

BETTER PREPARING UNDERGRADUATE ANIMAL SCIENCE STUDENTS FOR  
CAREERS IN EDUCATION BY PROVIDING UNDERGRADUATE TEACHING  
ASSISTANT OPPORTUNITIES AND SUPPORT

A Dissertation

by

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## ABSTRACT

In a time where employers and students are expecting a degree to prepare them for future employment, it is necessary for animal science programs to consider all career pathways graduates may take. Many animal science graduates enter educational careers, yet animal science departments typically do not explicitly teach towards educational careers or provide opportunities to learn and practice teaching methods. Utilizing undergraduate teaching assistants (TAs) may be a viable option to better prepare these students for careers in education. The objectives of the studies in this dissertation were to characterize what undergraduate TA opportunities currently exist in animal science departments in the United States and to develop an effective opportunity for animal science undergraduate students to receive instruction and practice in preparation for future educational careers similar to the opportunities presently available for industry or veterinary careers. Many animal science departments reported that they currently offer undergraduate TA opportunities, but the experiences of the TAs varied widely and departments expressed interest in improving these opportunities and making them more uniform. Characterizing what such opportunities may provide undergraduate TAs, undergraduate students, and the department, informs plans to improve their implementation. The development of the Animal Science Laboratory Teaching Methods (ANSC 289) course is a prime example of providing a learning experience effective for preparing students for future educational careers, while simultaneously leveraging the benefits of utilizing undergraduate TAs to improve teaching for all involved within the

department. In addition to the academic and universal skills provided by ANSC 289, this course filled a gap in preparing students for educational careers. All students in the course reported improvement in their teaching skills, and many indicated that they are more likely to enter educational careers after the course and accompanying undergraduate TA experience. Additionally, there was increased interest in TA opportunities from the undergraduate students in the course served by undergraduate TAs. The intent of making this course an official course within the animal science department is to continue to raise awareness and preparation for educational careers until it is equal to that of information addressing industry or veterinary career options in the field of animal science.

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## CONTRIBUTORS AND FUNDING SOURCES

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## CHAPTER I

### INTRODUCTION

Amongst the expectations of an educational institution is to prepare students for future employment. Within the discipline of animal science it is necessary to consider all career pathways graduates may take. Many animal science graduates enter educational careers, yet animal science departmental curriculum typically does not include courses emphasizing educational careers or provide opportunities for students to learn and practice teaching methods. Utilizing undergraduate teaching assistants (TAs) may be a viable option to more effectively prepare students for careers in education.

The objectives of these studies are to characterize what UTA opportunities currently exist in animal science departments in the United States and develop an effective and novel strategy for animal science undergraduate students to receive instruction and practice in preparation for future educational careers similar to opportunities available for engagement with industry or veterinary careers.

Explicitly addressing educational career opportunities in animal science courses, paired with curriculum that addresses teaching methods and practice better prepares undergraduate students to have more realistic job expectations and competence in teaching upon entry into graduate school or other educational careers. Serving as an undergraduate teaching assistant expands students' skill set and employability after graduation, and it also benefits the department as well. The undergraduates participating in teaching opportunities increase the instructor-to-student ratio of courses which

improves safety and logistics of hands-on large animal labs while increasing one-on-one instruction time with students in the lab, which increases overall engagement and learning. The field of animal science will prosper from increased student competence in pedagogical techniques as it will provide a richer, more complete educational experience for students both in and beyond the university setting. Sustainability of animal science depends on retaining students in educational careers and actively improving our educational practices.

## CHAPTER II

### LITERATURE REVIEW

#### **College Degrees**

Attending college, collectively meaning most institutions of higher education (community college, college, universities, etc.), is often the expected next step for high school graduates. These graduates are expecting that a degree will lead to a job and increased salary. Employers' expectations seem to align with those of students, as many jobs have degree requirements for hiring or degree associated pay differences. It is clear that educational institutions must value these reasons, as many advertise that their degrees prepare graduates for future employment. Employment data and published statistics on the number of graduates who have successfully entered employment post-graduation are frequently part of higher education marketing. These data are often in reference to the departments and/or majors within a particular college, which are typically referring to a specific career field and associated jobs within that field. However, educational institutions historical aims were more focused on improving society by making better citizens via teaching students skills useful in public service, advancing knowledge and leadership. Job-specific training was expected to be provided by the employer (Chan, 2016). While educational institutions still value civic endeavors, pressures from employers, government, and a changing society have pushed institutions into proving their value in modern society and working more like corporate entities which must focus on marketing and economics (Kerr, 1994; Gumport, 2000; Thompson Jr, 2014). This has changed higher education to a more transactional and monetary

driven set of processes rather than the traditional transformative potential (Bylsma, 2015).

*What Is a Degree Expected to Provide and How do Institutions Achieve These Outcomes?*

In the modern view of educational institutions, the two general things a degree should provide to students for successful preparation are career-specific knowledge and skills, as well as universal skills.

Often advisory committees overseeing degree programs and/or departments have representation from those employed in the current local career field. This is an attempt to ensure that current degree outcomes align with the knowledge and skills employers expect graduates to have mastered. Additionally, degree programs often partner with local industry for class activities and/or require students to complete industry internships. These types of experiences, frequently called experiential or high-impact learning, put students in direct contact with the industry they are hoping to join post-graduation. This connection provides more realistic job expectations and has been shown to increase engagement in class (Dewey, 1897; Winsett et al., 2016; Li et al., 2019) and improved retention of content knowledge (White et al., 2017).

When it is not feasible to take students out of the classroom for experiential learning experiences, there are ways instructors can still maintain some of the associated benefits. Modified experiential learning, such as digital video games and augmented or virtual reality, have been shown to be effective avenues of learning. Less technological



approaches such as bringing experiences into the classroom through pictures, video, and discussing personal experiences likewise improve students' learning.

Providing career-related content, skills and future job expectations are all important to students and their future employers. However, it is critical for students to master universal skills. Sometimes referred to as soft skills in literature, universal skills are skills that are necessary for success in any career, regardless of field. These skills include, but not limited to, collaboration, communication, problem solving, critical thinking, adaptability, leadership skills, and self-regulation (Colbeck et al., 2000; Schulz, 2008; Robles, 2012). Experiential learning is often highly valued as it has been shown to develop these skills (Montrose, 2002; Grover and Stovall, 2013; Mitrovic et al., 2016).

#### *Are College Degrees Successful in Preparing Students for Future Careers?*

If career-specific knowledge and skills and universal skills are the two primary objectives of higher education outcomes, it is reasonable to assess if graduates are meeting such expectations. A consensus of attainment of these objectives is difficult to find. Data suggests that while students know field specific content, they are lacking in the universal skills required for career success (Schulz, 2008; Borza and Crişan, 2012; Associates, 2015; Islam et al., 2015; Stewart et al., 2016). The ability of higher education programs to successfully prepare students with needed discipline specific content knowledge, that material is typically easier to learn and more likely to change over time which ultimately makes it less useful than mastery of universal skills.

Research reports that while educational institutions are teaching critical thinking skills and students report learning these skills, upon assessment there has actually been a decrease in critical thinking skills by college graduates over the past several decades (Huber and Kuncel, 2015). Similarly, perceived competency is greater than assessed abilities in complex reasoning, writing, and other universal skills (Arum and Roksa, 2011). Typically course syllabi includes statements that students will learn universal skills by completing the course in addition to the content. But many of these universal skills are not effectively assessed to ensure that students have reached these outcomes. Additionally, these skills are not explicitly taught to students but rather folded into disciplinary content. As example, assigning a group project does not guarantee that students learn how to collaborate effectively. Most courses fail to instruct students in proper techniques for working with others on a task before providing instruction on the content of the project (McAllister, 1995; Bolton, 1999).

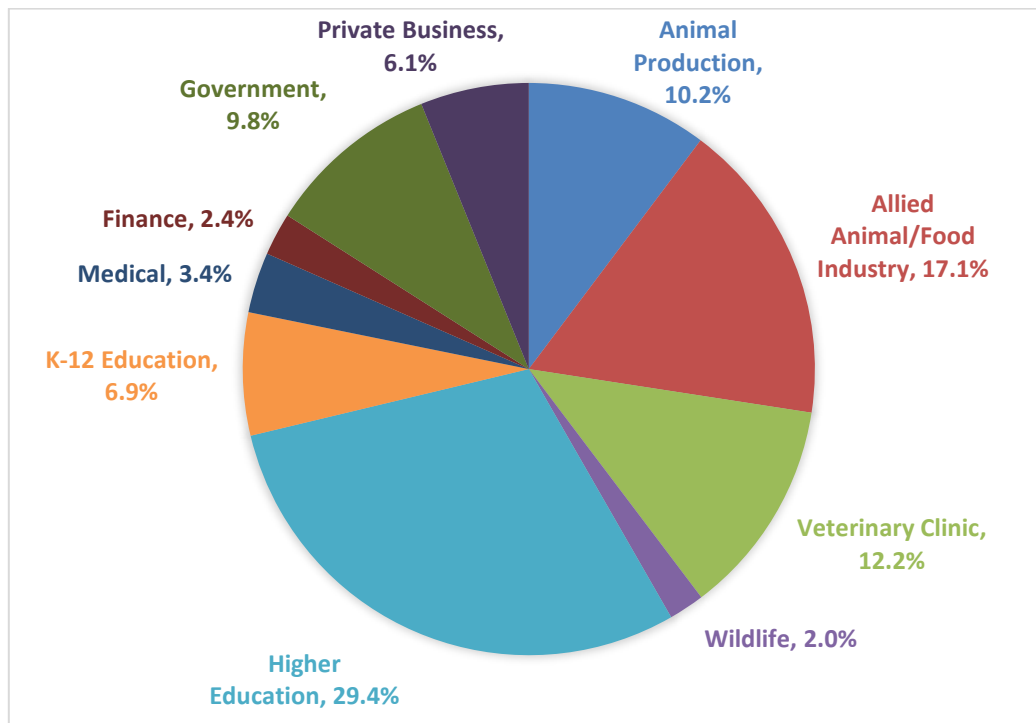
There are multiple factors spanning societal, institutional, and individual levels contributing to this discrepancy. Motivation to attain a degree has changed from wanting to better oneself in order to better the world one lives in to a more modern approach of completing tasks required to obtain a job or job-related goal (Entwistle and Peterson 2004; Zimmerman 1996). This shift in motivation can make it more difficult for an instructor to engage students. Additionally, universal skills are typically more difficult to accurately assess than disciplinary content (Heckman and Kautz, 2012). The gap in universal skill instruction is greater in science related fields have progressed less

quickly on developing universal skills in graduating students than other disciplines such as English or History (Schwanitz, 1999).

### **Animal Science Graduates**

Though there are standard institutional requirements, each degree program within an institution generally has differing objectives and associated learning experiences for their students. Deficiencies in universal skill mastery by students trained in animal science has been reported by employers (Lube et al., 1991; Bennett-Wimbush and Amstutz, 2011; Anderson, 2015). In response to this challenge, animal science departments have focused on increasing experiential learning to take advantage of its benefits of improving universal skills. Experiences such as industry tours, internships, and participation in competitive teams have been shown to help students develop universal skills (Reiling et al., 2003; White et al., 2012; Deslauriers et al., 2016; White et al., 2017). These experiences are highly valuable for students entering industry positions directly aligned with courses. Examples include farm production or owning their own animals aligning with production course content or physiology courses preparing veterinarians. These two specific career options are the most discussed by the public and within the literature, however it is reasonable to question how representative they are of careers actually entered into by animal science graduates.

Interestingly, research over a 50 year period indicated that these two career tracks (production and veterinary medicine) make up less than 40% of the careers animal science graduates actually enter (Figure 1).



**Figure 1. Careers animal science majors enter after graduation. Adapted from Dodson and Benson, 2010.**

While traditional experiential learning activities in animal science benefit students intending to enter animal science careers beyond industry production or veterinary medicine, they may not provide enough job-specific career content for the student to be successful in that career.

*Preparing Undergraduate Animal Science Students for Careers in Education*

More animal science graduates enter educational careers than would be expected based upon classical curriculum tracks. There is minimal literature regarding preparation of animal science students for education-related careers. This is likely because educational careers are not as immediately connected to the discipline of animal science as are those in animal industry and veterinary medicine. As evidenced in the research from other STEM fields, if opportunities for undergraduates to learn about and practice education-related knowledge and skills do exist within a discipline they are likely to vary greatly between institutions (Marbach-Ad, 2012). This gap in curriculum may be, in part, because within animal science and most other STEM fields, there is an expectation for faculty to be expert professors to be experts in their discipline but do not require training or experience in teaching. There is little research on methodology by which animal science professors obtain their teaching skills and knowledge; whether it was attained via trial and error or if they personally sought out education-based courses and/or experiences.

There are animal science students who express a desire to teach upon entry to the degree program, however, data suggests that many students are unaware of career options beyond industry production or veterinary medicine (Edwards, 1986). Approximately 36% of graduates entering education, even if it may not be their final destination, such as masters or doctoral students who are expected to teach as part of their graduate training. Resultantly, education related careers are a significant area that animal science students may not be effectively prepared to enter. Another barrier to effectively preparing animal science students for education related careers in the future

is that colleges typically require credentialed experts teach courses. Such requirements are professors teach most classes, and yet some lower-level courses are given to graduate students to instruct under the supervision of a professor. It is understandable that undergraduate students are not permitted to teach other undergraduate students, however there are ways in which undergraduates can be given opportunities to gain valuable teaching experience. Seminars or workshops can help to expose undergraduate students to teaching knowledge and skills, but these experiences do not typically allow students to effectively practice the entire process of teaching spanning from course development to lesson planning and preparation to providing instruction to others. More comprehensive education in teaching could be provided by a teaching methods course, and yet many animal science students do not have the space or flexibility in their degree plan to take elective courses beyond their major. Additionally, there are few courses with an objective of providing a comprehensive overview of teaching methods. More likely there are multiple courses that form a degree plan for preparation of future K-12 teachers. Including students in informal educational opportunities such as extension clinics or tutoring can be helpful in gaining experience, but these informal education experiences differ from class room teaching. A favorable option would be to allow undergraduate animal science students with an interest in education to assist with animal science courses within their own department through serving as undergraduate teaching assistants (TAs).

