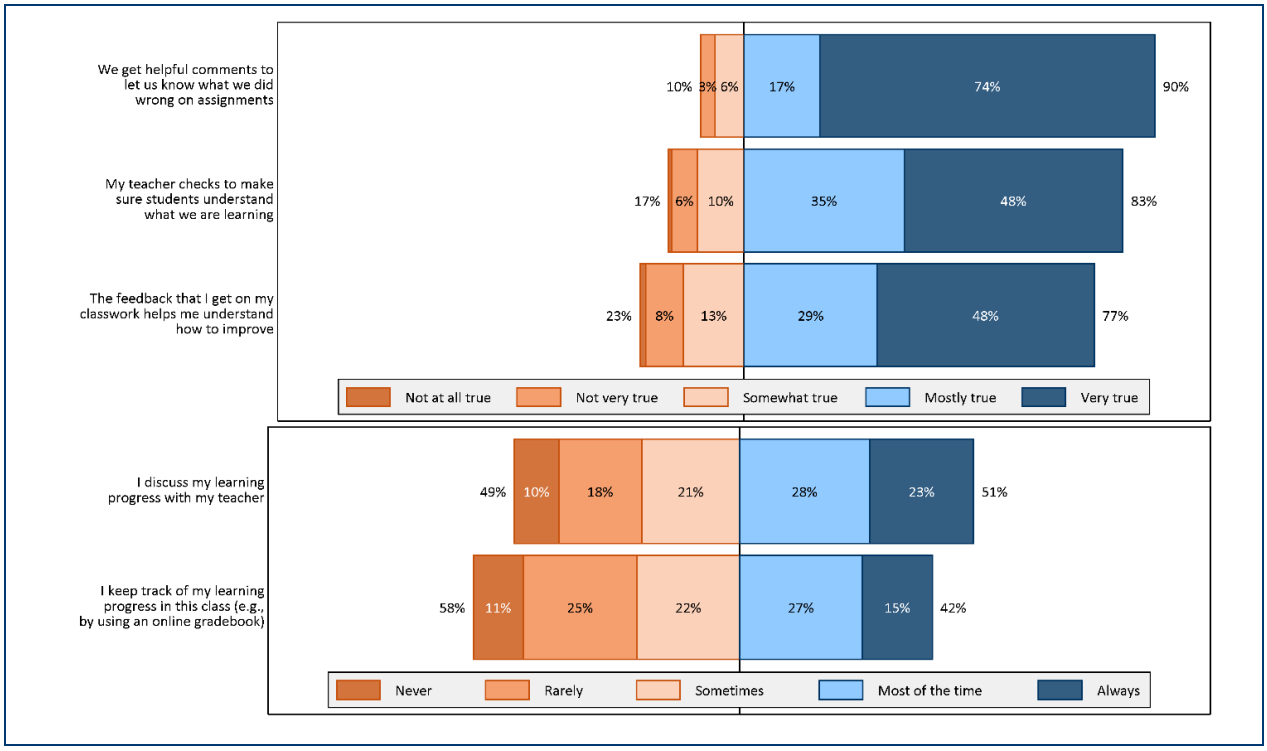
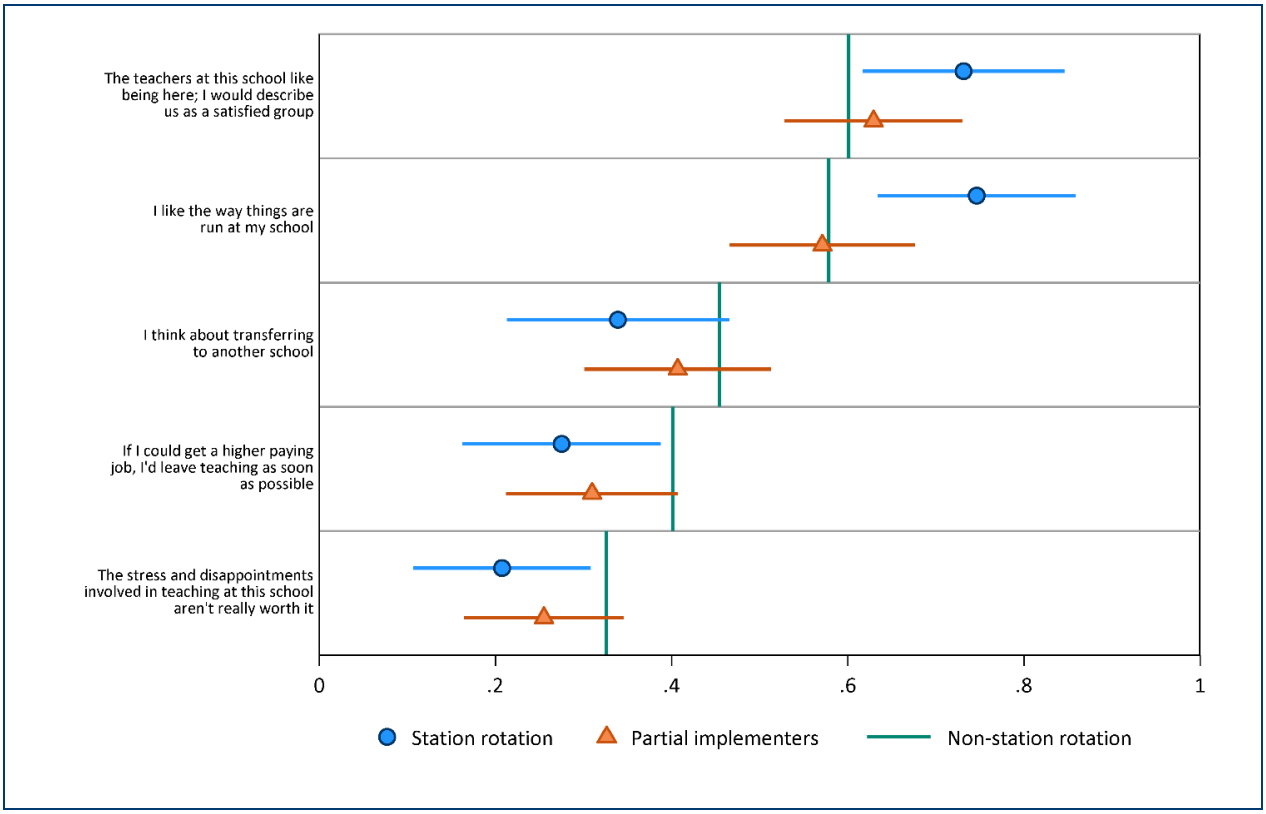


