

University of Texas Rio Grande Valley

ScholarWorks @ UTRGV

---

RGV STEM ED Conference Proceedings 2023

RGV STEM ED Conference Proceedings

---

2023

## Food Security: at the Intersection of Entrepreneurship, Engineering, and Agriculture

Noe Vargas Hernandez

*The University of Texas Rio Grande Valley*

Sylvia Robles

*The University of Texas Rio Grande Valley*

Joanne Rampersad-Ammons

*The University of Texas Rio Grande Valley*, joanne.rampersadammons@utrgv.edu

Follow this and additional works at: <https://scholarworks.utrgv.edu/rgvstemed2023>



Part of the [Higher Education Commons](#)

---

### Recommended Citation

Vargas Hernandez, N., Robles, S., & Rampersad-Ammons, J. (2023). Food Security: At the Intersection of Entrepreneurship, Engineering, and Agriculture. Proceedings of the 6th Annual RGV STEM Education Conference. 6th Annual STEM Education Conference, South Padre Island, TX. scholarworks.utrgv.edu/rgvstemed2023/6

This Conference Proceeding is brought to you for free and open access by the RGV STEM ED Conference Proceedings at ScholarWorks @ UTRGV. It has been accepted for inclusion in RGV STEM ED Conference Proceedings 2023 by an authorized administrator of ScholarWorks @ UTRGV. For more information, please contact [justin.white@utrgv.edu](mailto:justin.white@utrgv.edu), [william.flores01@utrgv.edu](mailto:william.flores01@utrgv.edu).

## **Food Security: at the Intersection of Entrepreneurship, Engineering, and Agriculture.**

**Dr. Noe Vargas Hernandez<sup>1</sup>, Dr. Sylvia Robles<sup>2</sup>, Dr. Joanne Rampersad-Ammons<sup>3</sup>**

<sup>1</sup>Department of Mechanical Engineering, University of Texas Rio Grande Valley

(noe.vargas@utrgv.edu)

<sup>2</sup>Robert C. Vackar College of Business and Entrepreneurship, University of Texas Rio Grande

Valley (sylvia.robles@utrgv.edu)

<sup>3</sup>School of Earth, Environmental and Marine Sciences, University of Texas Rio Grande Valley

(joanne.rampersadammons@utrgv.edu)

### **Focus/Problem Statement**

Providing students with authentic learning experiences is challenging, but these are some of the most effective teaching activities. Authenticity can be increased by providing real-world contexts and considerations to challenge our students. Problems that closely resemble real-life typically demand a comprehensive solution and hence call for multidisciplinary collaboration and when too complex can be termed ‘wicked’ problems (Head and Alford, 2015).

### **Theoretical or Conceptual Framework**

Dr. Vargas Hernandez is an expert in innovative engineering product design and sustainability, Dr. Robles is an expert in entrepreneurship and service learning, and Dr. Rampersad-Ammons is an expert in agriculture and food security. The trio of professors have collaborated for the last 4 years on hands-on student projects (Robles, 2022). Collaboration has been a learning process, using pedagogical best practices (e.g., service learning),

multidisciplinary collaboration models (e.g., quintuple helix), and innovation & entrepreneurship approaches (e.g., lean canvas). Although these theoretical models have informed the collaboration, it has been through experiencing challenges that the collaboration has been improved and reinforced.

### **Methodology/Design of the Study or Organization**

The objective of this session is to share our experience providing students with effective multidisciplinary learning experiences. For the last 4 years, faculty from entrepreneurship, engineering, and agriculture have collaborated in agricultural projects that have a direct impact in the Rio Grande Valley community in Texas. While students focus on their specific area (engineering, entrepreneurship, agriculture), they must learn from each other to provide a comprehensive solution. We highlight our experience, key elements for successful collaboration and practical recommendations to replicate success shared at the conference.

### **Our experience**

- The Rio Grande Valley is not ‘Silicon Valley’ where this type of collaboration is deeply rooted.
- At our institution, there was no historical collaboration between Engineering and Business colleges, so trust had to be developed between collaborators.
- Our faculty are reminded to focus on their core research and teaching so that they meet tenure requirements. This approach may not be conducive to those criteria as faculty need time to brainstorm, assess, develop corrective measures where necessary and debrief together at the end.
- Students lack entrepreneurship role models in this geographic region.

- Students in different disciplines already have ‘busy’ curricula that are reflected in their syllabi.
- Our graduating students get good job offers, so they wonder why invest energy in these collaborations and what positive skill sets they will bring.

### **How to start**

- Start with one faculty from each discipline who is convinced to make a change. In our case, our disciplines were Engineering, Business, and Agriculture.
- Identify courses to collaborate and a shared problem. Our shared problem was “How to feed the world with 1 ½ times the population that we have today...In 30 years” (Association of Public and Land-grant Universities, 2017). Our courses were Senior Design in Mechanical Engineering and New Venture Creation in Business.
- Start with small changes so as to not overburden the students and focus on student soft skills development.
- Keep ‘people’ first. Help students develop trust in each other and see all members across the disciplines as ‘One Team”. Foster Unity and Identity, Communication, Solidarity
- Initially, assessments across the disciplines will not be aligned, but with time and discussion among the faculty, common metrics emerge that can be utilized. A good place to start is with Gelmon, 2018; Berman, 2006. This is one of the areas that we will continue to work on as we gain experience.
- Document and where appropriate advertise your achievements especially at an institutional level in the collaborating Departments and Colleges.

## **Acknowledgments**

This research was partly supported by the intramural research program of the U.S. Department of Agriculture, National Institute of Food and Agriculture, Agriculture and Food Research Initiative Program grant nos. 2019-68017-29694 and 2022-67022 and an Institutional Grant NA22OAR4170092 to the Texas Sea Grant College Program from the National Sea Grant Office, National Oceanic and Atmospheric Administration, U.S. Department of Commerce.

## References

Head, B., & Alford, J. (2013). Wicked problems. *Administration & Society*, 47(6), 711–739.

<https://doi.org/10.1177/0095399713481601>

Robles, S. (2022). Adopt a Startup (HIS-E) model: An example of education for sustainable, humane entrepreneurship despite COVID-19, *Journal of the International Council for Small Business*., DOI: [10.1080/26437015.2021.1982371](https://doi.org/10.1080/26437015.2021.1982371)

Association of Public and Land-grant Universities (APLU). 2017. The Challenge of Change; [www.aplu.org/ChallengeofChange](http://www.aplu.org/ChallengeofChange) (Accessed on March 15, 2019).

Gelmon, S. B. (2018). *Assessing Service-Learning and Civic Engagement: Principles and Techniques*. [https://openlibrary.org/books/OL27796340M/Assessing\\_Service-Learning\\_and\\_Civic\\_Engagement](https://openlibrary.org/books/OL27796340M/Assessing_Service-Learning_and_Civic_Engagement)

Berman, S. (2006). *Service Learning: A guide to planning, implementing, and assessing student projects*. <http://ci.nii.ac.jp/ncid/BA80058264>