# IMPACT OF A STUDY ABROAD COURSE ON HELPING PRE-VET STUDENTS AFFIRM THEIR CAREER ASPIRATIONS TO BECOME VETERINARIANS: A MIXED METHODS CASE STUDY

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To ALL who have and keep contributing to my journey of education. Gracias!



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Abstract: This mixed methods, embedded case study sought to explore, understand, and interpret the impact of a study abroad course on pre-vet students' aspirations to become veterinarians. The study also strove to describe their views on the influence of local culture and the practice of veterinary medicine in Mexico. Several research procedures complemented the study as operationalized in three phases: qualitative, quantitative, and qualitative. Twenty-five students participated in a study abroad course tailored to veterinary medicine during the summer of 2019 and were the source of data. To answer the study's three research questions, the first research phase used textual content analysis, phenomenological, and photovoice procedures to distill students' perceptions from their written and photo journals. A retrospective evaluation was used for the study's quantitative phase. And timeline interviews guided the final phase of data collection to better understand the students' aspirations of remaining in or exiting the pre-vet option. Students perceived that veterinary medicine in Mexico was structured differently from the U.S. approach and the nation's socioeconomic and agroclimatology conditions impacted the delivery of veterinary care and affected the work settings and practice of veterinarians. They also perceived that socio-cultural views about the purpose of animals were significantly different compared to the United States, and veterinary medicine and animal welfare in Mexico were practiced in accord with such. The course contributed to enhancing students' understanding of application requirements to schools of veterinary medicine, practice options, and professional expectations of a DVM. Overall and in concert with the proposition of human capital theory, the course helped some students confirm their career aspirations and others realize that veterinary medicine was not the best career fit for them. Students' interactions with the learning environment, i.e., the study abroad experience, influenced their career aspirations, as postulated by interest-based motivation theory and person-environment fit theory. Recommendations are offered for practice and additional research, e.g., institutions should create or facilitate appropriate and timely learning opportunities for students to fully understand and confirm their interests in the veterinary profession while undergraduates; and other investigations should also seek to determine factors likely to influence pre-vet students' career choices.

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# CHAPTER I

## INTRODUCTION

Sprecher (2004), a Doctor of Veterinary Medicine (DVM) and coordinator of professional programs in the College of Veterinary Medicine at Michigan State University, foresaw:

> Veterinary medicine is at a crossroads: the future of the profession will be determined by those who join it and by those who select who will join it. Veterinary schools are the gatekeepers of the profession, and the entire veterinary profession is responsible for ensuring that the image it presents to those who will join it matches the social needs that it must serve. (p. 199)

Approximately three million first-time students enroll at institutions of higher education in the United States each year (National Student Clearinghouse, 2017, 2018, 2019). Many intended to apply to schools of veterinary medicine after their undergraduate studies (Association of American Veterinary Medical Colleges [AAVMC], 2019; OSU College of Veterinary Medicine [CoVM], 2020). These students will be referred to as *pre-vet students* in this study.

Pre-vet students will invest considerable amounts of time, money, and effort during college trying to meet application requirements to schools of veterinary medicine

(AAVMC, 2019; OSU CoVM, 2020), e.g., taking or retaking required courses (AAVMC, 2020b; Burzette et al., 2017; Jackson & Dawson-Saunders, 1987; Kogan et al., 2009; McRae, 2010) and working or volunteering to gain veterinary practice experience (AAVMC, 2019). However, for a majority of pre-vet students, this investment will be unproductive for two reasons: 1) they will not be able to fulfill application requirements during college, or 2) they will not be admitted to schools of veterinary medicine (AAVMC, 2019; OSU CoVM, 2020). And even for some students admitted to schools of veterinary medicine, their time spent in college may not have adequately prepared them to succeed (Amass et al., 2011; Fish & Griffith, 2014).

Helping pre-vet students realize whether the veterinary profession is an appropriate career fit, as early as possible during college, could save them significant tangible and psychological investments. And doing so may not only benefit the students but also the veterinary profession. In this study, three components framed this approach to helping pre-vet students affirm their career aspirations: a) the fulfillment of application requirements to schools of veterinary medicine; b) the understanding of different practice options within veterinary medicine; and c) the professional expectations for the practice of veterinary medicine.

Admission to schools of veterinary medicine in the United States involves not only the consideration of a high-grade point average but also course prerequisites with minimum grade requirements, standardized tests, veterinary practice experiences, leadership skills, communication skills, and letters of recommendation from experts in the field (AAVMC, 2019). According to the AAVMC (2014), the average applicant to schools of veterinary medicine in the United States is as a 24-year old, White female with a suburban background

who had earned a bachelor's degree and applied for admission an average of 1.2 times. She had an average GPA of 3.56, more than 2000 veterinary practice experience hours, and Graduate Record Examination (GRE) scores of 155, 154, and 3.9 on the verbal, quantitative, and analytical components of the test, respectively (AAVMC, 2014). The average GPA for a college graduate in the United States in 2018 was 3.15 on a 4.0 scale and the average GRE scores for those who took the test were 153, 150, and 3.9 on the verbal, quantitative, and analytical components, respectively (AAVMC, 2019; Educational Testing Service, 2019). The maximum scores a test taker can receive for the GRE categories are 170, 170, and 6 (The GRE Test, 2020).

In addition, a better understanding of the different practice options in veterinary medicine by pre-vet students may only benefit the profession. Veterinary medicine is experiencing an imbalance in supply and demand of veterinarians in practice options such as food animals versus companion animals, especially in rural areas of the United States (Bushy & Leipert, 2005; Daly & Erickson, 2012; Hashizume et al., 2015; Kondalsamy-Chennakesavan et al., 2015; Laven et al., 2003; Rolfe et al., 1995; Walker et al., 2012). However, most veterinary practice experience opportunities for pre-vet students focus mainly on companion animal practice in urban or suburban areas (Ilgen et al., 2003; Lenarduzzi et al., 2009; Sprecher, 2004). And it is important to consider that type of veterinary practice experience has been found to be related to the practice options chosen by beginning veterinarians; i.e., their practice options are usually similar to the veterinary practice experience choices they made (Amass et al., 2011; Ilgen et al., 2003; Lenarduzzi et al., 2009). Offering pre-vet students veterinary practice experiences representative of all practice

options in veterinary medicine may contribute to correcting the imbalance in supply and demand of veterinarians in the United States.

Moreover, although always a demanding occupation, the veterinary profession has experienced rising rates of practice-related distress, job dissatisfaction, and practitioner suicide rates in recent years (Bartram & Baldwin, 2010; Chan, 2019; Lau, 2018; National Research Council, 2013; Nett et al., 2015; Platt et al., 2012; Strand et al., 2005; Tomasi et al., 2019). Experts recommend that those aspiring to join the profession have a broad understanding of the occupational expectations of veterinarians (AAVMC, 2019; Chan, 2019; Lau, 2018; National Research Council, 2013). They have proposed to *deglamorize the profession* (Lau, 2018). For example, a social worker who developed a suicidal prevention program for the company Banfield stated: "[The veterinary profession is] not all puppies and kittens and wonderful experiences. There's a lot of pain involved" (Chan, 2019, para. 12). Pre-vet students would likely benefit from learning experiences intended to help them understand better the veterinary profession, including its challenges, stressors, and difficulties.

Again, learning experiences that help pre-vet students better understand application requirements to schools of veterinary medicine, different practice options available to them, and professional expectations for the practice of veterinary medicine would most likely benefit the students and the veterinary profession (Amass et al., 2011; Fish & Griffith, 2014). In a review of literature about postsecondary student success, Kuh et al. (2006) identified effective educational practices that promoted *deep learning* by enhancing student engagement and overall student success. Later, Kuh (2008) outlined 10 learning experiences as *high-impact educational practices* (HIEPs): 1) first-year seminars and experiences; 2)

common intellectual experiences; 3) learning communities; 4) writing-intensive courses; 5) collaborative assignments and projects; 6) undergraduate research; 7) diversity/global learning; 8) service learning, community-based learning; 9) internships; and 10) capstone courses and projects. Kuh (2008) recommended that student participate in at least two of these HIEPs.

