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Content has Killed Science Education

The holy three – not them, this is not about Intelligent Design – the other hallowed triad: Earth, life, and physical science. I recall we have a Committee of Ten to thank for this organizational structure. I suppose this orderly arrangement of curriculum seems consistent with a Victorian way of thinking – putting everything neatly in its place. Talk about staying power, as science standards came online in the latter decades of the 20th century, this enduring triad served as the framework for those "consensus documents." Along the way we have embraced a few curricular stragglers which have run parallel to these lines, with NOS (nature of science) certainly dominating the science education research agenda in recent years. There has been some background noise in the research community about redefining the very notion of content, yet regrettably, the current framework dominated by what I'll term the Content Triad does not seem well suited to support, nevertheless advance, a reform-minded agenda.

A Success

In a sustained professional development effort with a grade-level team of three elementary school teachers we endeavored to "make science meaningful" for second graders. Like most district-level curriculum the Content Triad dominated the scene. One teacher taught a unit of weather (Earth science), one taught a magnet unit (physical), and the third was a butterfly unit (sort of a life science unit). Ownership was the name of the game. Each teacher taught "their science unit" and the classes rotated through each teacher for a five week period, three times throughout the academic year (yes, science was only taught for 15 weeks out of the 40 week school year – a problem for another day). The professional development effort was well into the first academic year with university faculty teaching alongside the teachers of record to promote and model so-called "best practices" of science teaching. During our weekly planning sessions I consistently pushed the notion that there must be value to what was being taught. I view learning in public schooling as normative, and feel strongly about keeping the question of the value or worth of knowledge on the front burner during planning and subsequent instruction.

In the traditional sense there was an "ah-ha" moment during one of these planning sessions when one teacher asked their colleague why she had decided to afford a certain amount of time to one objective versus another. It was stunning. Until that moment I seemed to be the only one who held a license to venture into others' curricular territory. It was the first step (6 months into a 10 month school year) in which I saw the Content Triad give some ground to what was tentatively considered a more important outcome – developing the

beginnings of an understanding of NOS. At the conclusion of this project, the Content Triad held mostly steadfast, but there were a few chinks in the armor. Upon reflection I view the holy three as the principal curricular barrier to more of shift toward what the teachers themselves had defined as meaningful. From the perspective of the teachers, the framework of Earth, life, and physical science seemed too much of a sacred canon to mess with.

My Vexation

I suspect my motives are clear. For those of us who believe teaching science is moral imperative (wow, strong words), we are desperately seeking a means to bring meaning, perhaps even value, to science education. Although there are many lines in which one might work, for this brief statement, I, like countless others before me, address the idea of curriculum.

Should we alter the very definition of curriculum? If it s considered merely as lessons bound by a three ring binder to outline what will be taught the next day in class – all is lost. I view curriculum as a window on what knowledge should be valued. Pragmatically, it will ultimately outline what is to be taught, the materials to be utilized, etc., but way before we arrive at those decisions we must consider why we choose to teach what we teach. Why does this seemingly straightforward notion seem beyond many professionals? In an age when science has shattered the boundaries of disciplines which seemed rock solid even a decade ago – how can the Content Triad endure?

- Is there a compelling argument which might convince others' to move beyond the Content Triad?
- Is an integrated approach to science curriculum merely a blending of the Content triad - or does it move us forward?
- Does the need for standardized assessment serve as a barrier to curriculum reform?