



Introduction

While having access to a guaranteed and viable curriculum supported by evidenced-based instructional practices and high-quality instructional resources is a critical part of providing equitable learning environments for all students, educators also must create a classroom culture that supports students in meeting the intended learning outcomes. According to Ritchhart (2015), the classroom culture is foundational to student success and determines how the curriculum comes to life. Maintaining a classroom culture conducive to learning is key to a teacher’s instructional efforts and to the ultimate success of the students. Even if a teacher uses evidence-based practices with instruction and assessment but does not attend to the classroom culture, the teacher and students will likely fail despite those practices. Conversely, a teacher who works to create a safe and supportive culture and intentionally aligns instructional efforts to those shared beliefs is more likely to experience significant changes in student outcomes (Erkens, Schimmer & Vagle, 2018; Ruzek et al., 2016).

Culture is a collection of a group’s commonly shared attitudes, beliefs, values, goals, behaviors, rituals and social norms. Teachers are the primary drivers of classroom culture. The way in which teachers design and deliver instruction and how they respond during instruction conveys what they most value. “*Who* teachers are teaching matters more than *what* they are teaching, since teachers can’t authentically get to the *what* until they attend to the *who*” (Erkens, et al., 2018; p. 13).

Students want their teachers to care, to be treated fairly and to know what to expect each day they arrive in the classroom. Fisher and Frey (2015) state, “The qualities of interactions between students, as well as the students and their teachers, can mark the difference between learners who feel valued and involved and those who are marginalized and therefore find ways to distance themselves from the environment” (p. 131). Teachers need to focus on purposefully creating a classroom culture where learners see each other as resources, rather than competitors. The classroom should be a place where learners are provided the opportunity to achieve more as part of the collective whole than they could individually. It should become a place where students want to linger and be (Hoffer, 2020). When students are a part of a safe and supportive environment, they are more likely to (Grit & Major, 2018; Hoffer, 2020; McTighe & Willis, 2019):

- Be self-confident;
- Be themselves;
- Be willing and able to exchange ideas;
- Participate even when mistakes are possible;
- Collaborate successfully with peers;
- Ask questions of the teacher and other students;
- Contribute to discussions without fear of ridicule or personal judgement;

- Receive feedback that supports the growth of the work or learning;
- Provide feedback to others to support the growth of the work or learning;
- Reflect and assess their own work as well as contribute to the assessment of others' work;
- Persist in work that is appropriately challenging; and
- Set personal goals in relation to the work.

Why is it so important to create safe and supportive classroom cultures? What insights can educators gain from the fields of neuroscience and psychology regarding the brain and the type of environments that are conducive to learning? How do teachers apply that understanding to create these types of spaces for all students? This section will focus on (1) **current brain research and the role of emotions in learning**, (2) **the importance of fostering strong teacher-student relationships**, (3) **creating the physical and social environment to support learning** and (4) **improving student motivation**.

Brain Research and the Role of Emotions in Learning

Research from the field of neuroscience has shown that cognition and emotions do not operate independently but are intricately linked. For learning to occur, educators must not only focus on students' academic learning, but also on the social and emotional factors that affect student learning (McTighe & Willis, 2019). Research also shows that all children have the ability to learn, but how they do so is highly individualistic and influenced by their immediate experiences, relationships and environment. Learning environments matter for all students, but especially for those students from poverty and those who face other challenges outside the classroom (Rimm-Kaufman & Jodl, 2020). In the book, *Culturally Responsive Teaching and the Brain*, Hammond (2015) states:

“The brain’s two primary directives are to stay safe and happy. The brain takes its social needs very seriously and is fierce in protecting an individual’s sense of well-being, self-determination and self-worth, along with its connection to community. We cannot downplay students’ need to feel safe and valued in the classroom. The brain will not seek to connect with others if it perceives them to be threatening to its social or psychological well-being based on what they say and do” (p. 46).

