

MatEdU, Project TEAM Lead the Way in Additive Manufacturing Competency Development

NCATC member institution Edmonds Community College houses two valuable resources for the field of additive manufacturing in the form of the National Resource Center for Materials Technology Education (MatEdU) and Project Technician Education in Additive Manufacturing, funded by the National Science Foundation's Advanced Technological Education Program. Through a wide range of leadership and professional development activities, MatEdU is advancing materials technology education nationally. It serves as a focal point for collaboration among the materials community, industry, and educators as they strive to meet the needs of the materials technology workforce. MatEdU's website provides quick access to curriculum resources, professional development opportunities, and industry-approved and industry-accepted core competencies.



Scientists test the capabilities of an additive manufacturing printer to create a part in zero gravity conditions in an orbiting space station.

The MatEdU staff works closely with Edmonds Community College faculty on its Materials Science Technology (MST) degree program, the only associate's degree program of its kind in the State of Washington. Through targeted recruitment and outreach activities supported by MatEdU, the program has grown steadily and its graduates enjoy an extremely high job placement rate in the field of materials science. A key factor in the program's success is a unique, replicable educational internship model. The MatEdU staff was instrumental in the internship's design and implementation, producing a model that exposes students to high-tech materials testing and research labs over two summers. Both employers and students give high ratings to the internship model that has helped generate strong program completion rates as well as matriculation to bachelor's degree programs.

MatEdU's collection of modules, labs, and demonstrations supports educators across the country who are preparing technicians to understand a broad array of materials and their diverse uses. MatEdU's modules consist of hundreds of peer reviewed, classroom-

ready materials on material science topics including metals, ceramics and glass, polymers/composites, biomaterials, and materials sustainability. The center's mentoring and instructional materials are helping colleges around the country add materials science to technician education programs. The MatEdU staff has also played important roles in curriculum development for K-12, creating the framework for materials science adopted by K-12 educators for the State of Washington.

Professional development for educators is also a key service provided by MatEdU. Through the National Educators Workshop (NEW), MatEdU serves two- and four-year college instructors, K-12 teachers, and industry representatives by sharing with workshop participants the latest developments in material science and technology while offering strategies for improving teaching techniques. The next NEW workshop is November 2-4 in Seattle and the *call for presentations* is currently open.



A Veterans Workshop participant carefully removes her designed and printed part from the build box on a Z-Corp 510 additive manufacturing printer.

Perhaps one of the most significant roles played by MatEdU is its current effort to develop Additive Manufacturing (AM) core competencies and replicable modules. Through a separate NSF grant, Project TEAM: Technician Education in Additive Manufacturing represents an unprecedented opportunity for educators to be involved

at the ground level of global standards development, focused on AM technician education. The project is designed to accelerate skills development by decreasing the lag time between global AM standards development, their translation into core competencies, active integration into curriculum, and their delivery in the classroom. Project TEAM is providing technical and educational input in the areas of terminology, test methods, processes, materials, and design that is facilitating the creation of AM core competencies. The work is a part of a larger partnership between SME and ASTM to undertake the effort to establish global standards for AM. The MatEdU/TEAM staff have been involved in the standards work from its inception and were instrumental in helping establish an Educational Working Group to focus on education and training concurrent with standards development and approval. The TEAM project's goal is to develop and disseminate core competencies for both the emerging workforce (students) and the incumbent workforce (working technicians). TEAM project personnel are part of ASTM's F-42 technical committee, tasked with identifying major areas of concern for the additive manufacturing technology industry, establishing subcommittees to identify and review standards, and achieving consensus among committee members to not only produce global standards but to continuously review and revise the standards as the industry evolves.

To learn more about the MatEdU Center, visit: <http://materialeducation.org/> or contact Mel Cossette, Principal Investigator, mel.cossette@edcc.edu. A white paper on Project TEAM's contributions to the global AM standards effort is also available for download. ◆