VALDOSTA STATE UNIVERSITY

Experiential Learning Seed Grant (ELSG)
APPLICATION COVER SHEET

Name: [redacted] **Email:** [redacted] **Amount Requested:** $ 3975.00

Dept: [redacted] **Rank:**
- ☐ Instructor/Lecturer
- ☒ Assistant Professor
- ☐ Associate Professor
- ☐ Professor

Status:
- ☒ Untenured but on Tenure Track
  - ☐ First Year on Tenure Track
- ☐ Tenured
- ☐ Staff

Is this a collaborative project? ☐ Yes ☒ No

Collaborator Name: **Email:** **Dept:**

Collaborator Name: **Email:** **Dept:**

Collaborator Name: **Email:** **Dept:**

SHORT PROJECT TITLE: The effect of captivity on the behaviors of wild animals

Is this proposal a revision of a previously submitted proposal that was not funded? ☐ Yes ☒ No

If "yes," is this the first time it has been resubmitted for consideration? ☐ Yes ☐ No

If a resubmission, briefly summarize the major revisions made to the previous proposal:

Please indicate if the proposed project involves any of the following:
- ☐ Human research participants
- ☒ Use of vertebrate animals
- ☐ Biohazards (rDNA)
- ☐ Hazardous waste
- ☐ Radiological hazards

Is this project expected to generate personal income from sales (e.g., book royalties, sale of works of art, etc.)?
- ☐ Yes *(Explain in Project Narrative)*
- ☒ No

Application Checklist
- ☒ ***Application Cover Sheet*** (two pages with all signatures)
- ☒ ***Project Narrative*** (maximum four pages, single-spaced with double-spacing between paragraphs; 1" margins all around; Arial or Times New Roman 11+ point font; following sections identified with section titles)
  - ☒ Project Summary (maximum one-half page suggested)
  - ☒ Alignment with QEP Goals and Student Learning Outcomes
  - ☒ Background and Objective(s)
  - ☒ Project Plan
  - ☒ Anticipated Results
- ☒ ***References Cited*** (only those referenced in the Narrative; 1" margins all around; Arial or Times New Roman 11+ point font)

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- [x] ***Budget*** (required template; maximum $4,000)
- [x] ***Budget Justification*** (maximum one single-spaced page; 1" margins all around; Arial or Times New Roman 11+ point font; statement[s] of unavailability of tangible items requested such as cameras, iPads/iPods, computers, software, and equipment >$3,000 from IT, Media Center, or department)
- [x] ***Facilities, Equipment, and Other Resources*** (maximum one single-spaced page; 1" margins all around; Arial or Times New Roman 11+ point font)

I certify that, to the best of my knowledge, the information provided in this application is true, complete, and accurate. I understand that any false, fictitious, or fraudulent statements or claims may subject me to administrative penalties. I agree to be responsible for the conduct of this project and to abide by the terms and conditions of the award specified in the Experiential Learning Seed Grant guidelines.

Signature: [redacted] **Date:** [redacted]

Collaborator Signature: [redacted] **Date:** _____

Department Head Signature: [redacted] **Date:** [redacted]

Associate Dean or Dean's Signature: [redacted] **Date:** [redacted]

**We strongly suggest that you use Docusign to complete the signature process for the application. If you are new to the Docusign process or need a refresher, please email QEP@Valdosta.edu at least 10 days before the due date for this application.

****All applications must be submitted with all signatures by November 1, 2021 @ 5 pm EST to be considered for review by the QEP committee.** Decisions regarding approved applications will be distributed by early December.

Project Narrative: Determining the effects of captivity on social behaviors and interactions across a diverse array of animal species

Project Summary: Wild animals are often brought into captive environments for conservation, experimental, and entertainment purposes that can lead to negative effects on their mental and physiological wellbeing (Jordan 2005). Previous studies have documented a wide range of behavioral changes across different species maintained in captivity, with some species thriving and reproducing under captive conditions while others have struggled to adapt or survive the change in their inadequate new environments (Fischer and Romero, 2019). To further investigate the effects of captivity on a diverse set of species, students in Dr. Rose's Animal Behavior course at Valdosta State University will conduct observational studies comparing the behaviors of animals in enclosures at captive facilities, such as Wild Adventures and other animal facilities, with the interactions of animals of the same species in the wild. Each pair of students will choose a species to investigate that they can document behaviors via videos of the animals at a captive and wild location through a combination of field trips locally and the use of live-camera footage that is available online and streamed from nature preserves and Aquarium and Zoo Associate facilities. Interpretation of the documented behaviors will incorporate the use of computer programs and statistical analyses during lab. To develop their hypotheses and design methods for the species-specific experiments, students will use their knowledge of animal behaviors and their diverse set of skills for quantifying behaviors that they have gained throughout the semester to conduct this final project. Animal Behavior students will be given the opportunity to disseminate their ideas and results by giving presentations and writing lab reports that will contribute towards a peer reviewed manuscript submitted for publication at the end of the course.