In this regard, studying abroad, a component of Kuh's (2008) HIEPs, including global learning, has been identified by participants as "one of the most important experiences students can have during their undergraduate years" (Paige et al., 2009, p. 41). Geyer et al. (2017) concluded that short-term study abroad courses have an impact on students' leadership and career development. In its general education curriculum, OSU requires that undergraduate students complete at least one contemporary international culture (I) course to learn about global issues and challenges, and many of these courses include an international travel component of about two weeks in length (Oklahoma State University, 2021b). If tailored to the veterinary profession, these short-term study abroad courses may help pre-vet students to fulfill application requirements to schools of veterinary medicine, to explore different practice options, to realize the occupational expectations of veterinarians, and to determine whether the veterinary profession is an appropriate career fit for them. Moriba et al. (2012) reported that courses of this kind in OSU's college of agriculture enhanced students' views of their international awareness and the need for such, including aspects of the agriculture sector.

Study abroad courses related to veterinary medicine could help pre-vet students not only understand better the different practice options in veterinary medicine but also affirm their career aspirations to become veterinarians (Abrams; 1979; Arghode et al., 2020; Geyer

et al., 2017; Jon et al., 2018; Kronholz, & Osborn, 2016; Paige et al., 2009). Exposing pre-vet students to opportunities to either *affirm* or *disconfirm* their professional aspirations to become veterinarians as early as possible during college may save them time, money, and effort, and perhaps persuade some students to focus on different career pathways as a result (AAVMC, 2019; Chan, 2019; Lau, 2018; National Research Council, 2013). In addition, Mohajeri Norris et al. (2009) posited that "advisors serve an important function in helping students investigate program options. Advisors and students need to understand not only the student's priorities for studying away from the home institution but also the student's ideas about graduate school and career" (p. 395), this includes pre-vet undergraduate majors and concentrations. As such, universities should consider offering study abroad courses tailored to pre-vet students and encourage them to participate in such.

In this regard, OSU's Ferguson College of Agriculture offered the study abroad course *AG 3803: International Study Tour in Agricultural Sciences and Natural Resources: Mexico* during the summer of 2019. The description of the course was the following:

> This course consists of multiple experiences through readings, meetings, site visits, travel, multidisciplinary discussions, and critical written, verbal, and multimedia reflections on veterinary education in Mexico. Also, students will have the opportunity to experience rural ambulatory veterinary medicine in a developing country, as well as the use of equids in agriculture and daily lives of rural Mexicans and human-animal interactions that are an integral part of rural Mexican life. Overall, this course is an exploration into the contemporary education, culture, agriculture, veterinary medicine, and animal welfare of a culturally and historically rich neighbor of the United States (see Appendix A).

The course included eight objectives stating:

At the conclusion of the course, students will have:

1. Developed familiarity with history, culture and current issues relating to Mexico.
2. Experienced and explored the unique relationship between rural Mexican communities and animals they own.
3. Enriched understanding of the One Health concept.
4. Hands-on experience of field veterinary medicine in two rural communities in Mexico, a university-owned ranch, and in a private operation.
5. Developed lasting relationships with Mexican veterinary students and veterinarians by working side-by-side in ambulatory clinics.
6. Developed skills in cross-cultural/international communication with persons from a different culture.
7. Developed writing and self-reflection skills through daily journaling during the trip.
8. Experienced orally presenting their individual focus topics to others on the trip and after conclusion of the trip.

See Appendix A to review the course syllabus in its entirety.

## Statement of the Problem

Although studies have been conducted to understand the influence of study abroad courses on undergraduate students' career aspirations (Arghode et al., 2020; Jon et al., 2018; Kronholz & Osborn, 2016; Mohajeri Norris et al., 2009; Paige et al., 2009), limited research exists regarding the impact of study abroad courses on the affirmation of pre-vet students'

career aspirations to become veterinarians (Cake et al., 2019). With so much at stake for pre-vet students, schools of veterinary medicine, and the veterinary profession, examining a learning experience that may help students make better-informed choices as well as improve their related career outcomes warranted rigorous investigation. The need to fill this gap in the literature motivated the researcher to pursue this line of inquiry.

## Conceptual Framework

This study was undergirded by human capital theory (HCT). *Human capital* includes the array of abilities individuals can acquire that may positively impact their well-being (Becker, 1962, 1994; Mincer 1958; Schultz, 1961; Smith, 1776), including work-life and career-related pursuits. These abilities or skills are attained by knowledge gained from formal and informal education, training, and other experiences, and are also shaped by individuals' personality attributes (Becker, 1962, 1994; Mincer 1958; Schultz, 1961; Smith, 1776). The experiences undergone by undergraduate students who participated in a study abroad course may help them affirm professional aspirations while also impacting their overall well-being. Study abroad courses, as offered by U.S. universities, may be an important contributor to human capital development depending on the students themselves, their career motivations and aspirations, and the learning contexts they experience, i.e., interest in their surrounding environment, including pre-vet students.

## Theoretical Framework

Interest is the main driver of motivation (Dewey, 1913; Krapp, 1999, 2005; Renninger et al., 1992; Schiefele, 1991) regarding individuals' aspirations, including their career choices. To this point, Dewey (1913) stated:

> The genuine principle of interest is the principle of the recognized identity of the fact to be learned or the action proposed with the growing self; that it lies in the direction of the agent's own growth, and is, therefore, imperiously demanded, if the agent is to be himself [herself, or themself]. Let this condition of identification once be secured, and we have neither to appeal to sheer strength of will, nor to occupy ourselves with making things interesting. (p. 7)

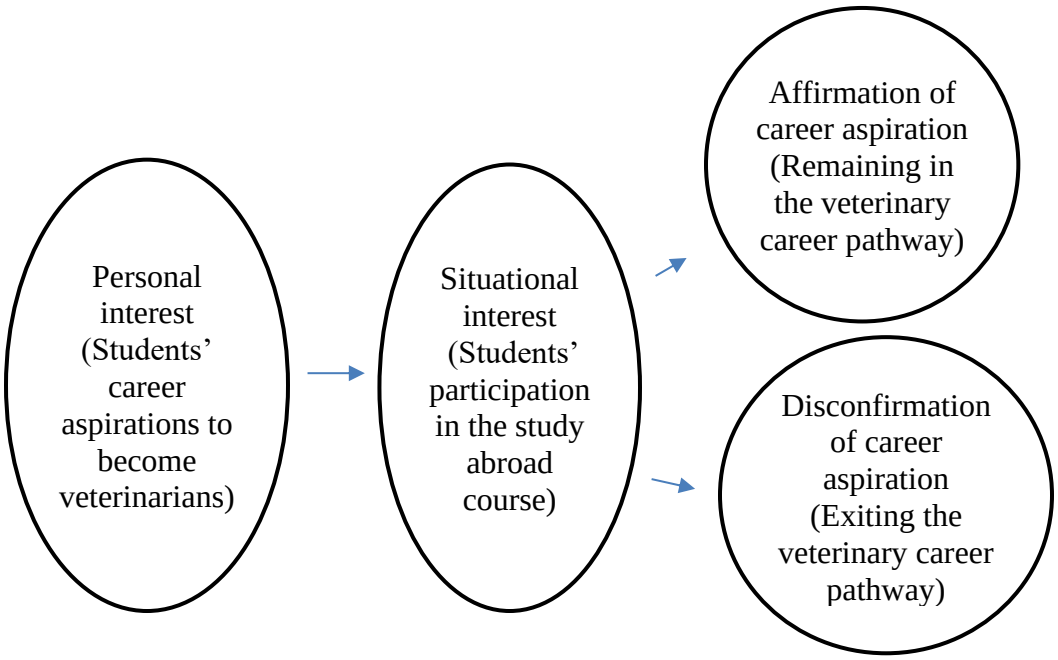
Interest-based motivation theory (IBMT) (Hidi & Anderson, 1992; Krapp et al., 1992; Renninger et al., 1992; Shen et al., 2003) served as the primary lens through which to understand and interpret this case study. According to IBTM proponents, *interest* is a physiological preference of an individual over a range of choices, and is, therefore, the main motivation to execute an action (Hidi & Anderson, 1992; Krapp et al., 1992; Renninger et al., 1992; Shen et al., 2003). IBMT researchers have conceptualized two components of motivational interests: *personal interest* and *situational interest* (Hidi & Anderson, 1992; Krapp et al., 1992; Renninger et al., 1992; Shen et al., 2003). *Personal interest* can be defined as an individual's long-term psychological preference of one action over others (Hidi & Anderson, 1992; Krapp et al., 1992; Renninger et al., 1992; Shen et al., 2003), and *situational interest* is operationalized as the state to which an individual's interaction with a *context and moment-specific activity* may capture the person's attention (Hidi & Anderson, 1992; Krapp et al., 1992; Renninger et al., 1992; Shen et al., 2003). *Situational interest* often has a short-term effect on an individual's preferences, but it can have a longer effect and thereby influence one's personal interest (Krapp et al., 1992).