So, how do teachers create an environment that allows the brain to feel safe and happy? To answer that question, it is critical to understand the role of certain structures in the brain and how those structures can hinder or support learning. The brain’s sensory register constantly pays attention to external stimuli from the environment but also internal stimuli already present in one’s emotions, experiences and stream of consciousness. In order for learning to occur, “new learning must first cut through the clutter of students’ sensory registers and the constant churn of internal emotions, ideas, and thoughts they bring to the classroom” (Goodwin, Gibson, and Rouleau, 2020; p. 20).

Ultimately, to acquire new learning, to consolidate that learning and make connections to existing knowledge, the information must make its way to the prefrontal cortex, which is the site of executive function and is the main command center of the brain. The prefrontal cortex oversees thinking,

manages working memory and is responsible for planning, abstract thinking, organization, and self-regulation, as well as housing imagination. This part of the brain has almost an endless capacity to learn and rewire itself and is the area where students have the chance to build their brain power. However, in order for that to occur, stimuli must make it past the lower brain's primary gatekeepers, one of which is the amygdala (Hammond, 2015).

Located in the temporal lobe, the amygdala is the brain's emotional filter. According to Hardiman (2012), the amygdala "is engaged in both implicit emotional reaction, such as an unexpected fearful event, and in explicit emotional learning, such as learning about a danger and remembering the information" (p. 35) It also engages another structure called the hippocampus, which plays a key role in memory. The connection between these two structures explains why someone can more easily remember emotionally-charged events better than mundane daily occurrences.

The amygdala is designed to act in less than a second in response to any hint of a social or physical threat and can override the prefrontal cortex. When this occurs, it triggers the release of cortisol, the body's main stress hormone. This is known as an "amygdala hijack," and once cortisol is released, it inhibits all other cognitive functions, such as learning, problem-solving and creative thinking (Hammond, 2015). ***When someone is in a state of stress, whether actual or perceived, new information will not move through the amygdala's filter and into the prefrontal cortex.*** Instead, the input goes to the lower, reactive brain, which has a limited set of behavioral responses that include "fight, flight or freeze" and is focused purely on survival. When learners are anxious, sad, frustrated, bored, hurt or angry, these survival behaviors can take over and undermine the most carefully designed lessons (McTighe & Willis, 2019).

Sadly, many students come to school already in a heightened emotional state. McConchie and Jenson (2020) report that healthy emotions appear to be less and less common in schools today. Many students are suffering from chronic stress whether from social media, fewer intact families, immigration-status questions, discrimination or other factors. In the school setting, this stress may be due to a lack of peer acceptance, bullying or repeated failures with a task or subject. In addition, students often lack the self-regulation skills to help them process and manage emotions caused by these stressors.

Chronic stress results in increased levels of cortisol and leaves a person in a constant state of high alert. It can affect both short- and long-term memory. Someone who is stressed is not able to generalize or adapt old pieces of information to new scenarios as well as non-stressed individuals. It impacts an individual's ability to concentrate, to recall declarative information and hinders executive function (Medina, 2014).

A key action educators must take to improve student outcomes is to ***create a safe and supportive environment that helps calm the amygdala and opens the neural pathways to the hippocampus and the prefrontal cortex.*** Teachers need to create a classroom environment that seeks to neutralize negative emotions and elicits positive emotions that enhance memory, cognition and creativity. Rimm-Kaufman & Jodl (2020) state that "when educators construct learning environments with the

understanding that childrens' cognitive, emotional, and social domains are integrated and mutually reinforcing, children are better equipped to learn and make greater academic progress" (p.32).

Classrooms that are emotionally safe, prioritize relationships, and are cognitively stimulating contribute to brain development and help offset stress and trauma. ***Even in the presence of negative stressors outside the classroom, neuroscience points to the brain's malleability and the potential for growth, change, and resilience if children experience enriched environments where they are exposed to rich language and learning materials, feel safe, have a sense of belonging, and experience healthy relationships with their teacher and their peers*** (Rimm-Kaufman & Jodl, 2020).

