ASSISTing with STEM Education: Promoting Argument-based Strategies for STEM Infused Science Teaching

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Abstract

Science teachers are faced with an ever increasing list of requirements in helping students develop true science literacy. In addition to focusing on developing conceptual understanding, use of science and engineering practices, communication skills, and an appropriate view of the nature of science, STEM initiatives now encourage teachers to integrate mathematics, engineering, and technology into their science instruction. The Argument-based Strategies for STEM-Infused Science Teaching (ASSIST) approach attempts to provide both an overall framework and practical tools to help science teachers accomplish the many goals associated with engaging students in effective science learning environments. In this article, we present a brief description of the research supported ideas that provide the framework supporting the approach, as well as an overview of some of the tools we have developed with teachers to help them implement the approach. We conclude by describing some initial reactions from these in-service teachers with whom we have worked in professional development activities. These reactions are included as a way to highlight benefits and challenges associated with the approach, as well as suggest future work.

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Discover STEM education opportunities at Teach.com. Science, Technology, Engineering, and Mathematics (STEM) are core components of a solid educational foundation and great teachers to teach these subjects are needed now more than ever before. STEM is the acronym for Science, Technology, Engineering, and Mathematics, and encompasses a vast array of subjects that fall into each of those terms. While it is almost impossible to list every discipline, some common STEM areas include: aerospace engineering, astrophysics, astronomy, biochemistry, biomechanics, chemical engineering, chemistry, civil engineering, computer science, mathematical biology, nanotechnology, neurobiology, nuclear physics, physics, and robotics, among many, many others. The STEM (Science, Technology, Engineering and Mathematics) Education Review Group (STEMERG Composition, Appendix I) was established in November 2013 with a view to carrying out a comprehensive review of STEM education in Ireland and to making a set of recommendations that would address identifiable deficits and enhance the quality of our STEM education system significantly. Without an effective strategy for STEM education to secure and sustain a sufficient supply of high-quality scientists, engineers, technologists and mathematicians, there are serious concerns that Ireland could lose economic competitiveness and fail to realise its potential as a nation. Smart Futures promotes STEM careers to second-level students, parents, guidance Firstly notions of STEM education infer the collective activity which draws from science, technology, engineering and mathematics. It is therefore important to stress and incorporate technology and engineering, aspects which are sometimes overlooked. The technological aspect suggests that one of the motives behind STEM endeavour is to develop solutions to problems which are functional and useful. Engineering reflects the use of science, technology and mathematics in the application of design and manufacturing skills to realise solutions. ASSISTing with STEM Education: Promoting Argument-based Strategies for STEM Infused Science Teaching. Article. Jan 2016.