In this study, *personal interest* was represented by students' preferences to become veterinarians (career aspirations), and *situational interest* was exemplified by their

participation in a study abroad course. The extent to which situational interest influenced personal interest was demonstrated by the impact of the students' participation in the study abroad course on their aspirations to become veterinarians, i.e., career choice affirmation (see Figure 1). The effect of the interaction between an individual and his or her environment also has been highlighted in the person-environment fit theory (P-E Fit) [Edwards et al., 1998; Rauthmann, 2021], which essentially hypothesizes the impact of the interaction between individuals and their environments.

**Figure 1**

*The Study's Operationalization of* ***Interest-Based Motivation Theory (IBMT)*** [Renninger et al., 1992]




## Purpose of the Study

Overall, this mixed methods case study sought to explore, understand, and interpret the impact of a study abroad course on pre-vet students' aspirations to become veterinarians. In addition, the study strove to describe pre-vet students' views on the influence of local

culture and the overall practice of veterinary medicine in Mexico. The investigation identified specific factors associated with the study abroad course that appeared to help students either affirm or disconfirm their career aspirations to become veterinarians.

Rule and John (2015) concluded:

> Case study is a widely prevalent approach within educational research but has been criticized for its lack of theoretical depth and rigor. . . . [However, i]n the recursive practice of research, case study can involve a dialogic relation between theory and research, and case study might engage with theory in different ways at different stages of the study. (p. 7)

The pre-vet students who participated in the study abroad course *AG 3803: International Study Tour in Agricultural Sciences and Natural Resources: Mexico* (see Appendix A) during the summer of 2019 were the subjects of this investigation's case and source of its data.

## Research Questions

Three research questions guided this study:

1. What were the perceptions of students who participated in the study abroad course *AG 3803: International Study Tour in Agricultural Sciences and Natural Resources: Mexico* regarding the practice of veterinary medicine in Mexico?
2. What were the AG 3803 students' perceptions regarding the influence of culture on the practice of veterinary medicine in Mexico?
3. How did the study abroad course *AG 3803: International Study Tour in Agricultural Sciences and Natural Resources: Mexico* impact students' decisions to affirm or disconfirm their career aspirations to become veterinarians?

## Assumptions

Five assumptions were identified for this study:

1. Participants in the study abroad course *AG 3803: International Study Tour in Agricultural Sciences and Natural Resources: Mexico* had similar learning experiences regardless of their majors, class levels, or pre-veterinary curriculum concentrations.
2. Participants in the study abroad course *AG 3803: International Study Tour in Agricultural Sciences and Natural Resources: Mexico* were honest regarding the preparation of their assignments.
3. Participants in the study abroad course *AG 3803: International Study Tour in Agricultural Sciences and Natural Resources: Mexico* were truthful when responding to the course's evaluation.
4. Participants in the study abroad course *AG 3803: International Study Tour in Agricultural Sciences and Natural Resources: Mexico* were forthcoming and honest in their responses during the study's follow up interviews.
5. The researcher, who was also the instructor for the study abroad course *AG 3803: International Study Tour in Agricultural Sciences and Natural Resources: Mexico*, bracketed his potential biases while collecting, analyzing, interpreting, and reporting the study's findings.

## Limitations

Eight limitations were identified for this study:

1. The study abroad course was designed, promoted, administered, taught, and evaluated mainly by the researcher.

2. The researcher is employed by the Ferguson College of Agriculture at OSU and part of his job appointment involves designing, administering, and evaluating study abroad courses.
3. The researcher is a citizen of Mexico who had previous professional relationships with most of the local contacts in the places visited during the study abroad course.
4. The data collected were readily available, reliable, sufficient, and suitable to achieve the study's purpose.
5. Travel delays, changes in travel itineraries, cancellations, or health-related issues may have prevented some students from fully participating in the study abroad course.
6. Some of the participants submitted only part of their assignments after the study abroad course ended, and a few students did not submit any of the required assignments.
7. The population of interest included students with an interest in studying veterinary medicine at OSU; therefore, the findings of this study may not be generalizable to students attending other universities.
8. Data analysis of the investigation's initial phase may have influenced the researcher's interpretation of findings in the study's subsequent phases.

## Significance of the Study

Understanding the overall impact of the study abroad course *AG 3803: International Study Tour in Agricultural Sciences and Natural Resources: Mexico* on participants' career aspirations has the potential to assist undergraduate, pre-vet students in either affirming or disconfirming their career aspirations to become veterinarians. Moreover, because this study also explored the students' perceptions regarding the practice of veterinary medicine in

Mexico, a culture different from their own, how that experience impacted their career aspirations may be understood better. This is of special interest to undergraduate students, as well as their academic advisors and institutions, because all would benefit from learning experiences that assist students in affirming their career aspirations before enrolling in schools of veterinary medicine, assuming they achieve admission. In their study of first-year veterinary students, Fish and Griffith (2014) reported that most changed their interests in practice options after taking a required course on veterinary careers; they attributed the students' course experiences as one factor that caused them to reconsider practice choices.

## Definitions of Terms

**Career aspiration**: ". . . an individual's desire to select a specific career (e.g., aspiration to be a lawyer or a photographer)" (Gray & O'Brien, 2007, p. 318).

**Career interest(s)**: The attention given to undertaking a profession (Evans & Diekman, 2009).

**Colleges of Veterinary Medicine**: Institutions of higher education dedicated to preparing veterinarians (Peters, 2007).

**Contemporary international culture (I) courses at OSU:**

> . . . prepare students for engaged citizenship in today's global society through understanding of cultural perspectives outside the United States. Requirements of "I" courses are to prepare students to examine current interactions of groups or cultures external to the United States within their political, economic, ideological, or natural contexts; understand how current international cultures relate to complex systems related to oppression, political ideology, globalization, or other similar dynamics; and

> demonstrate their understanding through written work that provides them the opportunity to enhance their writing skills. (Oklahoma State University, 2021b, para. 6)

**Course**: A unit of teaching consisting of educational activities (Forest et al., 2002).

**Culture**: "[T]hat complex whole which includes knowledge, belief, art, morals, law, custom and any other capabilities and habits acquired by man as a member of society" (Tylor, 2016, p. 1).

**Culture Shock**: ". . . a normal human response to an alien cultural environment, which can be disabling in some individuals" (Mumford, 1998, p. 153).

**Mexico**: A country in the southern portion of North America bordering the United States to the north, the Pacific Ocean to the south, the Gulf of Mexico to the east, and Guatemala, Belize, and the Caribbean Sea to the southeast (Hopkins & Staff, 1997).

**Motivation**: "Motivation is considered as a complex concept, closely aligned with 'the will to learn,' and encompassing self-esteem, self-efficacy, effort, self-regulation, locus of control and goal orientation" (Harlen & Deakin Crick, 2003, p. 169).

**Pre-veterinary Curriculum Concentration or Pre-Vet Option**: ". . . [required and] critical science coursework [offered by some colleges and universities in the United States] before matriculation in veterinary school" (Kogan et al., 2009, p. 164). At OSU,

> Pre-veterinary at Oklahoma State is a statement of intent that demonstrates an interest in exploring a professional veterinary education after graduating from OSU. No one major is a better fit for a future veterinary student, and we encourage degree selection based on individual interests, talents and skills. Students may apply to veterinary

school from any major at OSU as long as they have completed coursework required for the veterinary application process. (Oklahoma State University, 2021c, para. 1)

**Student classification in colleges and universities**: undergraduate classification of students attending an institution of higher education in the United States usually denoting their year in college, e.g., Freshman for first year, Sophomore for second year, Junior for third year, and Senior for fourth year. This classification may also describe the number of academic hours students have earned in college, e.g., Freshman for fewer than 30 hours, Sophomore for 30 to 59 hours, Junior for 60 to 89 hours, and Senior for 90 or more hours (Oklahoma State University, 2021d).

