



Multi-State and Multi-disciplinary
Partnership Effort:
Nexus of Food and Nutritional Security,
Sustainability and Hunger Graduate
Course

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Introduction

- This grant-funded project developed a new course to enhance graduate education in Food, Nutritional Security and Hunger—a critical and emerging USDA-NIFA priority related to the triple burden of malnutrition (undernutrition, over-nutrition and micronutrient deficiencies).
- The course was a collaborative educational partnership among Texas A&M University, Purdue University, and Ohio State University.



COURSE HIGHLIGHTS



13 Experiential
Innovative Modules



5 Key study areas:
Food Security, Nutrition,
Hunger, Sustainability,
Human Impact



4 University
Partners



19 Internationally
Renowned Speakers

Introduction

- The goal of this course was to promote interdisciplinary learning by engaging a diverse group of students from different disciplines and multiple institutions to think critically about food and nutritional security and encourage students to analyze the local relevance and global importance of key indicators.
 - Flipped class model
 - Experiential learning activities
 - Innovation of this course was to address the need for a 21st century grand challenge to be learned from a variety a perspectives (i.e., disciplines, institutions, and local-regional-global contexts)

Takeaways from the Literature

Interdisciplinary education and research helps students think critically and outside the box to learn complex issues. Many challenges are more global and complex in nature, the creation of interdisciplinary programs, research groups, centers and institutes is rapidly becoming an integral feature of academia (Ewel 2001, National Academy of Sciences et al. 2005).

Advances in technology and active learning have brought forth the “flipped classroom” model to better engage students. Flipping the traditional classroom had positive outcomes in feasibility and in regards to student learning preference (McLaughlin et al., 2014).

Educating the leaders of the future will be key to the U.S. commitment to food security and will pay exponential dividends as motivated, experienced, educated students effect change on local and global levels (APLU, 2009).



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Collaborative Partnership

- 4 Partner Institutions
- 30 Students
 - Texas A&M University (10)
 - Texas A&M University Kingsville (4)
 - Purdue University (7)
 - The Ohio State University (9)



Collaborative
Partnership

Interdisciplinary Lectures

- 19 Guest Lecturers Across Disciplines
- Coming from several Universities, Governmental Agencies, & Non-Governmental Organizations
- Participated in Curriculum Development

SPEAKERS



Dr. Dave C. Sands
Professor of Plant Pathology
Department of Plant Sciences and Plant Pathology
Montana State University



Dr. Ratan Lal
Distinguished University Professor of Soil Science
Director, Carbon Management Sequestration Center, Ohio State University



Dr. Leah Bevis
Assistant Professor
Department of Agricultural, Environmental and Development Economics
Ohio State University



Dr. Ross Maynard Welch
Lead Scientist, USDA-ARS
Professor of Plant Nutrition,
Department of Crop and Soil Sciences, Cornell University



Dr. Suresh Babu
Research Theme Leader
International Food Policy Research Institute
Washington DC



Dr. Marco Palma
Associate Professor
Department of Agricultural Economics
Texas A&M University



Dr. Gary E. Briers
Professor
Department of Agricultural Leadership, Education, and Communications
Texas A&M University



Dr. Rajan Varadarajan
University Distinguished Professor & Distinguished Professor of Marketing
Regents Professor Ford Chair in Marketing & E-Commerce
Mays Business School



Dr. Vijay Singh
Distinguished Professor
Caroline & William N. Lehrner Distinguished Chair in Water Engineering
Texas A&M University



Dr. Price Edwin
Professor
Department of Agricultural Economics
Howard G. Buffett Chair on Conflict and Development
Texas A&M University



Dr. Luis Ribera
Associate Professor
Department of Agricultural Economics
Texas A&M University



Dr. Cizmas Leslie
Assistant Professor
Department of Environmental & Occupational Health, Texas A&M University



Dr. Leonardo Lombardini
Professor
Department of Horticultural Sciences
Texas A&M University



Dr. Gary Wingenbach
Professor
Department of Agricultural Leadership, Education, and Communications
Texas A&M University



Dr. Fred Davies
Regents Professor Emeritus
Department of Horticultural Sciences
Texas A&M University



Dr. Kevin Crosby
Professor
Vegetable & Fruit Improvement Center
Department of Horticultural Sciences
Texas A&M University



Dr. Dennis R. Heldman
Dale A. Seiberling Endowed Professor
Departments of Food Science Technology, Food Agricultural & Biological Engineering
Ohio State University



Dr. Fred Nafukho
Professor and Head
Department of Educational Administration and Human Resource Development



