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Discussion forum

Where are the educators? What is our role in the debate?

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One of the purposes of education is to expand the opportunities that may exist for each student. Teachers are constantly looking for ways of ''reaching'' their students so that the student might be able to benefit from their education. Teachers in their attempt to improve student achievement use a wide range of techniques and strategies. Some of the ways in which teachers do this is through an intersection of such things as curriculum instruction and assessment wisdom based on their knowledge of how students learn. Bennett and Rolheiser (2001) refer to the knowledge that teachers must have related to how students learn as ''instructional organizers''. This term relates to those bodies of research that inform educators about how students learn. Examples would include: child development, learning disabilities, motivation, multiple intelligence, learning styles, children at risk etc. A new example is now focused on how the research related to the human brain is presently being used in education.

In a book written by The Organisation for economic cooperation and development (OECD, 2002) the authors state that:

> ''Teachers and educational specialists are eager to put into practice what they have read in the popular press, and policymakers want to enact effective educational policy by using research-based information. Even business is eager to commercialise on what is perceived of financial interest in brain-based learning tools. Due to the expectations of the applicability of brain research to education practice, myths have rapidly developed and range from the benefit of synaptogenesis, to hemisphere dominance, to critical periods of learning and enrichment – to name the popular ones. When misconceptions such as these are both argued for and criticised in journals and the popular press, educators and policymakers alike are left in a quandary discerning fact from fiction. Although some myths do have some truth to them, careful reading of the original research from where they came from demonstrates that this research has often either been misinterpreted (simplified) or based exclusively on animal studies with limited implications for human beings''.

In short there is a recognized gap between education and science and a need to bridge that gap.

Recently, a great deal of attention has been paid to the research of neuroscientists and cognitive psychologists and the relationship of their findings to learning, however, the consideration of work by neuroscientists, cognitive psychologists and other ''brain scientists'' is a relatively novel concept in the field of education. Given most educators' educational background does not include an intensive comprehension of neurology and cognitive psychology, they are reliant upon someone else to help them interpret and understand the primary sources of the findings from these fields.

A multimillion-dollar industry has developed in recent years around upon what is being called ''brain-based learning''. Articles have been published in the popular press and educational journals; conferences have been held to promote brain-based learning for educators and universities and private corporations are offering courses and training in brain-based learning.

There is increasing enthusiastic acceptance and endorsement by educators of the idea of ''brain-based learning''. Educators appear to be taking on the mantle of ''brain-based'' learning because it comes with a scientific credibility that education has historically lacked. Kurt Fischer, director of Harvard University's Mind, Brain and Education graduate program is concerned about what is being promoted as brain-based education. He feels much of it is ''hogwash''. He is quoted in the Washington Post as stating that, ''One of the reasons there is so much junk out there is that there are so few people who know

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enough about education and neuroscience to put the thing together'' (Strauss, 2002). Educators have been reliant upon others' expertise for the interpretations from Neuroscience hence have not been able to discern whether the claims made are valid or false representations of the research.

Educators and parents of Special Education students are particularly interested in this research. A biological explanation for various learning disabilities is sought as a justification for the difficulties these students have in their learning. This research has led to the development and marketing of various programs as strategies to remediate students with learning disabilities. Currently these programs have little independent research to support their claims; yet they have been purchased and are being used by school boards, private companies and parents.

The dilemma that members of the education community face is their dependence on others to interpret this research without knowing the cautions that may be attached to the conclusions drawn in the original research. Without access to or understanding of the primary research completed by neuroscientists and cognitive psychologists, educators are at risk of misusing the results from these areas.

''Neuroscience has advanced to the point where it is time to think critically about the form in which research information is made available to educators so that it is interpreted appropriately for practice – identifying which research findings are ready for implementation and which are not'' (Bransford et al., 2000). Presently the application is running ahead of the research.

In previous years, the study of learning was the domain of philosophers such as Socrates, Descartes, Locke, and more recently Dewey who explored learning through observation and discussion. Educators and others have relied upon studying the results of various experiments to conclude what was happening in the ''black box'' that we call the brain. Technologies such as PET, MRI, fMRI, and BEAM may reduce educators' current dependence on the ''black box'' approach to the brain by allowing researchers to observe and measure the activity in the brain. The relevance of this new information, however, is part of this ongoing discussion.

Eisner (1993) points to the inclusion of other divergent and previously thought of as unrelated fields when he says ''One of the most significant shifts that is likely to occur in the educational research community is the broadening of its conception of what counts as educational research. This increased breadth is not a license for ''anything goes'', but a recognition that the roads to understanding are many and that a narrow view of method is likely to lead to a limited understanding of how schools work''.