**Study Abroad Course**: A unit of teaching which includes a travel component to a foreign destination as part of its academic activities (Paige et al., 2009).

**Undergraduate(s)**: Students enrolled in an institution of higher education in the United States seeking a bachelor's degree (Bye et al., 2007).

**Veterinarian**: A professional who practices veterinary medicine (Bierer, 1955).

**Veterinary Medicine**: ". . . medical specialty concerned with the prevention, control, diagnosis, and treatment of diseases affecting the health of domestic and wild animals and with the prevention of transmission of animal diseases to people" (Bowen, 2018, para. 1).

**Veterinary Medical College Application Service (VMCAS)**: A centralized application service to schools of veterinary medicine used in the United Sates by member institutions of the American Association of Veterinary Medical Colleges (AAVMC, 2020a).

**Veterinary Practice Option(s)**: The animal species' specializations or public or corporate employment settings in which veterinarians may choose to conduct the profession of veterinary medicine (AVMA, 2020).

# CHAPTER II

# REVIEW OF LITERATURE

Chapter II provides a review of literature that undergirds this study and is divided into five sections. The first section provides an overview of veterinary medicine as a career aspiration in the United States, including considerations for application and admission to schools of veterinary medicine, career options, and career expectations in the field. The second section explores study abroad as a learning experience for undergraduate students in the United States, especially experiences related to career aspirations. In the third section, an overview of career motivation is presented, specifically regarding aspiration, preparation, and affirmation. The fourth section of this chapter explores literature related to the study's overarching conceptual framework, i.e., human capital theory [HCT], and interest-based motivation theory [IBMT], the theoretical framework on which the investigation was grounded. A summary of the literature reviewed comprises the chapter's final section.

## Veterinary Medicine as a Career Aspiration in the United States

The first schools of veterinary medicine were established in the early 19th century in the United States (Peters, 2007). According to Bierer (1955), about 300 graduate veterinarians populated the United States in 1883. However, veterinary medicine was formalized as a profession during the mid-twentieth century (Bierer, 1955; Smithcors,

1963), and the number of veterinarians grew exponentially in only a few decades thereafter. The profession currently includes thousands of veterinarians. The AVMA (2020) reported 116,091 positions held by veterinarians in the United States for the year 2019.

Even though the number of practicing veterinarians increased substantially in the last few decades (AVMA, 2020; Bierer, 1955; Smithcors, 1963), veterinary medicine continues to be a competitive and demanding profession. Nevertheless, thousands of aspirants apply to schools of veterinary medicine each year, but a majority will not be admitted (AAVMC, 2020a; AAVMC & Dabdub, 2020). Some of the most important considerations related to veterinary medicine as a career option for pre-vet students in the United States include: 1) application and admission requirements to schools of veterinary medicine (AAVMC, 2019, 2020a, 2020b; AAVMC & Dabdub, 2020; Amass et al., 2011; Burzette et al., 2017; Daly & Erickson, 2012; Educational Testing Service, 2019; Hashizume et al., 2015; IHS Healthcare [IHSH] & the Center for Health Workforce Studies [CHWS], 2013; Ilgen et al., 2003; Institutional Research and Information Management [IRIM], 2014, 2015, 2016, 2017, 2018, 2019; Jackson & Dawson-Saunders, 1987; Kane et al., 2013; Kogan et al., 2009; Lenarduzzi et al., 2009; McRae, 2010; National Research Council, 2013; OSU CoVM, 2020; Sprecher, 2004), 2) practice options within veterinary medicine (Amass et al., 2011; AVMA, 2019, 2020; Bain & Salois, 2019; Daly & Erickson, 2012; IHSH & CHWS, 2013; Ilgen et al., 2003; Lenarduzzi et al., 2009; Sprecher, 2004); and 3) professional expectations of veterinary medicine (AVMA, 2017; Brody et al., 2018; Chan, 2019; IHSH & CHWS, 2013; Lau,

2018; National Research Council, 2013; Nett et al., 2015; Norris et al., 2017; Platt et al., 2012, Stone et al., 2018; Strand et al., 2005; Tomasi et al., 2019).

## Application and Admission to Schools of Veterinary Medicine

Regarding application requirements to schools of veterinary medicine, course prerequisites, GPA, standardized test scores, and veterinary practice experiences represent special importance. This is due to the time and effort pre-vet students invest to attain these credentials.

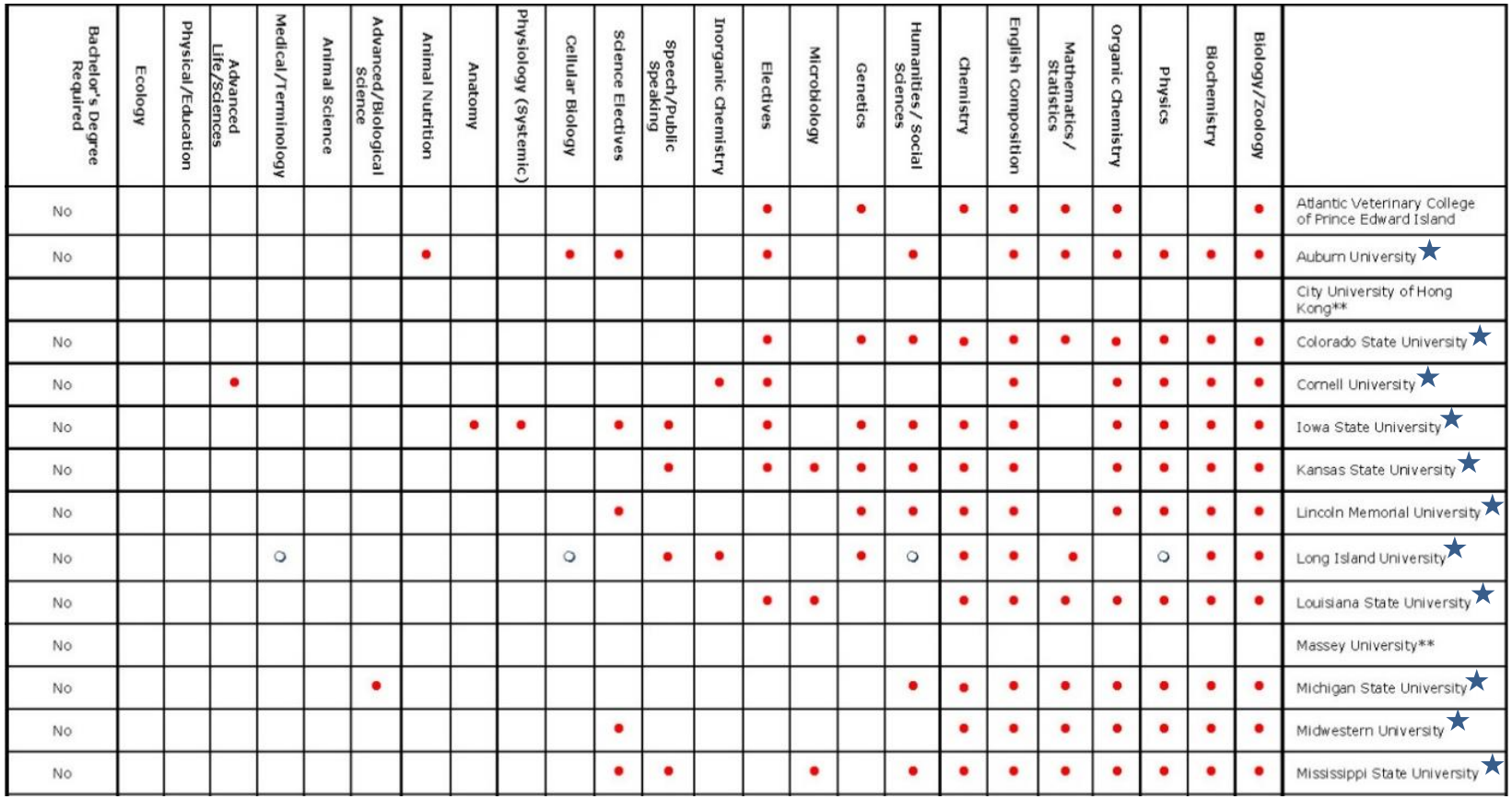
### Application Requirements to Schools of Veterinary Medicine

#### *Course Prerequisites*

For the 76 AAVMC member institutions that reported in 2020, 59 identified at least 24 different courses they required or recommended pre-vet students complete if applying to their programs for matriculation in 2021 (AAVMC, 2020b) [see Figure 2]. Schools of veterinary medicine usually require a minimum letter grade of “C” for required courses when applying to their programs of study (AAVMC, 2020b; Burzette et al., 2017; Jackson & Dawson-Saunders, 1987; Kogan et al., 2009; McRae, 2010).

