Preschoolers Grow Their Brains

Shifting Mindsets for Greater Resiliency and Better Problem Solving

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It is the end of the day. Seventeen preschoolers come into the classroom and sit in a circle on the rug for their closing ritual, which involves asking and answering a question. The question this afternoon is "What challenge did you work on today?" Juan begins by asking Jenny, the girl next to him, the question. He passes her the talking piece, a polished purple shell each child holds when it is his or her turn to speak.

Jenny (who receives occupational therapy): I exercised my finger muscles with the tweezers and beads.

Michael: I worked on swinging. I can go by myself now, but not really high yet.

Quincy (who is on the autism spectrum): I'm working on not crowding Matilda and playing with a lot of friends.

Stacey (referring to the visual timer): I worked on staying at one thing until all the red was gone.

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Challenges, mistakes, and problems are inherent every day in learning activities and social interactions. How children think about and respond to those difficult situations has an impact on how they see themselves as being able to shape their own learning and on how they handle the next problem that comes their way (Hall & Pearson 2003). Building resilience means fostering children's sense of agency (the knowledge that they are in control of their actions) and self-efficacy (the belief that they are competent and capable) and developing a framework for approaching problems. By supporting children's developing sense of agency and self-efficacy, teachers give children confidence in their ideas, their understanding of challenges, and what they do to work with those challenges.

As teachers of young children, we use our words as powerful tools for developing these skills (Cimpian, Markman, & Dweck 2007). Noticing and commenting on effort rather than ability makes a world of difference in a child's sense of agency:

> "Wow! You have been working on riding the like-a-bike (pedalless bike) every day this week. Do you remember how last week you could only use your tiptoes and walk the bike around the path? Now you can get up speed and glide sometimes! When we practice something, we get better at it and it feels good inside."

By developing a "growth mindset"—an attitude that allows for possibilities and promotes progress and problem solving—children improve their skills for effectively solving problems every day and in more challenging scenarios (Dweck 2006).

When we hear children respond to challenges with phrases such as "That's too hard; I want to do something easier," we know we have some work to do. When children repeatedly come to teachers for help or flounder and

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become frustrated in their efforts, these are opportunities for building children's skills in approaches to problem solving and for shifting children's perceptions of themselves as problem solvers.

How can teachers promote an attitude of excitement and confidence in the face of challenges and difficulties? How can the words we use with children help them see the world as a place where mistakes are opportunities to learn and bounce back from defeat? How can we make exerting effort feel like a normal part of problem solving and facing challenges? The work we authors have done with our class of 4- and 5-year-olds shows the value of intentionally framing challenges, mistakes, and problems. With this support, young children develop a more positive attitude about challenges and are more open to potential outcomes of difficult situations.

Effort in the face of challenges

Carol Dweck, a professor at Stanford University, is dedicated to researching attitudes about challenges, mistakes, and efforts and how adults influence those attitudes in children. She coined the terms *fixed mindset* and *growth mindset* in her book *Mindset* (2006). Dweck emphasizes that by developing a growth mindset, people realize that through effort they can grow, learn, and effectively respond to their world. People with a fixed mindset tend to avoid challenges and fear failure and making mistakes—they don't want others to see them as failures or not smart. This attitude stems from a belief that ability is fixed and that effort is for people who can't perform (Whimbey & Whimbey 1976, quoted in Costa & Kallick 2008, 8; Dweck 2006). Martin Seligman views these same concepts through the lenses of optimism/pessimism and attribution theory (Seligman [1998] 2006)—the idea that people's perceptions about themselves influence how, when, and if they tackle problems.

When we authors read about growth mindsets and fixed mindsets, we became intrigued by the idea of promoting the resilience and problem-solving skills of the children in our prekindergarten classroom and influencing their attitude toward challenges and mistakes. We kept the following goals in mind: normalizing challenges and the effort needed to meet them; helping children look at problems from a place of empowerment; building strategies for children to apply in difficult situations; and fostering a community that seeks and supports learning and problem solving through a wide range of experiences. Then we set forth to revamp our classroom language and expand learning opportunities.

