The Blips of Neuroscience

By

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Researchers have discovered a great deal about how the brain works. Some even suggest that facts about the brain have serious implications for education. For instance, Harvard's graduate program in education offers a course titled, Mind, Brain, and Education. According to the program description, those who go through this course "… develop the skills needed to critically and cautiously examine trends in education that, even if well intentioned, may be misinformed about current findings in psychology and neuroscience. Some graduates of the program return to schools or other educational settings where they use this new understanding in educational practice."

Will they create superior instruction or teaching techniques by virtue of their understanding of cognitive functions? Categorically no.

Why not? Because neuroscience doesn't identify either the specific content that got in the brain or how skills, relationships, and content that are in the brain are processed to create new learning. Neuroscience may predict which areas of the brain will have "activity" but they don't reveal scratch about the relationships between this activity and the specific features of the examples the teachers present, the range of examples, or the criterion of student performance the teacher requires before assuming that the current learning has been successfully implanted in the students. Yet, these are *necessary aspects of teaching*. Note that they are far beyond the ken of the investigator who observes only the energy level and patterns of brain activity.

Stated differently if serious implications for teaching were revealed by "neuroscience" we would be able to look at the dynamic display of brain activity and not only identify specific problems a learner is experiencing but also *identify what the teacher is teaching*.

It would go something like this:

"Look here. This shows that the teacher is teaching some number skill. Sure, it's square root, and the kid is confused. Oh look, the kid thinks that you can divide *any*

fraction by the denominator to get the square root. Yes, that's what he thinks, and the teacher doesn't have a clue because he's getting some of the problems right…"

Obviously, the firings in the specific areas of the brain do not provide this kind of qualitative information. For any effective instructional remedy, however, the teacher must operate strictly on the level of qualitative issues—not where there is brain activity but the specific content that is being processed and the specific mistakes that students make. These qualitative issues are revealed only through direct observation of what is taught and the overt responses the student produces. To reduce the observations to electronic blips that occur in specific areas of the brain is to suck all the relevant information from the issue and render it perfectly redundant. The most specific content-related issue the patterns address is the part of the exercise the student had trouble with. If the teacher did not observe this without the neuroanalysis and observe a whole lot more, the teacher would have serious problems.

It could be argued that if students are hooked up when they do independent work, the system would provide the teacher with real-time information about which items give students trouble and would therefore provide a basis for timely remedies. True, but is this information worth the elaborate set up when there are less-invasive remedies in many instructional settings?

For example, the teacher in a no-machinery setting could say, "Remember, if you get stuck, raise your hand and I'll help you out. If a lot of students have trouble with the same item, we'll skip that item and work on it next time." I would rank this remedy sensitive, relevant, and efficient. I would rank remedies based on neuroscience awkward and prima-facie ineffective because they lack necessary qualitative detail.