**Figure 2**

*Summary of Course Prerequisites for Application to 59 Schools of Veterinary Medicine for Matriculation in 2021* (AAVMC, 2020b)



| Bachelor's Degree Required | Ecology | Physical/Education | Advanced Life/Sciences | Medical/Terminology | Animal Science | Advanced/Biological Science | Animal Nutrition | Anatomy | Physiology (Systemic) | Cellular Biology | Science Electives | Speech/Public Speaking | Inorganic Chemistry | Electives | Microbiology | Genetics | Humanities/ Social Sciences | Chemistry | English Composition | Mathematics/ Statistics | Organic Chemistry | Physics | Biochemistry | Biology/Zoology | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No | | | | | | | | | | | | | | ● | | ● | | ● | ● | ● | ● | | | ● | Atlantic Veterinary College of Prince Edward Island |
| No | | | | | | | ● | | | ● | ● | | | ● | | | ● | | ● | ● | ● | ● | ● | ● | Auburn University ★ |
| | | | | | | | | | | | | | | | | | | | | | | | | | City University of Hong Kong** |
| No | | | | | | | | | | | | | | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | Colorado State University ★ |
| No | | | ● | | | | | | | | | | ● | ● | | | | | ● | | ● | ● | ● | ● | Cornell University ★ |
| No | | | | | | | | ● | ● | | ● | ● | | ● | | ● | ● | ● | ● | | ● | ● | ● | ● | Iowa State University ★ |
| No | | | | | | | | | | | | ● | | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | Kansas State University ★ |
| No | | | | | | | | | | | ● | | | | | ● | ● | ● | ● | | ● | ● | ● | ● | Lincoln Memorial University ★ |
| No | | | | ○ | | | | | | ○ | | ● | ● | | | ● | ○ | ● | ● | ● | | ○ | ● | ● | Long Island University ★ |
| No | | | | | | | | | | | | | | ● | ● | | | ● | ● | ● | ● | ● | ● | ● | Louisiana State University ★ |
| No | | | | | | | | | | | | | | | | | | | | | | | | | Massey University** |
| No | | | | | | ● | | | | | | | | | | | ● | ● | ● | ● | ● | ● | ● | ● | Michigan State University ★ |
| No | | | | | | | | | | | ● | | | | | | | ● | ● | ● | ● | ● | ● | ● | Midwestern University ★ |
| No | | | | | | | | | | | ● | ● | | | ● | | ● | ● | ● | ● | ● | ● | ● | ● | Mississippi State University ★ |

| | Biology/Zoology | Biochemistry | Physics | Organic Chemistry | Mathematics/ Statistics | English Composition | Chemistry | Humanities/ Social Sciences | Genetics | Microbiology | Electives | Inorganic Chemistry | Speech/Public Speaking | Science Electives | Cellular Biology | Physiology (Systemic) | Anatomy | Animal Nutrition | Advanced/Biological Science | Animal Science | Medical/Terminology | Advanced Life/Sciences | Physical/Education | Ecology | Bachelor's Degree Required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Murdoch University | | | | | | ● | ● | | | | | | | | ● | | ● | | | | | | | | No |
| North Carolina State University ★ | ● | ● | ● | ● | ● | | ● | ● | ● | ● | | | ● | | | | | ● | | | | | | | No |
| The Ohio State University ★ | | ● | | | | | | ● | | ● | | | ● | ● | | ● | | | | | | | | | No |
| Oklahoma State University ★ | ● | ● | ● | ● | ● | ● | | ● | ● | ● | | | ● | | | | | ● | | ● | | | | | No |
| Oregon State University ★ | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | ● | | | ● | | | ● | | | | | | No |
| Purdue University ★ | ● | ● | ● | ● | ● | ● | | ● | ● | ● | | ● | | | | | | | | | | | | | No |
| Ross University | ● | ● | ● | ● | ● | | ● | ○ | | ○ | | | | | | | | | | | | | | | No |
| Royal Veterinary College, University of London | ● | ● | ● | ● | ● | | | | | | | | | ● | | ● | ● | | | | | | | | Yes (for 4-year program) |
| Seoul National University** | | | | | | | | | | | | | | | | | | | | | | | | | |
| St. George's University | ● | ● | ● | ● | ● | ● | | | ● | | | ● | | | | | | | | | | | | | No, but preferred |
| St. Matthews University | ● | ● | | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | No |
| Texas A&M University ★ | ● | ● | ● | ● | ● | ● | ● | | ● | ● | | | ● | | | | | ● | | | | | | | No |
| Tufts University ★ | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | | No |
| Tuskegee University ★ | ● | ● | ● | ● | ● | ● | ● | ● | ○ | ○ | ● | | | | ○ | | ○ | | ○ | ● | ● | | ● | | Yes |
| United Arab Emirates University** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Univeriteit Utrecht** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Universidad Nacional Autonoma de Mexico** | | | | | | | | | | | | | | | | | | | | | | | | | No |

| | Biology/Zoology | Biochemistry | Physics | Organic Chemistry | Mathematics/ Statistics | English Composition | Chemistry | Humanities/ Social Sciences | Genetics | Microbiology | Electives | Inorganic Chemistry | Speech/Public Speaking | Science Electives | Cellular Biology | Physiology (Systemic) | Anatomy | Animal Nutrition | Advanced/Biological Science | Animal Science | Medical/Terminology | Advanced Life/Sciences | Physical/Education | Ecology | Bachelor's Degree Required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| University College Dublin | ● | ● | ● | | | | | | | ● | | ● | | | ● | | | | | | | | | | Yes |
| University de Montreal | ● | | ● | | ● | | ● | | | | | | | | | | | | | | | | | | Yes |
| University of Adelaide** | | | | | | | | | | | | | | | | | | | | | | | | | |
| University of Arizona ★ | ● | ● | ● | ● | | ● | ● | ● | | | ● | | | | | | | | | | | | | | No |
| University of Bristol** | | | | | | | | | | | | | | | | | | | | | | | | | Yes (for accelerated program only) |
| University of Calgary | ● | ● | | ● | ● | ● | ● | | ● | | | | | | | | | | | | | | | ● | No |
| University of California - Davis ★ | ● | ● | ● | ● | ● | | ● | | ● | | | | | | | ● | | | | | | | | | Yes |
| University of Edinburgh | ● | ● | ● | ● | ● | | | | ○ | ○ | | ● | | | ○ | | | | | | | | | | Yes |
| University of Florida ★ | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | | | | | | | | | | | | | No |
| University of Georgia ★ | ● | ● | ● | ● | | ● | ● | ● | | | | | | | | | | | | | | | | | No |
| University of Glasgow | ● | ● | ○ | ● | ○ | | ● | | | | | | | | | | | | | | | | | | No |
| University of Guelph | ● | ● | | | ● | | | ● | ● | | | | | | | | | | | | | | | | No |