## **Undergraduate Teaching Assistants**

Undergraduate TA positions vary greatly in teaching responsibilities and expectations, as well as training and support. Frequently, selection of students for undergraduate TA positions utilize past academic performance as the main criteria (Chapin, 2014; Marbach-Ad, 2012). Effects of employing undergraduate TAs on short-term impact on student learning effects has been the main focus of previous literature (Chapin, 2014; Drane 2014), with fewer studies examining the undergraduate TAs' own learning during their teaching experience. These studies generally have used quantitative means to analyze learning and have shown benefits to utilizing undergraduate TAs when examining these measures, such as grades or Likert scale responses. However, there is still much to explore on the long-term effects of serving as an undergraduate TA, the qualitative perspectives pertaining to the impact of undergraduate TAs, and the effect undergraduate TAs have on the systems they are employed by including the instructor, university, department, or the larger field to which the course(s) belong. Minimal research has been conducted specific to animal science undergraduate TAs.

### *Challenges*

Though the benefits of utilizing UTAs generally outweigh potential challenges, there still are some barriers to allowing undergraduate students to serve as UTAs. This is a process worth pursuing as literature suggests that positive impacts of undergraduate TAs is of significant enough value to expend resources to mitigate obstacles.

## **Undergraduate TA Is Expected to Teach, but Receives No Prior Training**

One of the greatest challenges encountered in university level courses is student perception that they need to teach themselves, instead of learning in class. This is particularly relevant in STEM departments, and may be largely impacted by the fact that while university instructors are trained experts in their field they have not received training in relation to the practice of teaching. Teaching is not an innate talent, rather it is development of a set of knowledge and skills related to how people actually learn. This is often also seen on the teaching assistant level, for both graduate TAs and undergraduate TAs. Research shows that providing teaching related education to undergraduate TAs greatly improves the experience for both the undergraduate TA themselves and the students they serve (Chapin, 2014; Quitadamo, 2009; Chan and Bauer, 2015; DeBeck and Demaree, 2012; Drane, 2014). The undergraduate TAs show improvement in teaching skills, as well as increasing positive perceptions about and confidence in teaching when they are provided formal teacher preparation opportunities. Education prior to being expected to teach also makes undergraduate TAs feel more prepared for future careers in STEM fields (Spike and Finkelstein, 2010; Rebello, 2012; DeBeck, 2010). These findings are based on data collected during, or soon after, the semester in which the undergraduate TAs taught. More research needs to be conducted to follow up on the long-term impact these formal trainings in teaching had on the undergraduate TAs for the rest of their time at university, as well as into their post-graduation career.



## **Undergraduate TA Is Essentially Extra Hands, Rather Than Learning About Teaching**

The findings previously discussed highlight the benefits of providing formal teacher education to undergraduate TAs. While it may benefit the instructor to have an extra set of hands, if the goal is to better prepare students for careers in education they also need to receive teacher education and the opportunity to practice their teaching skills. Additionally, having a undergraduate TA who is skilled in teaching will help them actually assist students in the courses they are serving.

## **Undergraduate TA Struggles with Having Authority Over Peers**

There is generally a benefit to the undergraduate TAs being seen as a peer within the course they are serving as students feel more comfortable approaching them compared to a graduate TA or instructor. However, this does have potential to cause some discomfort for the undergraduate TA as they may not want to have authority and may have a conflict of interest, especially if they share classes with students they serve (Chapin, 2014; Weidert, 2012). Additionally, the undergraduate TA may not perceive themselves to have the content knowledge, the teaching responsibilities, or both, to be teaching their peers. This issue may arise if the department is selecting students to fill designated spots, without ensuring that there is a good student match to the position

(Weidert, 2012). This problem can generally be mitigated by choosing undergraduate TAs that excelled when they were students in the course, as well as ensuring the instructor is effectively supporting the undergraduate TA. At times, professors may not have sufficient time, preparation, and/or skills to provide meaningful mentoring about teaching for their undergraduate TAs, which may contribute to some of the issues previously discussed. While undergraduate TAs likely help to improve the course without formal mentoring support, dedicated time benefit the undergraduate TA and the instructor as well as the students in the course (Weidert, 2012).

### *Benefits*

Literature presents many benefits to allowing undergraduate students to serve as undergraduate TAs. There are benefits directly to the students they serve, as well as to the undergraduate TAs themselves, the graduate TAs and instructors they assist, the department sponsoring the undergraduate TAs, and the general field of animal science.

#### **To Undergraduate TAs Themselves**

Undergraduate students who have the opportunity to serve as an undergraduate TA view the experience positively and report gaining beneficial skills and perspectives. They better understand teaching practices, and have likely gained experience with the workload and responsibilities of instructors in areas such as grading, lesson development, student/classroom management, and writing assessments. In animal

science, where more than one-third of the students will likely end up teaching in some capacity as part of their career (Dodson and Benson, 2010), serving as an undergraduate TA provides more realistic job expectations and valuable practice for teaching skills (DeBeck and Demaree, 2012). Undergraduate TAs also improve their universal skills (sometimes referred to as soft skills in literature), which would benefit them in any career, not just those that are teaching-focused. The students can also make professional connections by working closely with their professor(s), who may potentially serve as references for future job applications. These may support the findings that suggest that undergraduate TAs are more successful in future careers both in teaching and STEM fields than peers who do not participate in such high impact learning practices (DeBeck et al., 2010; Spike and Finkelstein, 2010).

### **To the Students They Serve**

Students in courses served by UTAs have shown comparable levels of mastery of learning outcomes to utilizing graduate TAs (Chapin, 2014; Fingerson and Culley, 2001; Sana, 2011; McKeegan, 1998; Goff and Lahme, 2003). In some cases, undergraduate TAs were shown to provide greater benefit as students in the course felt more comfortable approaching them and the undergraduate TAs were able to more effectively encourage the students they served (Drane, 2014; Chapin, 2014; Philipp, 2016).

Frequently, undergraduate TAs serve as the primary contact for students, who would rather engage a peer than the professor directly (Snyder and Wiles, 2015; DeBeck and Demaree, 2012). Students recognize that graduate TAs and undergraduate TAs possess

less content knowledge than the professor, yet often value that their teaching style is less formal. This informality, paired with more peer-like status, leads students to perceive TAs as more approachable, understanding, and flexible (Kendall and Schussler, 2012). The increased approachability results in significantly more interactions with students. This increase in engagement encourages students to persist through difficult material resulting in the development of improved critical thinking and communication skills (Snyder and Wiles, 2015; Drane, 2014; Weidert, 2012). Additionally, students served by undergraduate TAs show an improvement in their perceptions of the course and attitude toward science in general.

Many studies analyze student performance via examination of grades as they are an easily accessible quantitative measure. The increase in student grades seen by providing a teaching assistant is comparable whether it is a graduate TA or undergraduate TA when prior TA training and support is equal (Chapin, 2014). Students served by undergraduate TAs are more likely to earn a higher grade in the course they are currently in, as well as successfully complete the subsequent required courses within the major than those in courses without TAs (Drane, 2014; Philipp, 2016). These findings are consistent across a variety of disciplinary majors, as well as student demographic and personal backgrounds (Snyder and Wiles, 2015).

### **To Course Instructors**

Instructors benefit from utilizing undergraduate TAs as they frequently provide relief of some of the clerical and/or grading duties associated with teaching a course

(Kendall and Schussler, 2013). Additionally, the undergraduate TA can provide student feedback to the instructor as students in the course may feel more comfortable talking with a peer than approaching the instructor directly.

### **To Animal Science Departments**

Graduate TAs have long been utilized as an alternative to hiring additional faculty, especially in STEM lab courses (Chapin, 2014; Weidert, 2012). In recent years, financial constraints have led some programs to explore alternatives beyond graduate TA and undergraduate TAs have emerged as a feasible solution to help facilitate courses in resource depleted programs (Chapin, 2014). Typically, undergraduate TAs are financially neutral as they require no pay because they are receiving course credit. Alternatively, they may receive funding, but their pay is lower than that of a graduate TA receiving a stipend or tuition assistantship. Additionally, utilizing undergraduate TAs in combination with graduate TAs may help reduce the workload placed on graduate TAs who also are expected to complete their own courses and research. Undergraduate TAs also help foster inclusion and community between lower-level and upper-level undergraduates within the department (Reges et al., 1988; Roberts et al., 1995).

## **Conclusion**

In a time where employers and students alike are expecting a higher education degree to prepare them for future employment, it is critical that animal science considers all career pathways that graduates may take. Utilizing undergraduate TAs may be a viable option to preparing students with universal skills, while simultaneously improving outcomes for others associated with animal science education.

The objectives of the studies in this dissertation are to characterize what undergraduate TA opportunities currently exist in animal science departments in the United States and to develop a novel and effective opportunity for animal science undergraduate students to receive instruction and practice in preparation for future educational careers similar to the present career preparation opportunities directed toward for industry production or veterinary careers.

CHAPTER III  
SURVEY OF HIGHER EDUCATION INSTITUTIONS' CURRENT  
OPPORTUNITIES FOR ANIMAL SCIENCE UNDERGRADUATE TEACHING  
ASSISTANTS

**Introduction**

Utilizing undergraduate teaching assistants (TAs) has been shown to have clear benefits for both the undergraduate TAs and the students they serve. Students in courses served by undergraduate TAs report increased enjoyment (Goff and Lahme, 2003), improved perception of content and science in general (Drane et al., 2014), and increased self-efficacy (Weidert et al., 2012; Drane et al., 2014). Additionally, students often have higher grades when provided an undergraduate TA in their course than those without (Quitadamo et al., 2009; Chapin et al., 2014; Philipp et al., 2016b). The increase in grades can be attributed to multiple aspects of students working with an undergraduate TA including increased approachability and a willingness to ask questions (Goff and Lahme, 2003; Drane et al., 2014; Snyder and Wiles, 2015)) which promotes increased critical thinking (Quitadamo et al., 2009; Snyder and Wiles, 2015) and communication skills (Weidert et al., 2012; Chapin et al., 2014), as well as professional development (Marbach-Ad et al., 2012). Similar universal skill improvement is seen by the undergraduate TAs themselves (Schalk et al., 2009; Chapin et al., 2014; Snyder and Wiles, 2015; Philipp et al., 2016a). Undergraduate TAs also are more successful in

future careers in both teaching and STEM fields (DeBeck et al., 2010; Spike and Finkelstein, 2010).

While studies from other STEM disciplines provide a foundation promoting the use of undergraduate TAs, there is minimal research specific to undergraduate TAs in animal science specifically. From both the lack of literature and anecdotal evidence provided by current animal science instructors, it is clear that more information needs to be gathered regarding current opportunities available for undergraduate students to learn and practice teaching methods during their undergraduate curriculum. This study aims to assess how many animal science departments within institutions of higher education in the United States provide opportunities for undergraduate students to serve as TAs and what those opportunities provide to the students who partake in them.

## **Materials and Methods**

### *Participants*

Approval was obtained from the Institutional Review Board of the primary researchers at Texas A&M University. A list of universities and colleges within the United States that offer a bachelor's degree in Animal Science, or closely related field, was compiled (n=91)(Appendix A).

Participants were recruited through e-mails (Appendix B) sent to faculty member who oversee undergraduate curriculum (i.e., Head of Academic Programs or similar title) in each animal science department. This faculty member was given the option of responding to the Qualtrics survey (Qualtrics International, Provo, UT) themselves or



forwarding to another faculty member in the department who may be better suited to complete it.

### *Survey*

The survey (Appendix C) included three sections: informed consent for the research study, departmental demographic information, and questions to characterize the undergraduate TA opportunities in that department and why the department has made choices related to undergraduate TAs.

The informed consent is a required portion of the survey per the Institutional Review Board when doing research involving humans. If a participant declined to consent, the survey skipped to the end of survey without collecting data.

Departmental demographic information was collected to give provide context relevant to the size and relative research funding of the institution. These data may be informative if larger departments were to offer more teaching opportunities than smaller departments, or vice versa. Collecting graduate student enrollment allowed for analysis of total student enrollment (undergraduate + graduate enrollment). This enabled evaluation of the possibility that departments with more graduate students may offer less teaching opportunities for undergraduates as they are being given to graduate students.

The rest of the survey evaluated current undergraduate TA opportunities and the department's perspectives on why they do or do not, allow undergraduate students to serve as TAs. Answering Question 5 "Do you allow undergraduate students to serve as teaching assistants (TAs) in your department?" routed the participant to either Questions

19-23 if they answered “No” or Questions 6-18 if they answered “Yes” or “Rarely or only in special circumstances”.

### *Measures*

All measures were analyzed as a whole for United States animal science departments, and by institution classification identified by Carnegie Classifications of Institutions of Higher Education BASIC 2018 Classification (Carnegie Foundation for the Advancement of Teaching; Bloomington, IN) resulting in three categories: Doctoral Universities (DU), Masters Colleges or Universities (MCU), or Baccalaureate Colleges (BC).

Total response rate, as a percentage of total surveys distributed, was recorded. Survey completion rate, as a percentage of consenting participants who completed surveys from total response rate, was also recorded.

Percentage of departments that allow undergraduate students to serve as TAs was determined. Those departments who do not currently allow undergraduate TAs provided researchers quantifiable data in Question 19 as to if they have offered undergraduate TAs in the past. If participant answered “We have never allowed undergraduate TAs” the survey skipped to Question 21, but if participant indicated that they did allow undergraduate TAs in the past, Question 20 was presented. This provided quantifiable data on what changes occurred that caused the department to change their position regarding allowing undergraduate TAs. Question 21 provided the participant an opportunity to identify why undergraduates do not serve as TAs in their department and

responses were analyzed for emergent themes. Question 22 and 23 characterized the department's view on allowing undergraduate TAs in the future, providing categorical data on their plans (Question 22) and qualitative free responses that were analyzed for emergent themes (Question 23).

