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Design Principles Brief

Academic Acceleration

EdResearch for Action

DESIGN PRINCIPLES FOR ACCELERATING STUDENT LEARNING WITH HIGH-IMPACT TUTORING

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RESULTS FOR AMERICA

The EdResearch for Action *Design Principles Series* focuses on a single program or practice that has been proven to have positive effects on student outcomes. Authors – leading experts from across the field of education research – look across many high-quality studies of similar programs to identify the components and conditions that are key to its effective implementation. The *Design Principles Series* helps practitioners adapt and successfully implement an evidence-based program to meet the needs of their target population.

DESIGN PRINCIPLES AT A GLANCE

PROGRAM FOCUS

Content + Level

Intensive tutoring can be effective across grade levels and subject matter—even for high school students who have fallen quite far behind. The most research is on reading-focused tutoring for students in early grades (particularly grades K-2) but there is also significant research on math-focused tutoring and a smaller, but rigorous body of research on tutoring for older students.

Student Prioritization

There are three main models for prioritizing students for tutoring: need-driven, curriculum-driven, and universal. Decisions about which students to target should vary depending on the needs of the students, schools, and communities.

INSTRUCTION

Frequency and Duration

Effective programs include three or more sessions per week for a minimum of ten weeks. Older students can participate in 30-60-minute sessions, whereas young students can benefit from shorter sessions.

Group Size

The most effective programs have no more than three students per tutor. Moving beyond this number becomes small group instruction, which is less personalized and requires a highly skilled teacher to ensure learning gains for all students being tutored together.

Delivery Mode

Most research has focused on in-person tutoring programs, which have shown the greatest impacts on student achievement. However, emerging evidence indicates that virtual tutoring by a live tutor or through a blended model can also be effective.

TUTOR

Personnel + Support

A wide variety of tutors (including paraprofessionals, community members, college students, and classroom teachers) can successfully improve student outcomes, as long as they receive training and ongoing support aligned to their incoming capabilities.

Relationships

A consistent tutor (each student always meeting with the same tutor for the duration of the program) fosters strong, motivating relationships and ensures continuity in the learning process.

LEARNING INTEGRATION

Scheduling

Tutoring interventions that are conducted during the school day consistently result in greater student attendance and academic outcomes than those that are held after school or during the summer.

Curriculum

Students are likely to learn more when their tutoring sessions use high-quality materials that focus on missed content and skills while complementing their classroom grade-level instruction.

DATA USE

Data Informed

Tutoring programs that support data use and ongoing informal assessments are better able to identify successful practices, understand student progress, and make informed decisions about resource allocation. They are also able to provide information to tutors about student understanding and where to focus instruction to best support each student's learning.

THE EVIDENCE BASE

What is high-impact tutoring?

Research consistently shows that tutoring helps students learn, with numerous studies confirming its strong benefits. Driven by this evidence, policymakers and educational leaders nationwide are investing in tutoring initiatives. However "tutoring" can mean various types of educational support, and tutoring programs can differ significantly in their characteristics and effectiveness.

- **High-impact tutoring is intensive, relationship-based, individualized instruction.** Effective programs share key characteristics:
  - Sustained and strong tutor-student relationships
  - Occurs at least three times a week for a minimum of 10 weeks (adjusted for developmental needs)
  - One-on-one or small groups (up to three-on-one) settings
  - High-quality instructional materials
  - Student progress monitoring with data
  - Alignment with the school curriculum
  - Tutor oversight and necessary training
- **Program design and implementation matter.** Not all tutoring programs are effective, so educational leaders should turn to research for direction on evidence-based ways to design and implement their programs for maximum effectiveness. Investments in tutoring will only pay off if the programs are high-quality and provide support to the students who need them.
- **Differences across schools may lead to different optimal choices for program design.** Tutoring programs may reasonably differ by grade level, subject matter, resource availability, or the goals of the program. The design principles described below can guide educational leaders' decision-making when designing and implementing high-impact tutoring programs.

What are the effects of high-impact tutoring on student outcomes?

High-impact tutoring is the most effective school-based intervention for students struggling in math and reading.

