TEACHER MINDSETS

HOW EDUCATORS' PERSPECTIVES SHAPE STUDENT SUCCESS

BY CRAIG WACKER AND LYNN OLSON

JUNE 2019

FutureEd
GEORGETOWN UNIVERSITY

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FOREWORD

As the education sector increasingly focuses on students' social and emotional skills, a growing body of research points to the importance of teachers to that dimension of student learning. Through the messages they send and the experiences they provide in classrooms, teachers shape students' psychological experiences of schooling, their motivation to learn, and their achievement levels.

FutureEd Senior Fellows Craig Wacker and Lynn Olson explore the critical role that teachers' attitudes, beliefs, and practices play in fortifying students' investment in learning in this new FutureEd report. They examine the new findings on "teacher mindsets" and profile schools at the forefront of efforts to shift adult perceptions and practices in ways that strengthen students' view of themselves as learners and their motivation to learn.

We're grateful to the many researchers who contributed to the project. Greg Walton of Stanford generously provided us with valuable feedback on a draft of the report. And we are grateful to Amana Academy in Alpharetta, Georgia, part of the EL Education Network, Urban Assembly Media High School in New York, part of the Urban Assembly network, and Mission High School and MLK Jr. Middle School in the San Francisco Unified School District for inviting us into their classrooms.

Phyllis Jordan, Molly Breen and Jackie Arthur of FutureEd's editorial team did a great job producing the report. And the Barr Foundation, the Carnegie Corporation of New York, and Lucas Education Research at the George Lucas Educational Foundation made the work possible.

Thomas Toch
Director, FutureEd

Research increasingly points to the importance of social and emotional learning to student success. Whether students feel connected to school and have a positive sense of themselves as learners strongly influences academic achievement and school completion. Strengthening students' motivation to learn, it is becoming increasingly clear, is an important complement to the longstanding focus on standards, curriculum, and assessments in school reform.

Teachers play a central role in these social and emotional dimensions of student learning. Through the messages they send and the experiences they provide in classrooms, teachers shape students' psychological experiences of schooling, their motivation to learn, and their achievement levels, a growing body of research reveals.[1] While teacher-student relationships are often characterized as the "soft" side of schooling, in fact they are foundational to student success, especially for students who have been traditionally underserved by public schools.[2] But the education sector has largely neglected the teacher side of the social-emotional learning equation.

This report explores the critical importance of "teacher mindsets," or teachers' attitudes, beliefs, and practices, in fortifying students' investment in learning. "Student-facing interventions may not work if the school ecosystem does not support them," says Thomas S. Dee, an economist at Stanford University who has studied the effects of teacher beliefs and biases on student learning.

"In contrast, when you change teacher practice, you are simultaneously influencing students and changing the entire educational context."[3]

As research on the importance of teacher perspectives and practices on student success expands, educators have begun to translate the findings into practical applications in schools and classrooms. We profile several schools in the forefront of that work, schools that have begun to use the new findings on teacher mindsets to shift adult belief and behaviors in ways that strengthen students' view of themselves as learners and their motivation to learn.

Forging Teacher-Student Relationships

Relationships with caring teachers and other adults are critical to student success, especially for students at risk of poor outcomes. Research has found that starting in infancy, the presence of warm, consistent relationships with responsive caregivers shapes the architecture of the

developing brain and promotes the social, emotional, and cognitive competencies foundational to learning.[4]

Recent comprehensive research reviews by the National Commission on Social, Emotional, and Academic Development, the University of Chicago Consortium on School Research, and the Science of Learning and Development Project have linked strong teacher-student relationships to a more positive school climate, greater student engagement, better school and learning outcomes, greater social and emotional competence among students, and an increased willingness to take on challenges.[5] Students who feel supported are more likely to show interest and motivation in learning and are more willing to take the risks and show the persistence necessary to learn.[6] In contrast, when students are in conflict with their teacher they find it harder to engage and participate productively in class.[7]

"Teachers have to build in students some sense of beneficence, that you've got my back, that the teacher believes in me and is going to support me and be with me," Claude Steele, a social psychologist at Stanford University, said recently.[8]

There are pivotal ways in which schools can help teachers build positive relationships with their students. These include structures that put teachers and students in close proximity with each other, so they can know each other well, in addition to making the development of such relationships a schoolwide priority. Examples include mentorship programs, teams of teachers who share a cohort of students for all their core academic subjects, and advisory groups in which a teacher provides guidance and advocacy for a small group of students over a year or multiple years. Schools also can help teachers to see their students' strengths—and not just their challenges—in order to build students' view of themselves as effective learners.

Urban Assembly Media High School on the Upper West Side of Manhattan is implementing these approaches.[9] Like other middle and high schools in the Urban Assembly network—which serves more than 9,000 students in high-poverty areas of New York City—the high school has a daily advisory program, in which small groups of students meet with the same teacher over multiple years. These advisories are designed to foster strong teacher-student bonds and to teach social and emotional skills, such as identifying and managing emotions, coping with stress, and developing positive relationships. "It made me build up a relationship with that teacher," says Kieran, an 11th grader at Media High School. "Advisory gives us a place to open up and share our experiences," adds fellow student Aruja. "It's like making more friends and people to talk to."

Students meet in their advisory groups daily. Depending on the day of the week, advisory group teachers instruct students on social-emotional skills through the School-Connect curriculum, a leading approach based on a set of competencies developed by the Collaborative for Academic, Social, and Emotional Learning; lead group discussions to practice those skills and discuss how to apply them to life outside school; or check in with students on their academic progress.