The departments that do allow undergraduate TAs provided much more data than those who do not, as these teaching opportunities vary greatly between institutions. Questions 6-11 provided quantifiable descriptive data with Questions 6-9, and 11 presenting options for simple categorical data, and Questions 10 providing a descriptive scale from least to most teaching responsibilities and learning. Questions 12-18 were free response to allow participants to describe the benefits and challenges allowing undergraduate TAs presents to their department. These questions were analyzed for emergent themes by utilizing the researcher's emic perspective of teaching and working with undergraduate TAs within the animal science discipline which allowed them to have a thorough understanding of potential responses. Using this perspective, the researcher was able to code participant survey responses into congruent themes and the most common themes were reported. Additional singular responses were highlighted if they provided significant meaning to the study.

## **Results**

Following original email distribution with two additional email reminders yielded 25 departmental responses of the 91 departments contacted, which provides a 27% total response rate. Of those 25 that responded 20 of the participants consented to

provide their data and completed the survey for an 80% survey completion rate. Most of the departments that completed the survey were institutions that are classified as DU (n=18), with the remaining responses coming from MCU (n=2), and no responses were received from BC institutions.

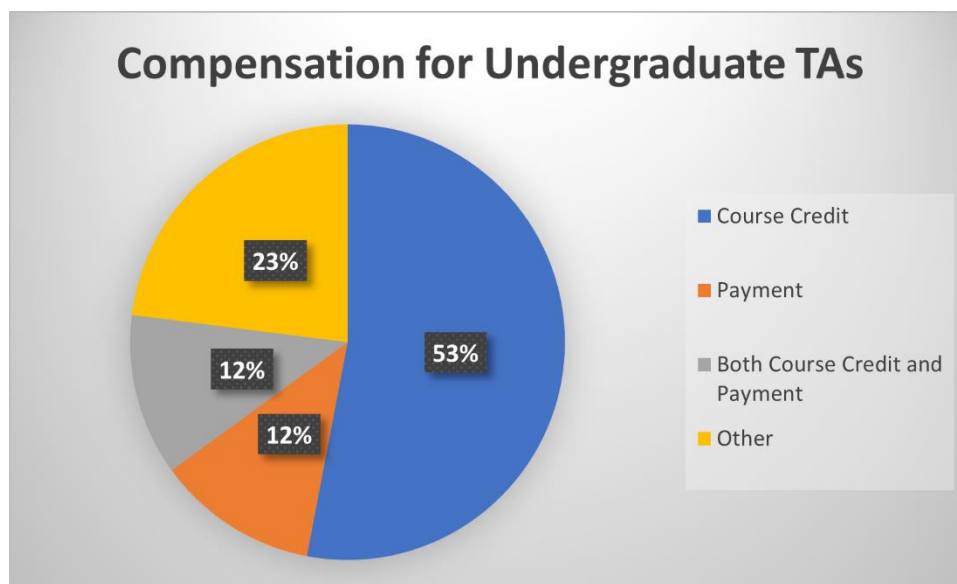
There were only two departments surveyed that did not allow undergraduate students to serve as TAs, both of which belong to the MCU classification. One of the departments responded that they never have allowed undergraduate students to serve as TAs and do not plan to do so in the future, while the other department expressed an interest in allowing undergraduate students to serve as TAs but have encountered challenges to providing this opportunity. This department identified that current university rules have prevented them from being able to provide opportunities for undergraduate TAs.

Of the DU classifications of institutions with animal science departments that completed the survey (n=18) all responded that they do allow undergraduate students to serve as TAs with most responding “Yes” to the question prompt (n=15) and others responding, “Rarely or only under special circumstances” (n=3). While all of these departments allow undergraduate students to serve as TAs in some capacity, the rest of the survey identified many differences in what an undergraduate student may experience serving as a TA in an animal science department.

When asked what types of courses undergraduate TAs serve all departments responded that these students serve in lab courses. One department identified that

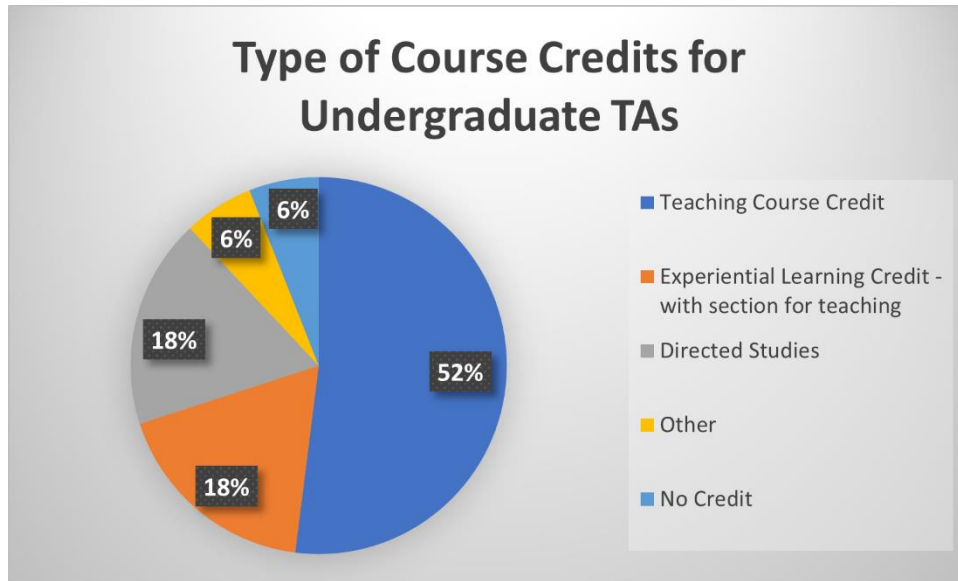
undergraduate TAs also assist with online courses, and 50% of the departments responded that undergraduate TAs also assist with lecture courses.

In characterizing what compensation undergraduate TAs receive, all but one institution identified that students are being compensated for their work, rather than just a learning experience. The single department that did not reply with compensation stated that students could receive course credit if they worked with a professor and identified course objectives for the student to complete. The response rates for undergraduate TA compensation types, as visualized in Figure 2, were course credit (53%), payment (12%), both course credit and payment (12%) and other (23%).



**Figure 2. Undergraduate teaching assistant compensation methods in U.S. animal science departments**

However, all programs surveyed identified that students could either receive course credit or payment, but not both in the same semester. The departments that provide course credit to students it was varied in the way they approached the type of course that provides credit and the number of credits that undergraduate TAs receive. None of the departments indicated that they had a specific teaching methods course. Teaching opportunities were varied as seen in Figure 3: department has specified course number specifically for teaching experiences, including serving as a TA (52%), department has a specified course section within our Experiential Learning or High Impact Learning (or similar title) course number specifically for teaching experience, including serving as a TA (18%), department has teaching experiences, including serving as a TA, receive credit through Directed Studies (or similar title) where a student can get credit for almost any experience if they have a professor supporting and grading them (18%), other (6%), and undergraduate TAs do not receive course credit (6%).

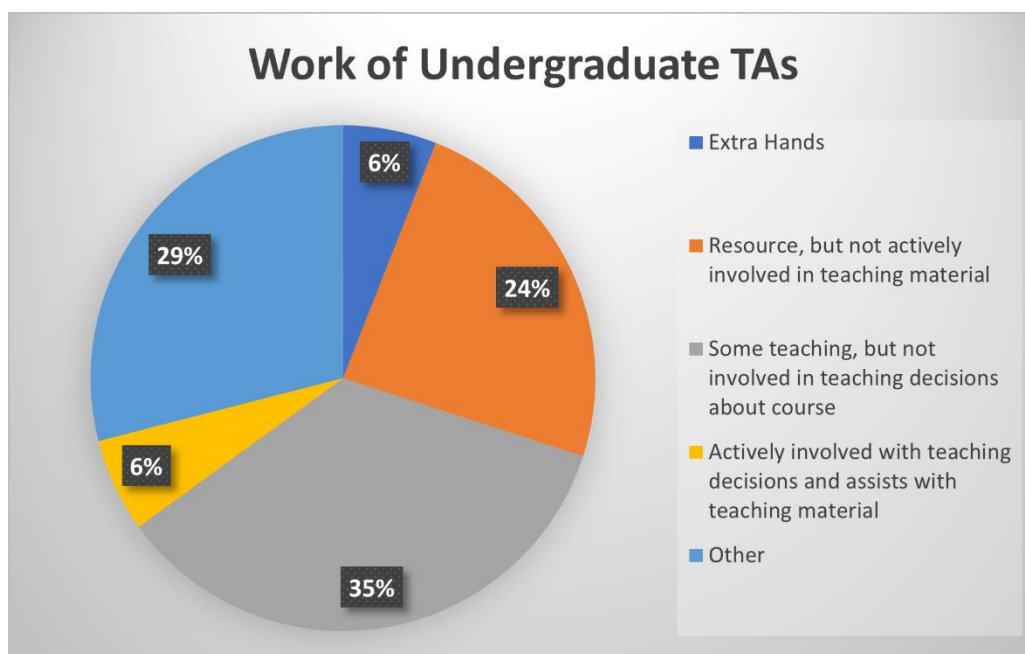


**Figure 3. Types of course credit undergraduate teaching assistants receive in U.S. animal science departments**

The individual department that selected “other” in response to the question prompt explained that they utilize a Special Topics course to provide credit to undergraduate TAs. The number of credits undergraduate TAs received varied from 1 to 3 credits between departments (1 credit – 23%, 2 credits – 6%, 3 credits – 6%), with some departments identifying that it varied even within their own department depending on the amount of work the student was expected to perform during their TA experience (59%). Consistent with previous responses, there was one program indicating that students do not receive course credit (6%). One department stated that students receive one course credit per class they assist with, which is a useful clarification as students may assist with multiple courses throughout their undergraduate career.

Subsequent questions helped to characterize expectations of the undergraduate student when serving as a TA. When asked to describe the work that a majority of their undergraduate TAs were expected to perform, the departments' responses varied. As expected, none of the departments expected undergraduate TAs to functionally work as the instructor like graduate students are often expected to. There was a considerable range of responsibility assigned to undergraduate TAs as seen in Figure 4. Moving through the rest of the spectrum from least to most responsibility departments responded: undergraduate TA is mainly just extra hands to help facilitate activities but not actively involved in teaching material for the course (6%), undergraduate TA is another resource to help answer questions about activities and content during class, but is not actively involved in teaching material for the course (24%), undergraduate TA is expected to do some teaching of material during class and/or outside of class, and/or helps with some grading during the semester, but is not actively involved in teaching decisions about the course (35%), undergraduate TA works closely with the instructor to actively be involved in many decisions about teaching during the semester and is expected to assist with the teaching of the material during the course (6%), and other (29%).





**Figure 4. Work expectations of undergraduate teaching assistants in U.S. animal science departments**

Departments identified two reasons for selecting “other”. The first was that roles vary depending on the course the undergraduate TA is serving, and the second was that undergraduates are not allowed to assist with grading per their institution’s rules, or a combination of both. When asked if undergraduate TAs are expected to receive teacher training, such as teaching strategies, pedagogical techniques, classroom management, etc., most responses fell into two categories: undergraduates receive no official teacher training (53%) or the instructor of the course they are serving is expected to provide teacher training to the student (20%). The remaining responses selected “other” and provided explanations. One stated that the professor taught students the skills they

needed to know to assist with the course but did not necessarily dedicate effort to teaching the undergraduate TA teaching skills. Others stated that undergraduate TAs did not receive teacher training, above, but did receive official university training in relation to teaching regulations (i.e., FERPA, responsibilities, data training).

The remainder of the survey consisted of open-ended questions. The most robust responses were collected from departments that described benefits they observed for the undergraduate students who served as TAs. Four main themes emerged from the list of benefits provided:

1. Improvement in universal skills, sometimes referred to as soft skills in the literature, such as communication and presentation, time management, organization, conflict resolution, and problem solving
2. Increase in teaching skills and awareness of teaching responsibilities and opportunities
3. Deepened content knowledge
4. Connection and appreciation for others

When describing the challenges undergraduate TAs experienced the most common issue was that students had trouble balancing their TA responsibilities with other coursework and responsibilities. Other reported challenges were students in the course not respecting the TA and varying levels of support received from the course professor.

The department also experienced benefits and challenges in providing undergraduate TA opportunities. The main benefits presented were providing help with facilitation of courses, especially for large and/or activity-intensive courses, as well as an

increased sense of community within the department. Some specific examples of how undergraduate TAs provided these benefits to the department were decrease in faculty/graduate student workload when courses have an undergraduate TA, having peers as TAs seem more approachable and help to increase student buy-in, and sometimes undergraduate students have a background or training that may help fill gaps in specialized areas where graduate students may be lacking (i.e. equine, species specific animal handling, etc.). Many of the responses indicated that there were no or minimal challenges the department encountered with undergraduate TAs. The only issues identified arose from individual differences in effort and/or expectations from either the student or the professor perspective.

The last area assessed for benefits and challenges was in reference to the students served by undergraduate TAs. It was clear that there were more benefits to these students than challenges or detriments to their learning. Because undergraduate TAs are considered peers many departments agreed that students felt more comfortable approaching them compared to their professor or graduate TA. Both by increasing the number of available teachers to contact and the increased approachability, students get more one-on-one time and their questions may be answered more quickly. One department stated that their retention rate has increased since implementing undergraduate TA opportunities. Also, because these TAs are typically upper classmen, but still viewed as a peer, mentorships and friendships happen more often and get the students involved in other activities in the department. The only negative aspect identified was that there can occasionally be an undergraduate TA who is not as

effective to promote the discussed benefits, but this was mostly attributed to the instructor either choosing poorly or not supporting the TA sufficiently.

The last question prompt asked departments what changes they would like to make with the undergraduate TA opportunities they offered. Some were content with their current opportunities, but those that did want to implement changes mostly desired a more uniform TA experience. Many identified that they felt this could be accomplished by adding an official teaching methods course, however faculty constraints were listed as a challenge. These constraints include lack of time, capacity within appointment, and expertise in teacher education. The other constraint to providing the best teaching experience identified was university rules that do not allow undergraduate students to help with grading.