- A recent meta-analysis reviewed studies of tutoring interventions that have been evaluated by randomized controlled trials in the past few decades and found that, on average, tutoring increased achievement by roughly 3 to 15 months of learning across grade levels.
- Another review of almost 200 rigorous studies found that high-impact tutoring—defined as more than 3 days per week or at a rate of at least 50 hours over 36 weeks—is one of the few school-based interventions with demonstrated large positive effects on both math and reading achievement.
- Tutoring is one of the most effective ways to increase achievement for students from lower-income families. A 2017 study examined interventions that aimed to improve educational achievement for elementary and middle school students from low socioeconomic backgrounds. Of all the interventions examined, including feedback and progress monitoring, cooperative learning, computer-assisted instruction, and mentoring of students, tutoring was the most effective.

Regularly scheduled tutoring with a consistent tutor can increase student engagement in school and combat chronic absenteeism.

- An analysis from a recent state-wide tutoring initiative in Washington, D.C. found students were less likely to be absent on days when they had a tutoring session scheduled. These findings were particularly strong for middle school students and students with high levels of absenteeism.
- The 1:1 or small-group nature of tutoring allows for deeper rapport between students and tutors, creating a supportive learning environment that students may look forward to, which incentivizes attendance in school.

High-impact tutoring can be scaled and still improve student learning outcomes.

- While many educational programs lose effectiveness when scaled up, studies of 15 larger-scale tutoring programs serving between 500 and 7,000 students showed an increase of 2-10 months of learning. As often occurs in interventions, program effect sizes somewhat decreased as programs scaled, but these programs still led to meaningful learning.
- As programs scale, it is important they prioritize the design principles of high-impact tutoring to ensure the tutoring continues to positively impact student outcomes.

DESIGN PRINCIPLES AT A GLANCE

Tutoring programs and their subsequent effectiveness vary greatly. Because the vast majority of research on tutoring has evaluated the effect of individual tutoring programs, rather than directly comparing across program types, we cannot definitively say whether or not a specific program characteristic leads to increases in student learning. However, we can identify common components of effective programs. Tutoring programs with the greatest effectiveness for improving math and reading achievement tend to include the following design principles.

Note: This brief is an update of the previous version published in 2021. It incorporates new research on effective design and implementation components in high-impact tutoring programs.

PROGRAM FOCUS

1. **Content + Level:** Intensive tutoring can be effective across grade levels and subject matter—even for high school students who have fallen quite far behind. The most research is on reading-focused tutoring for students in early grades (particularly grades K-2) but there is also significant research on math-focused tutoring and a smaller, but rigorous body of research on tutoring for older students.

    - Reading-focused tutoring interventions for kindergarten and first graders provide more than four months of additional learning in elementary literacy on average.
        - Elementary literacy programs are the most common type of program studied. For example, 81% (72 of 89 studies) of the programs in a 2024 meta-analysis focus on literacy.
        - Many early literacy tutoring programs are leveraging technology to provide tutor support during sessions to ensure fidelity in the implementation of a structured, scientifically-based curriculum.
    - At the middle and high school levels, there is greater evidence of success in math outcomes compared to reading outcomes.
        - A study of the Saga tutoring program in Chicago Public Schools found that intensive 2:1 math tutoring for 9th and 10th-grade males reduced math course failures by over 50%, decreased overall course failures, and improved math grades. The tutoring program was a for-credit class during the school day in addition to their regular math class.
        - Intensive high-school math tutoring programs generate an average of an additional ten months of learning.

2. **Student Prioritization:** There are three main models for prioritizing students for tutoring: need-driven, curriculum-driven, and universal. Decisions about which students to target should vary depending on the needs of the students, schools, and communities.

- **Need-driven:** This model targets students who are performing below a certain threshold. It is the most common approach as research suggests students who are struggling academically benefit most from tutoring. This model is relatively easy to implement, but it can be difficult to identify students who are truly struggling because reliance on an individual assessment can miss some students who need help. In some cases, non-tutored students can benefit indirectly from the reallocation of attention or resources.
- **Curriculum-driven:** This model targets students at critical stages of their learning development or during school transitions. For example, many tutoring programs occur during first grade because it is a crucial point for literacy development.
- **Universal tutoring:** Universal tutoring programs offer tutoring to all students in a grade or school. This can help to reduce stigma and support mid- and high-performing students in underserved areas. While more expensive than need-driven or curriculum-driven models, this approach ensures equity without singling out students. Opt-in tutoring programs, although often marketed as universal, often fail to reach those who need tutoring the most and may be inefficient. Tutoring programs can also be both need-driven and universal when districts aim to provide tutoring to all students in low-performing schools.