Urban Assembly also helps teachers see students' strengths as an asset for learning, rather than focusing solely on academic or behavioral challenges. The school has students rate themselves using the Devereux Student Strengths Assessment (DESSA) of self-management, self-awareness, social awareness, relationships, optimistic thinking, goal-directed behavior, personal responsibility, and decision-making skills. Teachers use the survey results, along with twice yearly observations of students' behavior, to set goals with students and to open up conversations. "We hear lots of stories of a teacher who rates a student as not having really good self-management skills, or who is always late to school," says Brandon Frame, Urban Assembly's deputy director of social and emotional learning. "But after a conversation with the student during a [DESSA] debrief, they hear, 'I wake up and get my little brother and sister ready and take them to school.'" Knowing the broader context in which students live, he adds, "forces a teacher to change their expectations."

Professional development for teachers in the Urban Assembly network includes topics such as how to build strong family and community ties, how to create a collaborative and supportive environment, and how to build rapport. Students also periodically rate teachers' behavior, a useful source of feedback on the educators' social and emotional skills. "We can't ask kids to do something we haven't done," says Jenine DeMarzo, a health and physical education teacher at Media High School.

Using a "walk-through" rubric, Urban Assembly administrators can visit classrooms to look for signs that teachers are developing relationships, respect, active engagement, and content understanding and relevance for students. Urban Assembly also provides teachers with concrete examples of positive verbal feedback that still pushes students to strive further. Examples include, "I noticed that you asked questions of your peers and encouraged students who were not engaging to participate in the conversation. Well done!" and "Johnny Thunder asked questions and wasn't afraid to be wrong. Going forward, don't be afraid to engage in the conversation, even if you're not sure."

Five years ago, Media High School was struggling with disciplinary and suspension issues. Since implementing these approaches, it has seen increases in positive social behaviors, lower disciplinary referrals, and greater trust between students and teachers.

The BARR Model

High schools across the country have adopted another model to improve learning outcomes and reduce dropout rates. The BARR model—Building Assets Reducing Risks—aims to intentionally build teacher-student relationships and use real-time data to improve social, emotional, and academic outcomes for students. The program places small groups of incoming freshmen together for their English, math, social studies, and science classes. Teachers meet weekly to discuss each student's performance at a granular level, with a focus on identifying strengths and fostering relationships. This

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USING STUDENT SURVEYS TO STRENGTHEN TEACHER MINDSETS

Urban Assembly, a nonprofit that supports a group of 22 small New York City public schools, encourages students to assess their teacher's strengths and weaknesses, working in groups using questions from the Devereaux Student Strengths Assessment. By letting students assess their teachers, Urban Assembly is trying to create a culture of social and emotional growth for students and adults alike.

The 40 student survey questions include:

"In groups, circle the score below each question based on how often you have observed your teacher do each behavior in the past four weeks."

6. Get along well with different types of people?

Never   Rarely   Occasionally   Frequently   Very Frequently

12. Respect another person's opinion?

20. Express high expectations for himself/herself?

22. Follow the example of a positive role model?

26. Show appreciation of others?

28. Adjust well to a new situation?

32. Show concern for someone?

40. Do the right thing in a difficult situation?

SOURCE: Devereaux Student Strengths Assessment

helps teachers have a clear view of both what a student has accomplished and where they need to improve and to truly believe that such improvement is possible.

The "I-Time curriculum," a 30-minute weekly lesson facilitated by the core-subject teachers, is built into the BARR program with the goal of helping students strengthen relationships with teachers and each other. During these lessons, students might share whom they connect with most at school, whether they care for a sibling, or whether they have a job outside of school. That information doesn't stay with one teacher but is shared with the group. Teacher teams identify the most at-risk students and move them into a structured risk-review process that engages the community to address their needs. This includes involvement by the school counselor or psychologist and other relevant professionals.

> **As a result of the home visits, educators reported greater efforts to communicate with families, a more empathic approach to discipline, and an enriched understanding of students' interests and culture.**

BARR provides teachers and administrators with six days of training,[10] on-site coaching visits, and unlimited virtual coaching throughout the first three years of implementation. "We focus on what's right with the student," says Justin Barbeau, a technical assistance director at the BARR Center in St. Louis Park, Minn., where the program started. "Are they social? Are they demonstrating an ability to lead? Many times, when teachers are talking about family factors, they lean toward the risk factors, students' challenges. We focus on strengths as well. We're really trying to reframe the teacher's mindset, what's right with the student? What's the student's connection to school, does he or she have one?" A rigorous, randomized control study of the model

across a national sample of schools found improvements in test scores, credits earned, and grade point averages, and a decline in failure rates.[10] Based on the program's track record, the U.S. Department of Education is supporting the model's expansion into 250 schools nationally by 2021.

Shifting Teachers' Assumptions

Research suggests that having teachers visit their students at home also helps build stronger relationships and shifts teachers' assumptions about the capacities and values of students' families.

"Mindset Shifts and Parent Teacher Home Visits," a study by RTI International, examines the effectiveness of the Parent Teacher Home Visits Model, which trains educators to visit the homes of their students in teams of two. The model's goal is to dissolve negative and sometimes unconscious assumptions that educators and families may hold about each other, enabling them to partner more effectively in support of students. Based on interviews with 175 home visit participants in two or three schools in each of four large districts implementing the model, the study found that, after completing a structured home visit, many teachers recognized their students' families had high ambitions for their children and moved from thinking that students lacked motivation or interest in school to acknowledging their capabilities. As a result of the home visits, educators reported greater efforts to communicate with families, a more empathic approach to discipline, and an enriched understanding of students' interests and culture, which helped them engage and motivate students more effectively.[11]

When assessing whether a student feels safe and connected at school, don't simply count how many friends she has or how many times she meets with a teacher, cautions Mary C. Murphy, a professor of psychological and brain sciences at Indiana University. "We really need to be doing a deeper dive into what it means for students to trust teachers and to trust their peers so that school is a safe place," she says. "You're

going to see me for who I am, and you're going to value me for that unique identity that I bring to the classroom."

Helping Students See Themselves as Successful Learners

Trust and mutual respect between teachers and students are foundational to learning. But for students to succeed, they must also develop a sense of themselves as learners who belong in an academic setting and who can persist and improve through focused effort. Much of that work starts with teachers' own beliefs about intelligence and the learning process.

