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Sierra College CACT Publishes Additive Manufacturing White Paper on 3D Printers for Teaching and Product Design

In response to the explosive growth of 3D Printing, Sierra College Center for Applied Competitive Technologies (CACT) published a white paper identifying trends, outlining uses and providing a review of Additive Manufacturing equipment for business and education.

(Rocklin, CA) Sierra College Center for Applied Competitive Technologies (CACT) has published **Additive Manufacturing Turning Mind into Matter -- Industry Evaluation and Recommendations Report** <http://www.sierracollegelearning.com/uploads/201307/sierra-college-cact-additive-manufacturing-report-and-recommendations-may2013.pdf> by Neal de Beer, Ph.D.

According to Carol Pepper-Kittredge, Director, Sierra College CACT, <http://sierracollegelearning.com/>, the Additive Manufacturing white paper was produced as a guide for the College's business services and educational programs as well as a resource for entrepreneurs and educators. "The ability to convert designs into products using 3D printers is transforming our world," said Pepper-Kittredge.

Additive Manufacturing is the ability to generate three-dimensional models that need no machining or tooling. In the 3D printer, material builds up layer by layer until the desired shape is achieved, instead of cutting away material as is done in machining. Computer 3D models are sliced into layers and the software directs the printer pattern as it builds the part from the bottom up. Products can be designed in Computer Aided Drafting (CAD) software or 3D scanners can be used to create designs from existing objects.

For over seven years, Sierra College <http://www.sierracollege.edu/> has produced 3D prototypes for entrepreneurs, inventors, businesses and students. "Now that the price is dropping, more people have access to 3D Printing technology but the choices of equipment can be overwhelming," said Pepper-Kittredge. "The CACT Additive Manufacturing report by Neal de Beer can be a resource for schools and companies interested in exploring the technology and purchasing printers to use at home or at work."

According to De Beer, the Additive Manufacturing industry is advancing rapidly. "The most significant change is that many new, less expensive printers using new materials have become available in the last year and design software has become more accessible," said De Beer.

The white paper describes how this new cutting edge technology is already being adopted and used in electronics, consumer products, motor vehicle, medical and aerospace industries. At every phase of the manufacturing cycle, companies can use objects made with 3D printers as presentation aids for new products, functional models, patterns for tooling and direct part production.

In the Medical industry, De Beer explains that Additive Manufacturing is being quickly adopted. “Models can be made from patient scans and used to plan surgeries and make implants,” said De Beer.

“Additive Manufacturing is likely to significantly change plastic manufacturing because better molds with cooling channels that conform to the shape of parts can be made directly in tool steels using Additive Manufacturing,” said De Beer. “This allows more even and faster cooling of the plastic in the mold. The result is improved quality and shorter cycle times for faster production.”

In addition, De Beer says researchers are making advances that include printing foods, biological cell structures and even electronic components. The Additive Manufacturing report describes how this cutting edge technology is being adapted and used by businesses.

With Additive Manufacturing spurring innovation in fashion, architecture, modeling and a wide range of manufacturing processes, educators are eager to incorporate 3D Printers into classrooms.

“When students can hold the products that they have created in their own hands, it changes the way they think about design and sparks their enthusiasm for Science, Technology, Engineering and Math (STEM) careers,” said De Beer.

Sierra College CACT placed a 3D printer in the college design lab several years ago as well as smaller models at Rocklin, Oakmont, Nevada Union and Del Oro high schools, explained Pepper-Kittredge.

“Students become more engaged when their ideas can be produced in a form that they can see and touch,” said Pepper-Kittredge. “At Rocklin High School, for instance, students designed trophies for NASA’s Lunabotics Mining Competition. Students need exposure to 3D printing to prepare them for growing career paths in advanced manufacturing.”

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About Sierra College CACT

The Sierra College CACT is funded through the Workforce and Economic Development program of the California Community College Chancellor’s Office. Since 1992, the Sierra College CACT has provided customized training for organizations, manufacturers and technology companies throughout Northern California. Additional information is available at www.sierracollegelearning.com or contact Carol Pepper-Kittredge at 916-660-7801 or cpepper-kittredge@sierracollege.edu.