INSTRUCTION

3. **Frequency and Duration:** Effective programs include three or more sessions per week for a minimum of ten weeks. Older students can participate in 30-60-minute sessions, whereas young students can benefit from shorter sessions.

- Tutoring interventions appear to be more effective as the number of tutoring sessions per week and the overall number of weeks increase.
  - Younger students may benefit from shorter but more frequent sessions (i.e. 5-10 minute bursts of instruction, multiple times a week).
  - Most effective tutoring programs last for at least ten weeks, but many last for the entire school year.
- Tutoring interventions often are not successful when there are no minimum dosage requirements.
  - One meta-analysis found that high-dosage tutoring (i.e., three or more tutoring sessions per week) is 20 times more effective than low-dosage tutoring in math. In reading, high-dosage tutoring was 15 times more effective than low-dosage tutoring.

4. **Group size:** The most effective programs have no more than three students per tutor. Moving beyond this number becomes small group instruction, which is less personalized and requires a highly skilled teacher to ensure learning gains for all students being tutored together.

- While one-on-one tutoring has been proven to be the most effective model, it comes with higher costs and serves a smaller number of students.
  - On average, one-on-one tutoring interventions tend to result in greater learning gains than small-group tutoring in reading for both elementary and secondary students.
  - A study of a virtual early literacy tutoring program found that one-on-one tutoring was more effective than two-on-one tutoring. Students who initially scored well below the benchmark experienced the largest gains from one-on-one tutoring.
  - A middle school math virtual tutoring program also found that one-on-one tutoring was more effective at raising math achievement than three-on-one tutoring.
  - Small group tutoring can produce equal or better outcomes compared to one-on-one tutoring for elementary math students. Consequently, the ideal group size likely depends on key factors such as age, subject, and delivery (in-person vs. virtual).
- The most effective tutoring programs that have been studied have no more than three students per tutor.
  - The Match Corps/Saga Education tutoring model pairs one tutor with two students at a time and has shown large positive student learning outcomes across numerous studies.
  - Grouping students by skill level or language learner status may make for a more effective tutoring session.
- Higher skilled tutors, such as experienced teachers, are likely better able to tutor up to three students at a time; while novice tutors, paraprofessionals, and volunteers may only be able to be effective with one or two students at a time.
  - Paraprofessionals and volunteers may be better suited to one-on-one tutoring because they are less likely to have developed the skills in behavior management and group instruction that are needed for working with multiple students.

5. Delivery Mode: Most research has focused on in-person tutoring programs, which have shown the greatest impacts on student achievement. However, emerging evidence indicates that virtual tutoring by a live tutor or through a blended model can also be effective.

- The vast majority of tutoring studies have evaluated in-person programs, whereas the evidence base on virtual tutoring is still emerging.
- Virtual tutoring with a live tutor can lower tutoring costs and better match students' needs to tutors' skills by expanding the tutor pool.
  - Studies of the OnYourMark and BookNook tutoring programs demonstrate that in-school virtual tutoring can improve elementary students' reading development.
  - In an experimental evaluation of the CUNY Reading Corps, researchers found no statistically significant differences in literacy outcomes between in-person and virtual delivery.
  - Other evaluations of virtual tutoring programs in Italy, Spain, and the U.S. for middle-grade math students provide promising evidence that live tutoring delivered virtually can meaningfully improve student outcomes. These programs involved students having multiple sessions per week with consistent tutors.
- Computer-assisted learning technology can complement what is being learned in in-person tutoring sessions.
  - Chapter One, an early literacy tutoring program, provides students with devices that allow them to practice the content independently, outside of tutoring sessions. A study of this program found that students assigned to tutoring were over two times more likely to reach the program's target reading level by the end of kindergarten (70% vs. 32%).
  - A recent evaluation of tutoring programs in Chicago and New York City public schools found that a blended model, combining intensive math instruction with a tutor and computer-assisted learning technology, was equally effective at increasing student learning as the costlier in-person-only tutoring.

TUTOR

6. **Personnel + Support:** A wide variety of tutors (including paraprofessionals, community members, college students, and classroom teachers) can successfully improve student outcomes, as long as they receive training and ongoing support aligned to their incoming capabilities.