| Bachelor's Degree Required | Ecology | Physical/Education | Advanced Life/Sciences | Medical/Terminology | Animal Science | Advanced/Biological Science | Animal Nutrition | Anatomy | Physiology (Systemic | Cellular Biology | Science Electives | Speech/Public Speaking | Inorganic Chemistry | Electives | Microbiology | Genetics | Humanities/ Social Sciences | Chemistry | English Composition | Mathematics/ Statistics | Organic Chemistry | Physics | Biochemistry | Biology/Zoology | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No | | | | | | | | | | | ● | ● | | | | | ● | ● | ● | | | ● | ● | ● | University of Illinois in Urbana-Champaign ★ |
| Yes | | | | | | | | | ● | | | | | | | | | | | | | | ● | ● | University of Melbourne |
| No | | | | | | | | | | | | | | | ● | ● | | ● | ● | ● | ● | ● | ● | ● | University of Minnesota ★ |
| No | | | | | | | | | | | | | | ● | | | ● | | ● | ● | | ● | ● | ● | University of Missouri ★ |
| No | | | | | | | | | | | | | | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | University of Pennsylvania ★ |
| No | | | | | | | | | | | | | | | | | | ● | ● | ● | | ● | | ● | University of Queensland |
| No | | | | | | | | | | | | | ● | ● | ● | ● | | | ● | ● | ● | ● | ● | ● | University of Saskatchewan |
| Yes (for DVM entry) | | | | | | | | | | | | | ● | | | | | ● | | | ● | | ● | ● | University of Sydney |
| No | | | | | | | | ○ | ○ | ● | ○ | | ● | | ○ | ● | ● | | ● | ○ | ● | ● | ● | ● | University of Tennessee ★ |
| | | | | | | | | | | | | | | | | | | | | | | | | | University of Tokyo** |
| Yes | | | | | | | | | | | | | | | | | | | | | | | | | University of Veterinary Medicine and Pharmacy in Kosice ** |
| No | | | | | | | | ● | ● | ● | | | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | University of Wisconsin ★ |
| | | | | | | | | | | | | | | | | | | | | | | | | | VetAgro Sup ** |
| No | | | | ● | | | | | | | | | | | | | ● | | ● | ● | ● | ● | ● | ● | Virginia/Maryland College of Veterinary Medicine ★ |
| No | | | | | | | | | | | | | ● | | | ● | ● | | ● | ● | ● | ● | ● | ● | Washington State University ★ |
| No | | | | | | ● | | | ● | | | | | | ● | ● | ● | | ● | ● | ● | ● | ● | ● | Western University of Health Sciences ★ |
| Total | 1 | 1 | 1 | 2 | 2 | 4 | 4 | 6 | 8 | 8 | 9 | 10 | 12 | 13 | 19 | 25 | 28 | 29 | 36 | 36 | 38 | 40 | 44 | 46 | Schools with common pre-requisites |

*Note.* ** = No data available. ● = Required courses. ○ = Recommended courses. ★ = U.S. institution. Texas Tech University's School of Veterinary Medicine is not included in this list (AAVMC, 2020b; AVMA, 2021).

In addition, it is not unusual for pre-vet students to take courses more than once to attain the required grade or a higher grade (Burzette et al., 2017; Kogan et al., 2009). These required courses, however, do not always guarantee a student's admission or better academic performance in schools of veterinary medicine. Kogan et al. (2009) reported that no meaningful statistical relationships existed between required coursework and academic performance in schools of veterinary medicine in the United States. They concluded that "veterinary schools may be unnecessarily restricting access to the profession by requiring long and complicated lists of prerequisite courses that have a questionable predictive value on performance in veterinary school" (Kogan et al., 2009, p. 158). Moreover, Burzette et al. (2017) researched three cohorts of graduates from a school of veterinary medicine in the midwestern United States and reported no significant statistical relationships between measures of achievement at the respective schools and their admission criteria. The criteria included a graduate or undergraduate degree or minimum number of undergraduate credits, number of honors courses, number of withdrawals from or repeats of prerequisite science courses, number of part-time semesters, and ratio of community college credits to total college credits (Burzette et al., 2017). According to the researchers, some students in their study's sample reported having repeated or withdrawing from required courses from zero to six times before gaining admission (Burzette et al., 2017). Retaking courses is a common practice of students applying to schools of veterinary medicine and to schools of human medicine (Jackson & Dawson-Saunders, 1987; McRae, 2010). However, Holladay et al. (2020) highlighted the ongoing debate regarding the traditional versus alternative criteria

proposed for admission to schools of veterinary medicine, including the value or utility of some mainstay course prerequisites, such as chemistry and physics.

> Like GRE, undergraduate prerequisite and total GPA have been heavily relied upon as predictors of success of those admitted to veterinary school. There is evidence that the utility of undergraduate total and science GPA for veterinary admissions decisions may be improved, however, by added consideration of where and how the undergraduate credits were earned (e.g., community colleges, traditional 4 year institutions, and online courses). It has also been reported that probability of admission into veterinary college can be forecast early in student undergraduate programs by use of non-GPA factors including American College Testing (ACT) scores. Replacing typical prerequisite courses such as organic chemistry and physics with anatomy, physiology and histology courses, so students will not first encounter this subject matter in the veterinary curriculum, has been suggested as another mechanism to reduce veterinary student stress. In possible support of this idea, the taking of a week-long anatomy pre-course by accepted veterinary students was found to enhance student learning in the 1st year veterinary anatomy course. A difficulty in replacing an organic chemistry or physics course with an anatomy course, however, may be that it is largely unknown whether this would reduce prerequisite prediction for success in the professional veterinary curriculum. (Holladay et al., 2020, pp. 1-2)

### *GPA and Standardized Tests Requirements*

Pre-vet students in the United States work on fulfilling GPA and GRE requirements during college, but sometimes they may be far from meeting the criteria at

time of graduation (see Table 1). For example, the average GPA of pre-vet students who were seniors in the Ferguson College of Agriculture at Oklahoma State University (OSU) during the spring semester of 2018 was 3.41 (IRIM, 2019). Considering that these students likely graduated in the spring or summer semesters of 2018 and applied to schools of veterinary medicine during the 2018 cycle, some may have been disadvantaged because their GPAs were lower than the average of 3.56 on a 4.00 scale for the cohort of admitted students to schools of veterinary medicine at that time (AAVMC, 2019). The average GPA of matriculated students to the OSU CoVM in 2020 was 3.59 (OSU CoVM, 2020).

**Table 1**

*GPA and GRE Test Score Results for Applicants to Schools of Veterinary Medicine, including College Graduates and GRE Test Takers in the United States during 2018*

| Criteria | U.S. Veterinary School Applicant Average | U.S. Average |
|---|---|---|
| GPA | 3.56 | 3.15[a] |
| GRE Verbal Reasoning | 155 | 153 |
| GRE Quantitative Reasoning | 154 | 150 |
| GRE Analytical Writing | 3.9 | 3.9 |

*Note.* Data taken from AAVMC (2019) and Educational Testing Service (2019). [a] College Graduate

### *Veterinary Practice Experience*

Veterinary practice experience is one of the most important application requirements to schools of veterinary medicine (AAVMC, 2019). Finding opportunities to attain broad and sufficient veterinary practice experience is difficult for many pre-vet

students in the United States. They usually undergo veterinary practice experience mainly related to companion animals (Sprecher, 2004). In Sprecher's (2004) longitudinal analysis of more than 300 students in the 8th grade who participated in a veterinary camp, almost 23.0% had veterinary practice experience. For those who specified the type of practice, they indicated that 22.0%, 8.3%, 5.1%, 4.8%, and 2.2% of the activities were related to small animal, mixed animal, equine, food animal, and other species, respectively (Sprecher, 2004). However, about one-fourth of their study's participants expressed an inability to find veterinary practice experience opportunities (Sprecher, 2004). A limited number of veterinary practice experience opportunities other than with companion animals have been reported in the United States (Amass et al., 2011; Hashizume et al., 2015; Kane et al., 2013; Lenarduzzi et al., 2009; Sprecher, 2004).

An imbalance exists between demand and availability of veterinarians for the different practice options in veterinary medicine (IHSH & CHWS, 2013; National Research Council, 2013), which may be a consequence of the lack of broad veterinary practice experience opportunities for pre-vet students. Pre-vet students' practice experiences usually mirrors their choice of practice options in veterinary medicine (Amass et al., 2011; Daly & Erickson, 2012; Ilgen et al., 2003; Lenarduzzi et al., 2009). For example, practice on companion animals in urban or suburban areas is increasing, while rural areas in the United States struggle to find veterinarians to fill their needs (National Research Council, 2013), which mostly include food animals.