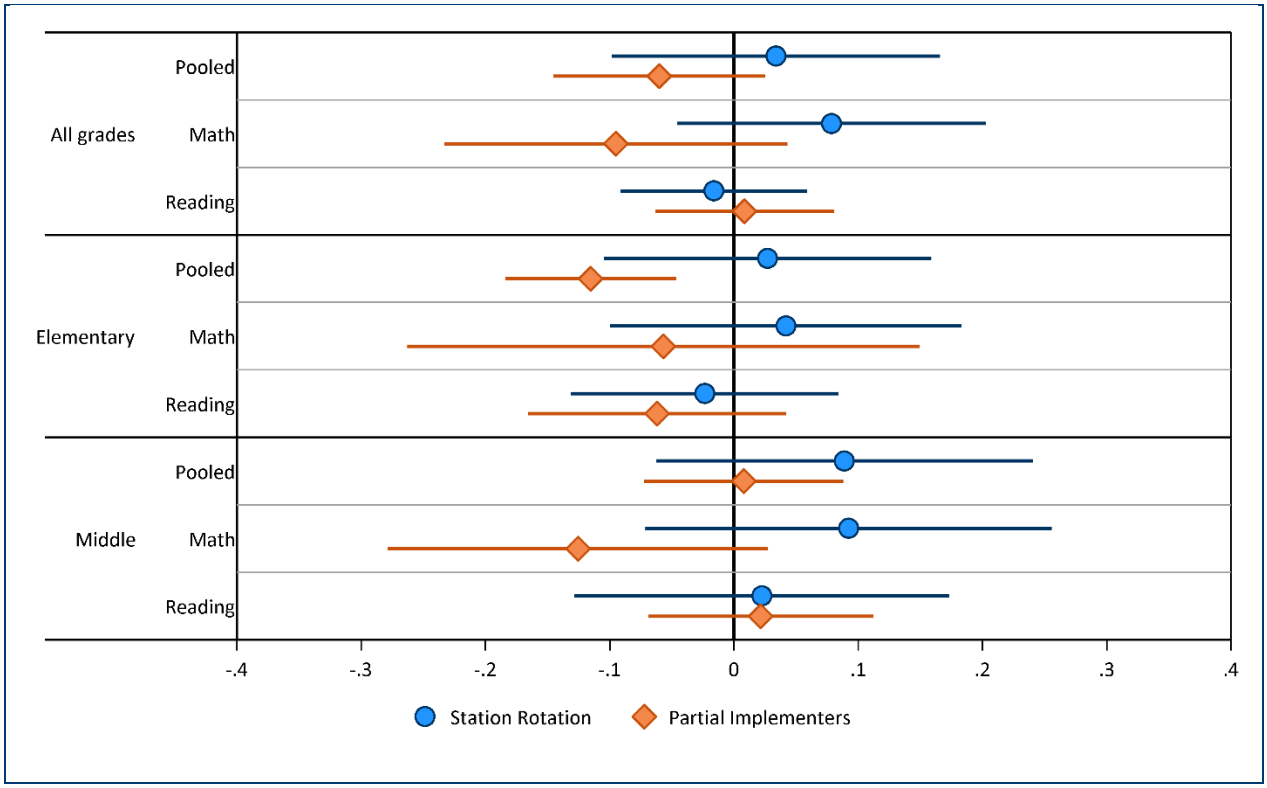
Figure C.18. Proportion of Teachers Who Agreed or Strongly Agreed With the Following Statements About Job Satisfaction



Notes. The vertical green line represents the point estimate of the proportion of non-station rotation teachers who indicated that they agreed or strongly agreed with each statement. The circle and triangle represent the point estimates for station rotation teachers and partial implementers, respectively. The horizontal lines through the station rotation teacher and partial implementer point estimates represent the 95% confidence interval around the difference from non-station rotation teachers. If the 95% confidence interval does not cross over the non-station rotation teacher point estimate, the difference is statistically significant.