- Although teachers tend to be the most consistently effective tutors, studies have found that AmeriCorps members and paraprofessionals can be just as effective when tutoring one-to-one or small groups.
  - One of the most promising studies in recent years used AmeriCorps fellows to conduct daily 2:1 tutoring sessions with low-performing students in 12 Chicago Public Schools. In addition to improved math test scores, students were 50% less likely to fail their math course and 28% less likely to fail a non-math course.
  - Several paraprofessional tutoring programs have proven to effectively increase their scale, including those that deploy service fellows as year-long tutors through AmeriCorps and Saga Education.
  - Schools can deploy the paraprofessional educators already working in schools as tutors, as long as they are provided with sufficient training and high-quality materials.
  - Tutoring programs that employ service fellows often require tutors to pass a subject-related exam, as well as undergo trainings focused on instructional techniques, social-emotional learning, and cultural competency.
- Unpaid and untrained volunteer tutors are generally much less effective tutors than paid tutors, but well-trained volunteers in structured programs demonstrate promising results.
  - Two large evaluations of volunteer literacy tutoring programs where tutors were neither compensated nor well-prepared found no improvements in reading comprehension.
  - While unpaid volunteers have not historically performed well as tutors, "paid volunteers" like paid employees of local businesses whose time is donated and paid college students show promise.
  - Successful tutoring programs that rely on volunteers (like Reading Partners) tend to involve substantial training—often a couple of weeks—and ongoing support throughout the program, including structured materials and curriculum.
- College students offer an effective and continuously replenishing source for tutors.
  - Higher education institutions can leverage federal work-study funds and teacher preparation programs to source college students as tutors, who can be near-peer role models for K-12 students and often share experiences with these local students.
  - A university tutoring initiative can provide valuable training for university students enrolled in teacher programs while also bolstering the supply of tutors in the state.
  - College students report personal benefits from tutoring, including improving their skill sets and resumes, as well as an opportunity to help the community.

- The Illinois Tutoring Initiative provides one example of this approach through teacher preparation programs. EQPD provides another example, outside of teacher preparation.
- A recent study found that highlighting the monetary benefits of serving as a tutor increased the pool of college students who applied to be tutors by 200%.

- Tutoring programs are more successful and sustainable when they employ school-based coordinators and dedicated staff to connect tutors with teachers and manage implementation.
  - Districts that provide dedicated district- and school-level staff to manage implementation are better able to effectively execute high-impact tutoring programs.
  - Like other tutoring programs, initiatives run by colleges and universities also require supervision to be effective and sustainable.

7. **Relationships:** A consistent tutor (each student always meeting with the same tutor for the duration of the program) fosters strong, motivating relationships and ensures continuity in the learning process.

- Tutors who meet regularly with students can better develop caring tutor-student relationships.
  - One study showed that students' attendance in tutoring sessions increased by four percentage points when they and their tutors took a get-to-know-you survey that highlighted their shared interests and commonalities.
- Like positive teacher-student relationships, positive tutor-student relationships may lead to greater academic, social, and motivational outcomes.
  - Some successful tutoring interventions are relationship-driven programs that focus on building trusting relationships between tutors and students, in addition to enhancing academic achievement.
  - Research on youth mentoring programs suggests positive mentoring relationships can have a wide range of benefits for students' social-emotional well-being.

LEARNING INTEGRATION

8. Scheduling: Tutoring interventions that are conducted during the school day consistently result in greater student attendance and academic outcomes than those that are held after school or during the summer.

- A recent meta-analysis found that the effects of tutoring programs during the school day are about twice as large as programs that are outside of school hours.
  - Few students participate in opt-in tutoring options that are not scheduled within the school day.
  - Tutoring that was a feature of the No Child Left Behind supplementary education services was delivered by independent providers outside of the school day. Poor student attendance and a disconnect from students' school experiences often led to disappointing results.
  - A recent study showed that on-demand tutoring programs that provide 24/7 homework help may not reach students who need it most. Less than 20% of secondary school students ever once used the program, and struggling students were least likely to reach out to a tutor for help.
  - Initiatives that give families money for tutoring also see low participation rates, as they require families to find and schedule sessions themselves.
- If tutoring must be scheduled outside of school time, it is crucial for programs to promote and prioritize attendance and meaningful engagement.
  - Schools that prioritize communication with parents and students see higher attendance in tutoring programs. The National Student Support Accelerator and Innovate Public Schools developed this tool to help families understand and advocate for high-impact tutoring.
  - The National Student Support Accelerator has created this guide for boosting enrollment and attendance.
  - Several program practices are associated with strong attendance in other out-of-school contexts:
    - Communicating the expectations and benefits of strong attendance during recruiting
    - Following up with reminders about the program
    - Creating an engaging site climate with positive adult-student relationships
    - Providing free transportation and meals can reduce barriers to participation, particularly for students from families with low incomes
    - Delivering their program in the school building either before or after school