In the early 2000s, researchers Laura Blackwell, Kali Trzesniewski, and Carol Dweck were interested in whether students who viewed intelligence as malleable—something they could increase through effort—would outperform students who believed intelligence was "fixed" at birth. The researchers designed an eight-week workshop for 99 low-income, relatively low-achieving 7th graders in New York City that focused on the brain and study skills. Students in the weekly, 25-minute workshops were split into two groups. The control group learned about memory and discussed academic issues of personal interest. The treatment group learned that the brain is a muscle that grows with effort and how to apply that concept to their studies.

After just eight weeks, students in the treatment group showed more motivation in class based on teacher re-ports; their grades, which had been declining, stabilized, while those of the control group continued to fall.[12]

Dweck's studies of what she calls a "growth mindset" are part of a larger body of research on how students' beliefs and attitudes toward learning contribute to academic engagement, persistence, and performance in school. Research by the University of Chicago Consortium on School Research has identified four key dimensions of a positive "learning mindset" in students: (1) a sense they belong in school, (2) a sense that they can succeed,

(3) a sense that their ability can grow through effort, and (4) a sense that the work has personal value. Research has consistently found that students with these positive attitudes toward learning have better academic behaviors and grades than students who don't feel these statements to be true.[13]

Research also has found that teachers' own views about whether intelligence is fixed or malleable strongly influences their students and may have deep implications for closing achievement gaps. A longitudinal, university-wide study of 150 STEM professors and more than 15,000 students by Elizabeth A. Canning, Katherine Muenks, Dorianne J. Green, and Mary C. Murphy found racial achievement gaps in courses taught by instructors with a fixed mindset were twice as large as those in courses taught by instructors with a growth mindset. Students' course evaluations also revealed that they were less motivated and had more negative experiences in the classes taught by fixed-mindset instructors. An instructor's mindset predicted student achievement and motivation above and beyond other characteristics, such as gender, raceor ethnicity, age, teaching experience, or tenure status.[14]

> **Racial achievement gaps in courses taught by instructors with a fixed mindset were twice as large as those in courses taught by instructors with a growth mindset.**

Research in secondary schools similarly suggests the important role that teachers play in shaping students' beliefs about learning. Research by Camille A. Farrington and her colleagues at the University of Chicago found that the same student can have different attitudes about learning from one classroom to the next. Students earn higher or lower grades across classrooms, as their attitudes change. Moreover, those differences can be traced to differences in their teachers' instructional practices and the conditions they create in classrooms.[15]

A small but growing number of schools are working to deploy this research in their classrooms, helping teachers develop positive beliefs about learning in their students. The Amana Academy in Alpharetta, Georgia, a K-8 charter school where students of color comprise 73 percent of the student body, is one such school. Named for an Arabic word that signifies "a trust that must be nurtured and guided," the school offers an integrated STEM curriculum and Arabic world-language instruction alongside a focus on students' ethical character. Amana is part of the EL Education Network, a consortium of 152 schools in 30 states that combines academic and character development.

Walking through Amana's classrooms reveals how teachers promote all four components of the Chicago Consortium's learning mindset taxonomy. Protocols for productive classroom participation, such as how to work effectively with a partner, actively listen and respond during classroom discussions, and be on time, ready, and prepared to learn, are everywhere. Examples of student work festoon the walls, as do inducements to persist and show courage in academic undertakings, such as "I can show perseverance when the work is hard."

Teachers emphasize positive language, telling younger students to "kiss your brain" and older students to look for successes and signs of progress, and not just errors, on homework assignments. Like other schools in the EL Education network, Amana's students engage in expeditionary learning projects: long-term, collaborative efforts that ask students to produce school work of value to them and their communities, using STEM-based solutions to real-world problems. In one STEM class, students may code a game to teach other students about bio-fuels. In a 7th grade classroom, students work in teams to design a working model water tower to understand how water towers function and why they are needed in communities.[16]

Twice a month, teams of teachers and administrators conduct "walk-throughs," quick observations of classroom practice, looking for signs of active and effective learning. Do students stick to a tough problem,

ELEVATING TEACHER MINDSETS IN PROFESSIONAL DEVELOPMENT

For Expeditionary Learning (EL Education), developing student character is equally important as mastering knowledge and skills. A key aspect of the EL Education character focus is to "become effective learners," or the development of mindsets and skills necessary for success in college, career, and life. Since teachers play a central role in cultivating these skills, "becoming effective learners" is a pillar of EL Education professional development. The following "becoming effective learners" walk-through tool is used to share best practices and identify areas for growth.

Among the strategies EL Education looks for during classroom visits:

Collaboration

Teachers assign students specific classroom roles and responsibilities that support collaboration and effective communication.

Perseverance

Teachers support students in embracing mistakes as learning opportunities, and in seeing failure as a temporary condition.

Responsibility and Ownership

When asked for help, teachers provide scaffolds and resources that enable student ownership, rather than making the learning task easier.

Self-Management

Teachers provide feedback to model how to self-assess, revise, critique, and support peers.

SOURCE: EL Education

even when confronted with mistakes, uncertainty, or challenges? Do teachers connect learning activities to their students' lives? Do they structure activities to foster student voice and leadership?

Along with other schools in the EL Education network, Amana is piloting observation and feedback tools designed to help teachers foster positive learning attitudes among students. Teachers participate in within-grade and cross-grade "crews," or teams, aimed at building strong peer relationships, similar to the "crews" that students participate in. Teachers also engage in monthly professional development that uses feedback from the walk-throughs and other data to inform their teaching. E-mails to staff members about the walk-throughs purposely highlight positive trends as well as areas for improvement, to mirror the growth-mindset messages the school wants teachers to convey to students.

