

Service Learning as an Effective Tool in an Animal Breeding Curriculum

Dr. Jolena Waddell
Associate Professor

Department of Animal Science and Veterinary Technology
College of Agricultural and Environmental Sciences



TARLETON
STATE UNIVERSITY

Member of The Texas A&M University System

Introduction

- Optional service-learning experience in ANSC 3319, Animal Breeding, in Spring 2016 and Spring 2017
- Supported by Engaged Scholar Academy
 - Center for Academic Outreach & Engagement
- Approved Applied Learning Experience (ALE)



TARLETON
STATE UNIVERSITY

Member of The Texas A&M University System

Service-Learning

- An approach to teaching and learning in which students use academic knowledge and skills to address genuine community needs.
 - *The National Youth Leadership Council*



TARLETON
STATE UNIVERSITY

Member of The Texas A&M University System

ANSC 3319—Animal Breeding

- Application of genetic principles to animal production in order to make informed decisions on improving the next generation
 - Genetics
 - Math and statistics
 - Business and management



TARLETON
STATE UNIVERSITY

Member of The Texas A&M University System

Challenges

- Students in ANSC 3319 were:
 - Disengaged
 - Not connecting course materials to real life applications
 - Performing poorly in “why?” questions



TARLETON
STATE UNIVERSITY

Member of The Texas A&M University System

Hypothesis

Students can learn complex animal breeding concepts **equally well** in a real-world scenario, while **gaining interpersonal skills** and providing a **service to the community**.



TARLETON
STATE UNIVERSITY

Member of The Texas A&M University System

Farm Partners

- Match 2-4 students with an area farm
- Farm identifies a genetic challenge/question
- Students analyze situation and present a solution
- Optional for students to participate *in lieu* of:
 - Two homework assignments
 - Two attendance quizzes
 - Final exam



TARLETON
STATE UNIVERSITY

Member of The Texas A&M University System

Service-Learning Details

- Initial report with project plan
- Two project status updates
- In-class group presentation of solution
- Deliverable to the Farm Partner
 - Decision flowchart, list of animals, spreadsheet, etc
- Peer and Partner Evaluations
- Program satisfaction survey
- ALE project reflection (individual)



TARLETON
STATE UNIVERSITY

Member of The Texas A&M University System

Quantitative Data Collected

- Service-learning vs. control scores in aggregate
 - Exam scores and course grade
 - Scores on skills assessment quiz
 - Questions testing skills in all topics covered in the course
- Satisfaction survey of service-learning students
 - (Likert scale)
- IRB# 2016-010616-16032



TARLETON
STATE UNIVERSITY

Member of The Texas A&M University System

Qualitative Data Collected

- Student reflection themes (ALE Learning Outcomes)
 - Knowledge and skills within the discipline
 - Knowledge and skills outside the discipline
 - Use of skills beyond academic experiences
 - Change in global awareness
 - Impact on themselves, partner, and industry



TARLETON
STATE UNIVERSITY

Member of The Texas A&M University System

Course Performance

Comparison of exam and course scores for service learning and control students.

	Spring 2016				Spring 2017			
	Service learning	Control	SL-C	P-value	Service learning	Control	SL-C	P-value
Number of students (n)	27	28			15	23		
Exam 1	68.32%	74.81%	-6.49%	0.13	78.67%	74.74%	3.93%	0.29
Exam 2	72.75%	81.25%	-8.5%	0.02	85.27%	77.83%	7.44%	0.06
Exam 3	72.14%	74.44%	-2.3%	0.47	77.40%	66.30%	11.10%	0.01
Total Course	77.32%	79.93%	-2.61%	0.33	86.03%	77.12%	8.91%	0.02



TARLETON
STATE UNIVERSITY

Member of The Texas A&M University System

Skills Assessment

Question-subject matter	% Service-learning students answered correctly	% Control students answering correctly	% Difference (Service learning – control)
1-Livestock industry trends	95.0%	85.2%	9.8%
2-Relatives as sources of data	95.0%	96.3%	-1.3%
3-Allele frequency changes	100%	70.4%	29.6%
4-Contemporary groups	15.0%	66.7%	-51.7%
5-Types of breeding values	5.0%	37.0%	-32.0%
6-accuracy of data calculations	95.0%	77.8%	17.2%
7-accuracy of measurements	90.0%	92.6%	-2.6%
8-proper data reporting	100%	100%	0.0%
9-phenotypic to genotypic relationship	100%	77.8%	22.2%
10-records adjustments	35.0%	22.2%	12.8%
11-records adjustments	25.0%	29.6%	-4.6%
Average score	68.64%	68.69%	-0.05%
			p=0.99



TARLETON
STATE UNIVERSITY

Member of The Texas A&M University System

Satisfaction Surveys

Question	Ave score (n=21 students)	Positive response (n=9 farms)
How effective was this overall experience?	3.71/5.0*	
How effective was this to help learn animal breeding concepts?	3.95/5.0	
Were the students' solutions useful?		7/9 = yes
Would you participate again?		9/9 = yes

*Likert scale: 5=extremely effective, 4=quite effective, 3=somewhat effective, 2=slightly effective, 1=not at all effective



TARLETON
STATE UNIVERSITY

Member of The Texas A&M University System

Reflections & Learning Outcomes

- Knowledge and skills within the discipline

“I got to work with this very real life problem and help solve it by using the information and classes that I have taken for my degree.”

- Knowledge and skills outside the discipline

“This was the first time I have ever done anything like it... I had to get my thoughts together and use information that I had learned throughout my school years that I never had the chance to apply until this project.”

- Use of skills beyond academic experiences

“...main skills consisted of organization, critical thinking, team work, and basic communication.”



TARLETON
STATE UNIVERSITY

Member of The Texas A&M University System

Reflections & Learning Outcomes

- Change in global awareness

“We as students do not think about all the hard work it takes to keep everything up and running and all the tough decisions that need to be made to be successful.”

“[Listening] to the other projects helped me realize that there are so many opportunities in agriculture...”

- Impact on themselves, partner, and industry

“Our group was able to make connections out in the animal industry that we may not have had before.”

“This is something I see myself doing later on, and to be able to get a foot in the door and see what it takes and what is involved in some of the production process really helps.”



TARLETON
STATE UNIVERSITY

Member of The Texas A&M University System

Conclusions

- Students did learn the material at least as well
 - Somewhat dependent on their specific project
- In addition to:
 - connecting to the industry
 - applying knowledge to a real situation
 - developing soft skills
 - benefiting the community partners



TARLETON
STATE UNIVERSITY

Member of The Texas A&M University System

Future Directions

- Continue the program in the future
- Consider further analyses:
 - How each student learns best?
 - What type of learners opt for the service-learning?
 - How to accommodate gaps in skill mastery?



TARLETON
STATE UNIVERSITY

Member of The Texas A&M University System

Thanks!



“We were better able to understand concepts taught in class and apply them in a real-world setting.”



**TARLETON
STATE UNIVERSITY**

Member of The Texas A&M University System