9. Curriculum: Students are likely to learn more when their tutoring sessions use high-quality materials that focus on missed content and skills while complementing their classroom grade-level instruction.

- High-impact programs tend to use high-quality instructional materials that align with their core classroom content or grade-level standards.
  - Remediation, or giving students simpler, previous grade-level materials, has been found to result only in students falling further behind the grade-level material.
  - Rather than focusing on items that students have failed to master previously, tutors can address missed concepts and skills that are most critical to accessing the upcoming content.
  - Tutors can take on the role of catching struggling students up while taking some of the pressure off classroom teachers and allowing them to maintain the pace of their instruction. However, tutors need to ensure they build foundational skills while making connections to the content students are learning in class.
- Programs can leverage technology to provide tutors with a structured curriculum.
  - Many early literacy and math tutoring programs provide tutors with devices that allow tutors to walk through guided lesson plans with their students.

DATA USE

10. Data Informed: Tutoring programs that support data use and ongoing informal assessments are better able to identify successful practices, understand student progress, and make informed decisions about resource allocation. They are also able to provide information to tutors about student understanding and where to focus instruction to best support each student's learning.

- Successful tutoring programs often have clear learning objectives and collect data to assess the effectiveness of their programs.
  - Since much is still unknown about the design of tutoring programs and their effectiveness for different types of students, it is crucial to closely monitor student progress and to test and adapt approaches as needed. By carefully tracking student outcomes and regularly assessing the effectiveness of different program elements such as tutor interactions, curricula, and group sizes, districts can make informed decisions to optimize the impact of their tutoring initiatives.
  - The National Student Support Accelerator has many resources to help tutoring programs develop a data collection strategy including how to gather rigorous evidence of a program's effectiveness.
- Formative assessments, whether conducted in the classroom or in a tutoring session, provide the tutor with timely feedback on each student and allow for personalized instruction.
  - The Reading Partners program monitors student progress using mid-year and end-of-year assessments and updates each student's reading plan after the mid-year assessment.
  - For formative assessments to result in more student learning, tutors need time and support to review the assessment, as well as knowledge of how to address each student's needs.
  - Minnesota Math Corps tutors are provided with regular professional development to improve their data-based decision-making.

EFFECTIVE IMPLEMENTATION CONSIDERATIONS

The following conditions are key to successfully implement a high-impact, school-based tutoring program:

- **Program Integration and Alignment:** Programs are more effective when district and school leaders work in collaboration with classroom teachers and tutors to address learning objectives and ensure the tutoring sessions are relevant to students' coursework.
- **Organizational Capacity and Leadership:** Several studies have identified that a designated program coordinator and a team of teachers, administrators, and other stakeholders are necessary to collaborate across academic and operational departments to effectively coordinate and implement the program.
- **Stakeholder Engagement and Participation:** Effective communication strategies ensure that all stakeholders are aware of the program and its goals, and encourage participation from students, parents, and tutors.
- **Ongoing Monitoring and Evaluation:** Tutoring programs that have identified key metrics for success and implemented a process for progress monitoring are better able to understand the impact of the program and identify successful practices. Having a plan for evaluating success is especially important in cases where leaders are adapting proven models or experimenting with new innovations.

You can bring evidence-based tutoring into your district in a variety of ways. Depending on your district's capacity and needs, you might consider:

- Developing an in-house program to establish and integrate evidence-based tutoring as a long-term service
- Modifying existing school-based tutoring programs to better align with the principles outlined in this guide.
- Contracting with an external tutoring provider in your district, for example a community-based nonprofit.
- Contracting with a regional or national tutoring provider that is not yet working in your district, such as a private vendor.

This EdResearch for Action Project brief is a collaboration among:

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