Fostering Teacher-Student Relationships

A critical component of creating safe and supportive learning environments is for teachers to develop meaningful relationships with their students. The brain is wired to scan continuously for social and physical threats, except when in positive relationships. When people experience positive relationships, it triggers the release of chemicals in the brain that help to keep the amygdala calm so the prefrontal cortex can focus on cognition and learning. Hammond (2015) argues that "too often we ignore the quality of our interactions with students and instead focus primarily on the curriculum. In culturally responsive teaching, relationships are as important as the curriculum. It is the key ingredient in helping culturally and linguistically diverse students authentically engage" (p. 72).

Trust is at the core of positive relationships and showing genuine care for students helps to generate that trust. This involves not only caring for them in a general sense, but also in a social and emotional sense. Students need to know that teachers authentically care about who they are, what they have to say and how they feel. According to Marzano (2011), "positive relationships between teachers and students are among the most commonly cited variables associated with effective instruction. If the relationship is strong, instructional strategies seem to be more effective" (p. 82).

All students feel a fundamental need to belong, feel competent and to feel in control. Some students are dealing with difficult situations in their own lives that have wired their brains for stress and often do not have any positive relationships to help offset it. Sprenger (2020) reminds educators that these students "are not there to *give us* a hard time; rather, *they are having* a hard time" (p. 37). When educators take time to build relationships that support students in meeting these needs, it complements the overarching goal of education: to engage students and support their learning and achievement (Cook et al., 2018; Duong et al., 2019; Hattie & Anderman, 2020; Martin & Collie, 2019).

Teachers should not confuse positive teacher-student relationships with friendships. While it is important that students also experience positive peer relationships, educators are not their peers. Teachers should be viewed by their students as a "warm demander." A "warm demander" communicates personal warmth and positive regard toward students while at the same time demands they work toward high standards. These teachers provide concrete guidance and support for meeting the learning expectations, specific corrective feedback, and opportunities for processing information and culturally relevant meaning making (Hammond, 2015). The following list provides six actions

teachers can utilize to foster positive teacher-student relationships in their classrooms (Fisher, Frey & Smith, 2020; Sprenger, 2020).

- **Know students' names and how to pronounce them.** Students often report that their teachers do not know their names. For a teacher to know their students, it is important to know how to say their names. Pronouncing students' names correctly conveys important messages to the students, including that the teacher cares about each student, accepts each student and that each student is important.
- **Say hello and good-bye to every student every day.** Looking at each student and greeting him or her conveys that the student is valuable and worth the teacher's time. A study conducted by Cook, Fiat and Larson (2018) showed that greeting and welcoming students each morning increased achievement by 20 percent and lowered disruptive behavior by 9 percent. Through the ritual of greeting, adults model caring and demonstrate the importance of this social-emotional learning skill (SEL) to students. Students also can exercise the SEL skills of using words to identify their feelings as teachers greet them and give students a chance to ask for support. For example, teachers might say, "Let me know if there is something you need for today's project" or "You look upset. Are you OK?" In doing so, the teacher is helping to prime the students for academic focus through eliciting positive emotions before the class even begins (Benson, 2021).
- **Know their interests and attend extracurricular activities:** Part of creating a positive classroom environment that propels learning is getting to know students' interests and demonstrating care and support by attending extracurricular activities. Teachers also should plan instruction with students' interests in mind. Psychology and neuroscience both indicate that linking learning with students' interest is not a luxury, but a necessity. Teachers should invite students to make interest-based connections with the big ideas and key concepts they are learning (Tomlinson & Sousa, 2020).
- **Speak with respect:** Words are powerful, and harsh or sarcastic words from a teacher can damage relationships and prevent students from trusting the adult who is there to teach them.
- **Monitor nonverbal communication:** More than half of all communication is nonverbal and students pay attention to the adult's body language. Eye rolls, crossed arms and defensive stances send powerful negative messages to students about the approachability of the teacher and whether this teacher is trustworthy.
- **Share your world:** Students want to know more about their teachers, and teachers should share aspects of their life that are appropriate for school. In doing so, students are provided insights into a teacher's humanity, and it helps them form stronger connections to the teacher.

