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Emotions, Social Relationships, and the Brain: Implications for the Classroom

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In an age of increased school accountability, the talk at faculty meetings often focuses on how schools can increase their students' scores on tests. Yet, ironically, teachers talk in the teachers lounge not about testing results but about students' feelings, emotions, attitudes, and identitiesâ€""Mary has such a bad attitude and hates mathâ€"how can I teach her?" or "John only thinks about his reputation with his friends. He's smart, but he doesn't care about school!"

Too often, teachers and administrators are so stressed about testing that they lose sight of a major reason why students succeed or fail, even as they discuss it over the watercooler or the coffeepot: students' emotions and thinking are intertwined. Neuroscience has shown that, in normal health, it is close to biologically impossible for people to think without feeling, or vice versa. Every decoded word, every attempted math problemâ€"just like every lunchtime conversationâ€"is experienced subjectively and evaluated emotionally in terms of a person's own predispositions and memories, even though we are often unaware of these feelings.

Emotions and Thinking Are Intertwined

To understand better how emotions and thinking are interdependent, let's turn to scientific studies of how the brain processes emotions. Recent evidence from our lab and many others reveals a fundamental interdependence between the brain's social processing, the brain's emotional processing, and other aspects of learning. Often, teachers think of mature judgmentâ€"whether about social dilemmas like how to treat a friend, moral dilemmas like whether to report a cheater, or cognitive matters like which science topic to pick or how to solve a math problemâ€"as best accomplished without emotion. Teachers want students to get feelings out of the way to enable them to "think clearly."

But brain studies reveal that thinking clearly is, in fact, an emotional process. Without emotion, people become insensitive to risk and unaware of consequences. They are also less able to learn from their experiences. For example, stroke victims with brain damage in areas connecting emotion and thinking make poorer judgments, not better ones, when facing dilemmas like those listed above. This is not because they have lost their "intelligence" in the traditional sense of the word; with appropriate support, they do fine on IQ tests. Rather, they have lost the emotional "rudder" that steers their thinking and decision making.

You can think of this sort of emotional rudder as intuition, if you likeâ€"the sense that it would be mean to miss a friend's birthday, that tattlers are often the recipients of later revenge, or that you are on the right track with a math problem. We know these things because our emotions guide our behavior and help us learn from experience. We know these things because we care about them.

Emotions Link to Problem Solving

Coming back to the brain, we can begin to see now how emotions and cognition work together to help our students succeed in school. Often without our explicit awareness we use our emotional imagination in a sort of "what-if" process to predict the result of possible behaviors. We may imagine how others will treat us if we would tattle on a cheater. Or we play out the various ways to solve a math problem and sense whether we are getting warmer or cooler based on our previous experience with math. In a very real sense, the correct answers to the dilemmas posed earlier would be to report cheating in such a way as to minimize social consequences to yourself even as

you ensure others are treated fairly or to practice math enough to develop a set of intuitions about how to competently manipulate numbers.

I am not suggesting that emotions should run unchecked in school. Rather, I am suggesting that the emotional aspects of learning should be incorporated into lesson design and that students should be encouraged to notice, control, and use their emotions advantageously to solve academic and real-life problems. In meaningful learning, students use thought processes that are at once cognitive and emotional. They mentally represent the relevant pieces of information (the "representation" is cognitive, while noticing the "relevance" is emotional) and then subjectively evaluate the outcome of this simulation (a heavily emotional process that is based in previous experience and learning), in order to decide what to do next (some kind of cognitive action).

Take the math problem 2 + 2, for example. To solve this, a student must first recognize that this is something she has seen before (she has an "aha!" emotional reaction when she accesses the relevant cognitive knowledge). Then, she must call up the memories for previous experience with similar problems, as each of these memories contains cognitive information that is emotionally tagged. Next, based on this information, she acts on the numbers (a cognitive process). Finally, she evaluates the solution emotionally (Does this seem or feel right?). The chain of mental and neurological eventsâ€”these small emotional "jolts" that are generally nonconsciousâ€”steer the student's actions to help him solve the math problem.

Furthermore, not only do we use our emotions to steer our own thought and behavior, but the same "what-if" mechanisms also allow us to imagine how (and why) others are doing the same thing. For instance, for a student to learn from a teacher, the student must internalize the teacher's mental actions as if they were his own. This kind of imitation forms the basis of social learning and, critically, plays out on a student's own "self." The student learns how to solve 2 + 2, in part, by internalizing the teacher's actions and then playing them out as if they were his own cognitive and emotional actions and evaluations.

Many Emotions Are Social

But the story gets more interestingâ€”and more complicated. We know things because we care about them, but what exactly do we care about? And how do we care? Think again of John's frustrated teacher at the beginning of this essay, and you may notice a fairly obvious but often overlooked fact: people do not make decisions and carry out actions in a vacuum. Instead, our thinking and learning and deciding happen in social and cultural contexts, and a major part of our decision making is tied to our social reputation and cultural history. We set goals for ourselves, such as passing standardized tests or getting a good job, determined in large part by our culture, and we care what other people think of our success.

Remember those emotional "jolts" that steer problem solving in math? They are the result of accumulating experience with math problems, but because that experience happened in a social setting, part of the memory is for other people's opinions and emotional evaluationsâ€”those of the girl in the next seat, or of the teacher who encouraged the progress. We remember being embarrassed by the bad grade or the happiness of the successful answer, and, neurologically speaking, those emotions become part of our math knowledge. They are called up whenever we engage with math.

Learning from the Emotional Links

Lessons should teach students to use what are, to the brain, emotional skills. For example, teachers can encourage students to pay attention to intuitions about right and wrong answers and to notice similarities between skills they use or problems they face in different classes. Or teachers can allow students to develop their own approaches to solving open-ended problems because, in grappling with defining the task, students often recruit "intuitive" knowledge about what is interesting, familiar, creative, and useful. Alternatively, portfolio, project, and group work can make useful emotions more advantageous to struggling students.

The moral of the story? Emotions matter, and many of our emotions are social. When we ignore students' emotional knowledge in a frantic attempt to improve standardized test scores with stopgap measures such as excessive drills and practice, we deny students the full experience of engaging with learning as interesting and meaningful problem solving. Neurologically speaking, it is only through students' emotions that they will learn and remember, and it is through their own sense of "self" in social relationships that they will play out the implications of their decisions,

whether in class, during sports, in the lunchroom, or (it's true!) on standardized tests.

Additional Reading

Immordino-Yang, M. H. (2008). The smoke around mirror neurons: Goals as sociocultural and emotional organizers of perception and action in learning. *Mind, Brain, and Education*, *2*(2), 67â€“73.

Immordino-Yang, M. H., & Damasio, A. R. (2007). We feel, therefore we learn: The relevance of affective and social neuroscience to education. *Mind, Brain and Education*, *1*(1), 3â€“10.

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