Connecting to feelings

We began by talking with children in a class meeting about what it is like to try something hard (like pumping on the swings or learning to ride a two-wheel bicycle) and not be able to do it. Responses ranged from "It makes me sad and not want to do it anymore" and "I just leave" to "I try it a few times and then get my mom to help me" and "If I keep trying it, then I can do it." These are eloquent examples of the range of mindsets in a preschool classroom.

We talked with children about concepts of resilience—the ability to "bounce like a ball" when they feel disappointed or frustrated, instead of "flopping like a beanbag." The similes of the bouncing ball and flopping beanbag helped the children understand the concepts and gave them some basic language. Christie explained this idea to the attentive children:

"Flopping like a beanbag usually means we don't think we can help ourselves, so the problem doesn't get solved . . . our brains don't grow. But if we bounce like a ball, we usually think there are some things we can try to fix the problem. That feels *good!*"

When children have episodes of successful learning and of overcoming challenges, they gather evidence that they have the power to influence the outcome of a situation.

When children don't succeed in resolving a challenge, they sometimes need a few minutes to feel disappointed. But the sooner they recover from disappointment and move into resiliency mode, the sooner they can solve the problem. When children have episodes

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Setting the stage

Connecting to the emotional component of learning can make a difference in shifting mindsets (Mayr & Ulich 2009). Over several days we introduced the idea that problems and challenges are chances to "grow our brains," which makes people feel strong, happy, and excited to learn new things. We helped children connect to previous learning successes and reminded them about the confidence and excitement of learning something new through practice and working hard.

We teachers showed our own enthusiasm for learning new things and brought children's attention to the times when effort and practice yielded results. Christie said to a child at the easel,

> "Remember when you first started school and you didn't know the letters in your name? Now look at how you have all the letters in order! People really know whose painting this is, because they can read your name on it!"

The upside of problems

Our goal was to put a positive spin on the concept of problems and engage children in seeking and working on their own challenges. We created a treasure hunt of sorts, with everyone on the lookout for ways they could grow their brains. The hunt began with brainstorming sessions about things that were hard for some children to do. Children came up with some fantastical ideas (jumping onto the roof of a house, flying an airplane) as well as reasonable and appropriate goals (learning to zip a jacket, walk across a balance beam, play with a new friend).

We focused on physical challenges outdoors because it was an area in which children could readily relate to their past experiences. Their progress would be easy to see. Words like "Remember when you couldn't . . . but now you can" boosted children's confidence that with practice and effort, results would come. This area also gave us a framework for building children's vocabulary, fostering positive attitudes, and promoting problem-solving attention and skills.

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Practice makes better

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We posted a Challenge Choice board outdoors in the shed. It listed ideas for physical challenges the children had come up with together. We added items such as practice with throwing, kicking, and swinging to round out the selections. Each day, children chose activities from the list to try out and practice for a little while. Selections included throwing a Frisbee flat, dribbling a basketball, kicking a soccer ball, pumping on the swings, climbing a tree, and more. Leo, who has cerebral palsy, created challenges and growth opportunities based on his physical capabilities. Initially teachers gave Leo suggestions for activities; but with practice and familiarity with the challenge portion of the day, Leo began to create his own. Rather than practicing kicking a soccer ball, he grew his brain by working on balance and stretching his stride to take giant steps.

We were curious to learn who chose challenges independently and who avoided them by choosing activities already mastered. We spoke daily with children about the challenges they were trying, what they were learning, and how they were feeling about all their hard work. Reminding them that learning something new can take a long time and that "practice makes better" supported the process and promoted the "bouncing like a ball" attitude. Pointing out the growth children achieved over time reinforced their efforts. These conversations illustrated how everyone was working on something and learning through their efforts.

