Annual Program Assessment Report

Academic Year Assessed: 2020-2021
College: Agriculture
Department: Animal and Range Sciences
Submitted by: Carl Yeoman

Program(s) Assessed:
Indicate all majors, minors, certificates and/or options that are included in this assessment:

Majors/Minors/Certificate	Options
BS - Animal Science	Equine Science
BS - Animal Science	Livestock Management and Industry
BS - Animal Science	Science
BS -Ranching Systems	N/A
Minor - Genetics	

Annual Assessment Process (CHECK OFF LIST)

1. Data are collected as defined by Assessment Plan
    YES__X___   NO_____
2. Population or unbiased samples of collected assignments are scored by at least two faculty members using scoring rubrics to ensure inter-rater reliability.
     YES__X__   NO_____
3. Areas where the acceptable performance threshold has not been met are highlighted.
    YES___X__   NO_____   NA_____
4. Assessment scores were presented at a program/unit faculty meeting.
    YES__X___   NO_____
5. The faculty reviewed the assessment results, and responded accordingly (Check all appropriate lines)
    Gather additional data to verify or refute the result. _X__
    Identify potential curriculum changes to try to address the problem __X___
    Change the acceptable performance threshold, reassess _____
    Choose a different assignment to assess the outcome __X___
    Faculty may reconsider thresholds_____
    Evaluate the rubric to assure outcomes meet student skill level _____
    Use Bloom's Taxonomy to consider stronger learning outcomes _____

OTHER: The assessment committee gathered additional data to verify or refute the results of this evaluation. New instructors and challenging learning environments may have influenced the results of this data.

6. Does your report demonstrate changes made because of previous assessment results (closing the loop)?   YES_____   NO__X__

1. Assessment Plan, Schedule and Data Source.
a. Please provide a multi-year assessment schedule that will show when all program learning outcomes will be assessed, and by what criteria (data). (You may use the table provided, or you may delete and use a different format).

	ASSESSMENT PLANNING CHART					
PROGRAM LEARNING OUTCOME Our graduates will:	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	*Data Source**
1. design and evaluate animal management systems by synthesizing and applying knowledge of biological processes related to animals and the rangeland plants that support them. (knowledge)		X				Assessment exam given in ANSC 100, ANSC 432 and EQUS 430
2. identify and critically evaluate scientific or technical animal science content to make informed decisions providing a foundation for lifelong learning. (critical thinking)			X			Randomly selected student writing assignments
3. demonstrate effective oral and written communication to a range of audiences and within collaborative environments. (communication and collaboration)				X		Evaluators attend student oral presentation and randomly select students
4. use scientific principles to formulate questions, explore solutions, and solve real-world problems and advocate based on science. (problem solving)					X	Randomly selected student individual or group assignments
5. Apply ethical standards to manage animal resources. (ethics)	X					Module and Quiz administered in D2L

*Data sources can be items such as randomly selected student essays or projects, specifically designed exam questions, student presentations or performances, or a final paper. Do not use course evaluations or surveys as primary sources for data collection.

b. What are your threshold values for which you demonstrate student achievement? (Example provided in the table should be deleted before submission)

Threshold Values		
PROGRAM LEARNING OUTCOME	Threshold Value	Data Source
1. design and evaluate animal management systems by synthesizing and applying knowledge of biological processes related to animals and the rangeland plants that support them. (knowledge)	The threshold value for this outcome is an on average 20% improvement on knowledge test scores between freshman and seniors.	Assessment Exam
2. identify and critically evaluate scientific or technical animal science content to make informed decisions providing a foundation for lifelong learning. (critical thinking)	The threshold value for this outcome is for 80% of assessed students to score above 2 on a 1-3 scoring rubric.	Randomly selected student writing assignments
3. demonstrate effective oral and written communication to a range of audiences and within collaborative environments. (communication and collaboration)	The threshold value for this outcome is for 80% of assessed students to score above 2 on a 1-5 scoring rubric.	Evaluators attend student oral presentations and randomly select students
4. use scientific principles to formulate questions, explore solutions, and solve real-world problems and advocate based on science. (problem solving)	The threshold value for this outcome is for 80% of assessed students to score above 2 on a 1-3 scoring rubric.	Randomly selected student individual or group assignments
5. Apply ethical standards to manage animal resources. (ethics)	The threshold value for this outcome is for 80% of assessed students to score above 80% on ethics assessment.	Module and Quiz administered in D2L

2. What Was Done

a) Was the completed assessment consistent with the plan provided? YES_X___   NO_____
If no, please explain why the plan was altered.

