

Demythologizing or dehumanizing?
A response to Settlage and the ideals of open inquiry
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I read with intrigue and appreciation John Settlage's recent editorial piece (Settlage, 2007) in this journal regarding the notion of mythology and its pertinence to the ideals of open inquiry. Much of what Settlage describes gives me pause and a fresh new perspective on curriculum reform and the ideals of science education. Many of the points of his editorial are fascinating to me and, I believe, productive considerations for our field. Knowing that myths are pervasive and unavoidable empowers us to identify them for what they are and prevent them from preventing progress in any given field or endeavor.

I especially appreciate Settlage's mirror, now turned back upon us to show the discipline its own blemishes. In this case, we see the inconsistencies of advocating the ideals of open inquiry without clear evidence that it supports student learning of science content. As Settlage points out, "adhering to myths can distract our efforts from legitimate problems that are more deserving of our attention" (p. 463). Such distractions only weaken our reputation as a scholarly field and in creating and implementing public policy. How can we be supporters of science education when we, ourselves, are being so unscientific in our practice? Clearly, we need to practice what we preach.

Yet, there is a subtle but crucial point that Settlage misses as he boldly suggests that "it is very important for science educators to speak against open inquiry" (p. 465). Settlage is quite clear that open inquiry, as a pedagogical tool, may only be getting us into scholarly confusion, as well as distracting future science teachers. However, Settlage seems to neglect that "inquiry" is not simply a teaching tool, but a teaching goal. This is not a new fangled idea. Rutherford makes this distinction in 1964 clearly, separating inquiry as a teaching tool from inquiry as part of scientific process (Rutherford, 1964), and I have no doubt that the process of inquiry is interconnected with other longstanding ideals, such as reflective thinking (Dewey, 1910). That is, the process of inquiry is not simply something that we use to get learners to understand buoyancy. It is a scientific endeavor in itself, allowing students to be themselves within a culture of scientific inquiry, as advocated in a recent, notable methods textbook (Settlage & Southerland, 2007). The processes embraced by science that allow us to extract explanation from evidence are paramount to a citizen's understanding of science and creating "a society that is open, decent, and vital" (AAAS, 1990, p. xiii).

Additionally, I'd suggest that many of us feel strongly that science education is a small part of a broad education that makes possible for students and citizenry personal fulfillment, societal contributions, and perhaps even revolutionary change in cultural norms. Students must be prepared to think and inquire freely if not for science, then for everything else they will face in their lives. To be human, we should be free to inquire. Now more than ever, amidst wide-spread fear of high stakes testing, our schooling could be training our citizens to unthink and detach themselves from full considerations of how to ask questions and pursue answers in an open and critical manner. Science may provide the perfect milieu for students to practice this kind of pursuit, and open inquiry is perhaps exactly the inquiry that students should be prepared to do in order "to think for themselves and face life head on" (AAAS, 1990, p. xiii).

I would argue (in agreement with Settlage) that the myth of open inquiry as an effective teaching *tool* should not be unnecessarily perpetuated. If I need students to remember key characteristics

of a cell, I may teach in a relatively didactic manner; if I want them to understand freefall motion, I can easily imagine a guided or otherwise scaffolded inquiry activity. As for *open* inquiry, its very process should be a central learning *goal* in all that we do, more important than cell features or freefall or any other piece of scientific content. As educators, we must first identify our ultimate learning aims before we design effective evaluation of student learning and worthwhile classroom opportunities for such student learning (Wiggins & McTighe, 2001). By characterizing open inquiry as a process to be learned, rather than a silver bullet for learning content, we can reform science education. Alas, in an era of high stakes testing in which much of science is stripped of its inquiry processes in favor of content factoids, it must be our obligation to make open inquiry a learning objective in our classrooms.

While Settlage may be demythologizing some of what we take for granted in science education, he may also be in danger of dehumanizing science education as well. For me, I will continue to encourage my students and future teachers to inquire and promote inquiry – open or otherwise – in classrooms. A citizen who understands how to think as an open inquirer in a scientific context is one I would vote for in any election; and a classroom that promotes the ideals of open inquiry is exactly where I would want to place my own children.

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