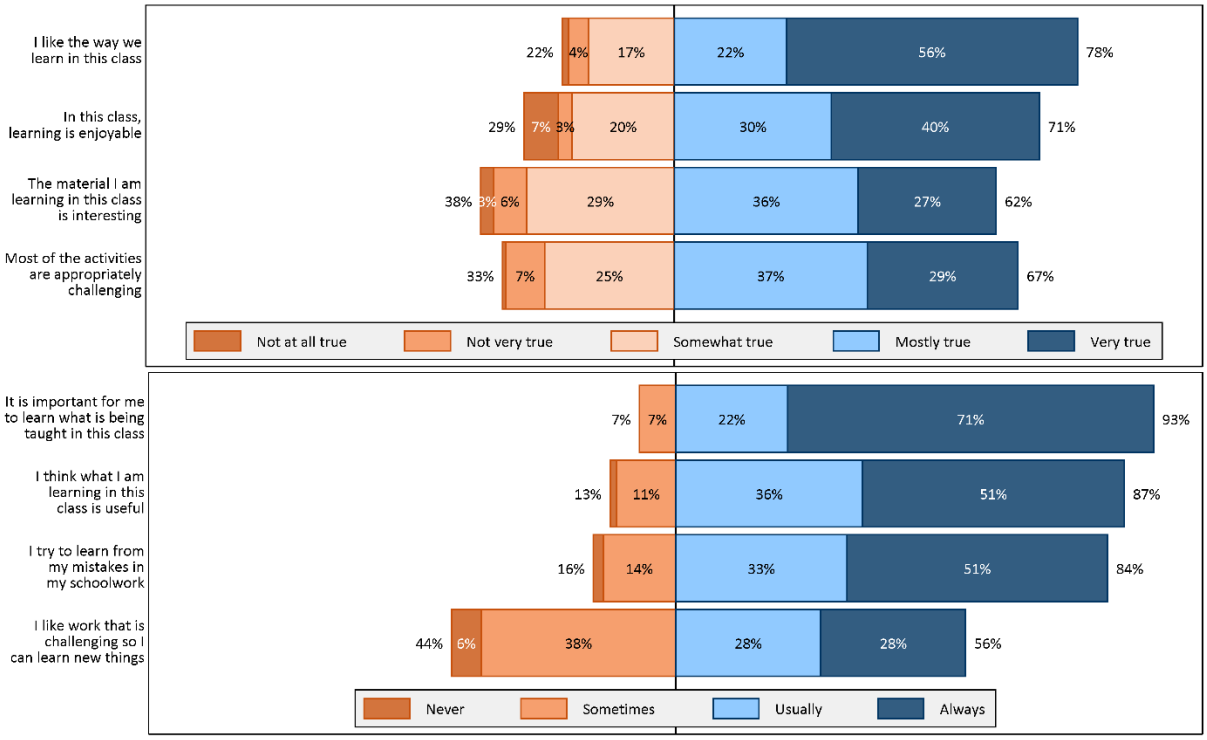
To what extent are station rotation models associated with changes in student outcomes?

Figure C.19. Achievement of Students in Station Rotation and Partial Station Rotation Classrooms Relative to Students in Non-Station Rotation Classrooms



Notes. The vertical black line at zero represents achievement of students in non-station rotation classrooms. The circle and triangle represent the point estimates for difference in achievement for students in station rotation and partial implementation classrooms, respectively. Differences are measured in standard deviations. The horizontal lines through the station rotation and partial implementer point estimates represent the 95% confidence interval around the difference from non-station rotation estimates. If the 95% confidence interval does not cross over the zero line, the difference is statistically significant.

Figure C.20. Students' Perspectives of Learning



Appendix D: Data Collection Instruments

STATION ROTATION STUDY

TEACHER SURVEY

2018-19 SCHOOL YEAR

Dear Teacher,

Thank you for agreeing to participate in the Station Rotation Study Teacher Survey.

- **Purpose of Study:** To better understand the implementation and impact of Station Rotation Models.
- **Participation Requirement:** Participation is voluntary. You may choose not to respond to certain questions or discontinue the survey at any time.
- **Reporting and Confidentiality:** Responses to this survey will be used to summarize findings in an aggregate manner (across groups or sites) or will be used to provide examples of program implementation in a manner that does not associate responses with a specific site or individual. The study team will use only the survey responses you provide in its analysis and your name will not be used in any reporting. The study team will make sure that access to all data with identifiable information is limited to members of the study team. Except for that which is already public, all information collected will be confidential. **We will not provide information that identifies you or your district to anyone outside the study team**.
- **Response Burden:** This survey should require approximately 20-30 minutes of your time. You can stop and restart the survey
- **Benefits:** Your participation will help inform policy makers, educators and researchers at the local, state, and national level about how station rotation models are implemented. You will receive a $30 Amazon gift card for completing the survey.
- **More Information:** For questions or more information about this study, you may contact the AIR study team at stationrotationstudy@air.org or call the study at 1-202-403-5068.

Thank you for your participation with this very important effort!

1. **Including this school year (2018-19), how many total years have you been teaching full time, regardless of location?**

   ☐ *Enter number of years*

Your Classroom

The items in this section will ask about your classroom and teaching arrangement this year.

2. **Which of the following best describes your teaching arrangement this year?**

   - ○ Traditional elementary arrangement; sometimes called "self-contained"
   - ○ Traditional secondary arrangement; sometimes called "subject-specific," "subject -matter specialist," or "departmentalized"
   - ○ Co-Teaching or job share (one of two or more teachers who are jointly responsible for teaching the same subject(s) to a group of students [i.e., in the same classroom])
   - ○ Other, please describe:

     ☐

3. **Please indicate the grade level of the students you teach.**

   Select all that apply.

   - ☐ 4th
   - ☐ 5th
   - ☐ 6th
   - ☐ 7th
   - ☐ 8th
   - ☐ Our school does not use grade levels

4. **Please indicate the subject areas you teach.**

   Select all that apply.