The plan utilized written assignments selected from one of the courses identified through the curriculum mapping for Critical Thinking (ANSC 432R, Sheep Management), but also utilized results from an Equine course (EQUS 346) not identified through the curriculum map. This was done in an attempt to get a broader cross-section of students in the analysis.

b) Please provide a rubric that demonstrates how your data was evaluated.

The Rubric for the Assessment of: Critical Thinking (Learning outcome 2) was used in evaluating these assignments (see below).

Indicators of Critical Thinking	1	2	3	Score
Investigate and Research	Little inquiry; limited knowledge shown	Explores topic with curiosity; adequate knowledge from a variety of sources displayed	Knowledge base displays scope, thoroughness, and quality	
Examine and Identify the problem/question	Does not identify or summarize the problem/question accurately, if at all	The main question is identified and clearly stated	The main question and subsidiary, embedded or implicit aspects of a question are identified and clearly stated	
Analyzes and Synthesize: Identifies and evaluates the quality of supporting date/evidence; detects connections and patterns	No supporting data or evidence is utilized; separates into few parts; detects few connections or patterns	Evidence is used but not carefully examined source(s) of evidence are not questioned for accuracy, precision, relevance and completeness; facts and opinions are stated but not clearly distinguished from value judgements	Evidence is identified and carefully examined for accuracy, precision relevance, and completeness; facts and opinions are stated and clearly distinguished; combines facts and ideas to create new knowledge that is comprehensive and significant	
Constructs and Interprets: Identifies and evaluates the conclusions, implication, and consequences; develops ideas	Combines few facts and ideas; needs more development, conclusions; implications; consequences are not provided	Accurately identifies conclusions, implications, and consequences with a brief evaluative summary; uses perspectives and insights to explain relationships; states own position on question	Accurately identifies conclusions, implications, and consequences with a well-developed explanation provides an objective reflection of own assertions	

3. How Data Were Collected

a) How were data collected? (Please include method of collection and sample size).

A writing assignment was selected from the ANSC 432R Sheep Management course to serve as the medium for assessing critical thinking in students. The assignment was a case study and students were tasked with utilizing previous data and management information to determine the cause of decreasing reproductive performance in the MSU Red Bluff Research Ranch flock. Students were to review the scenario and provide recommendations for improving performance based on sheep management knowledge and research. A total of 11 student assignments from ANSC 432R were evaluated for this assessment, including only those students who were undergraduates and majoring in one of the options for a B.S. in Animal Science.

Assignments were collected via D2L and the ungraded files were shared with the evaluators who scored them according to rubric designed to assess Learning Objective 2, critical thinking. Two faculty members within Animal and Range Sciences independently scored each assignment according to the rubric.

An additional assignment was selected from EQUS 346 to achieve a better representation of Equine Science majors within the program and to gather a larger sample size of students. Students who were enrolled in both classes were only assessed once to avoid dilution of the data. For this writing assignment, students were tasked with authoring a research abstract on a relevant equine reproductive topic. A total of 9 student assignments from EQUS 346 were evaluated for this assessment, including only those students who were undergraduates and majoring in one of the options for a B.S. in Animal Science. The raw assignments were shared with the evaluators via D2L, and they were scored using the rubric for Learning Objective 2, critical thinking.

b) Explain the assessment process, and who participated in the analysis of the data.

The ANSC 432R assignment was manually scored using the rubric for assessment of Learning Objective 2 by Dr. Rachel Frost and Dr. Amanda Bradbery. The assignment for EQUS 346 was manually scored using the above mentioned rubric by Dr. Rachel Frost and Dr. Carl Yeoman. Dr. Bradbery teaches the EQUS 346 course, so Dr. Yeoman did the evaluation to avoid any potential bias from previously grading the assignment. For both assignments, each student's final score was calculated from an average of the scores of the 2 evaluators. The number of the final scores above 2.0 were divided by the total number of scores to determine the percent of scores above 2.0.

