

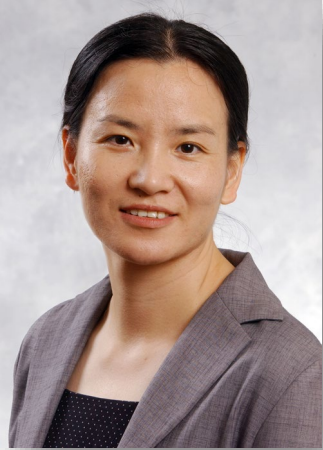
ENGAGING UNDERGRADUATE STUDENTS IN RESEARCH: FROM CROSS-DISCIPLINE PROGRAMS TO PUBLISHED ARTICLES



2024 RUTGERS ACTIVE LEARNING SYMPOSIUM (RALS)
MAY 14TH, 2024

PANELISTS

MODERATOR



Yanhong Jin, Ph.D.
Professor, Dept of
Agricultural, Food &
Resource Economics,
SEBS



Moustafa Basiony, BA
Summa Cum Laude From
Rutgers in Jan. 2024.
BA in Sociology
Aresty Student



Sanjib Bhuyan, Ph.D.
Professor,
Department of
Agricultural, Food,
and Resource
Economics, SEBS



Gal Hochman, Ph.D.
Professor, Department
of Agricultural, Food,
and Resource
Economics, SEBS



Mary Wagner,
Pharm.D., MS., Clinical
pharmacist &
Associate Professor at
the Ernest Mario
School of Pharmacy
(EMSOP)

BENEFITS OF ENGAGING UNDERGRADUATES IN RESEARCH

Benefits of Engaging Undergraduate Students into Research

1

2

3

4



1) Undergraduate students

- Develop and improve critical thinking, presentation, data analytics, communication, time management, and teamwork skills
- Establish and strengthen networking with a faculty advisor and the research team
- Deepen knowledge and appreciation of the specific fields
- Gain publication and presentation opportunities
- Enhance opportunities for graduate school and career aspirations

2) Faculty Advisor

- Gain fresh perspectives and potentially innovative ideas
- Cost-effective research outcomes
- Increase visibility and recognition
- Gain mentorship opportunities