   - ☐ Mathematics
   - ☐ English Language Arts
   - ☐ Social Studies
   - ☐ Science
   - ☐ Physical Education
   - ☐ Arts (Music, dance, visual arts)
   - ☐ Resource/Special Education
   - ☐ Other:_____

5. **Do you split your class into two or more groups to provide different learning activities during the same class period?**

   - ○ Yes
   - ○ No [SKIP to Question 16]

[Developer note: Items on this page are only shown if respondents chose "Yes" on Q5]

5a. How often do you split your class into two or more groups to provide different learning activities during the same class period?

- ○ Once a week
- ○ Twice a week
- ○ Three times a week
- ○ Four times a week
- ○ Five times a week
- ○ Other: _____

While answering the items on this page, consider class periods in which students are split into groups. During these class periods:

6. …Do the groups rotate and change activities at least once?

- ○ Yes
- ○ No

6a. …(If Yes to question 6) Approximately how many times do the student groups rotate activities?

- ○ Two times
- ○ Three times
- ○ Four times
- ○ Five times
- ○ Six or more times

7. …How many stations are available to students?

- ○ Two stations
- ○ Three stations
- ○ Four stations
- ○ Five stations
- ○ Six or more stations

8. Does at least one group use online learning software for delivery of instruction?

- ○ Yes
- ○ No

8a. If Yes: please enter the name of the online learning software:

9. …How much time does a group *typically* spend on each activity before moving to another activity or station?

- ○ Less than 10 minutes
- ○ 10 to 15 minutes
- ○ 16 to 30 minutes
- ○ More than 30 minutes

10. …How frequently do you change the composition of these groups based on students' progress with their learning?

- ○ Daily or almost daily
- ○ About weekly
- ○ Once or twice a month
- ○ A few times a year
- ○ Never, students remain in the same groups for the entire school year

11. …Groups are *typically* comprised of students with:

- ○ Similar learning needs (homogeneous)
- ○ Different learning needs (non-homogeneous)

12. …Students in these groups *typically* engage with learning material that is:

- ○ Grade-level
- ○ Remedial
- ○ Extension
- ○ Varied. Please explain:

BASED ON RESPONSES TO QUESTIONS 5 – 10, RESPONDENTS WHO APPEAR TO IMPLEMENT STATION ROTATION WILL RECEIVE THE FOLLOWING TEXT BOX:

Based on your responses, it appears that you use Station Rotation in your class. Please answer the remaining questions thinking about your classes) where you use the Station Rotation model.
(Station Rotation is an instructional model in which students rotate among stations on a schedule using a different modality to learn at each station. At least one station includes online learning while other stations may provide individual or small group instruction, large group instruction, or collaborative learning activities.)

13. Please select the grades in which you use the Station Rotation model.

(This grade levels listed below will be pulled from the responses in question 3).

- ☐ 4th
- ☐ 5th
- ☐ 6th
- ☐ 7th
- ☐ 8th
- ☐ Our school does not use grade levels

14. Please select the subjects in which you use the Station Rotation model.

(This grade levels listed below will be pulled from the responses in question 4).

- ☐ Mathematics
- ☐ English Language Arts
- ☐ Social Studies

☐ Science

☐ Physical Education

☐ Arts (Music, dance, visual arts)

☐ Resource/Special Education

☐ Other:_____

Personalized Learning Supports

The following questions ask about **personalized learning** for students.

For the purpose of this survey, personalized learning is defined as instruction that is focused on meeting students' individual learning needs and that encourages student ownership of their learning. Personalized learning is accomplished through targeted instruction based on measurement of student progress, and is often enabled by digital content.

15. Please indicate whether, in the current school year, you <u>received</u> each of the following kinds of supports specifically about personalized learning, and the extent to which you found each support <u>helpful</u> for improving your capacity to personalize learning.

	Did Not Receive	Received; Unhelpful	Received; Somewhat Helpful	Received; Moderately Helpful	Received; Very Helpful
a. Formally assigned mentor or coach	☐1	☐2	☐3	☐4	☐5
b. Informal mentor	☐1	☐2	☐3	☐4	☐5
c. Release time to observe other teachers	☐1	☐2	☐3	☐4	☐5
d. Observation of and feedback on your lessons by other teachers	☐1	☐2	☐3	☐4	☐5
e. Common planning time (formally or informally) with other teachers	☐1	☐2	☐3	☐4	☐5
f. Access to professional learning communities where you can discuss concerns or engage in instructional planning with other teachers	☐1	☐2	☐3	☐4	☐5

16. Including this past summer <u>and</u> this current school year, how many hours of professional development or training did you receive related to *personalized learning strategies* or any aspect of personalized learning?

☐ Hours

17. Please indicate the extent to which each of the following conditions is an obstacle to your efforts to promote personalized learning for students. .

	Not all an Obstacle	Slight Obstacle	Moderate Obstacle	Major Obstacle
a. My own limited knowledge of how to effectively personalize learning for students	☐1	☐2	☐3	☐4
b. Too many students for whom I am responsible	☐1	☐2	☐3	☐4
c. Too much diversity in achievement levels among my students	☐1	☐2	☐3	☐4
d. Lack of flexibility in the curriculum I am required to teach (i.e., I need to teach specific material at a specific time)	☐1	☐2	☐3	☐4
e. Pressure to cover specific material as a result of state or district standards or testing requirements	☐1	☐2	☐3	☐4
f. Excessive amounts of time I need to spend developing personalized content	☐1	☐2	☐3	☐4
g. Lack of a high-quality technology platform for selecting and assigning differentiated student work	☐1	☐2	☐3	☐4
h. Lack of high-quality content or materials	☐1	☐2	☐3	☐4
i. An inadequate amount of time to prepare personalized lessons for all students	☐1	☐2	☐3	☐4
j. Access to reliable high-speed internet				

Resources and Time

The following questions ask about the resources you have available to you and your students, as well as the amount of time you spend on various activities.

