

Professional Development Success and Evolution Education Quandaries

Success: Professional Development – The Winner

The importance of professional development (PD) in science education was recognized after the launching of Sputnik on October 4, 1957. The National Science Foundation provided the funding for science curriculum development and in-service workshops. The focus of these “one shot” or vaccination programs was to provide science teachers with update content knowledge and ways to teach the new innovative science curriculum.

Since the 1950's, PD has had a metamorphosis. There is recognition that science teachers need continual professional growth throughout their teaching career. At various stages of their teaching careers, they have different needs. For example, during their first five years, Missouri 7-12 teachers need assistance on improving their pedagogical expertise (e.g. classroom management, dynamic lessons, application of technology, etc.). In contrast, veteran Missouri secondary science teachers desire updating their science content. Different needs require different PD programs. Today, partnerships between providers and receivers hopefully provide better mechanisms of addressing science teachers' needs. Successful PD impacts teachers by giving them greater knowledge and confidence in their teaching and should result in greater student performance.

PD is no longer just for K-12 settings. The importance of high quality science faculty is being recognized at many institutions of higher education. Faculty interviews frequently involve candidates teaching a class where students provide input on hiring decisions. Many institutions have established Preparing Future Faculty programs institution conferences on teaching and Boyer's scholarship of teaching are used in tenure/promotion and salary decisions. The Journal of College Science Teaching and other journals provide resources to help science faculty in improving their teaching.

The importance of PD was recognized by the National Science Education Standards. The research of Loucks – Horsley et al. provided in-depth strategies for planning and conducting PD programs. Radford's model of long term programs, follow-up opportunities, resources that facilitate the implementation of the “new curriculum and/or teaching strategies,” and coaching assistance has been one major change. The absence of any of these components inhibits successful implementation of the PD program.

Vexation: Evolution Education is NOT Evil-ution

Within the biology community, evolution is viewed as the theme that connects all aspects of life. The Biological Science Curriculum Study brought evolution to its current place when they started the development of biology curriculum in the 1950's. Darwin's theory of natural selection has been a lightning rod for attack ever since it was published in 1859. There was discussion throughout the world of this “big idea;” even though, there was no known mechanism.

Professional Development Success and Evolution Education Quandaries

The theory of evolution has brought science discussion into popular press at the Scopes trial in Dayton, Tennessee in 1925. As a substitute teacher, Scopes was encouraged to teach about evolution to promote “tourism of Dayton.” It received a large amount of press coverage and was the first radio remote broadcast by WGN in Chicago. Even though Scopes was fired, found guilty and fined \$100, it was overturned on appeal and he spent the rest of his life as a geologist. The controversial aspects were established by Bryan and Darwin even depicted in the productions of “Inherit the Wind.”

Subsequently, various state legislators have passed laws limiting the teaching of evolution. Numerous Supreme Court decisions have ruled that creationism is not science and is not to be taught in science classroom. Moore has summarized these numerous court decisions. Today, the focus is at the local/state level (i.e., Kansas and curriculum standards, Ohio and model curriculum, Georgia and textbook disclosures, Pennsylvania and school board’s direction on oral disclaimer, and numerous states submitting bills limiting the teaching of evolution concepts). An alternative to evolution is what is called “Intelligent Design”, rather than creationism. The approach of “teach the controversy” as a dichotomy of evolution vs. religion. It is difficult to argue philosophical views (religion) using science facts. Bybee recommends not participating in this debate.

There are several questions that are associated with facilitating the understanding of evolution. What does a theory mean in everyday life? How do we know evolution happens when we don’t see it happening today? How do you develop high quality evolution curriculum when textbooks publishers could fear loss of sales? What are the best ways to promote scientific literacy about evolution among the adult population? If evolution is not on state tests, how do you justify teaching it? How do we assist out of field biology and earth science teachers who lack understanding of evolution concepts, meaning of a theory and quality resources to facilitate instructions as recommended by the National Science Education Standards? How do biology and earth science teachers become aware of the lack of science in ID resources? How do we work with future teachers in providing them an understanding of evolution when they don’t “believe” it?

Science educators need help in assisting current and future biology and earth science teachers when they are challenged (by students, administrators, parents or peers) regarding the teaching of evolution. Maybe we need Evolution Resource Agents (ERA) program like Physics Resource Agents?