### **Discussion**

As larger universities tend to have a larger number of students, courses, faculty, and funding, it is not surprising that the DU institutions were the ones able to provide TA opportunities to their undergraduate students. Though there were only two responses from smaller institutions (MCU institutions) we hypothesize that this would still be supported if more MCU and any BC institution responses had been gathered. However, programs at smaller institutions could likely still realize the benefits of utilizing undergraduate TAs by offering undergraduate TA opportunities. If resources are not available within animal science itself, it may be combined with other agricultural departments and/or taught by a qualified graduate student rather than instructor.

All the DU institutions that responded allow undergraduate students to serve as TAs, even if the opportunities varied between them. Also, a positive notation was that nearly all the responding institutions provided some type of compensation to their undergraduate TAs beyond the learning experience itself. Some manner of compensation should be expected as the amount of time and effort that these students are typically putting into their TA position is significant. Additionally, utilizing undergraduate TAs when reasonable can provide financial benefit to the department as undergraduate TAs cost significantly less than graduate TAs (Chapin et al., 2014; Philipp et al., 2016b).

Characterizing what undergraduate TA opportunities are like at these institutions revealed that the experiences varied greatly and the range leaves room for improvement within departments. This wide range in responsibilities is consistent with other STEM disciplines (Marbach-Ad et al., 2012). While it may help the department and/or professor for the course to have undergraduate TAs to serve as an extra set of hands to facilitate activities, if the undergraduate TA is not expected to engage beyond that there is less benefit to the undergraduate TA and the students they serve. When the undergraduate TAs are involved with the actual teaching that improvements in universal skills and learning of content are made. Interestingly, allowing undergraduate TAs to assist with teaching of content may actually decrease faculty workload (Kendall and Schussler, 2012) especially if TAs have received formal teacher training. Undergraduate TAs who have received formal training are more well received by students (Sana et al., 2011) and increase engagement and individualized instruction time with the students

they serve (Fingerson and Culley, 2001; Sana et al., 2011). Recognizing that if the department or institution does not provide formal teacher training it may appear a daunting task for the professor. However, working with the undergraduate TA(s) to provide this teacher training and incorporating time to do so, will likely yield time saving benefits, as well as ensuring undergraduate TA(s) and the students they are serving have a higher quality learning experience.

The benefits and challenges reported by departments for the undergraduate TAs, the department themselves, and the students served by undergraduate TAs aligned with previous research in other STEM disciplines. The number of departments reporting that the main change they would like to see is more formal teacher training for TAs highlights those benefits for all involved with undergraduate TAs are recognized, while also reaching for ways to make these opportunities more effective. One of the best ways to implement these changes is for department(s) to develop an animal science specific teaching methods course with a supported undergraduate TA opportunity as part of the course requirements. Texas A&M University outlined development of such a course pairing a teaching methods course with an introductory animal handling course. Such a course could be used as the foundational course for undergraduate students to take to be able to serve as an undergraduate TA for other courses within the department. This training and teaching experience would provide a great addition to the student's resume, especially if students intend to enter teaching careers or graduate school. If a course like this is not currently feasible within the department, partnering with the institutions'

Center for Teaching Excellence (or similarly named program) may provide additional trainings or suggestions for improving undergraduate TA opportunities.

CHAPTER IV  
DEVELOPMENT OF AN UNDERGRADUATE COURSE TO PROVIDE TEACHING  
METHODS INSTRUCTION ACCOMPANIED BY A SUPPORTED TEACHING  
ASSISTANT OPPORTUNITY

**Introduction**

Most research conducted in reference to undergraduate teaching assistants (TAs) has historically been completed within the humanities departments, with an expansion into some STEM departments since the early 2000s. Though some of the more traditional STEM teaching practices can be applied to agricultural disciplines, such as animal science, there is little data on the benefits or challenges of utilizing undergraduate TAs in these courses. Additionally, the undergraduate TAs in these studies are often involved in lower-level capacities (grading, tutoring outside of the course, small group discussion facilitator, etc.) and receive little to no training in pedagogical techniques (Baisinger, 1984; Larson, 1990; Osborne et al., 1997). This high-impact learning opportunity, where undergraduates learn pedagogical techniques, will positively impact the undergraduate TAs, graduate TAs/instructors and the larger undergraduate population in the department. In STEM courses student grades are comparable when graduate TAs, undergraduate TAs, or both are utilized (Chapin et al., 2014). In some cases, positive student perceptions are actually increased from both the undergraduate TA's perspective (Weidert et al., 2012) and the students they helped teach during the semester (McKeegan, 1998). When surveyed, students in the courses with undergraduate



TAs reported more enjoyment in the course than those without them (Goff and Lahme, 2003). Moreover, undergraduate TAs who receive formal teaching training are more well received by the students they are instructing compared to their peers without formal training (Sana et al., 2011).

Undergraduate TAs benefit from their experience by deepening their content knowledge within the course and improving universal skills, such as communication and professional conduct, while gaining insight into the career of teaching within an academic setting (Goff and Lahme, 2003). Developing and assessing universal skills within courses can prove difficult and therefore are often primarily addressed in business internships or research settings. Teaching experiences can offer similar outcomes in preparing students for careers (Schalk et al., 2009). Additionally, the undergraduate TAs are expected to enhance their own knowledge base when assisting with an introductory animal handling course (ANSC 111). Such reinforcement allow upper-level courses to have a more significant impact, especially those students who entered the major without prior animal science knowledge, skills, or experience.

These undergraduate TAs will support the graduate TAs/instructors by providing additional sets of helping hands to facilitate more active learning engagement and/or individualized instruction for students within the laboratory period (Fingerson and Culley, 2001; Sana et al., 2011). In a livestock handling course, more one-on-one supervision and interaction is required for student safety. This is critical to effectively teach live animal handling techniques to a lab of ~20 students, many of whom have had less exposure to agriculture than students of previous generations. This course will

enable each laboratory section to have a minimum of three TAs: the head graduate TA and two supporting undergraduate TAs enrolled in this course.

High enrollment undergraduate animal science departments are often challenged with providing rigorous, hands-on content to the large number of students enrolled in the introductory animal handling course. The objective was to develop a course that would provide interested students with teacher education and preparation, while simultaneously giving these students a chance to put this education into practice by serving as an undergraduate TA. Using undergraduate TAs also helps to foster a sense of community within the department between lower-level and upper-level undergraduates that will hopefully be maintained throughout their time in the department (Reges et al., 1988; Roberts et al., 1995).

### **Materials and Methods**

Approval was obtained from the Institutional Review Board of the primary researchers at Texas A&M University.

#### *Development of Learning Objectives and Departmental Approval*

The instructors, who have animal science teaching experience and current research focuses on scholarship of teaching and learning, determined what skills students taking an introductory teaching methods course should have obtained and what skills would be needed to effectively assist with a hands-on animal handling lab. They also sought input from the animal handling lab course's instructor and past graduate TA

instructors. Two basic learning objectives for the course were determined: (1) develop basic pedagogical skills and (2) review basic animal handling knowledge, with additional course specific learning objectives that are linked to the university and departmental (program) level learning objectives. The finalized learning objectives are outlined in Table 1 below.

**Table 1. Program and course level outcomes for animal science laboratory teaching methods course**

<b>PROGRAM LEVEL OUTCOMES</b>	
<i>Department of Animal Science Program Level Outcomes included in this course are listed below in bold, below those are their corresponding course level outcomes explored in this course.</i>	
<b>5. Communicate effectively across multiple mediums</b>	
a. Verbal communication skills	3. Demonstrate the use of a variety of types of supporting materials (examples, statistics, analogies) making appropriate reference to information or analysis that supports or establish the speaker's credibility/authority on the topic
	4. Create a central message that is compelling (precisely stated, appropriately prepared, memorable, and strongly supported. Practice verbal delivery techniques (posture, gesture, eye contact, and vocal expressiveness) that make the communication compelling, and the speaker appear polished and confident.
b. Written communication skills	3. Demonstrate skillful use of high quality, credible, relevant sources to develop
d. Listening skills	2. Practice effective listening skills through demonstration of receptive and professional body language and behaviors.

**Table 1 Continued**

<b>6. Demonstrate professional conduct</b>	
a. Respect for people and animals	2. Given situational examples/scenarios, predict expectations for respectful behavior.
	3. Demonstrate respect via utilization of professional practices.
b. Conflict management	3. Analyze components of conflict and formulate a strategy for resolution
c. Working collaboratively	2. Describe team roles and responsibilities
	3. Strategically assume/assign responsibilities among team members
d. Feedback	2. Identify areas to provide objective and constructive critique
	3. Develop a respectful approach to providing and seeking critique
<b>8. Prepare for lifelong learning</b>	
b. Independence	1. Recall and apply previously learned concepts.
	2. Identify gaps in discipline knowledge and associated challenges
c. Discernment and application	3. Identify and complete a discipline related high-impact learning experience.
<b>10. Integrated learning</b>	
a. Connection to experience	1. Identify connections between life experience and course materials.
c. Transfer knowledge	2. Apply skills, abilities, theories, or methodologies gained in one situation to another relevant situation.
d. Reflection and self-assessment	1. Describe one's strengths and challenges related to a particular performance.

**Table 1 Continued**

<b>COURSE LEVEL OUTCOMES</b>	
The objective of this course is to help you acquire the knowledge you will need to help facilitate the teaching of the ANSC 111 – Animal Production Systems Laboratory. This will be accomplished through meeting the following course objectives:	
<i>(Department of Animal Science Program Level Outcomes identifiers associated with each bolded course level outcome are listed in italics following the learning outcome title.)</i>	
<b>1. Develop basic pedagogical skills</b> to effectively teach freshman students in an introductory-level, hands-on animal course and apply them in the ANSC 111 course	
a. Assessment techniques (6.d.2, 6.d.3)	i. Define assessment as it is used in teaching and identify different ways of applying assessments
	1. Compare and contrast formative and summative assessments
	ii. Explain the advantage of grading based on rubrics
	iii. Develop an assessment suitable for a freshman level animal science course
b. Effective teaching techniques in front of a classroom (5.a.4, 5.d.2, 6.a.3, 6.d.3, 8.c.3, 10.c.2)	i. Identify aspects to consider during lesson planning or lecture preparation
	ii. Identify presentation/public speaking skills
	iii. Apply the knowledge gained from the above objectives within the context of the ANSC 111 course
c. Conflict resolution (6.b.3)	i. Explain best practices of handling conflict between students
d. Facilitating collaboration and group work (6.c.2, 6.c.3)	i. Identify different methods of selecting groups for courses and provide rationale for each method
	ii. Explain the phases that group members experience during their time together in a course
e. Characteristics of Instructors (5.b.3, 6.a., 10.d.2)	i. Identify characteristics of effective instructors and explain how they impact student learning
	ii. Self-evaluate teaching abilities and challenges
<b>2. Review basic animal science knowledge</b> covered in freshman level courses and work to better understand challenging topics (8.b.1, 8.b.2, 8.c.3, 10.a.1, 10.c.2, 10.d.1)	
a. Describe and display proper and humane animal handling techniques for domestic livestock	
a. Identify proper industry practices and provide rationale for each practice used with domestic livestock	

The course description and purpose intended for use in the university course catalog were then written as seen below:

#### ***COURSE DESCRIPTION***

*Upper level undergraduate students will review and solidify their basic animal production systems knowledge while concurrently learning effective pedagogical techniques to teach animal science laboratories and animal handling skills. This course concludes with a high-impact learning opportunity that will allow students to practice the pedagogical techniques they have learned in the course in a controlled and supported environment.*

#### ***COURSE PURPOSE***

*This course offers a unique, high-impact learning opportunity for undergraduates to review and enhance their animal science knowledge base through helping lower level undergraduates safely and correctly handle animals and learn about production systems. The pedagogical skills obtained in the class are pertinent to many other careers besides teaching, giving the students in this class more protentional opportunities after graduation. Additionally, formally teaching students pedagogical techniques helps the department teach the large number of students entering our program without animal experience in a safe and effective manner.*

The course learning objectives, description, and purpose were then submitted to the departmental curriculum committee for approval. Once approved, the course was taught for the first time in Spring of 2020.

## **Results**

The course, ANSC 289: Animal Science Laboratory Teaching Methods, was taught in the spring semesters of 2020 and 2021 with 10 and 12 students completing the course, respectively.

### *Course Structure*

In the first week of class the instructor and students together determined which ANSC 111 lab each undergraduate TA student would assist with for the semester, and expectations of the course were discussed.

After the first week, the course followed a consistent weekly schedule. On Thursdays the ANSC 111 lesson plan would be distributed to the students in the course. Course lecture was held on Fridays. Lecture typically started with a discussion of how the ANSC 111 labs had gone the preceding week and included any questions or observations the students had regarding teaching from the week. This recap was followed by approximately 45 minutes to an hour of guided discussion and/or activities for the planned content on teaching education. Lecture ended with an opportunity for students to ask about the lesson plan for the upcoming week's ANSC 111 Lab. Each student would then assist with teaching that lesson plan in one of the ANSC 111 labs the following week, as the undergraduate TA.

### *Course Assignments*

The first assignment students were asked to complete was the Teacher Characteristics paper. They were asked to write a paper discussing characteristics an effective instructor possesses and how each characteristic impacts student performance. Students were expected to utilize both peer-reviewed sources and personal narrative to illustrate characteristics.

After finishing the assessment topics in lecture, students were asked to develop their own lab quiz that would be suitable for use in the ANSC 111 Lab. Students were required to provide their quiz questions, an answer key, and most importantly a paper explaining and justifying why they developed the quiz in the manner that they did.

After the students had developed a formative assessment in the Lab Quiz Assessment assignment, they were asked to complete the assignment again but for a summative assessment for the Lab Practical Station Assessment assignment. This assignment was graded using the same rubric as it had the same overall requirements.

The final project of the course was to act as the instructor for the final review in the ANSC 111 lab section that they had assisted with all semester. Teaching the final review, rather than a specific lab topic during the semester provided an equal teaching experience and ensured each undergraduate TA was comfortable with the materials, as they had been present all semester with the graduate TA that was teaching content in the ANSC 111 lab. Students were graded both on their lesson plan for the lab period as well as their actual teaching. For the lesson plan, students submitted a rough draft that was critiqued by one of their peers, then a final lesson plan that was graded and received



feedback from the instructor. With a finalized lesson plan and feedback, students gathered any supplies they required for their lesson and taught their individual ANSC 111 lab section. During the teaching experience students were graded by the graduate TA that they had worked with throughout the semester. The graduate TA was given a rubric to maintain equal expectations between different sections, as well as given room to provide feedback to their undergraduate TA.