18. Did each student receive a school-provided laptop or tablet they could use for your class?

- ○ No, not all students have their own school-provided laptop or tablet
- ○ Yes, a laptop computer/Chromebook
- ○ Yes, an iPad or other tablet computer

18 A. If yes, did you assign students class work using their school-provided computer or tablet in your class?

- ○ Yes
- ○ No

19. Did students use computers during your class that were not individually provided to students – such as classroom-based computers, mobile computer carts, or in a computer lab?

Select all that apply.

- ☐ No
- ☐ Yes, a computer cart
- ☐ Yes, classroom-based computers
- ☐ Yes, computer lab

19 A. If yes, approximately what percentage of students' class time was spent using a computer during a typical week?

- ○ 0%
- ○ 1% to 25%
- ○ 26% to 50%
- ○ 51% to 75%
- ○ 76% to 100%

20. Did each student receive school-provided textbook or published materials other than a textbook (ex. novels, magazines, anthologies, workbooks) for this class?

- ○ Yes
- ○ No

21. What percentage of class time did you typically use each of the following materials with the class?

	0%	1-25%	26-50%	51-75%	76 – 100%
a. A school-provided textbook	☐	☐	☐	☐	☐
b. School-provided published materials other than a textbook (ex. novels, magazines, anthologies, workbooks)	☐	☐	☐	☐	☐

c.	Technology-based curricular materials or software	☐	☐	☐	☐	☐
d.	Other curricular materials	☐	☐	☐	☐	☐

22. How many hours during a typical week did the following people help you with your class? Please answer for all that apply.

	Number of Hours
a. Teaching assistant	_____hours
b. Special education teacher	_____hours
c. English learner teacher	_____hours
d. Principal or assistant principal	_____hours
e. Other administrative staff	_____hours
f. Volunteer	_____hours

23. During a typical week how many hours of time <u>outside of class</u> do you typically spend on the following activities? Estimate your time to the nearest hour.

	Record time (in hours)
a. Developing lesson plans	
b. Grading student assignments	
c. Developing curricular materials, student assignments, or student assessments	
d. Providing additional assistance to students	
e. Working with other teachers to help improve your instructional practices	
f. Other activities (e.g., coordinating with other staff; communicating with parents) Please describe _____	

Assessment Practices

24. How frequently do you receive the following types of information about performance of your students?

	Never	Once a Year	A Few Times Per Year	About Monthly	About Weekly	A Few Times Per Week
a. Information about students' performance on specific concepts or skills	☐1	☐2	☐3	☐4	☐6	☐7
b. Identification of specific students who need extra assistance	☐1	☐2	☐3	☐4	☐6	☐7
c. Identification of specific students who have achieved mastery	☐1	☐2	☐3	☐4	☐6	☐7
d. Non-achievement outcomes (for example, student behavior, attitudes, or motivation)	☐1	☐2	☐3	☐4	☐6	☐7

25. Please indicate your level of agreement with each of the following statements.

	Strongly Disagree	Disagree	Agree	Strongly Agree	Not Applicable
a. I have access to high-quality assessment data that help me adapt the pace or content of instruction to meet students' needs.	☐1	☐2	☐3	☐4	☐5
b. Our schools' data system provides real-time data that is actionable.	☐1	☐2	☐3	☐4	☐5
c. Our school's data system provides information at a level of detail that helps me inform my instruction (e.g., breakdowns for specific skills or topics)	☐1	☐2	☐3	☐4	☐5
d. I can use the school's data system to easily produce the views or reports I need.	☐1	☐2	☐3	☐4	☐5
e. The technology provides data that are not typically available without that technology.	☐1	☐2	☐3	☐4	☐5

26. This year, to what extent have you used student achievement/mastery data for each of the following purposes? (Consider data provided by instructional software, interim assessments or quizzes, unit or end-of-course tests, state accountability tests, district benchmark or interim tests, and other standardized tests.)

	Did Not Use	Used to a Small Extent	Used to a Moderate Extent	Used to a Large Extent
a. Tailoring the pace of instruction to individual students' needs	☐2	☐3	☐4	☐5
b. Tailoring the content of instruction to individual students' needs	☐2	☐3	☐4	☐5

c.	Developing recommendations for tutoring or other educational support services for particular students	☐2	☐3	☐4	☐5
d.	Assigning or reassigning students to groups within my class(es)	☐2	☐3	☐4	☐5
f.	Identifying topics requiring more or less emphasis in instruction	☐2	☐3	☐4	☐5

Curriculum and Instruction

27. Please indicate the extent to which you engage in each of the following practices related to curriculum or instruction.

