

An innovative way of incorporating hand on activities on remote learning courses to engineering technology students using low budget FDM printer during COVID-19 Pandemic

Topic: STEM Education Methodologies in the Current Environment

Additive manufacturing is growing exponentially towards rapid prototyping and fabricating complex topology using computer aided design. During this recent COVID-19 pandemic, additive manufacturing has been leveraged to manufacture face shields to protect front line workers and mitigate the spread of virus. SUNY Polytechnic Institute took initiative to manufacture thousands of face-shields and distributed them to upstate medical center, downstate medical center and various local organizations. Numerous innovative designs were first proposed, then the best design was fabricated with an aim to overcome shortages of essential medical equipment in upstate New York.

Most of the classes in schools and universities were transformed to remote learning from conventional in-person teaching within a very short period to alleviate the spread of virus. In order to leverage student's creativity and engage passionate students on hand-on learning activities, a new synchronous project based "Additive Manufacture" course was introduced in summer at SUNY Polytechnic Institute. In this course students were taught how additive manufacturing could play a vital role in manufacturing essential medical components to fight against COVID-19. Students were fully engaged on hand on activities to demonstrate their creativity on designing and manufacturing essential personal protective equipment (PPE) relevant to Covid-19 using low budget fused deposition method printer at home.

In this presentation, I will discuss how the course design was designed, outcomes of the course and future direction of such course where students can equally experience hand-on learning experience to that of being at school.

Author:

Jagannath (Jay) Upadhyay is an assistant professor of Mechanical Engineering Technology at SUNY Polytechnic Institute. His interests are in the field of additive manufacturing, experimental and numerical studies of multiphase flow, optical measurement techniques, ceramics and polymer materials.