At the conclusion of the semester students were asked to provide an evaluation of both the courses they were involved in, ANSC 289 (teaching methods course) and ANSC 111 (introductory animal handling), in the Course Critique assignment. They were also asked to reflect their personal growth as a teacher in the Teaching Self-Evaluation assignment. Recognizing the potential risk of grading bias because these assignments including the students' honest feedback on the course, these assignments were counted for completion upon submission to the learning management system and were not downloaded and evaluated by the instructor until after final grades for the course were entered. After the semester conclusion, the instructor downloaded and deidentified the assignments. The students' feedback was then evaluated to help improve both ANSC 111 and ANSC 289 for future semesters.

The other points possible for the students to earn toward their grade in this course were from quizzes over the teaching content knowledge learned as part of the ANSC 289 lecture, and attendance points for both ANSC 289 lecture and ANSC 111 lab, and actively participating in both. Students were expected to contact their peers in the course arrange substitute coverage for their lab sections if they were going to be absent.

## **Discussion**

Overall, the ANSC 289 course was an effective learning opportunity for animal science undergraduates interested in learning about proper teaching techniques and the role a teacher plays in learning. The department received positive feedback from the students in the course, as well as the instructor, graduate TAs, and students in the ANSC 111 lab. The department has added this course to their departmental course catalog. The intent is for the course to grow and is anticipated that undergraduate students who take the ANSC 289 course may find additional TA positions in courses in addition to the ANSC 111 lab.

Student feedback influenced changes implemented after the first semester the course was taught in spring of 2020. Both the student course critiques and instructors feedback led to the elimination of the Teacher Characteristic paper and those points were redistributed to other assignments. Students felt that this topic was well covered and assessed via discussions in lecture as well as the quizzes. Resultantly the paper was perceived as busy work, which is not an effective learning experience or use of time for students or instructors. The overall learning objectives were addressed in this course through written communication, and reading, and finding scholarly works all of which were incorporated within other assignments.

In the initial course offering the Covid-19 pandemic prevented students from completing the final project, teaching the ANSC 111 lab review, as all classes had moved online prior to the end of the semester. The students still did complete the lesson

plan portion of the project but were not able to present to students. This led to the emergence of the Course Critique assignment, to replace this missing grade. Students and instructors alike found value of the assignment both as a learning opportunity and course improvement tool, therefore it was retained for subsequent course offerings. The students who completed the course in the spring of 2021 provided positive feedback regarding the opportunity to teach their lesson, remarking that it was one of their favorite parts of the course.

The development of this course serves as a needed and effective course to help fill the gap in learning about educational careers and practices. Former students in ANSC 289 have gone on to help in other courses, to start jobs in K-12 schools, or apply the universal skills they gained to help them with other endeavors. The objective of this project was to provide insight into course development and implementation, so that other institutions may create courses similar to ANSC 289 for their students and departments. Collectively such courses will improve student preparations for educational careers related to animal science.

CHAPTER V  
CASE STUDY: PERSPECTIVES ON ANIMAL SCIENCE LABORATORY  
TEACHING METHODS COURSE

**Introduction**

Increasing the teacher to student ratio, helps improve learning for the students in the course through increased student engagement. (Fingerson and Culley, 2001).

However, due to time and financial constraints, providing additional faculty or graduate teaching assistants (TAs) to serve growing courses may not be feasible (Chapin et al., 2014; Philipp et al., 2016a). Utilizing undergraduate TAs could aid departments in maintaining high quality instruction, especially in laboratory courses where there are more hands-on activities. In animal science these activities often include working with large livestock, therefore having more teaching support helps to ensure safety in these large laboratories sections where students may have little animal handling experience prior to the course. Departments and students served by undergraduate TAs benefit from their presence and research shows that the experience is also valuable to the undergraduate TAs themselves (Schalk et al., 2009; Spike and Finkelstein, 2010; Chapin et al., 2014; Snyder and Wiles, 2015). The positive outcomes are increased when teacher education and support is provided to these undergraduate TAs (Sana et al., 2011).

Though it has been shown in other disciplines that undergraduate teaching assistants are beneficial, there is minimal literature pertaining to undergraduate TAs in

animal science specifically. As discussed in Chapter two of this dissertation many animal science departments allow undergraduate student to serve as TAs, but few are providing training and additional support for the development of teaching knowledge and skills. This, coupled with less discussion of educational career options in animal science compared to those in veterinary medicine or industry careers, may contribute to few students reporting intentions of entering educational careers (Edwards, 1986). Despite low reporting literature indicates that over one third of animal science graduates enter into educational careers after graduation (Dodson and Benson, 2010). Data also suggest that undergraduate TAs develop skills that allow them to be more successful their future careers, whether in education or STEM fields (DeBeck et al., 2010; Spike and Finkelstein, 2010).

In an effort to provide an effective experience in teaching for undergraduate students, as well as assist with high enrollment introductory animal handling laboratories, Texas A&M University developed a novel animal science laboratory teaching methods course (detailed in the previous chapter). Briefly, this course required students to attend a lecture over teaching information and skills on Friday afternoons and to serve as an undergraduate TA in one section of the animal handling laboratory offered at various times in the week. The objective of this study was to collect perspectives from those involved in the novel animal science laboratory teaching methods course in order to assess the potential impact that serving as an undergraduate TA had on participants and others in the department. The hypothesis was that utilizing undergraduate TAs by providing the opportunity for undergraduate students to earn

course credit through participating in a course where they would be learning instructional techniques and assisting with an introductory animal handling laboratory (ANSC 111) would have positive outcomes for both the students serving as undergraduate TAs and the students in the course they served.

## **Materials and Methods**

Approval was obtained from the Institutional Review Board of the primary researchers at Texas A&M University.

### *Participants*

Undergraduate TA perspectives were collected from students (n=22) who completed the ANSC 289: Animal Science Laboratory Teaching Methods course in the spring 2020 and 2021 semesters. Data was obtained retrospectively from two reflection and evaluation assignments submitted as part of the existing course curriculum. The ANSC 111 Laboratory student perceptions were collected from students (n=665) who completed the ANSC 111: Animal Production Systems course, and therefore accompanying laboratory, in the spring 2020 and 2021 semesters. Participants were recruited through emails (Appendix C) sent to their official university email.

### *Survey*

The survey (Appendix D) included three sections: informed consent for the research study, demographic information, and questions to assess the impact students felt undergraduate TAs have on courses and student learning.

The informed consent was a required portion of the survey per the Institutional Review Board guidelines for research involving humans. If a participant declined to consent, the survey bypassed all questions and moved to the end of the survey.

The demographic information collected provided some context for the student's experience in the ANSC 111 laboratory. Question 1 asked when participants took the course in order to determine if there were semester differences that could have impacted results. The answer also routed students who took the course remotely during the Covid-19 pandemic to the Perceptions on General Undergraduate TAs block as that was an online section that did not have an undergraduate TA in contrast to the semester which have face-to-face sections. Question 2, "Which semester did you take the ANSC 111 lab?", may be informative if the perspective of freshman students (majority of the students) differ from that of older students. There could also be potential perspective differences between higher-achieving and lower-achieving students in reference to course changes aimed at enhancing student learning. Question 3 requested that students self report their grades which enabled researchers to assess these data without violating FERPA regulations as the survey is anonymous and the grades are self-reported rather than obtained from student records.

The remainder of the survey evaluated these students' perspectives on undergraduate TAs, both in ANSC 111 laboratory and in general. The first set of questions was focused specifically on the ANSC 111 lab. Answering "No" to Question 4 routed participants to the Perceptions on General Undergraduate TAs block if they did not have an undergraduate TA for their section of ANSC 111 as there was one section in

each semester that did not. Answering “No” to Question 9 routed participants to the end of the survey as they had not been in a course being served by undergraduate TAs.

#### *Measures – Undergraduate TA Perspectives*

Student submissions for the Course Critique and Teaching Self-Evaluation assignment questions, found in Appendix E and F respectively, were compiled for analysis. All information was deidentified before analysis to ensure confidentiality of the students in the course.

Each question was analyzed to identify emergent themes that provide information about how the course was beneficial, and/or what aspects should be changed to provide a better experience for students. Emergent themes were analyzed utilizing the researcher’s emic perspective of teaching and working with undergraduate TAs within the animal science discipline which allowed them to have a thorough understanding of potential responses. Using this perspective, the researcher was able to code participant survey responses into congruent themes and the most common themes were reported. Additional singular responses were highlighted if they provided significant meaning to the study.

#### *Measures – ANSC 111 Student Survey*

All measures were analyzed as a whole for all ANSC 111 students. Total response rate, as a percentage of total surveys distributed, was recorded. Survey



completion rate, as a percentage of consenting participants who completed surveys from total response rate was also recorded.

Demographic data was reported as a percentage of participants for each parameter.

Within the instrument itself, Questions 5 and 8 provided quantifiable data on the impact the undergraduate TA had on student learning (via student perspective) within the context of the ANSC 111 laboratory. Questions 6 and 7 provided qualitative data on both the positive and negative impacts they perceive undergraduate TAs had on student learning in the ANSC 111 laboratory. Question 10 yielded quantifiable data that provided context on the participant's experience with undergraduate TAs. Question 11 also provided quantifiable data, but in reference to the participant's view on the impact undergraduate TAs have on student learning in general as opposed to animal science specifically. Question 12 allowed the participant to explain and provide qualitative data on why they like or dislike having undergraduate TAs. Question 13 assisted the department in identifying other animal science courses students believed undergraduate TAs would be beneficial to, with a look towards scaling these types of opportunities.

## **Results**

### *Undergraduate TA Perspectives*

Overall, both assignments, completed by the undergraduate TAs indicated that they thought this was a positive and useful experience for themselves and others involved.

The Course Critique assignment provided comments and suggestions from the undergraduate TA perspective directed toward both the ANSC 111 laboratory and ANSC 289 course. Two factors were discussed for each course: aspects of the course itself and the undergraduate TAs' perspective on the impact of the courses. As the scope of this case study was to assess the teaching methods course (ANSC 289), most of the answers pertaining to the aspects of ANSC 111 Laboratory course itself are not included in these findings, unless they are directly related to the experience of the undergraduate TAs. However, those responses regarding ANSC 111 were still utilized to improve the ANSC 111 Laboratory for future semesters. The only ANSC 111 comment that directly affected the undergraduate TAs that appeared in multiple students' assignments was to ask if the undergraduate TAs could be added to the online learning management system for the laboratory course so they may have access to resource materials in the form that they were presented to the students. The remainder of the assignment directly applied to the ANSC 289 course or topics relating to the undergraduate TAs and their experiences and impacts during their teaching experience. The emergent themes from those questions are outlined below in Table 2.

**Table 2. Emergent themes from course critique assignment – questions pertaining to ANSC 289 or the general undergraduate TA experience**

Assignment Prompt Question	Emergent Themes in Student Responses
<i>In reference to the ANSC 111 Lab, what are your views on the students' perceptions about:</i>	
The course	Overall, students really liked the lab
	Students with animal handling experience prior to the course however, did not find it as useful
Their undergraduate TA	They viewed undergraduate TAs as approachable and relatable
	Some students did not respect the undergraduate TA as an authority in the class
Their graduate TA	Respected them and enjoyed the class, but did not approach them as often as undergraduate TA
<i>In reference to the ANSC 289 course, please provide feedback about the following topics:</i>	
Class format	At first a bit uncomfortable with a discussion-based course as they had never taken one, but by the end of the semester felt really comfortable
	Liked having lecture once per week
Teacher Characteristics Paper (Sp20 semester only)	Understood the idea, but did not feel it contributed to learning
ANSC 111 Lab Quiz Assessment	Got a lot out of this assignment
	Very helpful for future assignments
	Receiving a lower grade freaked them out at first, but in retrospect it useful. Also, it was low-stakes so it did not affect grade too harshly.
ANSC 111 Lab Practical Station Assessment	Appreciated the format being similar to the Lab Quiz Assessment, but with better understanding and higher point value
	Enjoyed that they got to be creative
Lesson Plan for Final Review	Most beneficial assignment
	Liked that there was a rough draft and peer critiques prior to final submission
Final Review Teaching Evaluation by Graduate TA (Sp21 semester only)	Appreciated the feedback to improve their teaching
	Some graduate TAs did not provide much feedback
Teaching Self-Evaluation	Helped them reflect on course and gave them more appreciation for what they had learned
	Appreciated the open format

**Table 2 Continued**

<b>Assignment Prompt Question</b>	<b>Emergent Themes in Student Responses</b>
Course Critiques	Did not see as much value to their learning, but understood the importance of assignment
	Hoped their feedback would help the courses in the future
	Appreciated the open format
Quizzes	Stressed leading up to it, but review really helped and they did well
	Covered content well
Attendance	Good motivator to attend lecture
	Appreciated the instructor's flexibility if they communicated well in advance of absence
	Thankful for "easy" points to balance points lost on assignments
Content	Enjoyed learning content outside typical animal science topics
	Thought content was good for level of course
Way content was presented (activities and schedule)	Schedule was in good order and pace
	Suggested handouts with lecture topic summaries as the content they were required to know could get a little muddled in a discussion-based class
Instructor's teaching style	Some teaching behaviors felt weird at first (ex: utilizing wait time until students began answering questions instead of just providing answers), but then got used to them. Later students understood why that was a beneficial teaching behavior and tried to adopt it when teaching in lab
	Liked that they felt comfortable to express many viewpoints in discussion-based course
	Modeled good teaching behaviors
<i>Describe the impact this course had on the following areas:</i>	
Your teaching	Improved teaching skills
	Identified areas to keep improving
Your personal life/choices/characteristics/thoughts	More appreciation for teachers
	Encouraged future teaching aspirations
	More aware of differences in perceptions about learning

**Table 2 Continued**

Assignment Prompt Question	Emergent Themes in Student Responses
Undergraduate students in ANSC 111	Improved students' educational experience
	Provided a more approachable and relatable teacher
Graduate TAs for ANSC 111	Removing some workload means graduate TA could teach more effectively
Animal Science Department	Beneficial, and allowing TAs needs to keep happening and maybe even grow
	Better connection within the department
	Experiences like this help foster universal skills, so students represent the department even better when they leave/do activities outside the department
Other thoughts and/or ideas	Grateful for opportunity to participate in course
	Repeat of specific feedback from above or about ANSC 111 course

The Teaching Self-Evaluation assignment highlighted the benefits these students received from serving as undergraduate TAs. Every student reported an improvement in their teaching skills and knowledge, and most indicated that they were more likely to consider teaching as a career. The few students who differed, said that they had never really considered teaching as their future career and that while that hadn't changed after the course, they still thought this course would be beneficial to them in another career. The common themes that emerged from the other individual questions and student responses can be seen in Table 3 below.

