Utilization of 3D Printing Technology in a University Classroom Setting

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Abstract

The world of 3D printing or rapid prototyping technology has become an integral part of the product development process. It has become a technology we can't live without as a precursor the manufacturing process. According to Terry Wohlers (President, Wohlers Associates, Inc.) industry growth in this area could peak $5.2 billion dollars by 2020.

Because of this growth potential, there appears to be a significant need for rapid prototyping related curriculum. This should provide students with knowledge of the equipment, materials and processes related to the technology and will also allow an individual the capability to manage specific lab environments. They must also have the competences and expertise to interact with clients who request its services. This can be achieved by specific courses on multiple subjects directly related to this high growth technology.

This presentation will cover how the technology will be included into multiple majors and areas of interest. 3D printing is applicable to multiple majors, e.g. applied engineering, model making and engineering technologies. This would be applicable for many students who are disciplined in various 3D drawing programs. Various courses require students to incorporate rapid prototyping into their projects which allow them freedom for creativity and innovation. They must complete an extensive drawing first which is then transformed into a physical model. This model allows students to visualize the output of their idea and creation. These outputs create design challenges that require them to test, analyze, redesign and subsequently seek final design approvals of any given project.

They will also be exposed to "real world" situations by coupling them up with a business professional or mentor on a project. The students in turn will learn soft skills, such as; client interaction, purchasing, knowledge of production, etc. Along with courses in Project Management, Quality Assurance, Engineering Economics, etc., will assist these students in becoming successful in their future endeavors.

Biographies

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LYLE MEULEBROECK is an Assistant Professor of Technology, Art & Design at Bemidji State University. Mr. Meulebroeck holds a Master's Degree in Technology/Career and Technical Education and a BS in Industrial Technology with an emphasis in Model Making. Mr. Meulebroeck has industry related experience having worked as a model maker and a Project Engineer for Racing Champions/ERTL Toy Company for 11 years. He has been teaching for 14 years in a College/University environment. Course offerings include; Power Technology, Electricity/Electronics Technology, Automation, Materials Processes – Separating/Forming, 3D Parametric Modeling, Rapid Prototyping/3D Printing & Industrial Design. Mr. Meulebroeck may be reached at lmeulebroeck@bemidjistate.edu.