Alignment with QEP goals and Student Learning Outcomes: The proposed activity in the second half of VSU's Animal Behavioral course will provide students with the opportunity to:

Design their own experiments with hypotheses and unique methodologies prior to conducting their studies observing animals. Students will take an inquiry-based approach to choosing their species for behavioral study by learning how to conduct a literature search and designing a research question that is motivated by the findings of previous studies that they have learned about in lecture and from reading peer-reviewed publications on their chosen species.

Collect data and determine appropriate sampling methods of different model systems. By using a combination of videos that students will be filming for their captive or wild animals and the live footage in nature preserves and ocean settings, students will learn how to sample primary data from their observations. At each stage of the study, students will reflect upon how their methodologies need to be changed to adapt to the challenges of recording live animals and working in a field setting. Students will need to trouble shoot various aspects of the data collection depending upon the species they choose because each animal is found in different enclosures or natural settings. Students will be able to use the computational programs that they were trained with during previous labs and gain more experience with statistical analyses by determining the appropriate way to organize, test, and interpret their data.

Gain experience with sharing their research via diverse formats, including oral presentations and written publications. After conducting their experiments and data analyses, students will need to create visual representations of their results and stats in graph and table

formats that can be used for presentations and publications. Each pair of students will give a presentation for the class and write up a report on their species of choice. The entire class, with assistance from [redacted] for the outline and expectations of the class paper, will combine the studies across the different species to write a manuscript on the varying effects of captivity on the diverse species that students surveyed for their projects. This will provide students with a broader perspective on the study and the chance to be an author on a publication.

Background and Objectives: The primary goal for the proposed experiential learning activity is for students to learn how to design, conduct, interpret, and present a scientific experiment centered around understanding the effects of captive environments on a diverse group of animal species. Although there are often repercussions when wild animals are placed into foreign environments that differ in the space, resources, and species interactions, the impacts of captive environments differ drastically across the animal kingdom (Fischer and Romero, 2019). Behavioral observations are an important aspect of understanding an animal's health and welfare, especially to be able to determine if there is a change in behavioral patterns or signs of chronic stress (Jordan 2005). It is important to gain a better understanding of an animal's interactions within their own species and with members of other species that can lead to behavioral changes that have evolutionary consequences, such as decreases in reproduction causing species to become endangered (Altmann 1974). Students in the VSU Animal Behavior course will be trained throughout the semester on ways to sample and survey changes in an animal's response to stimuli that will help them to develop their own experimental methods.

The proposed project allows students to explore the scientific method and will be individualized for the students because pairs will choose a species that they will be observing throughout the study to determine collectively how different types of animal species respond behaviorally to captivity. At the end of the of study, the species will be divided into groups for the final paper by their different life history traits for each species; for example, whether they have many or few offspring or if they are territorial or randomly distributed in their environments because they have seasonal migrations. The overall hypothesis for the collective studies is that species that often occupy larger territories in the wild will show greater changes in their behaviors than species that have very specialized needs and smaller geographic distributions. Previous studies specifically focused on large carnivorous animals, such as polar bears, showed a decline in health and mental stability after bears were confined to captive environments (Clubb and Mason, 2003). However, few studies have done parallel studies of the same species in both captive and wild locations and taken a comparative approach across diverse species. The Animal Behavior student studies will allow for a comparison of the captive animal's behaviors with the behaviors of their counterparts in the wild either via field surveys for species found locally, such as gators and birds native to south Georgia at Okefenokee Swamp where students will travel for field surveys, or through the use of live streaming cameras that students can access online for species from other geographic locations, including lions or antelope at nature preserves in Africa or tropical birds from the South American rainforests. Combining the collection of the student's projects on a diverse array of species found in captivity at Wild Adventures will allow for a deeper understanding of how animals with very different ecological backgrounds respond to captive environments and an opportunity for the students to create a publication together.