A total of 11 assignments, from students in the Science option (5) and the Livestock Management and Industry option (6) were evaluated for ANSC 432R. The average score was 2.0 with a range of 1.0 – 2.875 and 45% of students scoring above a 2. This is well below the threshold of 80% of students scoring above a 2 for Critical Thinking.

A total of 9 assignments, all from students in the Equine option, were evaluated for EQUS 346. The average score was 2.2 with a range of 1.625 – 2.875 and 67% of students scoring above a 2. This is below the threshold of 80% of students scoring above a 2 for Critical Thinking.

4. What Was Learned

Based on the analysis of the data, and compared to the threshold values provided, what was learned from the assessment?

a) Areas of strength – The average score for all assignments in both classes was greater than 2.0. Therefore, a number of students in both classes are demonstrating a mastery of critical thinking. These students did exceptionally well identifying and utilizing appropriate references and connecting those references to the assignment. Students in EQUS 346 and ANSC 432R also were capable of clearly identifying and stating the main problem and subsidiary considerations in the assignments.

b) Areas that need improvement – Students in both courses struggled with effectively constructing and evaluating conclusions, as well as fleshing out the implications and consequences of the ideas presented in the assignment. This concept is section 4 of the rubric and was consistently the lowest scoring section for both assignments. There are several possible reasons for this. First, neither assignment was constructed specifically for assessment purposes, and may not have implicitly asked for some of the elements of critical thinking. Sharing the rubrics for assessment of critical thinking with all faculty in the department will help incorporate more specific language related to critical thinking and detailed descriptions of expectations within their assignments. Secondly, there was disparity between the scores of the 2 evaluators. One was consistently higher than the other, but there were also individual assignments that were evaluated quite differently. This is to be expected given the subjective nature of the evaluations and amplified by the assignments not being specifically designed to be evaluated by the Critical Thinking rubric used to conduct the assessment. However, more consistent scoring might be achieved if the rubric is discussed together prior to the faculty scoring the assignments individually.

5. How We Responded

a) Describe how "What Was Learned" was communicated to the department, or program faculty. Was there a forum for faculty to provide feedback and recommendations? The results of this assessment were presented to Animal Science faculty during a faculty retreat in August 2021. The faculty discussed the findings as a whole and then held breakout sessions to brainstorm new ways to increase critical thinking skills in students. The rubric used to assess critical thinking will be shared with all faculty to facilitate more active inclusion of critical thinking elements in assignments and discussions. A sophomore seminar class was suggested as one possible avenue to increase student awareness and skills and is being discussed further, while all faculty agreed to place greater emphasis on critical thinking in classes.

b) Based on the faculty responses, will there any curricular or assessment changes (such as plans for measurable improvements, or realignment of learning outcomes)?
YES___X___   NO_____

If yes, when will these changes be implemented? The addition of the sophomore seminar is being explored currently and could be included as soon as Fall of 2022. All faculty have committed to incorporating more exercises in critical thinking into their classes, particularly at the sophomore and junior level.

Please include which outcome is targeted, and how changes will be measured for improvement. If other criteria is used to recommend program changes (such as exit surveys, or employer satisfaction surveys) please explain how the responses are driving department, or program decisions.

c) When will the changes be next assessed? The learning outcome "Critical Thinking" will be assessed again in 2022-2023.

6. Closing the Loop

a) Based on assessment from previous years, can you demonstrate program level changes that have led to outcome improvements? In previous assessments of critical thinking, the students met the threshold of 80% scoring over 2.0. Whether this is an actual decline in the quality of the program, or an artifact of the unique nature of this assessment is unclear. The 3 years since the last assessment have brought many changes from the challenges of COVID, to multiple new faculty in the department that have not been through a formal program assessment. Overall, the assessment process was an excellent learning experience for all involved and a great opportunity to have fruitful discussions on the importance of critical thinking and how all faculty within the Animal Science degree options can support each other to reinforce critical thinking in students.

Submit report to programassessment@montana.edu