These strategies give teachers opportunities to reflect on their beliefs and assumptions. "In our own small groups, we have the opportunity to talk about issues outside the classroom that might influence teacher mindsets and practices," notes Erica Young, the school's student-engagement coordinator. "Teachers feel like it's a safe space to grapple with sticky issues," including their own biases, and see things from different perspectives.

Teachers say their growth mindset starts with Principal Cherisse Campbell, a chemical engineer turned educator. "We put [teachers'] student-relationship work at the center" of professional development activities, Campbell says, "and it's grounded in respect." Amana performs better on the state's college- and career-ready performance index than 95 percent of schools statewide. The academic growth of its middle school students outpaces 99 percent of Georgia middle schools.

Who Can Do the Math?

The importance of teacher beliefs and practices also has played out in the 57,000-student San Francisco Unified School District, where officials are trying to tackle underperformance and uneven classroom participation in math among students of color.

There is a widespread misconception, including among many teachers, that only some people are born with the ability to do math. Jo Boaler, a professor in the Stanford Graduate School of Education, has proposed that this belief lies at the root of math anxiety and reduced math performance in U.S. classrooms. Traditionally, teachers' professional development has focused on different ways of teaching mathematics. But recent evidence from neuroscience, psychology, and education points to the need to also change teachers' ideas about who can achieve in math and to directly challenge the myth of the "math person."[17]

"It all starts with teachers changing their mindsets and changing their relationship with math," says Boaler. In some classrooms, the need to change teacher mindsets is striking. "I am continually upset when I hear what math teachers and math professors are saying to their learners," Boaler adds. "Things like, on the first day of the year, 'only a few of you are going to be successful in this class.'"

Boaler and her colleagues have been studying an instructional strategy used in San Francisco and elsewhere known as Complex Instruction. In Complex Instruction classrooms, students work in small groups on challenging, open-ended tasks that encourage students from diverse backgrounds and at different achievement levels to share and discuss their ideas. Guidelines about group participation help ensure that no one student dominates the conversation. Teachers learn about the value of mistakes and struggle in promoting brain growth so that they become more comfortable letting students wrestle with tough problems.

When teachers use Complex Instruction, says Angela Torres, who manages the program for the San Francisco Unified School District, they look for opportunities to assign competence to students who may not be traditionally recognized in math classrooms, and they assess whether all students have equal access to

mathematical conversations. Teachers collaboratively analyze videos of teaching practice to identify moments when teachers point out students' strengths, encourage use of mathematical language, and affirm a student's competence.

These techniques are on full display in Dayna Soares' algebra class at Mission High School. "I want as many justifications as possible," Soares, a 10th grade math teacher, told her Algebra 2 students on a recent Friday morning. The students worked in small teams of three or four to solve a complex math problem: "Jaliyah invests $500 with a 40 percent annual interest rate. How much money will she have after 4 years?" As Soares circulated, she purposely highlighted students' work, including that of students who may rarely shine in class. "That's a totally valid way to set this up," she told one student. "That's a really nice way to see this," she complimented another about their novel use of language to describe a mathematical principle.

Because the students have internalized the routines for working in groups, Soares was free to circulate, observing each group carefully, offering feedback when students got stuck, and checking to make sure each student was participating actively. Research has found that when students talk and work together more, they learn more. But students who are perceived as lacking ability often fail to participate and thus learn less than they would have if they were more actively engaged.

In 2018, Boaler and her colleagues published a study of 40 teachers in eight districts who participated in online and in-person sessions about Complex Instruction and how the brain learns and grows, to directly tackle the myth about who can do math. The study found significant, positive improvements in student beliefs, teacher instructional practices, and students' math test scores. Complex Instruction was particularly successful in raising the achievement of girls, English learners, and economically disadvantaged students.[18]

Noted one teacher: "The most powerful is the mindset, and that's not only for my students but more for me because I didn't think I was a math person … In class, we'll say, we don't say that something is hard, we say it's challenging. I am the one that usually says about something being hard and then [the students] all tell me, 'No, it's not hard, it's challenging.' So, they're doing really well with the growth mindset."[19]

Fostering "Belongingness"

Instructional techniques like Complex Instruction help to tackle "stereotype threat," or students' fear that they will be perceived or treated through the lens of a negative stereotype about their group and that performing poorly would confirm the stereotype. The messages that teachers provide through both words and actions can reinforce or mitigate these beliefs, which can influence students' sense of whether they belong in school and, ultimately, whether they engage in learning.[20]

In a landmark study, researchers Claude Steele and Joshua Aronson set out to assess how students' fear of how they could be perceived influences test performance. They invited African American and white Stanford students, mostly sophomores, into the lab and gave them a difficult test of verbal reasoning. They told one group of students the test was designed to measure their verbal ability, and the second group that it was to study problem solving in general and did not measure ability. African American students in the second group performed at the same high level as white test takers, and significantly higher than the African American students who had been told the exam was a test of ability. Steele and Aronson hypothesized that the framing of the exercise as an intelligence test prompted African American students to think about the racial stereotype that African Americans are less intelligent than whites, which depressed their performance.[21]

Stereotype threat is not limited to students of color. Girls, who are often underrepresented in science and math careers, also are vulnerable to stereotype threat and to social cues that they do not belong in science and math classrooms.[22]

Teachers can influence these perceptions, either on purpose or accidentally, including in how they give feedback to students on written work. Social psychologist David Yeager theorizes that students look to teachers for signals about whether they can succeed, meet their expectations, and belong in the classroom. When these signals aren't clear, students sometimes fill in the blanks—particularly if they come from populations that have been historically ill-served by public education, leading to an underlying mistrust of teachers and schooling.

