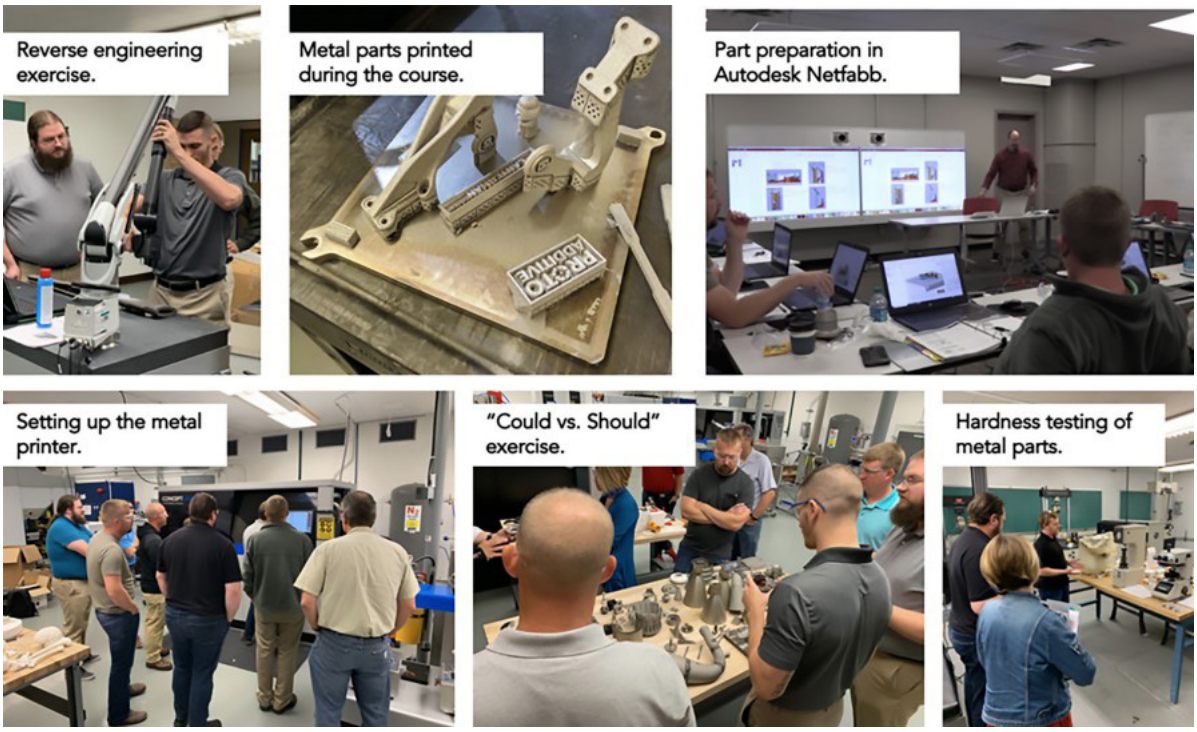
SUCCESS STORY 3018

Expansion initiative introduced new five-day course for DoD and partners

Course attendees received hands-on exposure to production of metal AM parts, technology



Exercises done during the five-day "Metal Additive Manufacturing Application Expert" course.

PROBLEM

The Department of Defense (DoD) has the need to attract, inspire, and develop exceptional STEM talent across the education continuum to enrich their current and future workforce to meet defense technological challenges, including advanced manufacturing technologies. This training project is being used to enhance the current DoD advanced manufacturing education portfolio to leverage the benefits of applying the "Design for Additive Manufacturing" methods and techniques for meeting mission specific needs and requirements.

OBJECTIVE

The objective of this project was to modify and expand the existing course offering for The Advanced Curriculum in Additive Design, Engineering and Manufacturing Innovation (ACADEMI) program around DoD-identified gaps in its advanced manufacturing education portfolio, specifically by working with other Manufacturing USA Institutes and DoD partners, including the U.S. Army, U.S. Department of Navy, OSD Systems Engineering, and Defense Logistics Agency. The expanded curriculum was to be offered as continuing education and on-the-job training for these DoD partners.

AMERICA MAKES TECHNOLOGY DEVELOPMENT ROADMAP

This project aligns to:

DESIGN

ASTM PROCESS CATEGORY: N/A

EQUIPMENT: N/A

MATERIAL: N/A

TECHNICAL APPROACH

ACADEMI was a collaboration between America Makes, The Lanterman Group (TLG), and other members to help speed the transfer of business and technical knowledge for additive manufacturing (AM) technologies to industry. The target audience for this training included design engineers, manufacturing engineers, and material science engineers who desired to learn skills from a holistic and integrated set of additive manufacturing disciplines.

The project team looked to better understand the strategic AM business objectives within each of the DoD organizations and the specific AM training initiatives in place to offer support. Interviews were scheduled (approximately one hour per person or per small group), and face-to-face meetings or phone calls were conducted, as appropriate. TLG also performed secondary research on existing DoD AM training efforts and reviewed over 50+ sources of information for the identification of high-impact DoD application areas that were further enhanced by cross-institute participation, roadmap alignment and content. A training needs analysis was also conducted and revealed unmet needs along a continuum of warfighter and sustainment-focused initiatives within all branches of the DoD. Three high-level options to focus the course for the ACADEMI Expansion Initiative were identified. These were a DoD-wide AM standardization training effort, a logistics, maintenance and sustainment track, and a warfighter enablement track. The three options were evaluated across 11 variables that ranged from evaluating the options alignment to the existing DoD roadmap, filling real training gaps, and creating better pull-though for a larger student population, etc. Options that scored higher were viewed as more attractive and a better fit for the program.

ACCOMPLISHMENTS

Students who attended the course were interested in obtaining knowledge on the process of accessing parts for metal AM, gaining a deeper metal technological understanding, and receiving hands-on experience with creating metal parts. Participants stated they enjoyed the pace of the course and were highly satisfied with the level of detail provided from beginning to end. Obtaining industrial exposure to production-level metal AM in a "hands-on nature" and printing real parts was a highlight listed by many attendees. The culmination of all learning into the final project (assessing the viability of metal AM) was also listed as extremely relevant to what the students did on a day-to-day basis. At the completion of the course, students were asked to rate competency improvements across 13 categories. These categories were identical to the categories assessed at the beginning of the course. Eight of eight participants in cohort 1 stated their expectations were met and said they would recommend the course to peers. Furthermore, their self-assessments indicated an 85% AM skills improvement. Similarly, six out of six participants stated their expectations were met and said their self-assessments indicated a 63% AM skills improvement.

PROJECT END DATE

March 2019

DELIVERABLES

- Training needs analysis
- Course syllabus
- Course content
- Two workshops
- Final report

FUNDING

$66,500 total project budget

PROJECT PARTICIPANTS

Project Principal:
The Lanterman Group (TLG)

Other Project Participants:
NCDMM/America Makes
The Ohio State University Center for Design and Manufacturing Excellence (OSU CDME)
Proto Precision Additive
Freshmade 3D
Youngstown State University
Autodesk
AST2
Ansys

Public Participants:
U.S. Department of Defense