Project Plan: The proposed project for the Animal Behavior course will take place over the last six weeks of the course after students have learned the skills required for documenting, interpreting, analyzing, and presenting the project in both written and oral formats.

Week 1: Designing experiments and learning behavioral analyses programs- Prior to collecting data for the behavioral observations, students must first determine which species they will focus on for their study. Students must first identify previous studies on social behaviors to narrow down which interactions are important to document and quantify. For each of the behaviors surveyed, students will determine appropriate type of sampling, either focal data on individuals or scan surveys, to prepare for their filming and data collection over the next two weeks.

Week 2: Captive behavior data collection- Students will take a field trip to Wild Adventures to document the behaviors of species kept in captivity. Students will record video footage with the GoPro cameras of the animals before and after visitors arrive to determine the effect of humans on the interaction between the animals in captive conditions. Depending on the species and their proposed methods, the methodology and approach to sampling the behaviors of one individual or group interactions will differ. After filming, students will determine if their prior predictions based upon their literature reviews are supported and reassess which behaviors they were able to successful document in captivity to conduct comparisons in the wild settings. Reflecting upon their ability to document the behaviors they predicted will allow for students to get a better understanding of the limitations of observational behavioral studies and make alterations to their methodology and experimental designs.

Week 3: Wild behavior data collection- The methods for data collection will differ for each of the species of animals that students have developed their hypotheses for. Some students will focus on watching live-camera footage for nature preserves in Africa for large mammals found on savannahs, such as elephants and antelopes. Some students will watch oceanic footage for marine species, such as coral reef fishes. The class will also take a field trip to Okefunokee Swamp to observe the behaviors of local species, such as fish, otters, birds and alligators. This will allow for a second experience of data collection and enable students to use what they learned from the first data collection session.

Week 4: Data analyses and interpretation- In a previous lab, students will learn to use the computer program called BORIS, Behavioral Observation Research Interactive Software, to document the behaviors of their focal species in their video footage. This program will be available on the computer in the Bailey Science Center Computer labs for students to access. Students will use the different techniques for interpreting the behaviors, either documenting the interactions as point events that are tallied or state events that have specific durations that the program can measure and quantify one the reviewer identifies the start and end of the state (Altman 1974). Students will learn how to organize their data for different statistical tests depending upon if their data is continuous or categorical variables. The pairs will also discuss as a team how to best represent their findings in a visual format for the presentations or papers. By connecting their data with the findings of peer reviewed articles and other case studies on similar species, students will then be able to put their results into a larger framework of animal behavior to determine the effects of humans and captive environments on the animals.

Anticipated Results:

Week 5 & 6: Dissemination of results via presentations and publication- Students will be spending the end of the course presenting their findings for their species to the class and submitting their written report for their literature review, results and interpretations. After the students peer review each other's reports, the class will combine the group efforts for the different species into a larger paper for publication. Through this process, students will be able to execute the entire scientific process of developing a question with testable hypotheses, collecting and analyzing data, and dissemination of their findings with oral and written formats. After completing their studies, the students will then be able to reflect on the overall scientific process and determine what future studies could be conducted or what they would change with their methodologies for additional studies or replicates if they continue their current study. After the first semester that this project is conducted in Spring 2022, [redacted] is will be provided with valuable feedback on the benefits or constraints of only using regional captive or wild comparisons to design future variations of the proposed activity.

Citations:

Altmann, J. 1974. Observational study of behavior: sampling methods. Behaviour 49: 227-267.

Clubb, R., Mason, G. 2003, Captivity effects on wide-ranging carnivores. Nature 425, 473–474.

Fischer, C.P., Romero, L.R. 2019, Chronic captivity stress in wild animals is highly species-specific, Conservation Physiology, 7(1), coz093.

Jordan, B. 2005, Science-based assessment of animal welfare: wild and captive animals. Revue Scientifique et Technique (International Office of Epizootics), 24(2):515-528.

Mason, G., Burn, C.C., Dallaire, J.A., Kroshko, J., Kinkaid, H., Jeschke, J.M. 2013, Plastic animals in cages: behavioural flexibility and responses to captivity, Animal Behaviour, 85 (5): 1113-1126, https://doi.org/10.1016/j.anbehav.2013.02.002.