In a study, Yeager and his colleagues recruited 7th graders earning Bs and Cs to see whether their perceptions of teachers' feedback explained their effort and performance. The students, who included both African American and white students, were prompted to write an essay that would be graded and critiqued by their teachers. The researchers then randomly assigned students to receive one of two notes from their teacher. One note read, "I'm giving you these comments so that you'll have feedback on your paper." The note to the treatment group read, "I'm giving you these comments because I have very high expectations and I know that you can reach them." After receiving the notes and the teacher feedback, students were given the option of revising their essays. An estimated 71 percent of African American students in the treatment group chose to do so, compared to only 17 percent of students who received the standard message.[23]

In a related analysis, the same researchers required students to revise their essays after receiving the teacher notes: 88 percent of African Americans in the treatment group improved their essay scores, compared with 34 percent of African American students in the control group. In both studies, the intervention had a positive effect on white students' behavior, but it was not statistically significant.[24]

Yeager says effective feedback has three elements: (1) The teacher conveys the high standards he or she has for the student. (2) The teacher assures the student that he

THE BENEFITS OF "WISE FEEDBACK"

How students make sense of the world, including their schooling, is an important aspect of educational success. Students of color can construe critical feedback of their academic work as a teacher being biased or doubting their intelligence. When students draw these kinds of conclusions, they may be less likely to approach a teacher with questions and more likely to misbehave.

Breaking the Cycle

Teachers can shift the meaning that students of color attach to feedback and restore trust, especially if teachers address students' underlying fears or beliefs, research has found. This includes communicating messages such as "I have high standards, and I know you can meet them," to convey to students the teacher's belief in their ability to improve. Researchers have termed these kinds of messages "wise feedback."

SOURCE: Yeager, D. S., Purdie-Vaughns, V., Garcia, J., Apfel, N., Brzustoski, P., Master, A., Hessert, W., Williams, M. & Cohen, G. L. (2014). Breaking the Cycle of Mistrust: Wise Interventions to Provide Critical Feedback Across the Racial Divide. Journal of Experimental Psychology: General, 143, 804-824.

or she can reach the high standards, which lessens the possibility that students will see the feedback as limiting. (3) The teacher provides resources, including concrete suggestions for how to improve, to help the student reach the standards demanded of them.

"School is hard," says Greg Walton, an associate professor of psychology at Stanford who has studied feedback. "People are trying new things. They fail a lot. There are moments of negativity," such as when students are disciplined or get critical feedback on their work. "These are times when students have to make meaning

and those meanings are up for grabs," he adds. "The key is, how can teachers anticipate these challenge points and navigate them in ways that maintain positive relationships with children and help students learn?"

Building Bridges to Students' Backgrounds

Research has demonstrated that to effectively build students' understanding, it's important to connect new information to what they already know and have experienced.[25] Connecting to students' cultures, interests, and prior knowledge also builds a stronger emotional bond between students and teachers and fosters greater student interest in academic coursework.[26]

In addition to the Complex Instruction initiative, San Francisco Unified is using an ethnic studies curriculum for 9th graders to enhance the relevance of student work and better engage its diverse student body. Research has found that students are more motivated to learn when they view what they're learning as having value and relevance. Developed by a group of SFUSD teachers in partnership with San Francisco State University, the curriculum also provides common ground for teachers and students from different backgrounds.[27]

The ethnic studies curriculum is part of a larger movement to help teachers become culturally responsive in their instruction by being more aware of their own cultural background and experiences and attuned to how those experiences inform their teaching, as well as more proactive in creating learning activities and assignments that respect and build on students' cultural and linguistic backgrounds.

This approach plays out vividly in Cat Reyes' 9th grade ethnic studies classroom at Mission High School in San Francisco. On a recent afternoon, a Mission High School senior was visiting the class to talk about his third and final journey to immigrate from Tegucigalpa, the capitol of Honduras, to the United States. "It's not a good experience, but it's a good story," he said.

The student recounted how his family cried as he left Honduras, wondering if they would ever see him again. "I actually got on La Bestia [the beast] three times," he told the students, referring to the freight train that migrants use as transport across Mexico. "When I got to Houston, there was a woman in the car next to me, hugging me, and she was my mom. The first time I met my mom and dad was when I was 11 years old." Reyes pushed students to try to understand the experience from the student's perspective and what it means for his life in San Francisco. The student, who began as an English language learner, is now an AP English student and a strong role model for others.

Studies find a positive association between student engagement and culturally responsive teaching, with particular benefits for students of color.[28] Principal Eric Guthertz says teachers' beliefs play an important part in the success of the high school's ethnic studies program. Mission's curriculum wouldn't work, he says, "for a teacher who believes black and brown kids can't succeed."

Stanford's Thomas Dee and his colleague Emily Penner of the University of California, Irvine, conducted a study of San Francisco high schools piloting the ethnic studies

> **Connecting to students' cultures, interests, and prior knowledge also builds a stronger emotional bond between students and teachers and fosters greater student interest in academic coursework.**

curriculum and found surprising gains in attendance and performance. The program increased 9th graders' attendance by 21 points, equivalent to approximately 38 days in a 180-day school year, and boosted their grade-point average by 1.4 points. The researchers concluded that aligning instructional practices and content with the experiences of minority students can help connect them to school.[29]

Dee argues that far from being an add-on to the curriculum, educators might want to think about culturally relevant instruction as central. "I see strong connections between culturally relevant pedagogy and the psychological mechanisms that can unlock student potential. Those mechanisms include affirming belongingness, values, and cultures; inquiring into stereotypes and how they shape students' worlds; and emphasizing external attributions for educational challenges."

Promoting Empathic Discipline

Like many urban districts, San Francisco also struggles with disciplinary issues, including suspensions and expulsions that disproportionately affect African American students, and a concern that unconscious bias is driving teachers to treat white and African American students differently.

"Do educators see African American students as learners, or do they simply see them as a problem?" asks Landon Dickey, the director of the district's African American Achievement and Leadership Initiative, launched under previous superintendent Richard A. Carranza. "Do they see African American students as having expertise and insights on academic subjects, or do they see them as empty vessels that we need to fill?"