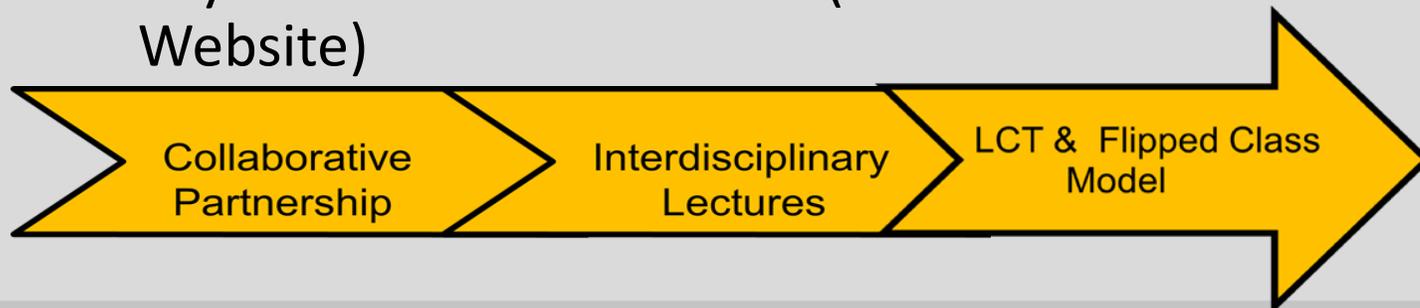
Dr. Alexandra Towns
Technical Advisor,
Research & Learning Program Impact and Quality Assurance (PIQA) Department,
Catholic Relief Services

Collaborative Partnership

Interdisciplinary Lectures

Flipped Class Model & LCT

- 13 Modules
- ~60 Minute Online Lectures
- Case Study Method
- Distance Learning
- Synchronous Discussions
- Asynchronous Discussions (Classroom Website)



MODULES

- INTRODUCTION: GLOBAL PERSPECTIVES
- FOOD SECURITY AND NUTRITION INDICATORS AND ANALYSIS CONTEXT AND INDICATORS
- FRAMING THE COURSE AND FRAMING THE PROBLEM
- EXPERIENTIAL LEARNING AND CURRENT TOPICS
- FOOD MALNUTRITION AND DISEASE PREVENTION
- FOOD-WATER-ENERGY SECURITY UNDER CLIMATE CHANGE
- FOOD PRODUCTION ENVIRONMENT AND SOILS
- CONFLICT MIGRATION AND HUMAN CAPITAL
- NUTRITIONAL EDUCATION, BEHAVIORAL CHANGE AND COMMUNICATION
- INNOVATING FOR ENVIRONMENTAL SUSTAINABILITY
- AGRICULTURE, FOOD SECURITY & SUSTAINABLE INTENSIFICATION: CAN WE FEED THE WORLD ?
- FARM AND FAMILY DECISIONS: MANAGING RESOURCES AND CONSTRAINTS IN SMALLHOLDER FARM SYSTEMS
- SUSTAINABILITY OF ALTERNATIVE FRUITS AND VEGETABLE PRODUCTION INCREASE FOOD SECURITY

Place Based Experiences (Experiential Learning)



- Practical Application of skills was a major component
- Combining classroom experience with real-world application
- Using the 4 key areas, student teams:
 - Developed a Needs Assessment for a respective local area
 - **Nutrition**- Interacted with Nutrition Educators within their University/Community
 - **Sustainability**- Visited local farms that use sustainable agricultural practices
 - **Human Impacts**- Shadowed Extension Educators who's work relates to Food Security
 - **Hunger**- Visited Local Food Banks to understand their role in the local food system

E-Learning Tool/Case Study Modules

E-learning tool/
Case Study Modules

- Student Teams produced E-Learning Case Study Modules engaging them with:
 - Interactive Media (i.e. Nearpod, Ed-Puzzle)
 - Videography
 - Lesson Planning
 - Assessment Planning
 - Micro-Teaching
 - Teaching Practicum
 - Solution Oriented Critical Thinking
 - Reflection



Student Outcomes

- Contextual Knowledge
- Key Indicators
- Local/Global Analysis
- Interdisciplinary Thinking
- Teamwork & Communication Skills



Collaborative
Partnership

Interdisciplinary
Lectures

LCT & Flipped Class
Model

Place Based
Experiences

E-learning tool/
Case Study Modules

Post-Test Questionnaire Highlights

With regard to the Multi/Interdisciplinary approach of the course:

- 18 out of 19 (94%) students felt that this course “developed their ability to think in an interdisciplinary way.”
- 17 out of 19 (89%) students felt that “in this course they were challenged to see the relationships of complex content.”
- Student Reflections to Confirm:
 - *“I enjoy the multidisciplinary makeup of our classroom. This is very helpful especially with our group project.. our project is made easier by having a diverse team and more realistic to how the real world works where there is collaboration across disciplines to solve multidisciplinary problems.”*

Post-Test Questionnaire Highlights

With regard to how Experiential Learning helped students apply concepts:

- 16 out of 19 (84%) felt that “Engaging in experiential learning experiences helped them understand the content in the course more.”
- 17 out of 19 (89%) students felt that the “experiential learning experiences were valuable to them.”
- Student Reflections to Confirm:
 - *“For me, this project has opened my eyes to poverty and the strain it causes in accessing healthy food...this local project has brought some surprising findings to the fore that I would expect in developing countries, but not within a 15 minutes’ drive from the campus.”*

Post-Test Questionnaire Highlights

With regard to how Learner Centered Teaching engaged students:

- 17 out of 19 (89%) students felt that “they were motivated to learn in this course.”
- 16 out of 19 (84%) felt that “this course improved their understanding of concepts and principles in this field.”
- Student Reflections to Confirm:
 - *“It has pushed me to look at the slides and into the lecture presentations more in depth because I want to ensure that I am knowledgeable. I believe that this model gives me an opportunity to not be confined to an in-class lecture.”*



Questions?

References

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