	Not At All	To a Small Extent	To a Moderate Extent	To a Great Extent
a. I adapt course content to meet students' needs by providing additional assignments, resources, and activities for remediation or enrichment.	☐1	☐2	☐3	☐4
b. I provide a variety of materials or instructional approaches to accommodate individual needs and interests.	☐1	☐2	☐3	☐4
c. Different students work on different topics or skills at the same time.	☐1	☐2	☐3	☐4
d. I give students a chance to work through instructional material at a faster or slower pace than other students in the class.	☐1	☐2	☐3	☐4
e. I require students to show what they understand.	☐1	☐2	☐3	☐4
f. Students have opportunities to review or practice new material until they fully understand it.	☐1	☐2	☐3	☐4
g. When students are working on an assignment or activity, they know what the goals of the assignment or activity are.	☐1	☐2	☐3	☐4
h. I have adopted strategies that allow students to keep track of their own learning progress.	☐1	☐2	☐3	☐4
i. Students are able to access instructional material both in and outside the classroom.	☐1	☐2	☐3	☐4
j. I connect what students are learning with experiences they have throughout the rest of the school day or outside of school.	☐1	☐2	☐3	☐4

28. I have adequate access to technology-based curriculum materials that…

	Strongly Disagree	Disagree	Agree	Strongly Agree
a. … are of high quality.	☐1	☐2	☐3	☐4
b. … address the learning needs of all of my students.	☐1	☐2	☐3	☐4
c. … are easy for me to use in the classroom.	☐1	☐2	☐3	☐4
d. … support anytime/anywhere learning by being accessible at other times and in other places.	☐1	☐2	☐3	☐4
e. … aligns to non-technology-based curriculum materials	☐1	☐2	☐3	☐4

29. Approximately what proportion of the curriculum and instructional materials you use were provided to you by your school or district?

- ○ All of the Materials
- ○ A Majority
- ○ About Half
- ○ Fewer than Half
- ○ None, I Don't Receive Any Materials from my School or District

Reflections

30. Please indicate your level of agreement with the following statements.

	Strongly Disagree	Disagree	Agree	Strongly Agree
a. The stress and disappointments involved in teaching at this school aren't really worth it	☐1	☐2	☐3	☐4
b. The teachers at this school like being here, I would describe us as a satisfied group	☐1	☐2	☐3	☐4
c. I like the way things are run at my school	☐1	☐2	☐3	☐4
d. If I could get a higher paying job, I'd leave teaching as soon as possible	☐1	☐2	☐3	☐4
e. I think about transferring to another school	☐1	☐2	☐3	☐4

31. Please indicate your level of agreement with the following statements.

	Strongly Disagree	Disagree	Agree	Strongly Agree
a. When I use station rotation, students are more motivated to learn.	☐1	☐2	☐3	☐4
b. When I use station rotation, students are more engaged in classroom activities.	☐1	☐2	☐3	☐4
c. When I use station rotation, there are fewer behavior disruptions.	☐1	☐2	☐3	☐4
d. When I use station rotation, I am better able to meet the needs of students who are below grade level.	☐1	☐2	☐3	☐4
e. When I use station rotation, I am better able to meet the needs of students who are at or above grade level.	☐1	☐2	☐3	☐4
f. When I use station rotation, I enjoy teaching more.	☐1	☐2	☐3	☐4
g. When I use station rotation, I have stronger relationships with my students.	☐1	☐2	☐3	☐4
h. When I use station rotation, I feel I am making a greater educational difference in the lives of my students.	☐1	☐2	☐3	☐4

Thank you for completing this survey.

Station Rotation – Instructional Leader Interview

Hello, I'm _____ with the American Institutes for Research. Thank you for taking the time for this interview. I am part of the team that is conducting a study of how schools are using the station rotation model to personalize instruction for their students. The questions in this interview will focus on your experiences with supporting the station rotation model and your perceptions of how it is being implemented. I anticipate that the interview will take 30 minutes.

Before we start, I want to remind you that your participation in this interview is voluntary, and you can withdraw from the interview at any time without penalty. I also want to assure you that your responses to my questions will be completely confidential, and in our reporting of findings, respondents will not be identified. I would also like to record our interview to accurately capture everything you tell me. The recording is purely for evaluation purposes and will not be shared with anyone else. Do I have your permission to record this interview?

If the respondent agrees to be recorded, turn on the voice recorder and say, "I am here with Teacher [ID number]. For the record, do you agreed to have this interview recorded?"

Respondent

Respondent ID:		**Date:**			
Interviewer:		**Start Time:**		**End Time:**	
Is this interview recorded?					
Comments:					

Background of station rotation

Before we get started, we would like to clarify what we mean by the term "station rotation." It is an instructional approach that takes place in a given course or subject in which students rotate among different types of learning modalities, such as online learning, group projects, individual tutoring, or paper-and-pencil assignments.

1. To start off this interview, would you please describe your school's approach to adopting the station rotation model? Is the whole school doing it, or just certain teachers or grades? *(Probe for why those teachers or grades.)*

2. When did your school first start rolling out the station rotation model in those grades? *(Probe for whether it happened all at once or whether it was a gradual roll-out.)*

3. Why was your school interested in adopting the station rotation model?

Implementation of station rotation

The next set of questions focuses on the use of station rotation in your school, and on the teachers who are currently implementing it.

4. What are your expectations for how frequently teachers will use the station rotation model? (Consider grade levels, subject areas, whether some teachers are leading others in station rotation, etc.) *(Probe about what they expect to see when they walk into a class using station rotation)*

5. In general, do you expect students to rotate around all of the different stations during a single class period?

6. What are your expectations for how teachers will use technology as part of station rotation? *(Probe: What online platform does your school provide to support station rotation?)*

7. In what ways, if any, do you communicate or reinforce these expectations?

8. What expectations, if any, do you have around heterogenous vs. homogenous groupings? (similar learning needs vs. different learning needs)

9. What expectations, if any, do you have around how station rotation is used for grade-level instruction, remedial instruction and/or advanced instruction?