As part of the leadership initiative, the district is piloting the Perspectives Experience Program, or PEP, developed by psychologist Jason Okonofua and his colleagues at the University of California-Berkeley to address the impact of unconscious bias on teacher-student relationships and student outcomes.
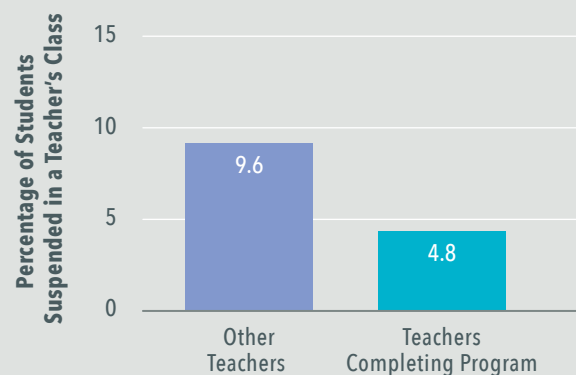
PEP includes two online modules for teachers and students in grades 4 through 12, spaced about six months apart. Using videos and written exercises that ask teachers to read and respond to research articles and stories about the effectiveness of valuing students' perspectives and the need for teacher support, PEP seeks to shift beliefs about minority learners and

mitigate more punitive approaches to classroom discipline. Within the modules, prompts ask teachers to reflect on their approaches for engaging students and addressing discipline issues. Student modules similarly prompt students to reflect on their relationships with teachers and peers and on equitable treatment from school staff. Teachers typically complete the modules during scheduled professional development time, while students complete their modules in class.

The program is meant to help teachers identify with minority learners and build a more empathy-driven approach to discipline. It is based on a series of experiments by Okonofua and his colleagues to see whether teachers' mindsets about student behavior and discipline could be shifted—from a punitive frame to a more empathy-driven one—in order to improve teacher-student relationships and mitigate harsh disciplinary outcomes such as suspensions, which have risen sharply in recent decades, especially for students of color.[30]

A NEW DISCIPLINE STRATEGY REDUCES SUSPENSIONS

Teachers in a 2016 national study who completed a new "empathic discipline" program had much lower student suspension rates than other teachers.

Percentage of Students Suspended in a Teacher's Class

Other Teachers	Teachers Completing Program
9.6	4.8

SOURCE: Jason A. Okonofua, David Paunesku, and Gregory M. Walton PNAS May 10, 2016 113 (19) 5221-5226.

African American students, for example, are suspended nationally at more than three times the rate of white students—17 percent vs. 5 percent—a disproportion that worsens the achievement gap and the school-to-prison pipeline.[31] Evidence suggests that students who experience exclusionary discipline in schools are at greater risk for a range of negative outcomes, including lost instructional time, lower academic achievement, and increased likelihood of dropping out.[32]

Okonofua and his colleagues conducted several experiments on "empathic discipline." The first randomly assigned teachers into two groups: one group read a brief article claiming "good teacher-student relationships are critical for students to learn self-control," while the other read an article claiming that "punishment is critical for teachers to take control of the classroom." Teachers in both groups were prompted to write about how they would discipline students in several scenarios. Teachers

Teacher Training: Translating Mindset Research into Classroom Practices

A small but growing number of programs are emerging to train teachers to use mindset research in their classrooms, including the Culturally Inclusive Growth Mindset program and the Center for Transformative Teaching & Learning.

Researchers Stephanie Fryberg at the University of Washington, Mary C. Murphy at Indiana University, and Megan Bang at Northwestern University developed the **Culturally Inclusive Growth Mindset** curriculum to shape teachers' beliefs about diverse students and teach them strategies for better engaging students from different racial and socioeconomic backgrounds.

Over the past two years, the researchers have delivered the curriculum through week-long professional development trainings that focus on giving teachers the tools they need to promote learning, engagement, and performance for all students, and particularly for low-income students and students of color. Teachers learn about the neuroscience of brain development and theories about the importance of cultural inclusion.

They also learn strategies such as how to frame new material that's likely to be difficult for students ("I know you can't do this yet, but we are just beginning to learn it"), and how to give feedback that supports

growth-mindset behaviors ("What are some other strategies you could try?"). The theory is that if teachers create classrooms where students from all backgrounds feel at home, every student's motivation and performance will improve.

At the end of the week-long training, teachers choose two or three practices to implement consistently during the coming school year, such as how to provide effective feedback to students or how to create more collaborative student groups. The researchers periodically visit teachers' classrooms and videotape their teaching to document what's changed as a result of the training. They also survey students to gauge improvements in their engagement and review school records to assess achievement.

"We're seeing promising results," notes Mary Murphy. "Growth mindset cultures inspire more trust amongst students, more of a sense of belonging." After the training, teachers are less likely to agree with statements such as, "If a student is really struggling, sometimes it's best to say that this just isn't their area of strength." The research team is currently translating the curriculum into interactive modules and plan to make them available to educators nationwide.

The **Center for Transformative Teaching & Learning** at St. Andrew's Episcopal School in Potomac,

in the empathic discipline group were less likely to recommend punitive responses to student behavior, more inquisitive about the causes of misbehavior, and more interested in improving the teacher-student relationship.[33]

In the last of their studies on empathic discipline, Okonofua and his colleagues conducted a longitudinal randomized controlled field experiment of student outcomes for math teachers from three other districts

who had completed a multi-part online empathic discipline program at the beginning of the school year. The study found that students of teachers who had received the program were half as likely (5 percent vs. 10 percent) to be suspended by year's end.[34]

Teachers' differential treatment of students of color may stem from "unconscious" rather than "conscious bias," write Dee and his colleague Seth Gershenson in "Unconscious Bias in the Classroom: Evidence and

Maryland, is working to bridge the gap between research on the brain and how we learn, and the realities of classroom practice. The Center's week-long Science of Teaching and School Leadership Academy was co-designed by center staff and researchers from the Science of Learning Institute at Johns Hopkins University. During the five-day session, teachers and school leaders take deep dives into such topics as memory; emotion, stress, and cognition; learning mindsets; attention, engagement, and executive functioning (or the ability to plan, organize, and execute to achieve a goal); and assessment and feedback.