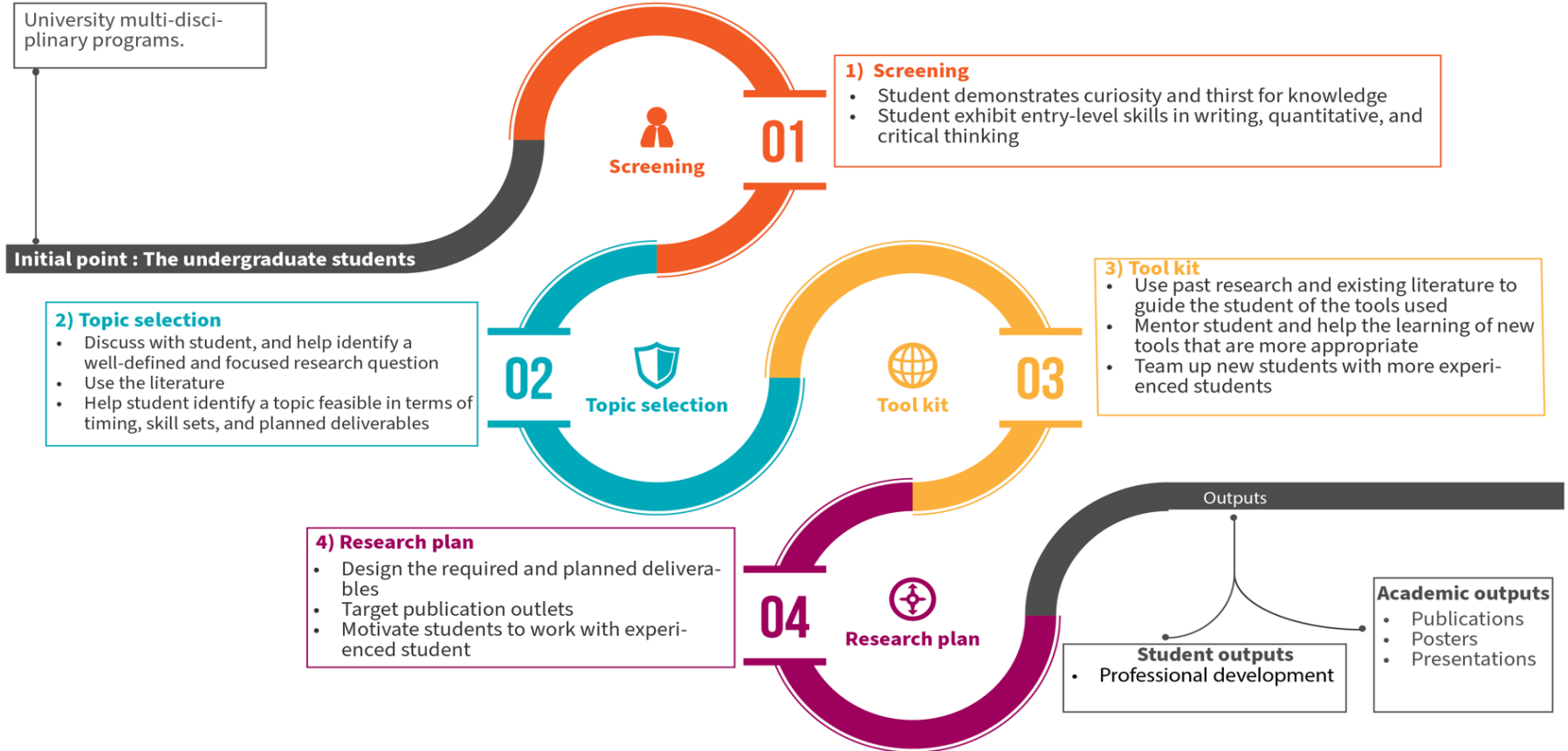
3) University

- Provide experiential learning
- Increase students engagement and retention
- Prepare students for graduate studies and careers
- Increase research productivity

4) Society

- Advance knowledge
- Nurture entrepreneurial mindsets and encourage innovation
- Improve diversity and inclusiveness
- Build and train the future workforce and nurture future talent
- Create social empowerment and personal growth

THE PROCEDURE TO GUIDE UNDERGRADUATE STUDENTS IN ACTIVE AND PRODUCTIVE RESEARCH



Student Perspective on Undergraduate Research

Moustafa Basiony

STUDENT PERSPECTIVE ON UNDERGRADUATE RESEARCH

❑ Opportunity Seeking

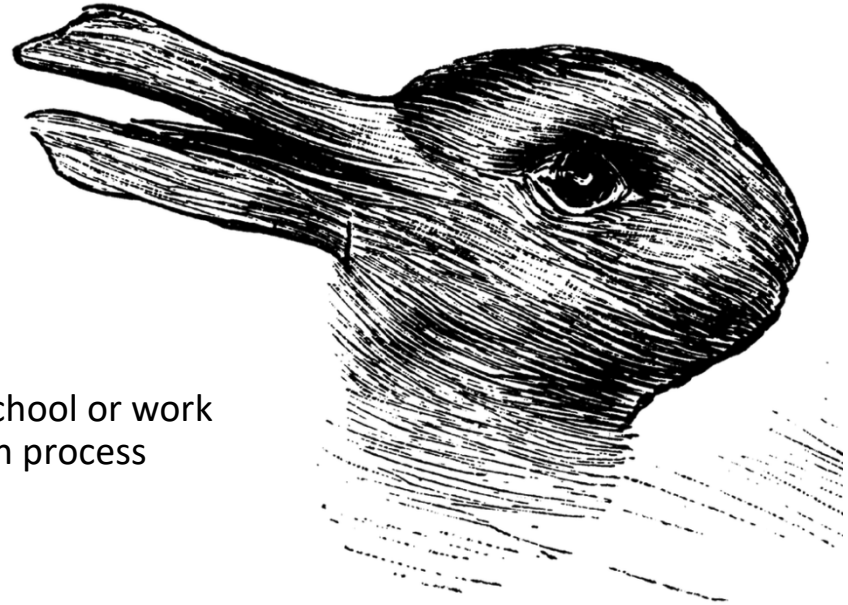
- Got to know available research opportunities for undergraduates i.e. Aresty RA Program
- Applying

❑ Getting Started with Research

- Expectations VS Reality
- Becoming familiar with the research process

❑ Outcomes

- Gaining technical skills
- Applying existing knowledge
- Better professional profile to apply for graduate school or work
- More confident and comfortable with the research process
- Unexpected outcomes