**Table 3. Emergent themes from teaching self-evaluation assignment student responses**

Assignment Prompt Question	Emergent Themes in Student Responses
1. How have your thoughts about teaching and/or teachers changed throughout this semester?	Teaching is harder and/or more work than students realized
	Students gained a better appreciation and understanding for the decisions their teachers make
2. How have your thoughts about students and/or being a student changed?	Students will work to stay more engaged with the teacher/class activities in future classes
	Students want to focus more on true learning, rather than viewing course activities as tasks to get a good grade
	Students will have more empathy for the teacher and try to understand their teaching decisions
3. What thing did you learn about teaching that surprised you the most?	Students did not realize how much work teachers put in behind the scenes, especially when developing courses
	How important, and difficult, clear effective language is in teaching (especially in reference to learning objectives and assessments)
	What wait time 1 and 2 are, and how they assist to make teaching more effective
4. What was your favorite experience from this semester (either in ANSC 111 lab or 289 class, or both)?	Teaching the review at the end of the semester
	Forming relationships with the students they served, and helping to them succeed
	Because the ANSC 289 class was small and discussion-based, it allowed the TAs to become a closer group of friends
5. What was your least favorite experience from this semester?	Felt it could be difficult to get students to engage in labs sometimes
	Some assignments (ex: lab quiz assessment, review) were pretty difficult, but they still understood the benefit
6. What influences did your graduate TA have on you?	Helped identify universal skills to work on, and encouraged development of those skills
	Gave them the freedom to practice teaching in the ANSC 111 lab, but supported them as needed
	Provided information and guidance about future opportunities (graduate school, careers, etc.)
7. What influences do you think you had on your graduate TA?	Undergraduate TAs hoped that their graduate TAs knew they had someone competent and reliable to take some of the teaching workload
	Undergraduate TAs provided new ideas or perspectives for lab activities

**Table 3 Continued**

Assignment Prompt Question	Emergent Themes in Student Responses
8. What influences did your students have on you?	Made undergraduate TA more confident in their abilities
	Increased desire to continue teaching
	Better appreciation for differences between people, especially for past experiences and ways of learning
9. What influences do you think you had on your students?	More support in class because the undergraduate TAs were more approachable
	Undergraduate TAs were good role models showing their students that they can be successful in this degree
	Undergraduate TAs were able to provide information and advice to students about opportunities in animal science
10. What did you find the hardest part of teaching was for you? Why?	Dealing with authority/respect balance
	Learning to question and answer students in a more effective manner for learning
	Planning, organization, and attention to detail
11. After this experience, are you more or less likely to consider teaching as a career? Why or why not?	More likely, really enjoyed the experience
	No change because it was never a plan they considered, however this course will help in other chosen career
12. Whether you choose teaching as a career or not, what skills will you take from this course that will help you in your future?	Universal skills, most commonly:
	Communication
	Patience
	Collaboration
	Organization and Time Management
Teaching skills, and realizing most people teach others at some point without having a "teaching job"	
13. Do you think your teaching skills improved? Why or why not?	Yes, because they had more confidence/ease in teaching and/or better engagement from students as semester progressed
14. What teaching skills do you still need to work on? How will you accomplish this?	Planning and preparation
	Public speaking/communication
	Patience
15. Any other thoughts on how this semester's teaching experiences affected you?	Thankful for the opportunity to be in the course
	Positive and enjoyable experience

### *ANSC 111 Student Survey*

Following initial email distribution and two additional email reminders, 90 participants responded of the 665 contacted providing a 14% total response rate. Of those 90 that responded 84 consented to provide their data and completed the survey for a 93% survey completion rate.

The ANSC 111 students who completed the survey were almost evenly split between the spring semester of 2020 (50%) and 2021 (48%), with only 2% responding that they participated remotely in the spring semester of 2021 and therefore did not have an undergraduate TA experience to evaluate. There were two sections between the two years that did not have an undergraduate TA due to scheduling challenges, when asked if the participants' section had an undergraduate TA, 86% participants answered yes. The largest grade classification represented within ANSC 111 student participants was Freshman (64%) as expected because this course is intended to be a second semester course of first year students. The remaining grade classifications were reported as follows: Sophomore (25%), Junior (10%), Senior (0%), and Transfer or Non-Traditional students (1%). Additionally, when asked to self-report the letter grade they received in ANSC 111 most reported they received an A (89%), B (10%), C (1%), and there were no reports of D or F.

The ANSC 111 student participants who were served by an undergraduate TA did not feel that having an undergraduate TA hindered student learning in any way. 71% of students felt the undergraduate TA was beneficial to student learning, 15% felt the undergraduate TA was somewhat beneficial, while the rest (14%) felt the undergraduate



TA did not make a difference one way or the other to student learning. When provided with open-ended questions about the positive or negative impacts their undergraduate TA had on their laboratory section the positive responses far outweighed the negative. 90% of participants stated their undergraduate TA had no negative impacts on their laboratory section. The remaining responses (10%) stating that their undergraduate TA did not do much for the laboratory as they felt the TA was not as knowledgeable as they should have been. In contrast, all participants could identify positive impacts that their undergraduate TA had on their laboratory section with the most common being the presence of another available person to answer questions that was relatable and approachable as the undergraduate TA had recently been in their shoes taking the course. Additional value was found in providing another perspective or alternative explanation to help with student understanding as well as helping with creating a positive class environment by being attentive and encouraging.

The remainder of the survey provided student perspectives on undergraduate TAs and their utilization in other courses beyond ANSC 111 laboratory. When asked if they would like to see undergraduate TA positions in other animal science laboratories 82% of participants stated they would as the undergraduate TA is a benefit to laboratories, with the remainder (18%) stating that they were neutral doesn't benefit laboratory, but also doesn't hinder laboratory. Though many of the participants expressed that they would like to see undergraduate TAs in other laboratories, fewer had actually had this experience outside of the ANSC 111 laboratory (61% had been in other courses with undergraduate TAs, 39% had not been in other courses with undergraduate TAs).

Students who had had other experiences with undergraduate TAs still believed that having an undergraduate TA helped with student learning with 73% identifying that the TA was beneficial, 22% identifying that the TA was somewhat beneficial, 5% identifying that the TA did not make a difference, and no responses saying that the TA hindered student learning. The number of other courses taken with undergraduate TAs varied between these students with the number of courses broken down as follows: 1 (23%), 2 (32%), 3 (23%), 4 (2%), and 5+ (20%). When asked to explain why the participants liked or disliked having undergraduate TAs as part of their courses there was an overwhelmingly positive response of reasons similar to those reported for their ANSC 111 undergraduate TA. Additionally, participants were asked which animal science courses they felt would benefit from having undergraduate TAs. Almost all laboratories as well as the large introductory lecture courses offered by the department were identified.

## **Discussion**

As described in the previous chapter, the Covid-19 pandemic did not allow the students in the ANSC 289 course during the spring 2020 semester to teach their final review in the ANSC 111 laboratory. Though they still completed the lesson plan portion of the final review project, the points that were originally allocated to their teaching evaluation by their graduate TA were instead given to the course critique assignment.

The students expressed excitement at the possibility of teaching their reviews and were disappointed that they had to miss this part of the undergraduate TA experience. The rationale for the change to online courses in 2020 was understood and most found the course critique assignment useful. The teacher characteristics paper was removed from the course in the spring 2021 semester for multiple reasons. The instructor had already realized that the assignment did not work as well as originally intended and in the course critique assignment a majority of the students from the 2020 semester identified the teacher characteristics paper as one thing they would eliminate from the course. Assessment of teaching characteristic content was included in quizzes and written communications that remained a part of the course, ensuring that the learning objectives were met. The students' perspectives pertaining to the rest of the assignments they completed during the semester showed the understanding and the appreciation they had gained for the value of well-written assessments and how these assessments should be aligned with the learning objectives to effectively determine if students met those objectives.

The instructor appreciated the students' honesty in admitting their struggles with some of the assignments and was encouraged by their reflections discussing reasons why they may have struggled and what they did get out of it when finished. Learning, rather than rote memorization, often includes some cognitive and/or emotional dissonance as incorporating new information that is at odds with what they already know requires students to first become unsatisfied with the way they currently think about the subject and then work with new information to understand it and why it works better than their

previous ideas (Terwel, 1999). The instructor anticipated that these students, who had been mainly in traditional STEM courses previously where there were clearly defined answers and class structures, would possibly struggle having open-ended assignments and a discussion-based class. This coupled with new content about teaching that may be in opposition to some pre-existing concepts they may have about teaching, only viewing it from the student side, made the first lab quiz assessment difficult for many of them. The instructor provided warning about this potential challenge and made sure to support students through the process. The assignments scaffolded from one to the next allowing the students to develop increased confidence in their teaching knowledge with each progression. Students made great improvement throughout the semester, and by the final review project many said it was their favorite part even though it was the hardest assignment in the course. Students did highlight an appreciation for some less rigorous points in the course, such as attendance, to help provide low stakes opportunities to dissipate risks of higher stakes assignments on their ultimate grades.

While teaching and animal science content knowledge and skills are course priorities, students were also able to recognize the universal skills they gained through the experience. Universal skills, sometimes referred to as soft skills in the literature, are the skills that are transferable across disciplines and careers, whether it is in education, animal science, or other. The undergraduate TAs self-identified improvement in many universal skills explicitly outlined in the course outcomes such as verbal communication, written communication, feedback, respect, connection to experience, as well as reflection and self-assessment. They also stated that they had developed other skills by

working with each other, their graduate TAs, and the students they served, including empathy, confidence, adaptability, attention to detail, positive attitude, and relationship building. It was clear that they developed relationships with their students and could reflect on the influences the groups had on each other as many of the undergraduate TAs' perceptions of what influence they had on their students aligned with reported responses about undergraduate TA impact from the ANSC 111 students' perspective.

Though the teaching methods course is an addition to the departmental curriculum, data suggests having undergraduate TAs help with courses is an existing practice. However, these TA positions, some in non-animal science courses, varied greatly on the expectations for the TAs, including previous teaching experience, and teaching effectiveness. This variation is common in many STEM disciplines and their use of undergraduate TAs (Marbach-Ad et al., 2012). Within animal science, many TA opportunities occur in the more specialized content areas, such as equine or meats, where there may be a fewer number of available graduate TAs with the necessary expertise. This was one of the reported benefits to utilizing undergraduate TAs in the animal science department as previously discussed. The value of content specific knowledge and skills was raised by both the undergraduate TAs and the ANSC 111 students in this study. This is not surprising because the ANSC 111 laboratory covers a wide range of species. The graduate and undergraduate TAs worked well as a team because they could provide guidance from their respective experience while receiving support from the other on the content areas which they may be less familiar with, therefore providing students with quality information across the scope of the course. In the future, a course

such as ANSC 289 may serve as a foundation for developing teaching skills and serve as a prerequisite for students to fill undergraduate TA positions in other courses.

The department saw benefits from the teaching methods course, as did the students and undergraduate TAs. Resultantly this course has been moved from a pilot special topics course to an official part of the departmental curriculum. This course will enable more students to partake in a unique teaching opportunity while continuing to provide high quality education in the ANSC 111 laboratory and additional departmental courses. Developing opportunities for undergraduate animal science students to acquire teaching experience, supported by education of the knowledge and skills required to teach effectively, could be an effective ways to improve education within the field of animal science, while providing present benefits in animal science departments.

## CHAPTER VI

### CONCLUSIONS

Previous from many disciplines identified clear benefits from allowing undergraduate students to serve as undergraduate teaching assistants (Fingerson and Culley, 2001; Goff and Lahme, 2003; Schalk et al., 2009; Weidert et al., 2012; Crowe et al., 2014; Philipp et al., 2016a; Felege, 2018; Bank, 2019), and the studies in this dissertation demonstrate that similar benefits are seen in the discipline of animal science. Though STEM fields have traditionally been conservative in the adoption of evidence based teaching practices for preparation of students for future success (Schwanitz, 1999), it is clear that there has been a recent shift to pursue improvement in pedagogical knowledge and techniques. Animal science has also seen an increase in literature related to teaching within common disciplinary journals, however, a gap still remains in relation to teaching assistants in animal science, which the studies in this dissertation work to address.

It is encouraging to see that many animal science departments are already offering undergraduate TA opportunities. By better characterizing these opportunities and what they provide the undergraduate TAs, the students, and departments, it is possible to begin to develop a plan to improve implementation of these opportunities. Ultimately working to transform an undergraduate TA opportunity from simply a good experience and resume builder for one student and extra hands to assist the instructor, to an effective and impactful personal growth experience in which universal and teaching

skills are developed. If successful, such opportunities benefit the undergraduate TA, students they serve, the instructor, and the department.

The development of the Animal Science Laboratory Teaching Methods (ANSC 289) course is a prime example of providing an effective learning experience to prepare students for future educational careers, while simultaneously leveraging the benefits of utilizing undergraduate TAs to improve the level of teaching for all involved within the animal science department. In addition to the academic and universal skill benefits, this course fills a gap within the department in the area of preparing students for educational careers. All students in the course reported improvement in teaching skills, and most had profound realizations regarding the amount of typically unseen effort and skill that goes into teaching. Many students indicated that they are more likely to enter educational careers after taking ANSC 289 and participating in the accompanying TA experience. Additionally, there was increased interest in TA opportunities from the undergraduate students enrolled in the ANSC 111 laboratory utilizing the undergraduate TAs. The official addition of this to animal science departmental curriculum will continue to raise awareness of and preparation for educational careers.