In addition to spending a day in the lab with Johns Hopkins scholars, teachers design an "action research project" to take back to their school. The project allows them to try out a research-informed practice and collect qualitative and quantitative evidence to see if it makes a positive difference for students. For example, to determine whether giving students choices within an assignment increases their motivation, a teacher might first review the research literature; then develop a new practice to test; next decide what data to collect and analyze (such as the amount of time students spend on the assignment and their willingness to revise their

work); and ultimately conclude what to do differently in the classroom as a result of the project.

"The number one mindset that we want teachers to develop is that they are brain changers," says Glenn Whitman, who directs the center and also serves as the dean of studies for preschool through grade 12 at St. Andrews. "That means you need to know the science around how the brain works and thrives," particularly its ability to grow and change in response to experience. "The other mindset that we try to cultivate is that teachers are researchers." The center encourages teachers to make evidence-based changes in their practices and beliefs and then collect data from their own classrooms to see if those changes are an improvement.

"There are two [types of] brains in every school," Whitman says, "the adult learning brain and the student learning brain. A school needs to be a learning organization for both those groups…A belonging mindset for adults in a learning community is really critical. If adults don't feel safe to take risks and grow, then it's no different for students."

The Center has launched an online science of learning platform, www.neuroteach.us. It was recently awarded a $1 million grant from the Chan Zuckerberg Initiative to deepen and expand its work.

Opportunities", published by Google Inc. They theorize that the brain stores experiences from the larger society, such as racial stereotypes, that then influence people's instantaneous, automatic reactions and decisions. The researchers argue that it's important to build teachers' understanding of the psychological basis for unconscious bias and become aware of their own biases without blaming or shaming.

While there are few rigorous evaluations of efforts to reduce teachers' unconscious bias, Dee and Gershenson suggest teacher-facing interventions that tackle bias may be more attractive than student-facing interventions for several reasons: First, they reach into classroom practices in a way that higher-level policies do not. Second, they have the potential to change the entire classroom context and may, therefore, be more scalable than student-facing approaches. And, third, there is already an established infrastructure associated with teacher training and professional development.[35]

Calming the School Down

Helping teachers step back from teacher-student conflicts in the moment and take a more self-aware, relationship-focused approach to classroom management may also reduce the need for punitive disciplinary actions. In a meta-analysis of more than 100 studies, researchers Robert J. Marzano and Janet S. Marzano found that the quality of teacher-student relationships was the cornerstone for all other aspects of classroom management.[36]

At the 500-student MLK Jr. Middle School in San Francisco, Principal Michael Essien is promoting a more positive, relationship-based approach to discipline to reduce disproportionate disciplinary referrals for students of color. When he arrived at the school six years ago, nearly two-thirds of teachers were new and, as he put it, "You couldn't tell if it was passing period or instructional time, there were so many kids in the halls." Moreover, it was mostly the school's students of color who were being referred to the office.

Essien first asked why office referrals were so much higher in the 6th and 8th grades than in 7th grade. What were 7th grade teachers doing right? "Inside the 7th grade, we had teachers who were just fundamentally relationship builders," he says. He found that these teachers used innovative approaches to monitor and engage with a small group of students who were driving disciplinary referrals. In one case, for example, a teacher created special, helpful tasks for a chronically disruptive boy, such as getting him to deliver a message to another teacher when he needed a break. Coupled

> **Helping teachers step back from teacher-student conflicts in the moment and take a more self-aware, relationship-focused approach to classroom management may also reduce the need for punitive disciplinary actions.**

with sympathetic language like, "What I hear from you …" when students acted up, the approaches of these 7th grade teachers were successfully limiting disciplinary referrals.

A closer look at the data across grades and classrooms further revealed that some teachers were using referrals as a routine tool for classroom management, while others were unable to defuse conflict with students who were frequently disruptive. "Teachers had their own escalation and stress going on," Essien says.

So Essien worked with his teachers to devise a new approach, one that provided them with training on how to de-escalate conflict and created a policy known as "push-in" rather than "push-out." Now, teachers monitor for signs that a student's triggers have been pushed and he or she is losing self-control. The teacher makes a call, which sends a member of the behavioral action team—two counselors, two assistant principals, and a community-schools coordinator—to the classroom, where they can work with the student to re-engage

A New Tool for Helping Teachers Engage Students

The Project for Education Research That Scales (PERTS) at Stanford University has developed a system for giving teachers detailed feedback about whether their students are engaged, where disconnects may occur, and how to address them.

Under the PERTS Engagement Project, students fill out 10-minute monthly surveys focused on the "learning conditions" that have been shown to drive student engagement. These conditions include the perception by students that teachers care for them and the perception that their schoolwork has relevance to their daily lives, among others. Students respond to prompts such as, "I feel like my teacher cares what I think"; "This week, I got specific suggestions about how to improve my skills"; and "This week in class, I learned skills that matter for my life."

PERTS shares the survey results with teachers in detailed reports that reveal how students perceive their teachers and their classrooms. Over time, teachers can disaggregate the survey data by race, gender, and economic disadvantage, allowing them to pinpoint specific engagement issues or problems.

Some 177 teachers in more than 60 schools have participated in an Engagement Project pilot over the past year and some are already using survey data to change their practice. Meghan Byrne, who teaches at Boston Collegiate Charter School, found that her students—an English Language Arts class with 23 high-needs pupils—rated her lower on feedback than other learning conditions. In response, she began providing personalized feedback to her students at least three times a week.

While it's too early to tell whether the Engagement Project is producing improvements in student achievement, participating teachers praise the insights that have emerged from the data. Teacher Hirvelt Megie at John Dewey High School in New York City believes the program "helps build the right mindset to take feedback and implement changes in order to create the best settings for students." In the next phase, PERTS plans to cross-reference the student-engagement survey data with outcomes such as attendance, suspensions, and grades.

