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HOW STUDENTS' BELIEFS ABOUT THEIR INTELLIGENCE INFLUENCE THEIR ACADEMIC PERFORMANCE

At a Glance

Students' academic success may be influenced not only by their actual ability, but also by their beliefs about their intelligence. Studies have found that students enter a classroom with one of two distinct conceptions of their intellectual ability: some students believe their intelligence is expandable (growth mindset), while others believe their intelligence is a fixed trait (fixed mindset). A review of the research suggests that students with growth mindsets outperform their classmates who hold fixed mindsets. In addition, the adoption of a growth mindset may decrease or even close achievement gaps. This Information Capsule also summarizes strategies that teachers can use to foster growth mindsets. For example, studies indicate that teachers should emphasize effort and progress over final outcomes; encourage in-depth learning; and praise students for their effort, not for their intellect.

There is increasing evidence that academic success is influenced not only by actual ability, but also by students' beliefs about their own intelligence. Studies have found that students enter a classroom with one of two distinct conceptions of their intellectual ability: some students believe their intelligence is a fixed trait (fixed mindset), while others believe their intelligence is expandable (growth mindset) (Dewar, 2010; Dweck, 2010a; Stump et al., 2009; Cury et al., 2008; Murphy & Thomas, 2008; Mangels et al., 2006).

Individuals with a fixed mindset believe that a certain amount of intelligence was given to them at birth and that they will never have any more. They believe that when they have to make an effort to learn, it means they aren't smart enough; they become discouraged and give up when faced with setbacks; and they value looking smart above all else. Rather than risk failing, they often avoid challenges and engage only in tasks they know they can perform well (Dweck, 2010b; Bivens, 2008; Binder, 2007; Richard, 2007).

In contrast, individuals with a growth mindset believe they can develop their intelligence over time through effort and education. They embrace challenges, work harder when they encounter setbacks, and believe that advice and feedback are valuable sources of information. They view failure as an opportunity to learn. Effort is not seen as something to avoid, but as a tool to gain knowledge (Dweck, 2010b; Bivens, 2008; Binder, 2007; Richard, 2007).

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It is important to note that believing intelligence is expandable does not imply that everyone has exactly the same academic potential or will learn everything with equal ease. Instead, it means believing that each student's intellectual ability can always be further developed (Dweck, 2010b; Blackwell et al., 2007).

Studies have concluded that approximately 40 percent of students endorse a fixed mindset, about 40 percent endorse a growth mindset, and about 20 percent don't indicate a preference for either type of mindset. However, research indicates that most people don't have a 100 percent fixed mindset or a 100 percent growth mindset. In fact, students may hold different beliefs about intelligence in different domains. For example, they may have a fixed view of their math skills, but believe they can improve their vocabulary or reading comprehension by regularly reading the newspaper or complex literature. Similarly, they may have a fixed view of their math skills, but believe they can improve their athletic ability (Stump et al., 2009; Dweck, 2008a).

No relationship has been found between the type of mindset students have and their gender, ethnicity, or prior levels of achievement (Atwood, 2010; Dweck, n.d.). Studies have, however, found a relationship between mindset and age. Children are not born believing that intelligence is fixed or unchangeable and adolescence appears to be the time when beliefs about intelligence begin to crystallize (Dewar, 2010; Blackwell et al., 2007; Lehmann, 2002; Freedman-Doan et al., 2000).

Research on fixed versus growth mindsets, spearheaded by Carol Dweck but replicated by other researchers, has reached the following conclusions:

- Interventions that use attitude change techniques to teach individuals that intelligence is expandable have met with success. These types of interventions have been found to help both children and adults with fixed mindsets develop growth mindsets (Atwood, 2010; Em, 2010; Stump et al., 2009; Dweck, 2008a; Murphy & Thomas, 2008; Binder, 2007; Richard, 2007; DaFonseca et al., 2004; Aronson et al., 2002; Dweck, n.d.).
- Students with growth mindsets significantly outperform their classmates who hold fixed mindsets. In addition, teaching students to have growth mindsets leads to significant increases in their achievement levels (Atwood, 2010; Dweck, 2010b; Cury et al., 2008; Blackwell et al., 2007).
- Having a growth mindset appears to decrease or even close achievement gaps. Studies have found that when Black and Hispanic students adopt a growth mindset, their grades and test scores are closer to those of White students; when female students have a growth mindset, their math grades and test scores are similar to those of their male classmates (Dweck, 2010b; Aronson, 2007, as cited in Dweck, 2008a; Good et al., 2003).
- The impact of mindset on achievement does not typically emerge until students face challenges or academic difficulties. Studies have found that students who have fixed mindsets but who are well prepared and do not encounter any setbacks are usually able to succeed academically (Dweck, 2008a; Blackwell et al., 2007).
- Beliefs about intelligence have a powerful impact on students' behavior. For example:
 - Students with a fixed mindset don't like to exert effort on academic tasks because they believe academic success should come naturally. When they have to work hard, they feel dumb. Students with a growth mindset, on the other hand, value effort and believe it helps them learn and master new material (Dweck, 2010a; Bivens, 2008; Blackwell et al., 2007).