After only a few days we noticed a shift in the activities outdoors and the language children used in the classroom.

What started with a few children commenting "That's too hard, I want to try something easier" changed dramatically. Shelby reported,

> "Children were asking each other about how they were growing their brains and sharing with their friends what they had learned to do. They were supporting each other in practicing and recovering from making mistakes as well as finding new challenges for themselves. The words *we* were saying [about challenges, practice, and mistakes] were beginning to come from the children!"

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Annie practiced the monkey bars each day over several weeks, clearly making progress. When she fell, she jumped back up to try again. Her practical application of the concepts of hard work and resilience that we had been discussing gave Annie an "Aha!" experience: "The more you do it, the more you *can* do it!" she cried. Soon after that, children began generalizing their resilient learning attitude to challenges they were facing indoors and problems with peer interactions. For example, Zella said, "I couldn't write my last name, but I practiced and now I can." That's when we knew we were onto something.

Something for everyone

Our class includes children with a variety of special needs. Four of the 17 children receive speech and language support; two attend regular occupational therapy sessions to address sensory processing issues; two have Individualized Education Programs; one is on the autism spectrum; one has physical disabilities; and two receive psychotherapy for emotional needs. We figured that if building a growth mindset in the face of problems was a good thing for everyone, it would be especially helpful for children with special needs. As Christie put it,

> "These kids have more challenges than many of us. They need the skills the most. If we can help them see problems, challenges, and mistakes as opportunities to learn, they're more likely to work at the hard stuff with perseverance and be okay with things not being easy all the time."

With that in mind, we expanded the conversations to include challenges children encountered in areas aside from physical skills. Extrapolating the concepts from the independent skill building with which the children were familiar and applying them to social problem solving, we teachers constructed a model for solving problems in the

Rationales and Strategies for Supporting a Growth Mindset

Rationales

Everyone makes mistakes. Children should see mistakes as part of life, not something that derails them. Embracing/normalizing mistakes helps children stay calm and address the issue.

Making mistakes is an opportunity to do something differently and learn. Instead of becoming frustrated about a mistake, children can turn it around and think of it as a chance to grow their brain. Learning is exciting, and when mistakes represent chances to learn, then mistakes are exciting too!

Practice makes better. Practice doesn't make perfect. Remember, you're looking for progress, not perfection.

Strategies

Model resilience and problem-solving strategies. Articulate your feelings when you make a mistake. Use self-talk to show children how you apply the resiliency model, for example: "Oh, I'm so frustrated that I spilled that milk. But that's okay, everyone makes mistakes. Maybe next time I won't put that cup so close to the edge of the table, where my elbow can bump it."

Give children opportunities to solve appropriate problems on their own. When adults keep children from feeling frustrated and confronting challenges, they rob children of opportunities to develop resilience and problem-solving skills. That said, make sure the difficulties are manageable, so children can experience success.

Avoid using words like *fast* and *easy*. Language like this discourages children from sticking with a challenge and working hard for a lengthy period of time.

Implement the "Ask three friends to help" strategy. Encourage children to help each other by asking one another for help before seeking an adult's assistance.

classroom (see "Problem-Solving Routine"). Over time, the children became accustomed to the routine. Children practiced solving problems in social situations like sharing materials, joining friends in pretend play, organizing turn taking, and a host of other daily challenges. The following example shows some of the language we teachers use to support children when they face challenges, mistakes, and problem-solving situations.

Problem-solving strategies in action

Juan was pretending that a curved block was the steering wheel of a fire engine. Milo picked up the block to use for another purpose. In tears, both boys had their hands on it and insisted they had it first. Christie called a "freeze frame" a time-out to review and address the issue at hand: "Whoa! What's happening here? It looks like you both want to use this block and are pretty upset about this problem. Does this seem like a chance to grow our brains?" The boys agreed, took a deep breath, and shared their perspectives. This was an opportunity to identify the problem and recognize the situation as a chance to learn, thus activating the boys' sense of agency.