This imbalance in supply and demand of veterinarians for different practice options may have important repercussions for veterinary medicine in the future. In their study of employment in the U.S. veterinary workforce, IHSH and CHWS (2013)

estimated a surplus of 9,300 to 12,300 veterinarians between 2012 and 2025, which also represented a surplus of 11 to 14% regarding the profession's overall estimated capacity. Moreover, IHSH and CHWS (2013) projected, through different models, that supply would exceed the demand for veterinarians by 2025. Equine practice was projected to experience the largest surplus, followed by small animal practice, food production practice, and mixed animal practice (IHSH & CHWS, 2013). Given the employment distribution of recent graduates of schools of veterinary medicine in the U.S. workforce (see Table 2) and the current distribution of employment of working veterinarians (see Table 3), such projections are likely to be accurate forecasts. Offering pre-vet students practice experiences that better represent the expected demand of veterinarians in different practice options may help to address the projected surplus and related imbalance in supply and demand of veterinarians regarding practice options.

**Admission Rates to Schools of Veterinary Medicine in the United States**

Concerning admission, applicant admit rates continue to reflect a highly competitive and rigorous process (AAVMC, 2019; CoVM, 2020). The AAVMC (2020c) recommended the following guidance to students preparing to apply to schools of veterinary medicine:

How to Prepare in High School

- Gain a solid background in math and science.
- Take part in extracurricular activities (athletics, school clubs, FFA, etc[.])[.]
- Study and maintain a high GPA and high SAT/ACT scores.

- Acquire as much experience with pets as possible. Consider volunteering at your local humane society or with a local veterinarian.

How to Prepare as a College Undergraduate

- Take a pre-vet or comparable curriculum, that is, one that includes math and several science courses such as biology and chemistry.
- Maintain a high GPA[.]
- Gain as much broad exposure to veterinary medicine as possible. Consider job[-related] veterinary practice experience with veterinarians, scientists, working on a farm or volunteering at an animal shelter.
- Join a Pre-Vet club[.] (para. 2)

Applicants to schools of veterinary medicine in the Unites States applied to an average of five institutions in 2020 (AAVMC, 2020a). A total of 41,596 applications were submitted by 8,646 applicants through the Veterinary Medical College Application Service (VMCAS) [AAVMC, 2020a]. VMCAS is a centralized application service used by 40 of AAVMC's member institutions (AAVMC, 2020a). These 40 institutions reported 4,809 total available enrollment spaces for their 2020 admission year (AAVMC & Dabdub, 2020). Considering these numbers, one in every two applicants may have expected to be admitted to a school of veterinary medicine in the United States during the 2020 cycle. However, the number of U.S. undergraduate students enrolling in colleges and universities with aspirations of finishing their baccalaureate studies and applying to schools of veterinary medicine is usually significantly higher than the actual number of applicants to said institutions.

Many colleges and universities in the United States offer a pre-veterinary curriculum concentration for pre-vet students to fulfill admission requirements to schools of veterinary medicine (AAVMC & Dabdub, 2020). However, although recommended, such concentration is not a requirement to apply or to be admitted to schools of veterinary medicine, and many applicants do not matriculate from educational institutions that offer such (AAVMC & Dabdub, 2020). Some schools do not even require a bachelor's degree as part of their admission requirements (AAVMC & Dabdub, 2020). Therefore, applicants come from a variety of educational backgrounds, including those who may not have attained an undergraduate or graduate degree before applying, and others who might have spent time in workplaces before or after their undergraduate or graduate studies to gain veterinary practice experience. However, most of the applicants were recent graduates from a variety of undergraduate majors offered by U.S. colleges and universities (AAVMC, 2019). Nevertheless, thousands of applicants will not be admitted to schools of veterinary medicine and many undergraduate students will change their career aspirations during their college studies. For undergraduate students who give up on their aspirations to apply to schools of veterinary medicine during college, many would have likely benefitted from opportunities to affirm or disconfirm their career aspirations as early as possible during their collegiate studies.

### *Undergraduate Enrollment of Aspiring Veterinarians: The Case of Oklahoma State University (OSU)*

About 300 new, first-time students in the Ferguson College of Agriculture at OSU included an optional pre-veterinary curriculum concentration as part of their plans of study in the fall semester of 2017. That was about one-half of all new, first-time students

in the college during that academic term (IRIM, 2018), and was on par with the more recent fall semesters (IRIM, 2014, 2015, 2016, 2017, 2018). Members of this group will likely be part of the applicant cohort for the 2021 application cycle to schools of veterinary medicine. Yet, OSU's CoVM offers only 106 admission spots each year (AAVMC, 2020a). Of the 300 pre-vet concentrators, about 200 were in-state students and 100 out-of-state enrollees (IRIM, 2018). However, the CoVM offers only 58 places for in-state students and 48 to out-of-state students year-over-year (AAVMC, 2019; OSU CoVM, 2020). The OSU applicants compete with out-of-state as well as in-state applicants from other universities. The OSU CoVM received 917 applications in 2020 of which 760 were out-of-state applicants and 157 were in-state applicants (OSU CoVM, 2020). These numbers do not imply that all graduates of the Ferguson College of Agriculture at OSU will apply or be admitted to OSU's CoVM, but rather reflect the interest of the college's undergraduate students in the veterinary profession and those who may seek to enter schools of veterinary medicine at OSU or elsewhere. Offering pre-vet students additional guidance as they matriculate through college may help them to more fully understand the range of options within veterinary medicine, as well as what may be more suitable or realistic career choices.

**Practice Options in Veterinary Medicine**

The American Veterinary Medical Association (AVMA) defines employment options for veterinarians based on their specialization by animal species practice or by their public or corporate employment. Employment in private clinical practice by species has been defined by the AVMA (2020):

- Food animal exclusive: Sum of (Bovine, Porcine, Ovine/Caprine, Camelid, Cervid and Poultry [Avian or Galline]) is at least 90% of the contact.
- Food animal predominant: Sum of (Bovine, Porcine, Ovine/Caprine, Camelid, Cervid and Poultry [Avian or Galline]) is at least 50% of the contact.
- Mixed animal: Varied species with at least 25% from companion animal and 25% from either food animal or equine.
- Companion animal predominant: Sum of (Canine, Feline, Avian [non-poultry] and Exotics) is at least 50% of the contact.
- Companion animal exclusive: Sum of (Canine, Feline, Avian [non-poultry] and Exotics) is at least 90% of the contact.
- Equine: Combination of equine predominant and exclusive where there's at least 50% contact with equines. (para. 6)

Employment options in public and corporate employment have been described as 1) college or university, 2) federal government, 3) state or local government, 4) uniformed services, 5) industry, 6) other public and corporate, and sometimes advanced education opportunities is also included as an employment option (see Table 2) [AVMA, 2020; Bain & Salois, 2019]. Employment for recent graduates of schools of veterinary medicine joining the veterinary profession is also reported according to the AVMA guidelines (see Table 2). Often, employment options will mirror the veterinary practice experience of pre-vet students during college or before (Amass et al., 2011; Daly & Erickson, 2012; Ilgen et al., 2003; Lenarduzzi et al., 2009). However, opportunities in the different practice options for veterinary medicine may not be readily available to all pre-vet students who seek such (Sprecher, 2004).

Amass et al. (2011) reported that 38.3% of the 694 applicants to one veterinary school in the United States did not indicate a specific career path within veterinary medicine. It is likely that many pre-vet students would greatly benefit from opportunities to explore the different career pathways within veterinary medicine during their undergraduate education experiences.