A future study of interest would be to implement similar courses at other institutions, and then analyze the impacts across a wider population of animal science departments as well as follow long term effects of allowing undergraduates to serve as TAs. Additionally, a valuable aspect of such a study would include characterizing the teacher education of instructors currently working within animal science departments at institutions of higher learning.



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APPENDIX A

CHAPTER TWO – LIST OF SCHOOLS WITH ANIMAL SCIENCE DEPARTMENTS

Classification	Institution	City	State
DU	Arkansas State University-Main Campus	Jonesboro	AR
DU	Auburn University	Auburn	AL
DU	California State University-Fresno	Fresno	CA
DU	Clemson University	Clemson	SC
DU	Colorado State University-Fort Collins	Fort Collins	CO
DU	Cornell University	Ithaca	NY
DU	Iowa State University	Ames	IA
DU	Kansas State University	Manhattan	KS
DU	Louisiana State University and Agricultural & Mechanical College	Baton Rouge	LA
DU	Louisiana Tech University	Ruston	LA
DU	Michigan State University	East Lansing	MI
DU	Middle Tennessee State University	Murfreesboro	TN
DU	Mississippi State University	Mississippi State	MS
DU	Missouri State University-Springfield	Springfield	MO
DU	Montana State University	Bozeman	MT
DU	New Mexico State University-Main Campus	Las Cruces	NM
DU	North Carolina A & T State University	Greensboro	NC
DU	North Carolina State University at Raleigh	Raleigh	NC
DU	North Dakota State University-Main Campus	Fargo	ND
DU	Ohio State University-Main Campus	Columbus	OH
DU	Oklahoma State University-Main Campus	Stillwater	OK
DU	Oregon State University	Corvallis	OR
DU	Pennsylvania State University-Main Campus	University Park	PA

<b>Classification</b>	<b>Institution</b>	<b>City</b>	<b>State</b>
DU	Purdue University-Main Campus	West Lafayette	IN
DU	Rutgers University-New Brunswick	New Brunswick	NJ
DU	Sam Houston State University	Huntsville	TX
DU	South Dakota State University	Brookings	SD
DU	Southern Illinois University-Carbondale	Carbondale	IL
DU	Stephen F Austin State University	Nacogdoches College	TX
DU	Texas A & M University-College Station	Station	TX
DU	Texas A & M University-Commerce	Commerce	TX
DU	Texas A & M University-Kingsville	Kingsville	TX
DU	Texas State University	San Marcos	TX
DU	Texas Tech University	Lubbock	TX
DU	The University of Findlay	Findlay	OH
DU	The University of Tennessee-Knoxville	Knoxville	TN
DU	University of Arizona	Tucson	AZ
DU	University of Arkansas	Fayetteville	AR
DU	University of California-Davis	Davis	CA
DU	University of Connecticut	Storrs	CT
DU	University of Delaware	Newark	DE
DU	University of Florida	Gainesville	FL
DU	University of Georgia	Athens	GA
DU	University of Hawaii at Manoa	Honolulu	HI
DU	University of Idaho	Moscow	ID
DU	University of Illinois at Urbana-Champaign	Champaign	IL
DU	University of Kentucky	Lexington	KY
DU	University of Maine	Orono	ME

<b>Classification</b>	<b>Institution</b>	<b>City</b>	<b>State</b>
DU	University of Maryland-College Park	College Park	MD
DU	University of Massachusetts-Amherst	Amherst	MA
DU	University of Minnesota-Twin Cities	Minneapolis	MN
DU	University of Missouri-Columbia	Columbia	MO
DU	University of Nebraska-Lincoln	Lincoln	NE
DU	University of New Hampshire-Main Campus	Durham	NH
DU	University of Rhode Island	Kingston	RI
DU	University of Vermont	Burlington	VT
DU	University of Wisconsin-Madison	Madison	WI
DU	University of Wyoming	Laramie	WY
DU	Utah State University	Logan	UT
DU	Virginia Polytechnic Institute and State University	Blacksburg	VA
DU	Washington State University	Pullman	WA
DU	West Virginia University	Morgantown	WV
MCU	Abilene Christian University	Abilene	TX
MCU	Alabama A & M University	Normal	AL
MCU	Angelo State University	San Angelo	TX
MCU	Buena Vista University	Storm Lake	IA
MCU	California Polytechnic State University-San Luis Obispo	San Luis Obispo	CA
MCU	California State Polytechnic University-Pomona	Pomona	CA
MCU	California State University-Chico	Chico	CA
MCU	Delaware Valley University	Doylestown	PA
MCU	Fort Valley State University	Fort Valley	GA
MCU	Huntington University	Huntington	IN
MCU	Lubbock Christian University	Lubbock	TX

<b>Classification</b>	<b>Institution</b>	<b>City</b>	<b>State</b>
MCU	Northwest Missouri State University	Maryville	MO
MCU	Southeast Missouri State University	Cape Girardeau	MO
MCU	Sul Ross State University	Alpine	TX
MCU	Tarleton State University	Stephenville	TX
MCU	Tuskegee University	Tuskegee	AL
MCU	University of Mount Olive	Mount Olive	NC
MCU	University of Wisconsin-Platteville	Platteville	WI
MCU	University of Wisconsin-River Falls	River Falls	WI
MCU	West Texas A & M University	Canyon	TX
MCU	Wilson College	Chambersburg	PA
BC	Abraham Baldwin Agricultural College	Tifton	GA
BC	College of the Ozarks	Point Lookout	MO
BC	Dordt College	Sioux Center	IA
BC	Oklahoma Panhandle State University	Goodwell	OK
BC	SUNY College of Agriculture and Technology at Cobleskill	Cobleskill	NY
BC	SUNY Morrisville	Morrisville	NY
BC	University of Minnesota-Crookston	Crookston	MN
BC	Vermont Technical College	Randolph	VT

*Classification based on Carnegie Classifications of Institutions of Higher Education to be broken into three broad categories: Doctoral Universities (DU), Master's Colleges and Universities (MCU), and Baccalaureate Colleges (BC).*



## APPENDIX B

### CHAPTER TWO – STUDY RECRUITMENT EMAIL

Howdy!

*We are reaching out to faculty in Animal Science departments across the country because we are trying to learn more about undergraduate teaching assistants' experiences within United States animal science departments.*

You have been selected as a participant in this study because you are familiar with your department's undergraduate student curriculum and if your department allows undergraduate students to serve as teaching assistants, as well as why your department has made this decision. **We are asking you to complete the linked Qualtrics survey OR if there is a better-suited faculty member to answer questions about undergraduate TAs in your department, you are free to forward this email to them to complete it instead.**

This survey will only take about 20 minutes to complete, and any identifying departmental information will be kept confidential. *Your assistance in this study will help to better characterize current undergraduate TA opportunities and provide valuable information about how to improve these opportunities to more effectively prepare these students for future teaching positions.*

**Please begin the survey by clicking on the link below:**

[https://tamuag.az1.qualtrics.com/jfe/form/SV\\_agYS5AzP88hgriK](https://tamuag.az1.qualtrics.com/jfe/form/SV_agYS5AzP88hgriK)

Feel free to contact Taylor Barnes with any questions or concerns.

[Taybarnes93@tamu.edu](mailto:Taybarnes93@tamu.edu)

TAMU IRB#: IRB2021-0569M IRB Approval Date: 7/22/2021

## APPENDIX C

### CHAPTER TWO – QUALTRICS SURVEY

#### **Link to Qualtrics survey**

[https://tamuag.az1.qualtrics.com/jfe/form/SV\\_agYS5AzP88hgriK](https://tamuag.az1.qualtrics.com/jfe/form/SV_agYS5AzP88hgriK)

#### **Questions from Qualtrics Survey**

##### *Informed Consent Block*

***Title of Research Study: Current opportunities for undergraduate teaching assistants as animal science majors in U.S. higher education institutions.***

***Investigators: Kathrin Dunlap and Taylor Barnes***

***Why am I being asked to take part in this research study?***

You are invited to participate in this study because we are trying to learn more about undergraduate teaching assistants' experiences within United States animal science departments.

You were selected as a possible participant in this study because you are familiar with your department's undergraduate student curriculum and if your department allows undergraduate students to serve as teaching assistants and why your department has made this decision.

***Why is this research being done?***

This study aims to assess how many animal science departments within institutions of higher education in the United States provide opportunities for undergraduate students to serve as TAs and what those opportunities provide the students who partake in them.

***How long will the research last?***

It will take about 20 minutes to complete the survey.

***What happens if I say “Yes, I want to be in this research”?***

If you decide to participate, please do the following: Complete all of the questions in this survey.

***What happens if I do not want to be in this research?***

Your participation in this study is voluntary. You can decide not to participate in this research and it will not be held against you. You can leave the study at any time.

***Is there any way being in this study could harm me?***

There are no sensitive questions in this survey that should cause discomfort. However, you can skip any question you do not wish to answer, or exit the survey at any point.

***What happens to the information collected for the research?***

You may view the survey host’s confidentiality policy at:  
<https://www.qualtrics.com/privacy-statement/>

No direct personal identifiers will be collected from you as a participant. The researchers will not be able to track who has or has not participated in the survey. Institution and department names will be coded by researchers before analyzing data.

The results of the research study may be published but no one will be able to identify you or your department.

***Who can I talk to?***

Please feel free to ask questions regarding this study. You may contact me later if you have additional questions or concerns: you can talk to the research team by contacting the principal investigator, Kathrin Dunlap, at [kdunlap@tamu.edu](mailto:kdunlap@tamu.edu) or by phone at (979) 845-2045 or the co-investigator, Taylor Barnes, at [taybarnes93@tamu.edu](mailto:taybarnes93@tamu.edu) or by phone at (402) 916-0944.

You may also contact the Human Research Protection Program at Texas A&M University (which is a group of people who review the research to protect your rights) by phone at 1-979-458-4067, toll free at 1-855-795-8636, or by email at [irb@tamu.edu](mailto:irb@tamu.edu) for:

- additional help with any questions about the research
- voicing concerns or complaints about the research
- obtaining answers to questions about your rights as a research participant
- concerns in the event the research staff could not be reached
- the desire to talk to someone other than the research staff

If you want a copy of this consent for your records, you can print it from the screen.

- If you wish to participate, please click the **“I Agree”** button and you will be taken to the survey.
  - If you do not wish to participate in this study, please select **“I Disagree”** or select **X** in the corner of your browser
1. I agree to provide consent to participate and provide data to this study.
    - I agree
    - I disagree

### *Departmental Demographic Information Block*

Please provide answers about the following demographic information in reference to your department. This information will give the researchers context before asking questions about undergraduate TA opportunities at your institution.

2. Name of university or college
3. Name of department
4. Approximate number of undergraduate students enrolled in your department
5. Approximate number of graduate students enrolled in your department

### *Does Department Allow Undergraduate TAs? Block*

For the scope of this study, undergraduate teaching assistants (TAs) are "undergraduate students that take part in helping for a course that they are not

actively taking with the goal of improving learning for the students in that course" whether the title Teaching Assistant is utilized or not.

If your department does allow undergraduate students to serve as TAs, selecting "Yes" or "Rarely or only under special circumstances" will route you to the block of survey questions about the undergraduate TA opportunities in your department.

If your department does **not** allow undergraduate students to serve as TAs, selecting "No" will route you to the block of survey questions about why undergraduate TAs are not utilized in your department.

6. Does your department allow undergraduate students to serve as teaching assistants (TAs) in your department?

Yes

Rarely or only under special circumstances

**\*\*If participant answers either of the above two options, the survey will proceed to the Undergraduate Questionnaire block and skip the Does Not Allow Undergraduate TAs block at the end of the survey**

No

**\*\*If participant answers no, the survey will skip forward to Does Not Allow Undergraduate TAs block of questions**

### *Undergraduate TA Questionnaire Block*

The following set of questions will be related to your department's utilization of undergraduate teaching assistants (TAs).

7. What types of courses do your department's undergraduate TAs help with? Select the most appropriate answer, or provide your own explanation.

Lecture courses

Lab courses

Both lecture and lab courses

Other, please specify: \_\_\_\_\_

8. Are undergraduate TAs compensated for their work that semester, or is it only for the learning experience? Select the most appropriate answer, or provide your own explanation.

They receive course credit

They receive payment

They receive BOTH course credit and payment

It is a learning experience only, with no compensation

Other, please specify: \_\_\_\_\_

9. If course credit is provided to undergraduate students serving as TAs, how does that appear on their transcript? Select the most appropriate answer, or provide your own explanation.

We have a teaching methods training course where students are expected to teach as part of the course

We have a general course number for students serving as a TA

We have a specified course section within our Experiential Learning or High Impact Learning (or similar title) course number specifically for teaching experience, including serving as a TA

We have teaching experiences, including serving as a TA, receive credit through Directed Studies (or similar title) course where a student can get credit for experience if they have a professor supporting and grading them

Other, please specify: \_\_\_\_\_

Undergraduate TAs do not receive course credit

10. If course credit is provided to undergraduate students serving as TAs, how many course credits do they receive? Select the most appropriate answer, or provide your own explanation.

1

2

3

4

5+

It varies based on the experience

Other, please specify: \_\_\_\_\_

Undergraduate TAs do not receive course credit

11. How would you describe the work that a majority of your department's undergraduate TAs are expected to perform? Select the most appropriate answer, or provide your own explanation.

Undergraduate TA is mainly just extra hands to help facilitate activities (i.e. set-up before, clean-up after, hold animals, run errands, etc.) but is not actively involved in teaching material for the course

Undergraduate TA is another resource to help answer questions about activities and content during class, but is not actively involved in teaching material for the course

Undergraduate TA is expected to do some teaching of material during class and/or outside of class (i.e. holding exam reviews outside of class time) and/or helps with some grading during the semester, but is not actively involved in teaching decisions about the course.