Teacher-student relationships require effective communication and the time to address issues that strain the relationship. Teachers need to be consistent and fair and repair relationships that are damaged when problematic behavior occurs (Tomlinson & Sousa, 2020). Using restorative practices, the teacher provides students the opportunity to take responsibility for their behavior and to make amends. This can take the form of a simple impromptu conference, a class meeting or circle, or a more formal victim-offender dialogue. The point is to ensure that students understand that their actions caused harm and that they can repair that harm (Fisher, Frey & Hattie, 2016).

Establishing the Physical and Social Environment

In addition to prioritizing relationships, psychological safety in the classroom includes the extent to which students feel a sense of order and routine. When the expectations for acceptable behavior are unclear, classroom routines are lacking, resources are unorganized, or rules are inconsistently applied, students can become confused, distracted and unruly. Part of being an effective teacher is to be an effective classroom manager and establish clear expectations, procedures and routines at the beginning of the school year (Marzano, 2017; McTighe & Willis, 2019).

According to Hattie and Anderman (2020), classroom management acts as the gatekeeper of learning and includes the social, cultural, instructional and organizational contexts. It provides the teacher and students with a positive framework for both interpersonal and academic interactions. Research shows that effective classroom management significantly increases student academic achievement and decreases problem behaviors.

As part of creating a safe and orderly environment, teachers need to consider how they will involve the students in the creation of the classroom rules and procedures. Doing so helps move students away from merely compliance and maximizes their sense of ownership. Teachers also need to consider how they will help students understand the rules and procedures, why they are important and how they support a safe and orderly learning environment. Fisher, Frey and Hattie (2021) recommend using the term agreements instead of rules because agreements represent the social contract of the classroom community, rather than a narrower set of behavioral guidelines that have been written solely by the teacher. Based on a review of the research, teachers should consider the following characteristics of effective class agreements (adapted from Alter & Haydon, 2017; Fisher, Frey & Hattie, 2021):

- **Number of agreements:** A fewer number, rather than more, works better. The recommendation is about 3-5.
- **Created Collaboratively with Students:** Research recommends soliciting and integrating student input when creating classroom agreements. Students are more likely to follow rules or agreements that they help create.
- **Stated Positively:** Use wording that describes the desired behavior rather than the undesired behavior. Avoid a list of agreements that begin with the word “No” or “Don’t” because these do not tell students what they should do, only what they should not.
- **Specific in nature:** The agreements should state explicitly what the expected behavior should be, which is key to increasing students’ ability to self-regulate.
- **Publicly posted:** Once completed, the agreements should be posted in a way that serves as a visual prompt for teaching and promoting prosocial behavior. Consider using pictures to represent words for younger students.
- **Taught to Students:** The agreements should be taught each day for the first week of school and then revisited as needed throughout the year, especially after long breaks. One possible approach for teaching the agreements is to state each agreement, give a rationale, provide examples and non-examples and allow the students opportunity to practice.

The agreements should convey high expectations, mutual respect and an acknowledgement of the learning community's needs. They should emphasize a collaborative spirit, signal students that learning is social and done in the company of others. Additionally, the agreements should communicate to the students that the role of the teacher is to foster learning, not to merely control the students (Fisher, et al., 2021).

The physical layout and appearance of the classroom also can enhance or hinder students' perceptions of order (Rogers, 2020; Seet et al., 2022). The learning environment should be free from clutter and visually pleasing. The classroom walls should display deliberate pieces of student work that reflect the learning outcomes of the current unit of instruction. This might include anchor charts co-created with the students, work that meets the success criteria within the unit, or models and/or exemplars of student work. Teachers should also consider making regular changes to the learning environment as an effective way to capture student attention and provide visual stimulation. Possible ideas include changing the seating arrangement, rotating visual displays, and using objects that connect to the current content they are learning (Hardiman, 2012).