STUDENT PERSPECTIVES ON UNDERGRADUATE RESEARCH



2024 APS Annual Convention

San Francisco, CA, USA | May 23 - 26, 2024

Certificate of Acceptance

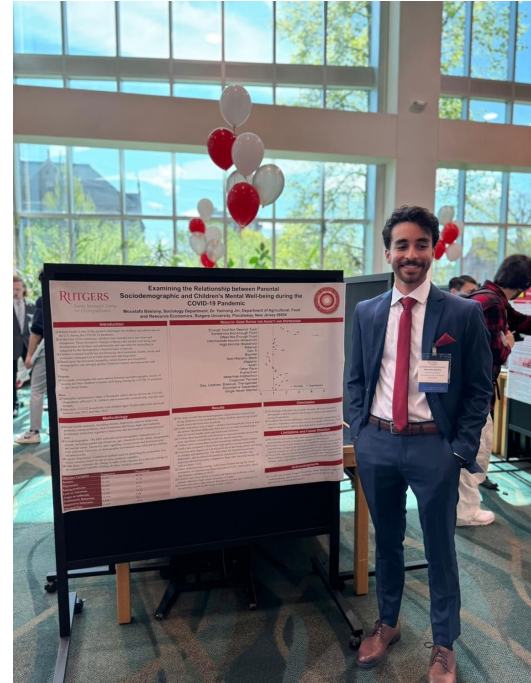
Poster: Exploring the Impact of COVID-19 on Children: Unraveling Mental and Behavioral Effects and the Mediating Role of Socio-Economic Factors

Presenting Author: Moustafa Basony

University/Affiliation: Rutgers University New Brunswick

All Authors: Moustafa Basony, BA, Rutgers University New Brunswick

Abstract: The study explores the impact of COVID-19 on children and adolescents' mental and behavioral health and the Mediating Role of Socio-Economic Factors. We utilized a sample of 120,393 American Households with children under 18 (n=426,043). The results of logistic regression suggest significant disparity over Socioeconomic factors.



Exploring the Impact of COVID-19 Disruptions on the Mental Wellbeing of Children and Adolescents in the United States

Moustafa Basony^a, Julia Yi^b, Olivia Chen^c, Spencer Gaylert^d, and Yanhong Jin, Ph.D.^{d*}, Child and Adolescent Mental Health journal

Why and How to Engage Undergraduates in Faculty Research

Sanjib Bhuyan

WHY AND HOW

- ❑ **Why is it important to engage undergraduate students in research at RU-NB?**
 - RU-NB is a R1 University with a dedicated teaching mission
 - Practical training of undergraduates is an integral part of the AMP
 - Teaching is enhanced when research is integrated into it
 - A win-win situation
- ❑ **How do I do it?**
 - Aresty, HC, G.H. Cook
- ❑ **Examples of student research topics in recent years:**
 - Examining the impact of member behavior in cooperatives
 - Food acquisition and consumption behavior in the northeast
 - Food access and diet quality
 - Product development and market assessment
 - Competitiveness of India's food industries
- **Lessons learned**



Engaging School of Pharmacy Students in Research

Mary Wagner

Healthy Eating Challenge - Pharmacy student Honors Thesis

Methods:

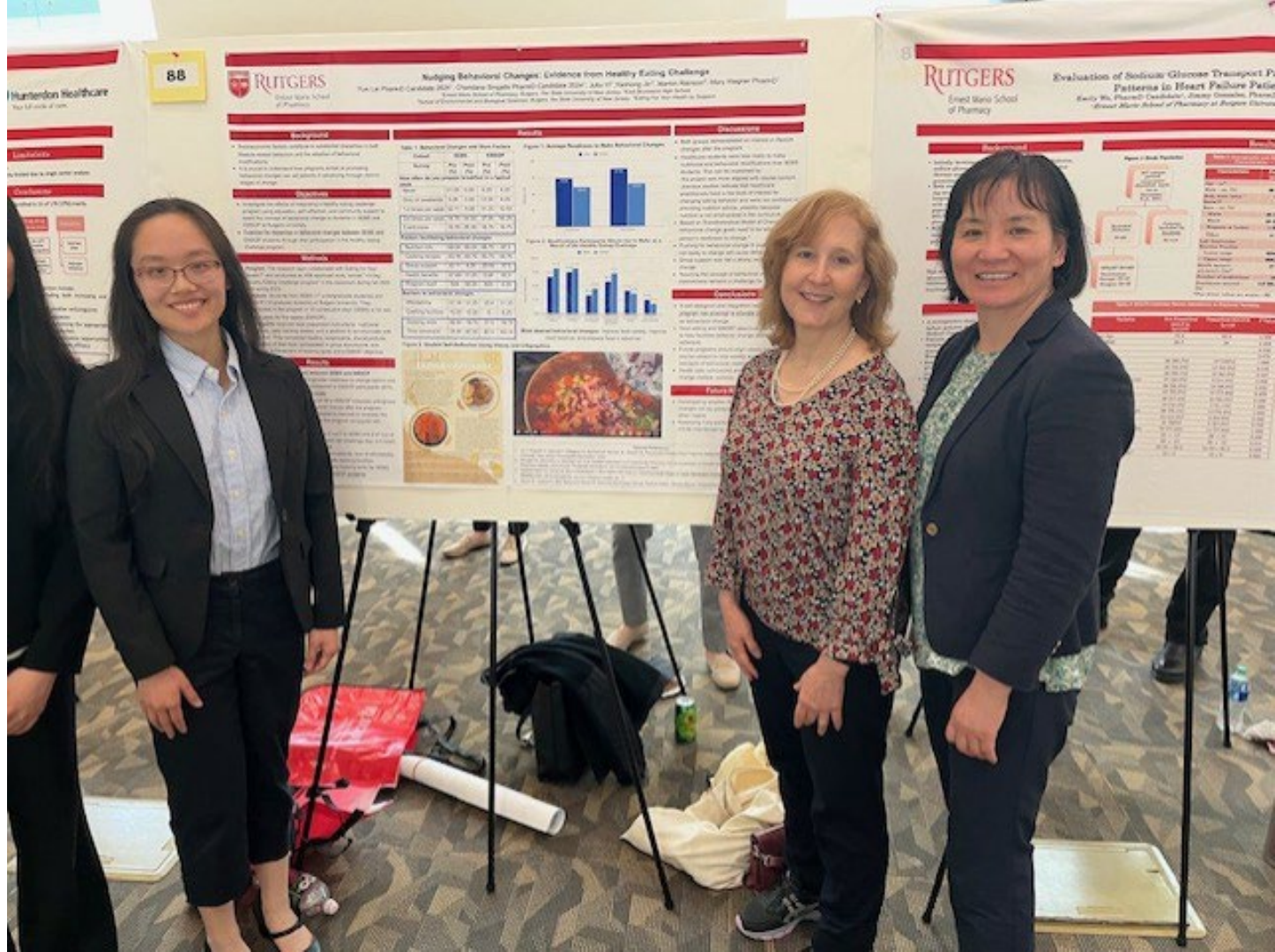
- 10-day healthy eating challenge (from **Eating for Your Health™** partner) in undergraduate SEBS course and graduate pharmacy psychiatry course
- Received meal preparation instructions, nutritional resources, daily tracking sheets, and a platform to communicate
- Completed reading assignments, shared pictures and videos of their food, participated in group discussions, and assessed achievement of learning goals and SMART objective

Outcomes:

- Students learned about behavioral change models
- Majority achieved their health goal
- students learned how to apply concepts for future patients/clients
- Student made videos and infographics engaged students
- Research student worked with us for 4 years in multiple settings

Wins: **Blend of Teaching, Scholarship, and Service.** Students made behavioral changes and can teach others what they learned. Press release, 3 presentations, and 2 publications. Future research and service opportunities with Eating for your Health

Collaboration between SEBS and EMSOP related to our common interest in healthy eating



Interprofessional training Event: Osteoporosis/Falls Screening

Methods:

- Faculty from nursing, pharmacy, and physical therapy created a course
- Program was offered yearly since 2020
- Research students from each school were involved in the development, implementation, data analysis, and publication of results
- Sessions:
 - Zoom session one: students reviewed the screening procedure with other students
 - Student screened a person of their choice,
- Zoom session two: students presented their SMART objective and screening results.
- 30 break out groups each with a faculty facilitator.