Undergraduate TA works closely with the instructor to actively be involved in many decisions about teaching during the semester and is expected to assist with the teaching of the material during the course

Undergraduate TA is expected to functionally be the instructor for the course, similar to a graduate TA. The instructor is not present in class so the undergraduate TA teaches content, manages the classroom, and performs all grading responsibilities themselves. Instructor is only serving a supporting role rather than an active presence unless an issue arises.

Other, please explain: \_\_\_\_\_

12. Are your undergraduate TAs expected to receive teacher training (teaching strategies, pedagogical techniques, classroom management, etc.)? If yes, please select the most appropriate answer, or provide your own explanation.  
No. Undergraduate TAs receive official no teacher training

Yes. Undergraduate TAs attend a university-required teacher training prior to teaching

Yes. Undergraduate TAs complete a teacher training course prior to teaching

Yes. Undergraduate TAs are enrolled in a teacher training course in which serving as a TA is part of the course requirements. After taking this course, undergraduate TAs may serve in other courses.

Yes. The instructor of the course is expected to provide teacher training to the undergraduate TA during the semester in addition to any training needed to simply assist.

Yes. Other, please explain: \_\_\_\_\_

---Page Break---

The following questions will be open-ended to allow you to describe the impact of allowing undergraduate students to serve as TAs in your department. We would like to examine this impact from multiple perspectives:

how this affects the undergraduate TAs themselves

how this affects your department

how this affects the students in courses who have undergraduate TAs

We hope to learn about both the benefits and the challenges of providing these teaching opportunities to undergraduate students.

13. What benefits have you seen *for the undergraduate students who serve as TAs* in your department?

14. What challenges have the *undergraduate TAs* in your department encountered?

15. What benefits has your department seen by allowing undergraduate students to serve as TAs?

16. What challenges has your department encountered in regards to undergraduate TAs? Could be in providing the teaching opportunities, the student work, or both.

17. Have you observed any benefits to the students who participate in a course with undergraduate TAs? If yes, please explain.



18. Have you observed any challenges and/or detriments to student learning by allowing undergraduates to serve as TAs in courses? If yes, please explain.
19. Is there anything you would like to change about the undergraduate TA experience in your department? If yes, please explain and identify any challenges your department is encountering to implementing these changes.

*Does Not Allow Undergraduate TAs Block*

The following set of questions will be related to understanding why your department does not utilize undergraduate teaching assistants (TAs).

20. Has your department ever allowed undergraduate students to serve as TAs?  
We have never allowed undergraduate TAs  
We used to allow undergraduate TAs, but encountered challenges that caused us to stop doing so

**\*\*If they used to allow, Question 20 will appear**

21. What caused your department to stop allowing undergraduate students serve as TAs? Please select all that apply and/or explain other factors.

University-mandated changes

Financial constraints

Problems with undergraduate TAs themselves (poor commitment, attendance, etc.)

Training constraints

Student interest in TA opportunities declined

Other, please explain:

22. Please explain why undergraduate students do not serve as TAs in your department.
23. Would your department be interested in providing undergraduate students the opportunity to serve as TAs?

No

**\*\*If participant answers “No” they will skip to the end of the survey**

We are planning to provide these opportunities in the future

We are interested in allowing undergraduate students to serve as TAs, but have encountered challenges to providing this opportunity

The idea of allowing undergraduates to serve as TAs has simply never been brought up in our department before

24. If your department would like to provide this opportunity to undergraduate students but currently do not, please describe the challenges you have encountered that are keeping you from doing so.

*End of survey slide*

## APPENDIX D

### CHAPTER FOUR – ANSC 111 STUDENT RECRUITMENT EMAIL

Howdy!

*We are reaching out to past ANSC 111 students as we are trying to learn more about undergraduate teaching assistant's impact on student learning.*

You were selected as a possible participant in this study because you were enrolled in ANSC 111 during the semesters where undergraduate teaching assistants (TAs) were utilized, Spring 2020 and Spring 2021. **We are asking you to complete the linked Qualtrics survey to help us with this study.**

This survey will only take about 20 minutes to complete, and any identifying information will be kept confidential. *Your assistance in this study will help to better characterize an undergraduate TA's impact on student learning and provide valuable information about how to improve these opportunities to more effectively prepare these students for future teaching positions.*

**Please begin the survey by clicking on the link below:**

[https://tamuag.az1.qualtrics.com/jfe/form/SV\\_7aBEdXNHBYFYJmu](https://tamuag.az1.qualtrics.com/jfe/form/SV_7aBEdXNHBYFYJmu)

Feel free to contact Taylor Barnes with any questions or concerns.

[Taybarnes93@tamu.edu](mailto:Taybarnes93@tamu.edu)

TAMU IRB#: IRB2019-1566M IRB Approval Date: 7/22/2021

## APPENDIX E

### CHAPTER FOUR – ANSC 111 STUDENT SURVEY

#### **Link to Qualtrics survey**

[https://tamuag.az1.qualtrics.com/jfe/form/SV\\_7aBEdXNHBYFYJmu](https://tamuag.az1.qualtrics.com/jfe/form/SV_7aBEdXNHBYFYJmu)

#### **Questions from Qualtrics survey**

##### *Informed Consent Block*

***Title of Research Study: Current opportunities for undergraduate teaching assistants as animal science majors in U.S. higher education institutions.***

***Investigators: Kathrin Dunlap and Taylor Barnes***

#### ***Why am I being asked to take part in this research study?***

You are invited to participate in this study because we are trying to learn more about undergraduate teaching assistants' experiences within United States animal science departments.

You were selected as a possible participant in this study because you are familiar with your department's undergraduate student curriculum and if your department allows undergraduate students to serve as teaching assistants and why your department has made this decision.

#### ***Why is this research being done?***

This study aims to assess how many animal science departments within institutions of higher education in the United States provide opportunities for undergraduate students to serve as TAs and what those opportunities provide the students who partake in them.

#### ***How long will the research last?***

It will take about 20 minutes to complete the survey.

#### ***What happens if I say "Yes, I want to be in this research"?***

If you decide to participate, please do the following: Complete all of the questions in this survey.

***What happens if I do not want to be in this research?***

Your participation in this study is voluntary. You can decide not to participate in this research and it will not be held against you. You can leave the study at any time.

***Is there any way being in this study could harm me?***

There are no sensitive questions in this survey that should cause discomfort. However, you can skip any question you do not wish to answer, or exit the survey at any point.

***What happens to the information collected for the research?***

You may view the survey host's confidentiality policy at:  
<https://www.qualtrics.com/privacy-statement/>

No direct personal identifiers will be collected from you as a participant. The researchers will not be able to track who has or has not participated in the survey. Institution and department names will be coded by researchers before analyzing data.

The results of the research study may be published but no one will be able to identify you or your department.

***Who can I talk to?***

Please feel free to ask questions regarding this study. You may contact me later if you have additional questions or concerns: you can talk to the research team by contacting the principal investigator, Kathrin Dunlap, at [kdunlap@tamu.edu](mailto:kdunlap@tamu.edu) or by phone at (979) 845-2045 or the co-investigator, Taylor Barnes, at [taybarnes93@tamu.edu](mailto:taybarnes93@tamu.edu) or by phone at (402) 916-0944.

You may also contact the Human Research Protection Program at Texas A&M University (which is a group of people who review the research to protect your rights) by phone at 1-979-458-4067, toll free at 1-855-795-8636, or by email at [irb@tamu.edu](mailto:irb@tamu.edu) for:

- additional help with any questions about the research
- voicing concerns or complaints about the research
- obtaining answers to questions about your rights as a research participant
- concerns in the event the research staff could not be reached
- the desire to talk to someone other than the research staff

If you want a copy of this consent for your records, you can print it from the screen.

- If you wish to participate, please click the **“I Agree”** button and you will be taken to the survey.
- If you do not wish to participate in this study, please select **“I Disagree”** or select **X** in the corner of your browser

1. I consent to participate in, and provide data for, this study.

**I Agree**

**I Disagree**

### *Demographic Block*

The questions in this survey will pertain to the semester you were enrolled in the ANSC 111: Animal Production Systems lab. Please provide information related to your time in the course below.

2. Which semester did you take the ANSC 111 lab? If it was Spring 2021, please specify if you took the course face-to-face or remotely.

Spring 2020

Spring 2021 - Face-to-face

Spring 2021 - Remote (all online)

\*\*If participant answers “Remote” they will be routed to the Perceptions on general undergraduate TAs block as they did not have an undergraduate TA

3. What was your grade classification (based on enrollment, not credit hours) the semester you took ANSC 111 lab?

Freshman

Sophomore

Junior

Senior

Transfer or Non-traditional student

4. What letter grade did you receive in ANSC 111?

A

B

C

D

F

I

Q-drop

*Perceptions on ANSC 111 Undergraduate TAs Block*

The following questions will pertain to your perceptions about the impact your undergraduate TA had on the ANSC 111 lab and student learning.

5. Did your lab section have an undergraduate TA? If your answer is no, because you were in one of the two sections who did not have an undergraduate TA, the survey will skip to the next set of questions.

Yes

No

**\*\*If participant answers "No" they will be routed to the Perceptions on general undergraduate TAs block as they did not have an undergraduate TA**

6. Did you feel that having an undergraduate TA in your ANSC 111 lab helped with student learning?

Undergraduate TA was beneficial to student learning

Undergraduate TA was somewhat beneficial to student learning

Undergraduate TA did not make a difference to student learning

Undergraduate TA somewhat hindered student learning

Undergraduate TA hindered students learning

7. What positive impacts did your undergraduate TA have on your lab section?

8. What negative impacts, if any, did your undergraduate TA have on your lab section?

9. Would you like to see undergraduate TA positions in other animal science labs besides ANSC 111?

Yes! The undergraduate TA is a benefit to labs

Neutral. The undergraduate TA doesn't benefit lab, but also doesn't hinder lab

No. The undergraduate TA hinders student learning

*Perceptions on General Undergraduate TAs Block*

10. Have you been in any courses, outside of ANSC 111, that had an undergraduate TA?

Yes

No

**\*\*If participant answers “No” they will skip to the end of the survey**

11. How many courses have you taken that had an undergraduate TA?

1

2

3

4

5+

12. Did you feel that having an undergraduate TA helped with student learning?

Undergraduate TA was beneficial to student learning

Undergraduate TA was somewhat beneficial to student learning

Undergraduate TA did not make a difference to student learning

Undergraduate TA somewhat hindered student learning

Undergraduate TA hindered students learning

13. Explain why you like or dislike having undergraduate TAs as part of courses you have taken.

14. What other animal science courses, if any, do you think would benefit from having undergraduate TAs? Please explain why an undergraduate TA would be helpful.

*End of survey slide*



## APPENDIX F

### CHAPTER FOUR – COURSE CRITIQUE ASSIGNMENT QUESTIONS

#### *Instructions*

1. Remember to put your name on the document
2. Provide your honest, constructive feedback, *both positive and negative comments*, on the topics listed on the next page. You can do this in whatever format you like (bullet points, outline form, paper format, etc.) as long as you clearly get your thoughts across. Please suggest changes for the aspects of the course you disliked. You are more than welcome to provide insight on topics not listed on the next page as well.
3. Save your file as “LastName – Sp20 Course Critiques” as either Word or PDF file.
4. Submit on Canvas by Wednesday, April 28<sup>th</sup> at 11:59 pm.

#### **ANSC 111**

- Class format
- Class assignments/grading
  - Weekly Quizzes
  - Weekly Attendance/Participation
  - Final Practical
- Content
  - Additional things to include? Things to remove from course?
  - Way content was presented (Activities and Schedule)
- Your work as an undergraduate TA
- Graduate TAs
- Your views on student perceptions
  - The course
  - Undergraduate TA
  - Graduate TA
- Other thoughts and/or ideas??

#### **ANSC 289**

- Class format
- Class assignments/grading

- Things you can consider are, but not limited to: assignment's contribution to your learning, instructions and grading, amount of work, weight (point value) of assignments as part of whole course grade, etc.
  - ANSC 111 Lab Quiz Assessment
  - ANSC 111 Lab Practical Station Assessment
  - Lead ANSC 111 Review
    - Lesson Plan
    - Teaching Evaluation by Graduate TA\*\*
  - Self-Evaluation
  - Course Critique
  - Quizzes
  - Attendance
- Content
  - Additional things to include? Things to remove from course?
  - Way content was presented (Activities and Schedule)
- Taylor's teaching behaviors and style
- Impact of this course allowing undergraduate TAs for ANSC 111
  - Your teaching
  - Your personal life/choices/characteristics/thoughts
  - Undergraduate students in ANSC 111
  - Graduate TAs for ANSC 111
  - Animal Science Department
- Other thoughts and/or ideas??

## APPENDIX G

### CHAPTER FOUR – TEACHING SELF-EVALUATION ASSIGNMENT QUESTIONS

#### *Instructions*

For this assignment I want you to reflect on the effects this course had on you, both as a person and as a teacher. There are no formatting requirements for this assignment, however you do need to put some thought into and answer the questions with detail. If you put your name on the document, thoughtfully answer each question, and turn this assignment in on time you will earn full points. **Submit this assignment on Canvas by Wednesday, April 28<sup>th</sup> at 11:59 pm.**

Please answer the following questions:

1. How have your thoughts about teaching and/or teachers changed throughout this semester?
2. How have your thoughts about students and/or being a student changed?
3. What thing did you learn about teaching that surprised you the most?
4. What was your favorite experience from this semester (either in ANSC 111 lab or 289 class, or both)?
5. What was your least favorite experience from this semester?
6. What influences did your graduate TA have on you?
7. What influences do you think you had on your graduate TA?
8. What influences did your students have on you?
9. What influences do you think you had on your students?
10. What did you find the hardest part of teaching was for you? Why?
11. After this experience, are you more or less likely to consider teaching as a career? Why or why not?
12. Whether you choose teaching as a career or not, what skills will you take from this course that will help you in your future?
13. Do you think your teaching skills improved? Why or why not?
14. What teaching skills do you still need to work on? How will you accomplish this?
15. Any other thoughts on how this semester's teaching experiences affected you?