Informed educators ''… give deliberate attention to how subjects should be taught. They consider not only what should be taught and what knowledge gets distributed to whom but what rules should govern teaching a subject, since the way we teach unquestionably influences the effects that accrue from studying a subject.'' … ''A common outcome of curriculum development, then is the notion that we should teach such and such to so and so in this way'' (Kliebard, 1989). These ''rules'' and ''ways'' of learning and teaching are what educators need to pay attention to, fine tune, or change in light of findings coming from the neuroscientists and cognitive psychologists.

By joining forces educators can develop a more precise research basis to improve their practice and not be dependant upon translators or others who do not have classroom expertise. Educators need to take an active role, bringing their expertise, along with those working in other disciplines, to develop the science of teaching. Dr. Howard Gardner and others have ''proposed the establishment of a class of professionals, ''neuro-educators''. The mission of this new professional is to guide the introduction of neurocognitive advances into education, in a sensible and ethical manner'' (Sheridan et al., 2005). Gardner goes on to caution that ''significant bridging research needs to be done in order for neuroscientific knowledge to become usable educational knowledge.'' (Sheridan et al., 2005). More Universities with Faculties of Education, Cognitive Psychology and Neurology need to begin this bridging research by establishing ''neuro-educator'' programs. Gardner also states that the advances that have been occurring in neural and cognitive research ''raises numerous ethical questions for scientists, educators and society as a whole: (1) What is the quality of evidence purporting to be relevant to education, and by which standards of evaluation? (2) What use should be made of new knowledge and advances? By whom and with what safeguards? (3) How do we respond to unanticipated consequences of research? Who has responsibility?'' (Sheridan et al., 2005). Those are just some of the issues that the ''neuro-educator'' would have to address.

''(N)euroscientific evidence is clearly relevant to the extent that it (1) corroborates (or refutes) contemporary models of cognition and learning; and (2) generates surprising findings that would not have been anticipated if one were to rely solely on contemporary psychology theories that lack a neuroscientific emphasis'' (Byrnes, 2001). Educators need to be able to critically evaluate this broadening of educational research; otherwise, they will be vulnerable to the marketing of overgeneralizations of this research. Brynes and Fox (1998) have suggested that developmental psychologists, educational psychologists and teachers generally fall into one of four orientations with respect to neuroscientific research '' (1) those who readily accept (and sometimes over interpret) the results of neuroscientific studies; (2) those who completely reject the neuroscientific approach and consider the results of neuroscientific studies to be meaningless; (3) those who are unfamiliar with and indifferent toward, neuroscientific research; and (4) those who cautiously accept neuroscientific findings as being a proactive part of the total pattern of findings that have emerged from different corners of the cognitive and neural sciences'' (Byrnes, 2001).

Educators and learners have much to gain by moving beyond the borders of their traditional educational research. As the body of knowledge increases through improved research techniques and technology, educators must accept that they can no longer be experts in all areas. For educators, this means that they can make better decisions about curriculum, materials, teaching strategies and the introduction of various skills, if they keep their minds open to the findings from other areas of study such as neurology and cognitive psychology. Cautious acceptance of neuroscientific findings and working proactively with these disciplines is the position that would most benefit educators and learners.

Bennett and Rolheiser (2001) point out that "teachers must be aware of and act on the science within the art of teaching". They go on to point out that educators must become aware of other methods and incorporate them into their practice. In chapter 12 of their book they "focus more on the critical role that specific bodies of knowledge play in assisting educators to make wise decisions concerning the design of learning environments" (Bennett and Rolheiser, 2001). The specific bodies of knowledge discussed by Bennett and Rolheiser are multiple intelligences, emotional intelligences, learning styles, the human brain, children at risk and gender. As the authors explain these and other areas are just "lenses designed to extend teachers' understanding of how students learn, and from that understanding, to make decisions about how and when to select, integrate, and enact items in the … list" (Bennett and Rolheiser, 2001). The more "lenses" or tools that educators can use to evaluate or develop their repertoire the greater their "instructional intelligence" (Bennett and Rolheiser, 2001) will be and the better able they will be to deal with the complexities of their classroom. Even though a painter or potter may have great innate ability, they are limited, unless they have some understanding of the science of the paints they use or in the case of the potter the glazes that they may apply. With this additional "intelligence" they can become better painters and potters. Educators have the same opportunity. "Teaching effectively is an art informed by a science … and personal experience" (Bennett and Rolheiser, 2001).

> "It is hoped that with new understanding about how the brain works, combined with the tenets of Developmentally Appropriate Practice, our ability to educate future generations will be greatly enhanced. The neuroscientist's job is to better understand the workings of the mind and brain; it is our job, as educators, to carefully sift through their findings and connect them to what we know empirically about how children learn best" (Rushton and Larkin, 2001).

Educators need to become equal partners with neuroscientists and cognitive psychologists so that they may bring the educators' expertise to this research. Through this collaboration we increase the chances that the most valid educational interpretation and application of this research may occur.

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