



NSF Award Abstract - #0202256

Capturing the Next Step in 3D: From 3D Modeling to 3D Parametrics

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Abstract

Moraine Valley Community College is updating the existing exemplary Mechanical and DesignDrafting/CAD A.A.S. degree and three corresponding certificates by incorporating 3D Parametric Modeling skills into the curriculum. Employers have identified that 3D Parametric Modeling must be incorporated into curriculum to ensure graduates have mastered the advanced CAD skills used currently in business and industry.

Parametric modeling combines the power of three-dimensional modeling as an intuitive engineering design tool with the ability to manipulate and control the corresponding engineering drawings in an adaptive environment. This simplifies the design process, reduces the engineer's design cycle time, achieves better design visualization, more closely associates 2D and 3D drawings, and makes the design process easier to manage. Rapid prototyping is also being incorporated into curriculum in order to provide faculty and students the opportunity to produce a prototype, or model, of their designs.

A collaborative partnership with three other community colleges and four high schools is forming to fully develop, pilot test, evaluate and revise curriculum for three existing and two new courses in the Mechanical Design and Drafting/CAD A.A.S. degree. Each member of this partnership, the Content Development Team, is participating in summer curriculum development workshops and year-round curriculum pilot testing, evaluation, and revision activities. The PI and three Co-PIs from Moraine Valley are serving on the Content Development Team and ensuring that the following project goals and corresponding objectives are implemented.

Goal 1: Revising/updating current Mechanical Design and Drafting A.A.S. degree and three Certificates to include 3D Parametric Modeling. Goal 2: Building on existing partnerships with high schools and other community colleges to develop, pilot test and evaluate 3D Parametric Modeling courses. Goal 3: Utilizing E-Learning tools to incorporate Web-assisted instructional course resources. Goal 4: Disseminating the Mechanical Design and Drafting A.A.S. degree and three Certificates to other educational institutions. Goal 5: Developing and implementing recruitment strategies to promote the revised programs to high school students - focusing on students currently underrepresented in Mechanical Design and Drafting/CAD courses.

To respond to student learning styles, alternative instructional techniques, such as group project work, and Web-assisted eLearning tools are incorporated into instructional delivery. 3D CAD instruction occurs using a variety of delivery methods, including traditional instructor-led classes and Web-assisted learning resources, such as online assignments, skills assessments, lab exercises, teacher guides, tests, quizzes, and course evaluations.

Dissemination of the updated Mechanical Design and Drafting/CAD degree includes providing summer teacher training workshops for 20 high school and college faculty in year two and three of the project. In addition, the college is implementing a variety of career awareness activities to increase high students' knowledge about CAD careers. In each of these activities, students currently underrepresented in CAD careers (minorities and women) are targeted for participation. A total of 51 high school and college faculty and several hundred of their students are gaining expertise and/or awareness of 3D parametric modeling and CAD careers.

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