

Materials Technology Education: Just Getting Started

Materials technology is the basis for the development of new and advanced systems in areas from aerospace and automotive to household appliances, all of which are made of materials whose properties are enhanced by their structure, properties and processing techniques. Use of micro- and nano-scale materials in combination with enhanced processing processes can yield new and specific enhancements properties, including mechanical, electrical, optical, magnetic behavior. New processing techniques utilizing natural material can enhance the environment and create a greener future. Combined with scientific and engineering advances in materials, new horizons are becoming achievable today.

The NSF-funded Advanced Technological Education program called MatEdU (DUE #2000347) has provided the basis for advances in materials education for technologists in several very important areas. While this specific National Science Foundation ATE project is closing, its impact on the world of Materials is just getting started. Overall, the project has moved materials education from the fringes of importance (where it was at the MatEdU's initiation in 2005) to leading the mainstream of technology today. How many new and better understood materials and processes have been developed in that time frame? Too many to count!

Impactful areas developed by MatEdU include:

- Technology Education Workshops for Instructors, focused on instructors teaching instructors has had a great impact on hands-on materials education, starting with the enormously impactful "National Educators Workshops" merging into the Materials in STEM (M-STEM) program.
- Technician Education in Additive Manufacturing & Materials, enhancing the need for technical knowledge of the materials used in AM and how potential materials interactions can affect the properties and lifetime of the resultant 3D printed product.
- Technology Curriculum Development, resulting in a portfolio of over 150 peer-reviewed educational modules in all aspects of materials technology as well as in the Materials Science Educational Handbook allowing instructors to develop their own materials-related curriculum using the lessons noted here.
- Enhancing Undergraduate Research in Community Colleges, demonstrating the worth of short projects in the educational experience at this level, as has been demonstrated at the 4-year college level.
- Providing a blueprint for community colleges and others for the development of a materials technology program.

The MatEdU website, www.materialseducation.org, along with specific programming ideas is being transferred to the Micro Nano Technology Education Center (MNT-EC) where the website will continue to be accessible. The programs of MatEdU will continue to be developed by MNT-EC and other ATE programs. A full article on this topic will appear in Journal of Advanced Technological Education (J ATE) in the near future.