Outcomes:

- Students learned how to screen future patients for falls and osteoporosis
- Peer teaching
- Students learned how to write SMART objectives with their client
- Screened about 600 people
- Research students created training videos related to their discipline
- Research students worked 1-4 years on the project (oral and written communication skills)

Wins: Blend of Teaching, Scholarship, Service and Interprofessional learning. 3 publications, 6 abstracts (nursing student won best poster). Community outreach.

How to Transform a Classroom Project into a Peer-reviewed Journal Article

Yanhong Jin

ANALYZING AND VISUALIZATION OF DATA: A TEAM PROJECT IN AN UNDERGRADUATE COURSE EVALUATING FOOD INSECURITY IN US HOUSEHOLDS

TEN STEPS

Ensuring the success of class projects

Ten Steps for a class project providing hands-on experience in data analysis and visualization, while engaging students in active, personalized, and iterative learning.



01

Establishing Learning Goals

Define learning goals for the class project by the instructor
Establish individual learning goals for the class project by the students

02

Identifying Research Questions for the Class Project

Relevant to the course and current events
Interesting to the students
Requiring data analysis

03

Identifying Data Sources

Discuss different types of data (cross sectional and panel data)
Review nationally representative data utilized by applied economists
Identify appropriate data for the class project

04

Identifying Data Analytical Tools

Review data analytical tools commonly used by applied economists
Discuss data analytical tools used in industry
Identify the appropriate data analytical tools for the class project

05

Streamlining and Allocate Tasks among Students

Deconstruct the overall research question into sub-questions
Exchange backgrounds, including majors, research experiences, and skills
Allocate tasks based on students' initiatives and instructor's consideration

06

Conducting Data Analysis

Review programming softwares for data analysis and select a suitable one
Provide a tutorial on the selected programming software
Perform data analyses

07

Discussing Research Findings

Present individual research findings by each student
Discuss the overall findings by the student group
Identify key insights from the research findings

08

Conducting Data Visualization

Evaluate tools for data visualization and identify a suitable one for the project
Provide a tutorial on the selected data visualization tool
Conduct data visualization for presenting research findings

09

Putting together the Class Project

Compose the background paper collaboratively
Complete the infographic project collaboratively

10

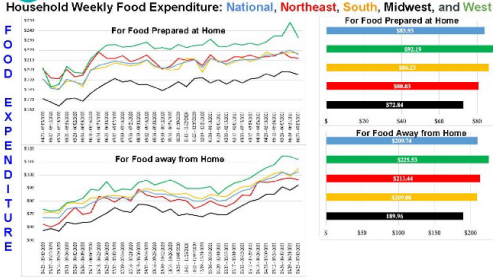
Reflecting the Achievement of Learning Goals

Evaluate the achievements of the project's learning goals by the instructor
Evaluate the achievements of individual learning goals by the students

Project Deliverable

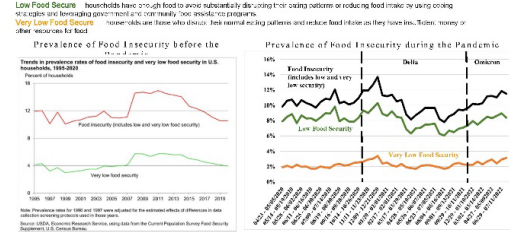
Food Insecurity among US Households during the Pandemic: *Food Spending*

Based on the Household Pulse Survey Conducted by the US Census Bureau from April 2020 to August 2022



Low and Very Low Food Security among US Households during the Pandemic: *Prevalence*

Based on the Household Pulse Survey Conducted by the US Census Bureau from April 2020 to August 2022

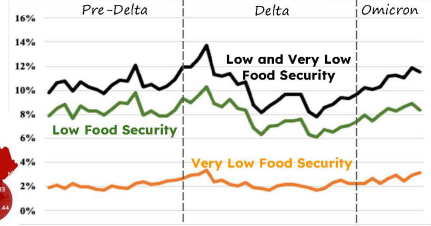


Food Insecurity among US Households during the Pandemic

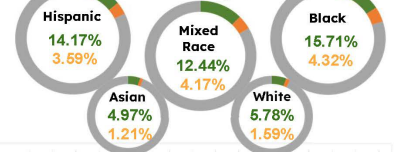
Based on the Household Pulse Survey Conducted by the US Census Bureau from April 2020 to August 2022

During the Covid-19 pandemic, household expenditure of food prepared at home and away from home experienced a 3.5% increase in the US. Inflation and disruptions to the food supply chain by the pandemic contributed to the increase. The regional differences in household food expenditure was pronounced – highest for the **West** and the lowest in the **Midwest**.

