



The Epic Challenge Program: Transforming the Way we Innovate, Educate, and Solve Complex Problems

The US education system is approaching a “tipping point” where the next disruptive idea can totally revolutionize not only the way we learn; but also optimize how we learn. What if we could ignite, excite, and align students’ passion for solving problems with a customized roadmap which guides and facilitates the process for acquiring the knowledge and mastering the necessary skills in a collaborative/cooperative environment using a problem-based learning methodology?

NASA Astronaut and retired Senior Advisor for Innovation and Engineering Development, **Dr. Charles Camarda**, has formulated and proposed the Innovative Conceptual Engineering Design (ICED) methodology as a means for both increasing innovation within NASA, and encouraging STEM/STEAM education in the United States. This methodology involves bringing real-world, open-ended, “epic” engineering challenges to a diverse mix of university, high school, and even middle school students. Under the guidance of relevant subject matter experts from academia, industry, and the government; these students initially work together in-person in a highly collaborative, concurrent engineering environment where creative ideas are rapidly conceptualized, prototyped, tested, and iterated upon. Following an initial workshop, a virtual platform is used to maintain links between the technical experts and the student teams, as they continue to mature their problem solutions. The ICED program was developed by Dr. Camarda over several years, while participating in a wide range of NASA and Air Force research and development programs. Over the past eight years, this program has been successfully field-tested over a wide variety of participant experience levels ranging from high school to young practicing engineers. One such collaborative effort involving students from MIT and Penn State resulted in a potential feasible solution to a contingency land landing system for NASA’s next generation space vehicle, the Orion capsule! The Epic Challenge Program has inspired over 5,000 students, from 23 countries around the world.