When determining the physical arrangement of the furniture, teachers should do so in a way that allows for easy movement of students around the room. Research shows that exercise and movement positively impact cognition and learning. In order to properly function, the brain requires high levels of oxygen and glucose supplied by the blood. When the brain is well-nourished, it is better able to attend to, process, retain and recall new learning (Kagan, 2016). One way to meet this need is to provide students opportunities for movement within the classroom and during content instruction. Possible ideas include the use of rotating workstations, special nooks and alcoves for reading, and using instructional strategies that involve movement that allow students to work with classmates as they process and respond to content questions/tasks. In addition, teachers also can utilize energizers and brain breaks to help increase blood flow and nourishment to the brain and help foster a joyful, positive environment.

Improving Student Motivation

Student motivation plays a crucial role in improving student outcomes and academic achievement. Students need to believe that they can be successful with the tasks they are assigned, feel they have some autonomy and self-direction in their activities and believe their abilities can grow and improve over time. According to Hattie and Alderman (2020), "Of all motivation-related conditions that have been studied, those related to students' perceptions of their competence, expectancies for success, and sense of efficacy have proven to be particularly robust predictors of achievement" (p. 166).

Students' level of motivation initiates and directs their behavior. It explains their willingness and promptness in starting academic tasks, as well as the amount of effort they give. Motivation impacts their persistence, or lack thereof, with academic work when facing challenges and distractions (Hattie & Anderman, 2020). Two key areas that impact student motivation is their sense of self-efficacy and their mindset.

Student Self-Efficacy

Efficacy is defined as an individuals' judgements of their own skills for performing specific actions, solving particular types of problems or achieving a desired outcome (Hattie & Anderman, 2020). Self-efficacy affects the choices individuals make, the effort they put forth, their perseverance when facing obstacles and how quickly they recover after experiencing a failure or setback (Silver & Stafford, 2017). Table 4.5 compares the characteristics of students with high self-efficacy to those with low self-efficacy (Fisher, et al., 2016; Hattie, 2012; Silver & Stafford, 2017).

Table 4.5 Characteristics of High Self-Efficacy vs Low Self-Efficacy

Students with High Self-Efficacy	Students with Low Self-Efficacy
<ul style="list-style-type: none">• Take on and persist with challenging tasks• Expend more effort• Demonstrate greater academic performance• View hard tasks as challenges rather than try to avoid them• View failures as an opportunity to learn and to make a greater effort or to look for new information next time• Are more motivated to use specific learning strategies and to engage in self-directed learning	<ul style="list-style-type: none">• Are more resistant to engaging in learning• Shy away from difficult tasks they view as personal threats• Show little to no commitment to goals• When faced with challenging tasks, dwell on their personal deficiencies and obstacles they will encounter• Give up quickly when facing challenges• Are slow to recover their sense of confidence following failure or setbacks• Tend to point to external factors as the cause of their success or failure

A critical first step teachers can take is to build a student's sense of confidence that they can attain the learning goal and success criteria within each lesson. When students lack confidence, they often will not focus on what is being taught (Fisher, Frey, & Hattie, 2016). When students know and understand the expected outcomes of a lesson, it provides them with a sense of control in the learning process and guides where they need to focus their time, attention and effort. The following list provides suggestions for increasing students' self-efficacy (Fisher, et al., 2016; Mathisen & Bronnack, 2009; Silver & Stafford, 2017).

- Share learning goals and success criteria with students.
- Develop learning progressions—a roadmap towards the mastery of a skill or task—that clearly represents expectations at different stages of achievement. This can help students track their progress towards the mastery of a skill or content-area.
- Provide direct instruction with modeled examples.
- Provide guided use of techniques on well-defined problems and supervised use of techniques on self-generated problems.
- Use peer models for learners to observe others who are working through or have mastered a similar challenge and are modeling an effective strategy.

- Concentrate on improvement rather than a finite goal. Provide specific feedback on attempts made by learners that help them determine next steps for improvement.
- Demonstrate teacher credibility by being fair to all.
- Create high levels of trust between the teacher and the student and between students.
- Welcome errors as opportunities for learning.
- Help students learn the difference between hard work and strategic effort.
- Treat students’ successes as though they are normal, not an isolated example or fluke.