- Students who hold a fixed view of intelligence tend to pursue only those activities at which they will succeed because they want to look smart even if they are not learning in the process. Students who hold an expandable view of intelligence, in contrast, are more likely to take risks and are less concerned with failure because they see each mistake as a chance to learn (Stump et al., 2009; Murphy & Thomas, 2008; Blackwell et al., 2007; Krakovsky, 2007; Lehmann, 2002; Dweck, n.d.).
- Students who view intelligence as fixed often sacrifice important opportunities to learn (for example, extra practice time or a remedial class) because these opportunities require them to admit deficiencies. Since they value looking smart above all else, they want to ensure that their failures will be attributed to lack of familiarity with a task rather than limited ability (Atwood, 2010; Dweck, 2010a; Cury et al., 2008; Moss, 2008).
- Students with different mindsets have very different reactions to setbacks. Those with growth mindsets report that after a setback in school, they simply study more or study differently the next time. Those with fixed mindsets, on the other hand, are more likely to say they would study less the next time and would seriously consider cheating (Carter, 2009; Bivens, 2008; Dweck, 2008b; DaFonseca et al., 2004).

What Schools Can Do to Foster Growth Mindsets

Researchers believe that achievement will increase if teachers encourage students to develop growth mindsets, even if the curriculum and instructional strategies don't change. Strategies that can be used to create a growth mindset in the classroom are summarized below. Most of these strategies can be easily incorporated into everyday classroom practices without altering the curriculum and without a great deal of additional time and effort on the part of teachers (Jensen, 2010; Dweck, n.d.).

- **Emphasize effort and progress over final outcomes.** Researchers urge teachers to focus on students' improvement instead of success or failure (Carter, 2009; Murphy & Thomas, 2008; Tarr, 2005; Lehmann, 2002; Freedman-Doan et al., 2000). Dweck (2010a) stated that it is important that no student be allowed to "coast to success time after time; this experience can create the fixed mindset belief that you are smart only if you can succeed without effort." Challenging tasks should be portrayed as fun and exciting, while easy tasks should be portrayed as boring and less useful for the brain.
- **Encourage in-depth learning.** Teachers should emphasize that students who take longer to learn sometimes understand things at a deeper level (Dweck, 2010a). Dweck (cited in Chen, 2007) noted the need for greater depth in the curriculum. She stated: "American curricula often try to jam too many different topics into each year. For example, American high schools try to teach fifty to sixty science topics per year, as opposed to nine in Japanese schools." Schommer (1994) recommended that teachers assign a limited number of problems that have no clear-cut answers so students realize that higher-level learning is challenging and that a great deal of time and effort are required in order to succeed.
- **Create a growth mindset culture.** Students should feel that their teachers' goal is to help them learn, not to judge their intelligence. School staff should convey to students that taking on challenges, exerting effort, and surmounting obstacles is valued more than "natural" talent and easy success (Dweck, 2010b; Em, 2010).
- **Praise students for their effort, not for their intellect.** Praise is closely connected to how students view their intelligence. Teachers often unknowingly perpetuate a fixed mindset by referring to students' abilities as a "talent" they possess rather than emphasizing students' ability to learn. Praise or feedback

that emphasizes students' intelligence promotes the idea that ability is innate, whereas praise or feedback that acknowledges effort promotes the idea that students have the ability to continue learning (Stump et al., 2009; Murphy & Thomas, 2008; Kamins & Dweck, 1999). Dweck (2008b) recommends that praise focus on the process students engage in - their effort, their strategies, their concentration, their perseverance, or their improvement - not on their intelligence.