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or briefly lead the class while the teacher handles the situation.

"It just calmed the school down," says Essien, "but more importantly because students weren't triggered, it allowed for the opportunity to create new relationships between students and teachers and increased learning time." In the year before Essien came, there were 2,160 office referrals; by the third year of his tenure, there were 127. Suspension rates are also down, although just over half of students report a sense of safety and belonging on a recent culture and climate survey.

Changing Beliefs and Behaviors

Like the students they teach, teachers' attitudes, beliefs, and practices are shaped by the education systems in which they work and by the larger society. "We can just blame teachers [for their beliefs] and not realize that they are working in this complex system that has social norms and policies in place that can make it hard for them to break out of where they are," says Chris Hulleman, director of the Motivate Lab at the University of Virginia. "Getting teachers to stop and reflect and change their attitudes feels like a bridge too far. But if

we give them the right supports, the right tools, we can change both beliefs and behaviors."

Linda Darling-Hammond, president of the Learning Policy Institute, agrees that it's not enough to tackle teachers' beliefs without providing teachers with new instructional strategies and resources that reinforce those altered beliefs and show they actually work. "Belief and practices are highly interrelated," she says. "If you change what people experience, then they can believe something else."

There's ample evidence that teachers' perceptions of their students significantly impact academic achievement. Most profoundly, perhaps, the American public education system has long set differing and lower expectations for students of color and students from low-income families. Given the current demographic gap between our nation's students—the majority of whom are students of color—and our nation's teachers—the majority of whom are white and female—bridging these gaps in attitudes and actions is crucial.

A growing body of research shows that education policymakers can make a big difference in how schools work with disadvantaged students and students of color. But to do so, they need to address teachers' central role in the social and emotional dimensions of student learning, the ways in which the messages teachers send and the experiences they provide in classrooms shape students' psychological experiences of schooling and commitment to learn. By helping teachers apply advances in the science of motivation, particularly new insights into the importance of positive student-teacher relationships, we can help teachers create classrooms that prepare many more students for success.

A Taxonomy of Teacher Mindset Strategies for Schools and School Districts

Building Teacher-Student Relationships

Relationships with caring teachers and other adults are critical to student success, especially for students at risk of poor outcomes.

Strategies: Create school structures that enable teachers and students to build positive relationships in which they can know each other well. Examples include: advisory groups, in which a teacher works with and advocates for a small group of students outside of the classroom over one or more school years; cohorts of students taught by a team of core academic teachers; and one-on-one mentoring by adult volunteers.

Research suggests that having teachers visit their students' homes also helps build stronger relationships and shifts teachers' sometimes negative assumptions about students' families.

Strategies: Programs like the Parent Teacher Home Visits Model train educators to visit the homes of their students in teams of two to dissolve negative and sometimes unconscious assumptions educators and families may have about each other and enable them to partner more effectively.

Helping Students See Themselves as Successful Learners

It's important for teachers to help students develop a sense of themselves as learners who belong in an academic setting and who can persist and improve through focused effort. Much of that work starts with teachers' own beliefs about intelligence and the learning process.

Strategies: Schools such as the Amana Academy in Alpharetta, Ga., and the Urban Assembly network in New York City use "walk-through" rubrics to provide

teachers with feedback and best practices for developing a positive learning mindset in students. They also create safe spaces for educators to deeply examine their own views and beliefs about their students and the potential of diverse learners.

Many Americans believe that only certain people can master math. In addition to equipping teachers with more effective math practices, research suggests it's important to tackle the myth of the "math person."

Strategies: Complex Instruction helps teachers learn how to help students work in small groups on challenging, open-ended math tasks that encourage students from diverse backgrounds and at different achievement levels to share and discuss their ideas, a strategy that strengthens student voice and engagement. In the process, teachers learn about the value of building on students' challenges and the importance of having student struggle productively. And they are able to observe how equitable classroom participation can promote math learning among all students.

Teachers' Role in Building Belongingness

Students of color can construe criticism of their academic work as a teacher being biased or doubting their intelligence. When students draw such conclusions, they may be less likely to approach a teacher for help and more likely to misbehave.

Strategies: Research on effective, written feedback suggests that teachers should: convey the high standards they have for the student; assure the

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A Taxonomy of Teacher Mindset Strategies for Schools and School Districts *(continued)*

student can meet the standards, reducing the possibility the student will see the feedback as limiting; and provide resources, including specific suggestions for improvement, to help the student meet teachers' expectations.

Research has demonstrated that to effectively build students' understanding it's important to connect new information to what they all already know and have experienced. Connecting to students' cultures, interests, and prior knowledge also builds a stronger emotional bond between students and teachers and greater student interest in academic coursework.

Strategies: The San Francisco Unified School District has developed an ethnic studies curriculum for 9th graders designed to enhance the relevance of the school experience for the district's many immigrant and African-American students. Research has found the curriculum improves student attendance and grade-point averages.

Building Empathic Discipline

Research suggests teachers' mindsets about student behavior and discipline can be shifted— **from a punitive frame to a more empathy-driven one—in order to improve teacher-student relationships and mitigate harsh disciplinary outcomes, especially for students of color.**

Strategies: The Perspective Experience Program uses a set of on-line modules to help teachers develop a more relationship-based approach to student discipline. San Francisco is now piloting the program, which earlier studies found sharply cut suspension rates in the classrooms of participating teachers.

A meta-analysis of more than 100 studies found that the quality of teacher-student relationships was the cornerstone for all other aspects of classroom management.

Strategies: At the MLK Jr. Middle School in San Francisco, Principal Michael Essien is promoting a more positive, relationship-based approach to discipline to reduce disproportionate disciplinary referrals for students of color. The approach includes helping teachers recognize the events that can trigger students to respond negatively and providing teachers with just-in-time help.

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