Next, Christie asked the two boys to brainstorm three ways to solve the problem. In the early stages of practicing the problem-solving strategy, this is more easily said than done. When one is emotionally connected to a problem, it is challenging to think clearly. The emotional centers of the brain hijack the higher-level thinking function necessary for flexible thinking (Goleman 1995, 2005). Additionally, children don't have a lot of experience solving problems independently, so their toolbox isn't particularly well stocked; with practice and support, their inventory grows.

"Well, we could take turns. You can use it when I'm done," offered Juan. Christie held up one finger. "Yeah, or we could see if there's another [block] so we both have one," replied Milo. Christie held up two fingers. "What if there is no other block like this one? We need one more idea," said Christie. "Well . . . I guess . . . um . . . maybe we could do your idea first [let Juan use the block as a steering wheel], then do my idea," said Milo.

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Once the children had identified three strategies (generating the third option occasionally requires adult support), they chose one to try first. "I'll see if I can find another block," chirped Milo.

Problem-Solving Routine

Anytime a child faces a conflict or a challenge, we start by framing it as an opportunity for growing our brains—"This looks like a challenge, a chance to grow our brains!" We use a lot of expression and excitement in our voices to convey a positive attitude, and we approach the situation as if we (children and adults) are lucky to have another opportunity to practice problem-solving skills.

We guide the children in a problem-solving routine that involves five steps: (1) Identify the problem; (2) brainstorm three ways to handle it; (3) choose one way to try first, and decide on a back-up plan; (4) try out the strategy; (5) evaluate how well the strategy works. Evaluation may simply be a comment from the teacher: "I see you have worked to solve your problem." With practice and over time, the children internalize this step. The following example shows how the brainstorming strategy works in a dramatic play scenario.

When three girls pretended to be a family, they disagreed about who would be the mom. Stacey wanted to be the mom, as did her friend Quincy. Stacey wanted Quincy to be the grandma. Shelby intervened with the "What are three ways to solve this problem?" routine. The children responded with three options: both girls be the mom (because there are all kinds of families), take turns being the mom, or be the big sister instead. In this way, the children figured out their own solution, with a little coaching from Shelby.

Because the boys had practiced using this problem-solving format, Christie urged them to choose Plan B from the two remaining strategies, in case the first solution didn't work. "Well, then I'll let Milo use it when I'm done. We can set the timer," declared Juan.

Christie's follow-up included a check-in with both boys to see how their strategies worked. As it happened, they found another block, so the situation was resolved quickly. "Wow! You worked hard to come up with three ideas, and you found one that solved your problem. Seems like you both grew your brains today!" Christie said with a smile.

Conclusion

This classroom is evolving into a radiating culture of resilience and problem solving. Teachers and children regularly identify problems to solve and challenges to overcome. Children offer one another ideas to address

problems and feel proud when they come up with three ways. When children notice someone struggling and looking sad, they say, "That's okay. You can do it, just keep trying. Maybe you need three ways to try. Do you want some help?" With increasing frequency, children begin a task with the confidence that they can manage whatever comes their way (Masten & Coatsworth 1998).

There is a pervasive discussion in US education and business circles about the need for students to have twenty-first century skills (Pink 2006; Gardner 2007). Skills such as self-directed learning, flexibility, creative thinking, and problem solving are key components of the Partnership for 21st Century Skills (P21) agenda (Metiri Group 2003). P21 is a national organization promoting an education agenda that teaches the 4 C's—"critical thinking and problem solving, communication, collaboration, and creativity and innovation" (P21, n.d.). For educators, this begs the questions, "How do these skills relate to early childhood learning? What can we do at the early childhood level to prepare children (and adults) for the changing expectations in our culture?" Building a mindset that enables children to see themselves as problem solvers capable of addressing whatever challenges present themselves is foundational in supporting these skills.

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