Studies have found that students praised for their intelligence tend to adopt a fixed mindset, while students praised for their effort tend to adopt a growth mindset. Research shows that students who are praised for their intelligence are more likely to lose confidence in their ability and in their enjoyment of tasks as soon as they begin to struggle, while students praised for their effort tend to remain confident and eager. Dweck and her colleagues reported that when asked to anonymously report their test scores, 40 percent of intelligence-praised students lied, but only about 10 percent of effort-praised students falsified their results (Dweck, 2007; Mueller & Dweck, 1998).

- **Differentiate academic tasks.** School grades are often determined more by ability than by effort. This is because many current instructional practices use an undifferentiated, “one-size-fits-all” curriculum that encourages students to attribute their success or failure to ability rather than effort. Lehmann (2002) suggested that tasks assigned by teachers be matched to students' skill levels and abilities. A differentiated task structure fosters the belief that effort and ability co-vary and that intelligence is expandable.
- **Avoid labeling students.** Educators often use words like “smart students” or “slower students,” but these terms affect a child's mindset in negative ways. They send the message that if you're “smart,” then you don't need to exert much effort; if you're “slow,” then you will not go very far so there is no need to exert much effort (Jensen, 2010; Chen, 2007).
- **Conduct interventions to develop growth mindsets.** Studies have found that students' views of intelligence can be changed through interventions that teach them that intelligence is expandable. Students can be taught that the brain is like a muscle that gets stronger with use and that every time they work hard and learn new things, the neurons in their brains form new connections (Atwood, 2010; Stump et al., 2009; Dweck, n.d.).
- **Engage in exercises that encourage a growth mindset.** Researchers recommend several exercises that foster the assumption that intelligence is expandable (Dweck, 2010a; Moss, 2008):
 - Encourage students to cultivate their knowledge of an individual topic or develop a specific skill. Knowledge and skill development imply that ability is not fixed.
 - Ask students to reflect upon which of their friends have changed the most over time. This exercise has been shown to instill the belief that individuals are malleable.
 - Recount proverbs that highlight the capacity for individuals to change. Phrases such as “It's never too late to learn” and “Experience is the best teacher” have been shown to promote the assumption that intelligence is expandable.
 - Study geniuses or those who have made significant contributions to their fields, emphasizing how hard they had to work to develop their abilities.
- **Evaluate students based on their growth.** The way in which teachers evaluate their students' work can help students develop a growth mindset. Dweck (2010a) advised that the word “yet” should be used frequently in every classroom. Whenever students say they can't do something or aren't

good at something, the teacher should add, “yet.” This word conveys the idea that ability is fluid. Some schools reward students’ improvement over time by basing a portion of their grades on effort, resilience, and challenge-seeking. Other schools use pre-and post-testing to help students and their parents see how much improvement students have made over time (Bivens, 2008).

- **Help teachers develop their own growth mindset.** Teachers’ own mindsets can have an influence on student success. Once teachers with a fixed mindset have decided that a student is not capable, they are not open to new information to the contrary. Therefore, they may not take steps to help that student develop to his or her full potential. Studies have found that when teachers have a fixed mindset, students who enter their classes as low achievers tend to leave as low achievers at the end of the year. When teachers have a growth mindset, however, many students who start the year as low achievers become moderate or even high achievers by year’s end (Dweck, 2010b; Murphy & Thomas, 2008; Butler, 2000).

Summary

There is increasing evidence that academic success is influenced not only by actual ability, but also by students’ beliefs about their own intelligence. Most students enter the classroom with one of two distinct conceptions of their intellectual ability: some students believe their intelligence is a fixed trait (fixed mindset), while others believe their intelligence is expandable (growth mindset). Researchers have concluded that students with growth mindsets significantly outperform their classmates who hold fixed mindsets. In addition, the adoption of a growth mindset appears to decrease or even close achievement gaps. Students’ beliefs about intelligence also impact how they respond to academic challenges, the types of academic tasks they choose to pursue, and the amount of effort they exert.

Strategies that teachers can use to foster growth mindsets include emphasizing effort and progress over final outcomes; encouraging in-depth learning; praising students for their effort instead of their intelligence; assigning differentiated academic tasks; avoiding student labels such as “smart” or “slow;” and evaluating students based on their growth over time.

All reports distributed by Research Services can be accessed at <http://drs.dadeschools.net>.

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