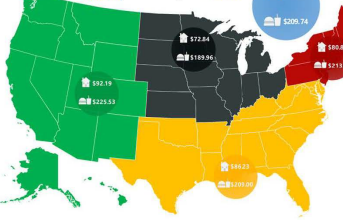
Food insecurity was higher than the pre-pandemic level



Disparities of Low and Very Low Food Insecurity by Race

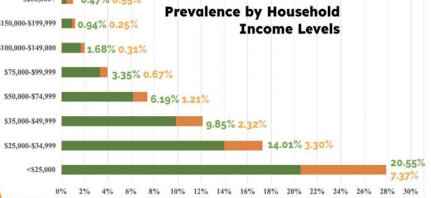


Weekly Household Food Expenditure: National, Northeast, South, Midwest, and West



13.69% Households with children had high food insecurity

Low and very low food insecurity consistently **rose** as household income level **decreased**. About **28%** of households in the the lowest income group are food insecurity.



Top Three Self-Reported Reasons for Food Insecurity



Percent of Food Insecure Households Received either Free Meals/Groceries or SNAP Benefits

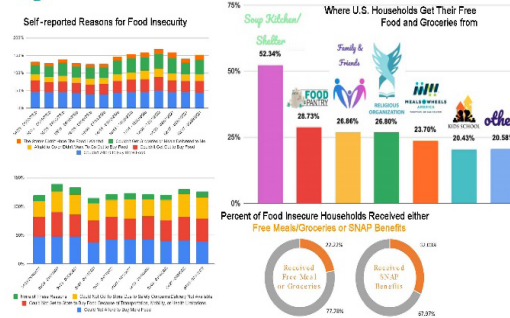


Where Food Insecure Households Received Help



Food Insecurity among US Households during the Pandemic: *Reasons and Resources to Improve*

Based on the Household Pulse Survey Conducted by the US Census Bureau from April 2020 to August 2022



Analyzing and Visualization Data: A Team Project in an Undergraduate Course

Evaluating Food Insecurity in US Households

Yanhong Jin, Mattias Arrindell, Shannon Austin, Leann Benny, Jason Campbell,

Qihong Chen, Lucas Fithian, Lynette Vasquez, and Julia Yi

Accepted at *Applied Economics Teaching Resources*

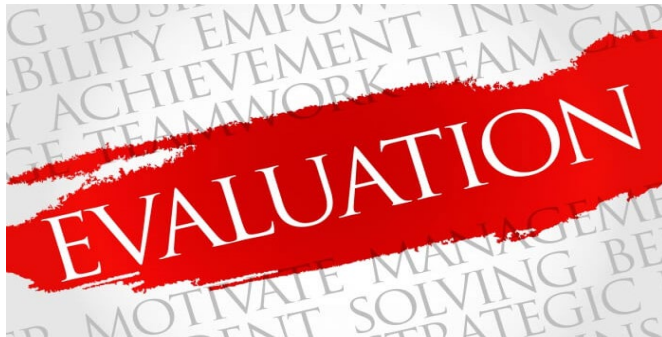
TIPS FOR SUCCESS



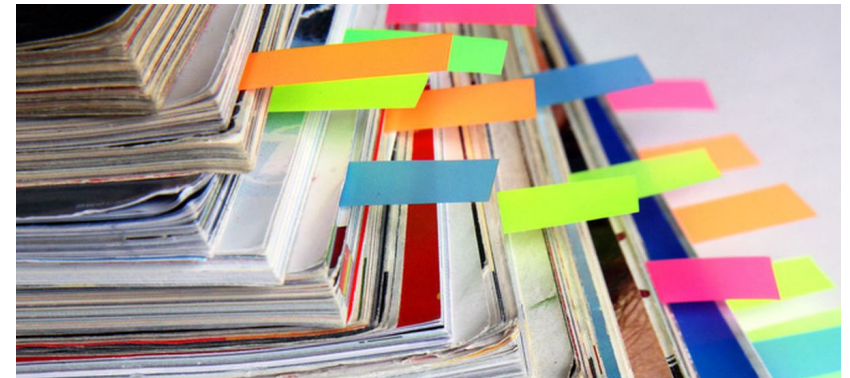
PLANNING & DESIGNING



STUDENT ENGAGEMENT



EVALUATION METRICS



IDENTIFY APPROPRIATE JOURNAL

Experiential Learning: The case of Integrate Multi-Trophic Aquaculture (IMTA) System