Student Mindset

Not only does self-efficacy play a key role in students' motivation to learn, but it also impacts their mindset - the way in which they view intelligence and their ability to learn. Mindsets are defined as the set of assumptions and beliefs individuals have about their ability to learn and grow and is the driver of student motivation (Conyers & Wilson, 2020; Hattie & Anderman, 2020). Individuals with a growth mindset believe that intelligence is malleable and that they can grow and develop their intelligence and skills over time. Those with a fixed mindset believe that their intelligence, talents and skills are fixed and cannot change. The characteristics of individuals with a growth mindset versus a fixed mindset are summarized in table 4.6 (Dweck, 2016).

Table 4.6 Growth vs. Fixed Mindset

Context	Growth Mindset	Fixed Mindset
Challenges	Embraces challenges	Avoids challenges
Obstacles	Keeps going when the going gets tough	Gives up easily and becomes defensive
Effort	Views effort as essential for achieving mastery	Views effort as pointless
Criticism	Actively learns from negative but useful feedback	Ignores negative but useful feedback
Success of Others	Learns from and is inspired by the success of others	Feels threatened by the success of others

Fostering a growth mindset begins with developing students’ understanding that the brain is malleable and can grow significantly in capacity over time. When learners understand and act on the belief that they can “build” brain capacity, they are more likely to persist in learning and less likely to be negatively impacted by setbacks along the way. (Tomlinson & Sousa, 2020). Research shows that if students are explicitly taught about brain plasticity (the ability of the brain to grow and change over time), their motivation to learn increases (Yeager, et al., 2019). Additionally, if teachers provide students with specific instruction on how to use effective learning strategies, research shows there is tremendous

potential for students to make steady academic gains. As students begin to experience success and make gains, it helps them sustain their growth mindset over time (Conyers & Wilson, 2020).

Not only is it important for students to understand that the brain has the capacity to change during learning, but it is also important for educators as well. Learning never stops, and while explicitly teaching students about brain plasticity is a powerful first step for the development of a growth mindset, it is not enough on its own. Educators need to also teach students how to be metacognitive, set their own learning goals, monitor their progress, and use effective strategies to support their learning. Teachers need to routinely use the formative assessment process to ensure students are tackling challenging content at an appropriate level and provide specific feedback to learners as they progress towards their goals. Teachers should praise students for their hard work and their effective use of strategies rather than for “being smart” (Conyers & Wilson, 2020). To promote a growth mindset in students (Tomlinson & Sousa, 2020):

- Explain, teach and reflect often with students on key aspects and benefits of growth mindsets.
- Teach students the skills, attitudes and habits of mind that help someone develop a growth mindset.
- Establish a classroom culture of achievement and quality work. When students are part of a group in which peers pull together for mutual growth and success, it’s far more likely that individuals will believe in their ability to succeed and will work toward such success.
- Teachers need to understand their own mindsets. They need to observe themselves in action and reflect on which students they easily respond to with interactions that foster confidence and an expectation of improvement, and which students they find it more challenging to believe in. Then teachers should use that information to grow, just as they hope students will grow.
- Know that teaching with a growth mindset also involves belief, hard work and smart work. Wanting to believe in the capacity of each student is a great start. Enacting those beliefs is tougher; it involves ensuring that, every day, each student moves one step beyond where they began the day or class period. Students must consistently observe themselves progressing, which will fuel their motivation and effort. Such progress can only happen when teachers begin where a student is currently functioning along their trajectory of learning. The challenge is in learning to help each student move ahead starting from that learner’s point of entry into the lesson.

Self-efficacy and mindset work together in determining a student’s motivation and willingness to engage in the learning process. Students who have high self-efficacy along with a growth mindset are more likely to successfully navigate setbacks when they occur. Even when they experience failure, noticing a gradual improvement in skills over time gives them the confidence they need to ultimately achieve the goal (self-efficacy) by increasing effort and abilities (growth mindset).

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