

# Empowering Students to Think Beyond the Classroom Through Real-World Problem Solving

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**Abstract:** Many students approach mathematics as a sequence of step-by-step procedures with a clear, definitive solution. Over time, this mindset leads them to believe that all problems can be neatly solved within this structured framework. However, once they enter the workforce, students quickly realize that real-world problems are rarely so straightforward. These challenges are often complex, multifaceted, and ambiguous, with multiple potential solutions rather than one "right" answer. This realization can be overwhelming for students who are accustomed to more predictable problems. To prepare students for this shift, it is crucial to provide them with opportunities to engage with "real-world chaos" through collaborations with business, industry, and government agencies. By tackling messy, ill-defined problems, students develop essential skills in innovative problem-solving, creative resilience, and out-of-the-box thinking. These hands-on experiences help students become comfortable with uncertainty, foster adaptability, and unlock their full potential for growth and impact in their future careers.



**Vinodh Chellamuthu** is an Associate Professor of Mathematics and Director of the Research Office at Utah Tech University in St. George, Utah. He is deeply committed to enhancing the education of future scientists by creating opportunities for career development through research, which he considers a high-impact teaching pedagogy. Dr. Chellamuthu has mentored numerous undergraduate research projects originating from business, industry, and government agencies. During his tenure at Utah Tech, he has guided over 60

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