VSU Faculty Research Seed Grant Program
Project Budget

Project Sponsor: [redacted]

Travel:			
Domestic travel - .56/mile (Tier 1 Rate-Automobile)		$ -	For other travel needs see USG travel rates
International travel		$ -	Use Federal travel rates
Supplies & Materials:			
Describe:	Go Pro Hero8 cameras and SD cards	$ 2,310.00	
Describe:	Tripods for cameras	$ 280.00	
Describe:	GoPro case, external battery and camera protective sleeve	$ 350.00	
Describe:		$ -	
Describe:		$ -	
Contractual Services:			
Describe:		$ -	
Describe:		$ -	
Describe:		$ -	
Telecommunications:			
Telephone survey expenses:		$ -	
Internet survey expenses:		$ -	
Describe:		$ -	
Equipment (≥$3,000 per unit):			
Describe:		$ -	
Other:			
Research Participant Compensation:		$ -	
Describe:	Entrance fees for Wild Adventures for captive behaviors	$ 690.00	
Describe:	Fees for Okefenokee Swamp trip	$ 345.00	
Describe:	Fees for Okefenokee Swamp trip	$ -	
TOTAL REQUEST (calculates automatically):		$ 3,975.00	**Maximum $4,000**

ADMINISTRATOR APPROVAL:

[redacted]

Department Head/Segment Administrator Signature Date

When you have completed the budget, save the file and print a copy for inclusion in the application package.

Rev: 09.22.2021

Budget Justification: The proposed project for Dr. Rose's Animal Behavior course (BIO 4650) requires the following items to determine the effect on captivity on animal behaviors by conducting observational studies via filming and analyses.

GoPro Hero8 cameras: The course will need 7 cameras to accommodate the 14 students in the lab working in pairs. Cameras for documenting the behaviors as videos are an important part of the data collection process that requires students to use the computer program BORIS for measuring several behaviors from one video across multiple animals, which cannot be done while watching live. These cameras will be used for this assignment every semester that Animal Behavior is taught and can also be used for species interaction labs in Dr. Rose's Ecology and Evolution course that is taught every semester (BIO 3250). The GoPros are the optimal cameras because of their ability to capture high quality video and since they are waterproof, they can be used in the rain or in aquatic settings if students choose to study animals underwater.

The GoPro Hero 8 camera, battery, and 64GB SD card for videos are $330 on Amazon each so for 7 pairs will total: **$2,310**

Tripods for the cameras: Since the locations of the filming can vary, each pair will be given a traditional tripod with adjustable heights and also a smaller tripod that has moldable legs to wrap around poles or fences to set up cameras near enclosures.

The tripods will be $20 for traditional and $20 for the flexible smaller ones for the 7 pairs will be a total of **$280**.

Protective case, extra external battery and sleeve/handle attachment for GoPro Hero8: The cases for students to transport the sensitive cameras ($15), external battery for the 3 hours labs of filming ($25) and protective sleeve accessory ($10) will help to protect the expensive cameras and will allow for students to use these items every semester. Since student will need to film for three hours, an extended battery will be required to obtain footage during the whole lab. These items will cost $50 per pair of students and total **$350.**

Entrance fee for Wild Adventures for captive behaviors: The fees for each student will be $46 so for all 14 students during the Spring 2022 semester plus [redacted] will total **$690.** The students will gain valuable experience in collecting animal behavior by getting to learn how to collect their videos outside of the normal academic setting on campus.

Entrance fee and canoe rentals for wild behaviors at Okefenokee Swamp: The entrance fee is $25 for our group and canoe rentals are $40/canoe so we will need 8 canoes for the 14 students and [redacted] to give students equaling $320 the opportunity to film any species that are local to the area in the wild. The visit will cost a total of **$345.** This trip is an important aspect of the wild data collection for students who use alligators, river otters, and any local bird or fish species.

Facilities, Equipment, and other Resources:

Computers: The analyses for the proposed activity will be conducted on campus in the Biology Computer Lab in Bailey Science Center 3018. The required programs for behavioral video analyses and statistical tests will be available for students on the computers in the computer lab.

Data storage: Students will be able to store the videos for their studies on the VSU One Drive.

Travel to the field trips: The Biology Department has a 15 passenger van than can accommodate the 14 students and [redacted] that will be in the course for traveling to the locations used for filming animals in captive and wild environments.