Supports for station rotation

Next, I would like to ask a few questions about the supports that your school or district provides for implementing the station rotation model.

10. In what ways does your school or district support teachers' efforts to implement station rotation? *(Probe: formal professional development [and name of provider], coaching and feedback, shared planning time, professional learning communities.)*

11. What is your opinion of the effectiveness of these supports? *(Probe: What additional supports do teachers need?)*

Differentiated instruction

12. To what extent, if any, has the station rotation approach affected teachers' capacity to differentiate instruction for students? *(Probe: How has it affected teachers' ability to differentiate instruction for students below grade level?)*

Curriculum materials

The next few questions address the curriculum materials that teachers in this school use for station rotation.

13. What curriculum materials does your school expect teachers to use in ELA and Math? (Probe: format type [digital vs. print].) (*Probe for specific name of curriculum materials.) (Probe: If the school has SR and non-SR (as determined by the teacher survey), do teacher who implement station rotation use different materials than those who do not use station rotation?)*

14. How useful are these materials for supporting the station rotation model? *(Probe: do you expect teachers to implement SR with fidelity to the curriculum? Do you see any tensions in this expectation?)*

Formative assessment for teachers implementing station rotation

Next, I would like to ask you a few questions about assessments and the assessment practices of teachers who are implementing the station rotation model.

15. How frequently do you expect teachers to collect and consider formative assessments?

16. What instructional decisions do you want teachers to make based on these assessments?

17. Are these assessments integrated into a learning management system?

Flexible pacing and progression

The next few items are about student progression through their learning goals. As before, please focus on the students of teachers who are implementing the station rotation approach.

18. What is your expectation for how teachers will communicate with students about their progress learning goals?

19. Do you expect students to demonstrate comprehension of a topic before moving on to another topic?

20. What kind of changes has the school made to establish and manage different paces of learning?

Flexible learning environments

21. What expectations do you have, if any, about classroom organization—that is, the proportion of time students will work independently versus working in small groups versus participating in whole-class instruction? *(If appropriate, probe about balance between teacher-led whole group instruction, teacher-led small group instruction, student-directed small group instruction, individual work, or other type of learning modalities).*

Perspectives on station rotation model

22. What do you see as the biggest benefits of the station rotation approach? (*Probe for reasons behind the response.*)

23. What are the drawbacks of the station rotation approach? (*Probe for reasons behind the response.*)

Conclusion

24. Is there anything else that you think I should know about your school's experience with the station rotation model?

Thanks very much for your participation today!

Station Rotation – Teacher Interview

Hello, I'm _____ with the American Institutes for Research. Thank you for taking the time for this interview. I am part of the team that is conducting a study of how schools are using the station rotation model to personalize instruction for their students. The questions in this interview will focus on your experiences with implementing the station rotation model and your perceptions of the supports and resources you have available for this model. I anticipate that the interview will take 30 minutes.

Before we start, I want to remind you that your participation in this interview is voluntary, and you can withdraw from the interview at any time without penalty. I also want to assure you that your responses to my questions will be completely confidential, and in our reporting of findings, respondents will not be identified. I would also like to record our interview to accurately capture everything you tell me. The recording is purely for evaluation purposes and will not be shared with anyone else. Do I have your permission to record this interview?

If the respondent agrees to be recorded, turn on the voice recorder and say, "I am here with Teacher [ID number]. For the record, do you agreed to have this interview recorded?"

Respondent

Respondent ID:		**Date:**			
Interviewer:		**Start Time:**		**End Time:**	
Is this interview recorded?					
Comments:					

Implementation of station rotation

To make sure we are on the same page, we would like to clarify what we mean by the term "station rotation" during this interview. It is an instructional approach in which students rotate among different types of learning modalities, such as online learning, group projects, individual tutoring, or paper-and-pencil assignments.

The first set of questions focuses on your use of station rotation in your classroom.

1. To start off, please give me some background about your adoption of station rotation. When did you start using this approach, and why?
2. How often do you typically divide your class into groups to provide different learning activities during the same class period?
3. On what basis do you most typically group students? (*Probe for the reason for the grouping. Examples include remediation, enrichment.*)
4. Please describe the composition of these groups: How many groups? How many students per group?
5. Do you typically have these groups rotate around the different activities during a class period?
6. What sort of preparation do you need to do for a station rotation classroom that is different from the preparation for a traditional classroom? *(Probe: How has using station rotation affected your preparation time?)*

Satisfaction with station rotation

7. In your experience, is station rotation a useful approach to classroom instruction? Does station rotation help you to meet the individual needs of your students? (*Probe for reasons behind the response.*)
8. In what ways, if any, has station rotation affected your relationships with your students?
9. In what ways, if any, has station rotation affected your working conditions? (*Probe for level of stress, classroom management. Probe for whether it has affected their attitude toward teaching.*)
10. What are some of the challenges associated with station rotation?

Curriculum materials

Continuing the focus on resources for stations and grouping, the next few questions address the curriculum materials that you have available to you.

11. We understand from your survey responses that you teach _____. Can you confirm that this is correct?
12. What curriculum materials does your school provide for use in [ELA] [Math]? *(Probe: format type [digital vs. print.])*
13. How well do these curriculum materials meet the learning needs of all your students?

14. How do you use these materials to support the use of stations in your classroom? (*Probe for use of "tech center" among the stations.*)

Formative assessment

Next, I would like to ask you a few questions about your assessment practices.