Gal Hochman

Concrete Experience

- Empowering the students results in productive outcomes to the faculty
- The students were hired to manage an IMTA system



Reflective Observation

- ❑ Initially, students follow our guidance.
- ❑ They try to mimic the faculty's work and thus share research load (e.g., collecting data).
- ❑ I discussed and showed the students the steps needed to manage the system, how to manage the log, why it is needed, and examples of how we will use the data generated.

Abstract Conceptualization

- ❑ As the students get more hands-on experience and feel more empowered, they start thinking independently, bringing novel thoughts from the discipline and courses they study, enhancing the faculty's research project.
- ❑ The student help design and develop ideas how to expand the system to include duckweeds





Active Experimentation

- ❑ As they introduce novel ideas, they invest in research and arrive at outcomes that become the faculty's subsequent paper, presentation, or research proposal idea.
- ❑ Plan extensions and help develop them, work on schemes for alternative systems, etc.

Active experimentation
(planning or trying out what was learned)



Concrete experience
(doing or having an experience)



Reflective observation
(reviewing or reflecting on the experience)



Abstract conceptualization
(concluding or learning from the experience)



**Papers
Presentations
Research
proposal ideas**

SELECTED RUTGERS RESEARCH PROGRAMS

- ❑ **Aresty Program:** <https://aresty.rutgers.edu/>
- ❑ **Douglas STEM Honor Program:** <https://douglass.rutgers.edu/douglass-discovery/douglass-honors-program>
- ❑ **Douglass Wise Project:** <https://douglass.rutgers.edu/wise/project-super>
- ❑ **Education Opportunity Fund:**
<https://admissions.rutgers.edu/costs-and-aid/financial-aid/eof> <https://saseof.rutgers.edu/>
<https://sebseof.rutgers.edu/initiatives/ru-researching-experience/>
- ❑ **Gardner Fellowship:** <https://lgfellowship.rutgers.edu/>
- ❑ **G.H. Cook Scholars Program:** <https://sebshonors.rutgers.edu/gh-cook-scholars/>
- ❑ **Honors College Interdisciplinary Thesis Projects:**
<https://honorscollege.rutgers.edu/academics/curriculum/capstone-requirement>
- ❑ **School Specific Honors Program:**
 - <https://sebshonors.rutgers.edu/> (SEBS)
 - <https://pharmacy.rutgers.edu/programs/professional-degree-program-doctor-of-pharmacy-pharmd/pharmd-honors-research-program/> (Pharmacy)
 - <https://soe.rutgers.edu/research/student-research> (Engineering)
- ❑ **SURF (Summer Undergraduate Research Fellowship) Program:**
An NIH-funded REU in the Ernest Mario School of Pharmacy: <https://surf.rutgers.edu/>
- ❑ **Teaching Excellence Network:** <https://sites.rutgers.edu/teaching-excellence/>
Semester Support Groups (SSG) and Summer Course Transformation Institute
Community Engagement (DICE) - Research2Practice Fellowship

SELECTED RUTGERS RESOURCES FOR FACULTY TO BRING RESEARCH INTO TEACHING

- ❑ Provost Teaching Fellow
<https://newbrunswick.rutgers.edu/chancellor-provost/faculty-affairs#teaching-fellows>
Provost Teaching Fellowship program
- ❑ Faculty Affinity Network (FAN) grants: <https://diversity.rutgers.edu/fdc>
- ❑ Semester Support Groups (SSG)
<https://sites.rutgers.edu/teaching-excellence/semester-support-groups/>

ENGAGING UNDERGRADUATE STUDENTS IN RESEARCH: FROM CROSS-DISCIPLINE PROGRAMS TO PUBLISHED ARTICLES

Yanhong Jin

yanhong.jin@rutgers.edu



Sanjib Bhuyan

Bhuyan@sebs.Rutgers.edu



Mary Wagner

mlwagner@pharmacy.rutgers.edu



Moustafa Basiony

mab802@scarletmail.rutgers.edu



Gal Hochman

gal.hochman@rutgers.edu

