An Innovative Project-Based Learning Approach to Engage Undergraduate Students in Research

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2018 North American Colleges and Teachers of Agriculture Conference
Iowa State University, Ames, Iowa, June 12-15, 2018
Acknowledgements

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“Integrating agricultural remote sensing, landscape flux measurements, and agroecosystem modeling in agricultural research and teaching.”
Course Theme: Make sense of data
Use information derived from data for decision making
Simplified datasets are used for deeper understanding

Eg: Central tendency and dispersion
Simplified datasets are used for deeper understanding

Eg: Regression Analysis

\[ y = 31.114x + 614.09 \]
\[ R^2 = 0.5001 \]

\[ y = -2.3809x^2 + 90.887x + 404.95 \]
\[ R^2 = 0.7286 \]
Open Excel Exams

Eg: Linear Programming
Student teams work on research projects

Any project that can provide information from data

Students present research posters developed (Final Exam)
Planning

- Discussions with faculty members
- Manageable project
- Datasets: Already collected or publicly available

Analyzing Changes in Agricultural Land use

Historic crop acreage and price data available from USDA NASS QuickStats

Impact of Soil Treatments on Olive Frost Damage

Data already collected from a field experiment

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Teams and project assignment

- Class capped at 30 (usually full)
- Six teams of 5 students each
- Randomize team order for choosing project

<table>
<thead>
<tr>
<th>Randomized team order</th>
<th>#</th>
<th>Available Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>1</td>
<td>Students’ performance in two agricultural teacher certification tests</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>Can exercise reduce depression?</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>Influence of soil amendments on the growth of olives</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>Analysis of prediction accuracy of US peanut production</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>Optimizing feed ration for beef cattle</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>The association between smoking and general health</td>
</tr>
</tbody>
</table>
Meeting with the teams

- 30 minutes meeting with each team
- Describing the data
- Examples of posters

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**Management of Small Hive Beetles in Beehives**
Fernando Paysse, Sky Hittis, Courtney Kiefer, Sean Langley, Luis Gueitz, Robert Lantu, Ph. D., and Sonya Noy, Ph.D.
Department of Agricultural Sciences
San Francisco State University

**Factors Influencing Teacher Certification Exam Scores**
Malcolm Walker, Warren Ronken, M. Dulaney, Robert Lantu, Ph. D., Joseph Gross, Ph.D., and Sonya Noy, Ph.D.
Department of Agricultural Sciences
San Francisco State University

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**Influence of Crops on Consumer Behavior**
John P. Haines, Paul E. Haines, Robert E. Haines, Ashley A. Haines, and Sonya Noy, Ph.D.
Department of Agricultural Sciences
San Francisco State University

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Activities outside class

- Literature review
- Analysis of individual variables
- Graphing variables and relationships

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Activities in class

- Choice of poster template
- Data analysis
- Putting together the poster

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Instructor and supporting faculty members

Typos, grammar, style etc.
In-class presentations: Final Exam

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Presentations in conferences

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Presentations in conferences
Thank you

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