Digitally Supported Pathways Transitioning Students Into Technical Education Fields

Background

The Center for Aviation and Automotive Technology Education using Virtual E-Schools (CA^{2}VES) is funded through the National Science Foundation's Advanced Technological Education (NSF ATE) program and represents a partnership among the Clemson University Center for Workforce Development, technical colleges, school districts, and local industry. During 2013, South Carolina's manufacturing industry had more than 7,000 job openings, but many of these well-paying jobs went unfilled due to a lack of skills in the workforce. CA^{2}VES' mission is to advance aviation, automotive, and manufacturing technician education to support workforce preparedness and meet the advanced technology workforce needs of South Carolina's anchor aviation and automotive businesses, industries, and suppliers. To achieve this mission, CA^{2}VES is developing a cutting-edge digital learning curriculum that includes virtual reality tools, immersive virtual reality environments, and online learning modules. CA^{2}VES' relationship with over 30 industry partners allows for the development of a digital learning curriculum that is current, relevant, and applicable to the industry. As a result of partnerships with all 16 South Carolina technical colleges and various ATE Centers, CA^{2}VES is well positioned to prepare students for careers in high-demand fields and provide maximum workforce impact in the Southeast through the distribution of cutting-edge educational resources that align with nationally recognized certifications.

Documented Results

CA^{2}VES' virtual reality simulations are designed to provide aviation, automotive, and manufacturing technology students the advantage of learning fundamental skills and inspection principles within safe, unrestricted, and authentic virtual environments. Hands-on experience with industry-specified equipment is important in any technician education program, but schools with limited resources may not be able to offer students ample practice opportunities with such equipment. In a recent study, students who utilized CA^{2}VES virtual tools received similar scores in a skill-based assessment when compared with those who received traditional instruction. Schools with limited resources can offer these virtual reality simulations to technician education students so they have plenty of time to master fundamental skills prior to entering the physical lab.

Potential Applications

Clemson University Center for Workforce Development (CUCWD) recently launched EducateWorkforce.com, a new and innovative online learning portal to house the digital curriculum developed through CA^{2}VES and meet the needs of both industry and educational institutions. This learning portal replicates the structure of many notable Massive Open Online Course (MOOC) platforms but will be specifically tailored to the unique needs of two-year colleges and will offer course materials free of charge or at low cost.

EducateWorkforce.com will allow students to navigate the virtual reality tools and digital curriculum at their own pace, with the option of repeating modules when additional practice is necessary. Instructors can also use this portal by integrating the module content, video lectures, virtual reality tools, and/or assessments into their own courses. CA^{2}VES' digital curriculum was

developed according to the universal design for learning (UDL) principles with the aim to make learning experiences more equitable and available to all learners. Students with varying learning styles, learning disabilities, and/or physical disabilities can benefit from the CA^2VES curriculum because the material is presented in a variety of formats (eBook, video lectures with interactive closed captioning, and virtual reality simulations) and offers learners ample opportunity to practice concepts and express what they have learned through a variety of assessments (true/false and multiple-choice questions, discussion prompts, authentic critical-thinking exercises, hands-on virtual reality activities, etc.). The EducateWorkforce.com platform allows students to navigate these resources with ease and the platform capabilities allow for immediate feedback for each assessment.

For More Information
For more information about CA^2VES and the CUCWD, please visit our website at
http://www.clemson.edu/centers-institutes/cucwd/centers/ca2ves/

Also visit the Educate Workforce website: EducateWorkforce.com