15. What formative assessments do you use to track students' progress? (*Probe for subject area of assessment and assessments of social and behavioral progress.*)
16. How easy is it for you to use the data system to get the data you need about students? How could this system be improved?
17. What are some examples of how you most typically use the data from formative assessments?

Differentiated instruction

The next few items are about differentiating instruction, defined as tailoring instruction to your students' individual needs.

18. What are your approaches to differentiating instruction to meet the needs of students at different levels of mastery? (*Probe for whether they use station rotation for this purpose, or whether they are differentiating without stations.*)

Supports for station rotation

The next few questions ask about the supports that your school or district provides for implementing the station rotation model.

19. Have you received coaching or professional development to help you implement station rotation? Please describe it.
20. What other supports, if any, does your school provide for the station rotation model? Please describe them. (*Probe for shared planning time or a professional learning community.*)
21. Do you find these supports helpful?
22. What additional supports do you need?

Flexible pacing and progression

The next few items are about flexibility in the pace at which students achieve different learning goals.

23. How, if at all, do you inform students of their progress toward learning goals?
24. Do you require that students demonstrate understanding before moving on to new material?

25. Do you allow students flexibility in the pace with which they progress through learning goals?

(If No, skip to the Conclusion)

26. Describe how you manage students working at different paces in your classroom? (Probe: What actions do you take as the teacher to support students working at different paces?)

27. What are some challenges you have experienced with allowing students to make progress at their own pace?

Conclusion

28. Is there anything else that you think I should know about your school's experience with the station rotation model?

Thanks very much for your participation today!

American Institutes for Research's Study of Station Rotation

Student Survey

Dear <STUDENT>,

Thank you for taking this important survey. We want your opinion about your school, classes, schoolwork, and yourself. The only right answers to these questions are your honest opinions.

This survey is voluntary. If you do not want to answer a question, you may skip it, but we hope you will answer as many questions as you can. Your responses will be kept private.

Your opinions are very important to us. Thank you for taking this survey!

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1. Think about the work you are doing in this class. How often are the following statements true about you?

	Never/ almost never	Some-times	Usually	Always/ almost always
a) I like class work that is challenging so I can learn new things	○	○	○	○
b) I think that what I am learning in this class is useful for me to know	○	○	○	○
c) It is important for me to learn what is being taught in this class.	○	○	○	○
d) I try to learn from my mistakes in my schoolwork	○	○	○	○

2. When your teacher puts you into a small group to do an activity, which of the following best describes the group you are in?

- ☐ The group is almost always with the same people
- ☐ The group changes sometimes
- ☐ The group is almost always with different people

3. The following questions ask about your experiences in this class. When you answer them, please think about your experiences with this teacher in this class.

	Not at all true	Not very true	Somewhat true	Mostly true	Very true
a) My teacher considers my specific strengths and weaknesses when deciding what I will work on	○	○	○	○	○
b) My teacher considers my interests when deciding what I will work on	○	○	○	○	○
c) I like the way we learn in this class	○	○	○	○	○
d) In this class, learning is enjoyable	○	○	○	○	○
e) The material I am learning in this class is interesting	○	○	○	○	○
f) Most of the activities I work on in school are challenging enough to be interesting, but not too challenging to complete	○	○	○	○	○
g) The feedback that I get on my classwork helps me understand how to improve	○	○	○	○	○
h) My teacher checks to make sure students understand what we are learning	○	○	○	○	○
i) We get helpful comments to let us know what we did wrong on assignments	○	○	○	○	○
j) I get to decide how activities are done in this class	○	○	○	○	○
k) My teacher respects my ideas and suggestions	○	○	○	○	○

4. The following questions ask about your experience in this class. Please think about your experiences in this class so far and choose the response that matches your typical experience.

	Never	Rarely	Some-times	Most of the Time	Always
a) I keep track of my learning progress in this class (for example by using an online gradebook or portfolio)	○	○	○	○	○
b) I discuss my learning progress with my teacher	○	○	○	○	○
c) During a single class period, I can learn in a large group, small group, or by myself	○	○	○	○	○
d) I work on projects independently (by myself) in this class	○	○	○	○	○
e) I need to show that I understand a topic before I move on to a new topic	○	○	○	○	○
f) I work on different topics or skills than what my classmates are working on at the same time	○	○	○	○	○
g) I can work on assignments at a faster or slower pace than other students in this class	○	○	○	○	○
h) I can review or practice new material until I really understand it	○	○	○	○	○

5. The following questions ask about your teacher in this class. Please think about how often your teacher does the following things.

	Never	Rarely	Some-times	Most of the Time	Always
a) My teacher cares about how much I learn	○	○	○	○	○
b) My teacher likes to see my work	○	○	○	○	○
c) My teacher wants me to do my best in school	○	○	○	○	○
d) My teacher likes to help me learn	○	○	○	○	○
e) I feel comfortable asking my teacher for help when I am off track	○	○	○	○	○

6. How often do you use technology at school in the following different ways?

	Never	Less than once per month	At least once per month	At least once per week	Every day
a) To learn about new topics or skills (for example, watch an educational video)	○	○	○	○	○
b) To let me move ahead to the next lesson before other students	○	○	○	○	○
c) To help me catch up on a lesson that I haven't finished yet	○	○	○	○	○
d) To help me keep track of how I am doing in school	○	○	○	○	○

This is the end of the survey.

Thank you very much for sharing your opinions and experiences!

To learn more about AIR's research on personalized learning, contact Ellie Fulbeck at efulbeck@air.org.

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