**Table 2**

*Veterinarian Employment Type, Positions by Practice, and Full-Time Starting Salaries of 2018 Graduates of Schools of Veterinary Medicine in the United States by Type of Employment*

| Employment Types | Veterinarians Accepting Positions | Percentage of Total Accepting Positions | Veterinarians Who Reported Starting Salaries | Mean and Standard Deviation of Starting Salaries |
|---|---|---|---|---|
| | | Private Practice | | |
| Food animal exclusive | 41 | 1.7% | 41 | $82,702 ± $13,830 |
| Food animal predominant | 58 | 2.4% | 58 | $74,016 ± $11,098 |
| Mixed animal | 238 | 9.9% | 236 | $73,048 ± $13,024 |
| Companion animal exclusive | 920 | 38.4% | 916 | $86,982 ± $15,331 |
| Companion animal predominant | 213 | 8.9% | 209 | $84,830 ± $18,957 |
| Equine | 42 | 1.8% | 42 | $51,893 ± $21,850 |
| All private practice | 1,512 | 63.1% | 1,502 | $82,897 ± $17,273 |
| | | Public and Corporate Practice | | |
| Civil service | 16 | 0.7% | 16 | $70,439 ± $10,864 |
| Uniformed services | 26 | 1.1% | 26 | $64,705 ± $12,443 |
| State or local government | 3 | 0.1% | 3 | $89,340 ± $16,020 |
| College or university | 5 | 0.2% | 4 | $50,868 ± $48,261 |
| Industry-commercial | 5 | 0.2% | 5 | $114,400 ± $28,580 |

| | | | | |
|---|---|---|---|---|
| Not-for-profit | 8 | 0.3% | 8 | $69,813 ± $15,950 |
| Other | 6 | 0.3% | 5 | $81,260 ± $27,109 |
| All public and corporate practice | 69 | 2.9% | 67 | $71,736 ± $22,928 |
| | | Advanced Education Programs | | |
| Master's degree | 14 | 0.6% | 9 | $58,333 ± $25,103 |
| PhD | 17 | 0.7% | 17 | $28,559 ± $38,917 |
| Internship | 714 | 29.8% | 712 | $32,794 ± $22,358 |
| Residency | 60 | 2.5% | 60 | $41,620 ± $8,768 |
| Other | 10 | 0.4% | 10 | $45,348 ± $7,238 |
| All advanced education | 815 | 34.0% | 808 | $33,879 ± $8,820 |
| All employment types except advanced education programs | 1,581 | 66.0% | 1,569 | $82,425 |
| All employment types | 2,396 | 100.0% | 2,377 | $65,896 |

*Note.* Data derived from Bain and Salois (2019).

### *Veterinarian Workforce in the United States*

The AVMA reports yearly employment statistics of veterinarians in the United States (see Table 3). It reported a total of 120,652 positions held by 116,091 practicing veterinarians in the United States for the 2019 calendar year (AVMA, 2020).

**Table 3**

*Positions held by Veterinarians in the United States by Occupational Options, including Private Clinical Practice or Public and Corporate Employment in 2019*

| Occupational Options | Total | Male | Female | Unknown |
|---|---|---|---|---|
| Total | 116,091 | 42,971 | 72,928 | 192 |
| | | Private Clinical Practice | | |
| | # Veterinarians | % Male | % Female | % Total in Private Clinical Practice |
| Food animal exclusive | 1,286 | 77.1% | 22.9% | 1.8% |

| | | | | |
|---|---|---|---|---|
| Food animal predominant | 3,105 | 74.3% | 25.7% | 8.7% |
| Mixed animal | 4,182 | 56.0% | 44.0% | 5.7% |
| Companion animal predominant | 6,372 | 49.0% | 51.0% | 8.7% |
| Companion animal exclusive | 48,898 | 35.9% | 64.0% | 66.6% |
| Equine | 4,125 | 45.8% | 54.2% | 5.6% |
| Other | 309 | 35.3% | 64.7% | 0.4% |
| Species unspecified | 5,096 | 21.8% | 78.1% | 6.9% |
| Private practice total | 73,373 | 40.1% | 59.9% | 100.0% |
| | | Public and Corporate Employment | | |
| | # Veterinarians | % Male | % Female | % Total in Public and Corporate Employment |
| College or university | 6,889 | 41.2% | 58.8% | 40.8% |
| Federal government | 1,869 | 51.0% | 49.0% | 11.1% |
| State or local government | 1,122 | 45.3% | 54.7% | 6.6% |
| Uniformed services | 760 | 48.2% | 51.7% | 4.5% |
| Industry | 3,555 | 53.1% | 46.9% | 21.0% |
| Other public and corporate | 2,702 | 30.1% | 69.9% | 16.0% |
| Public and corporate total | 16,897 | 43.3% | 56.7% | 100.0% |
| Employment unknown overall | 28,375 | | | |
| Not listed above | 2,007 | | | |
| Total number of positions held by veterinarians in the United States | 120,652[a] | | | |

*Note*. Data taken from AVMA (2020). [a]Some respondents reported more than one type of employment.

It is worth noting that the demand for U.S. veterinarians regarding the different practice options is projected to remain relatively constant in the ensuing years (see Figure 3) but their salaries may continue to decline in the future if the recent trend holds (see

Figure 4) [IHSH & CHWS, 2013]. Pre-vet students should have a good understanding of the occupational expectations for veterinary medicine, including the projected or likely salary range they should expect.

**Figure 3**

*Projected Demand for Veterinarians in the United States: a) 2012 versus b) 2025* (IHSH & CHWS, 2013)

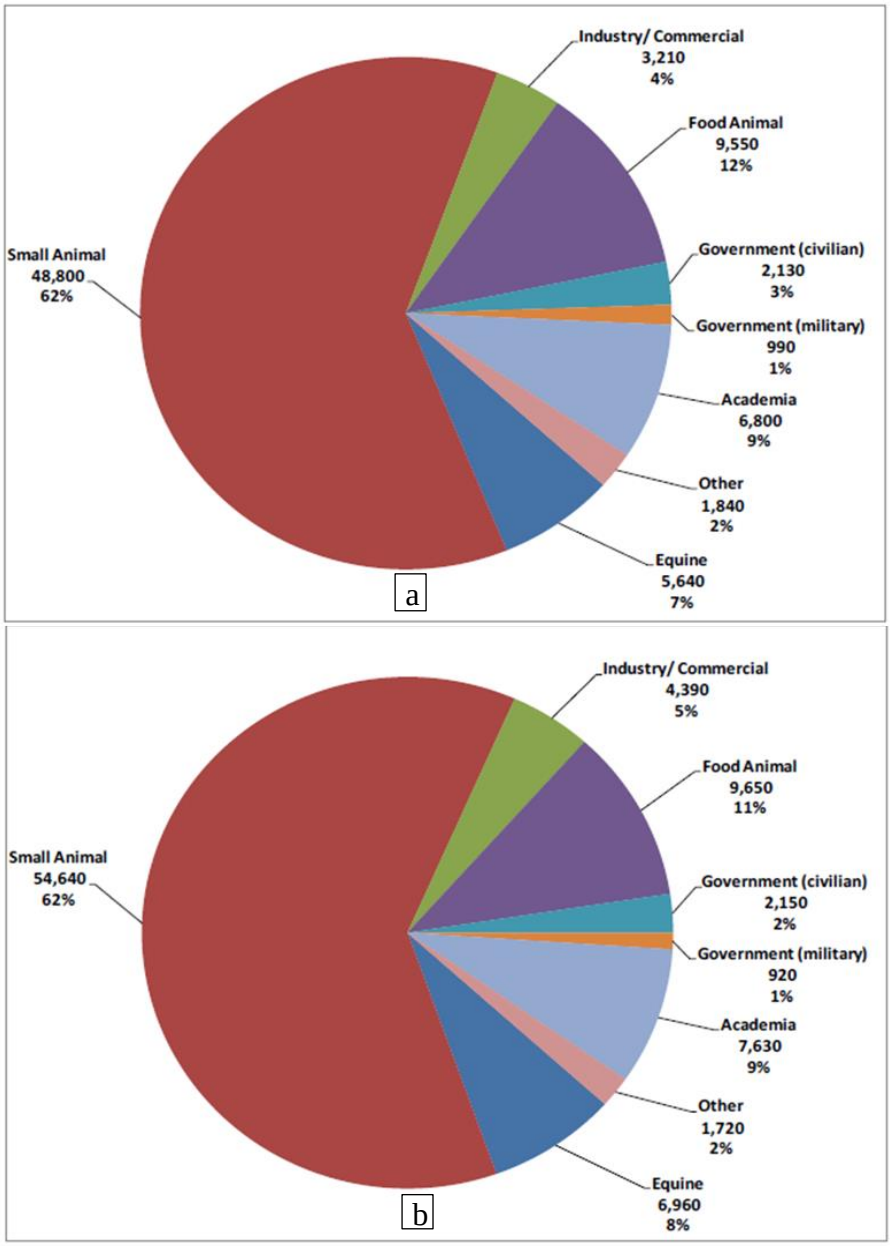
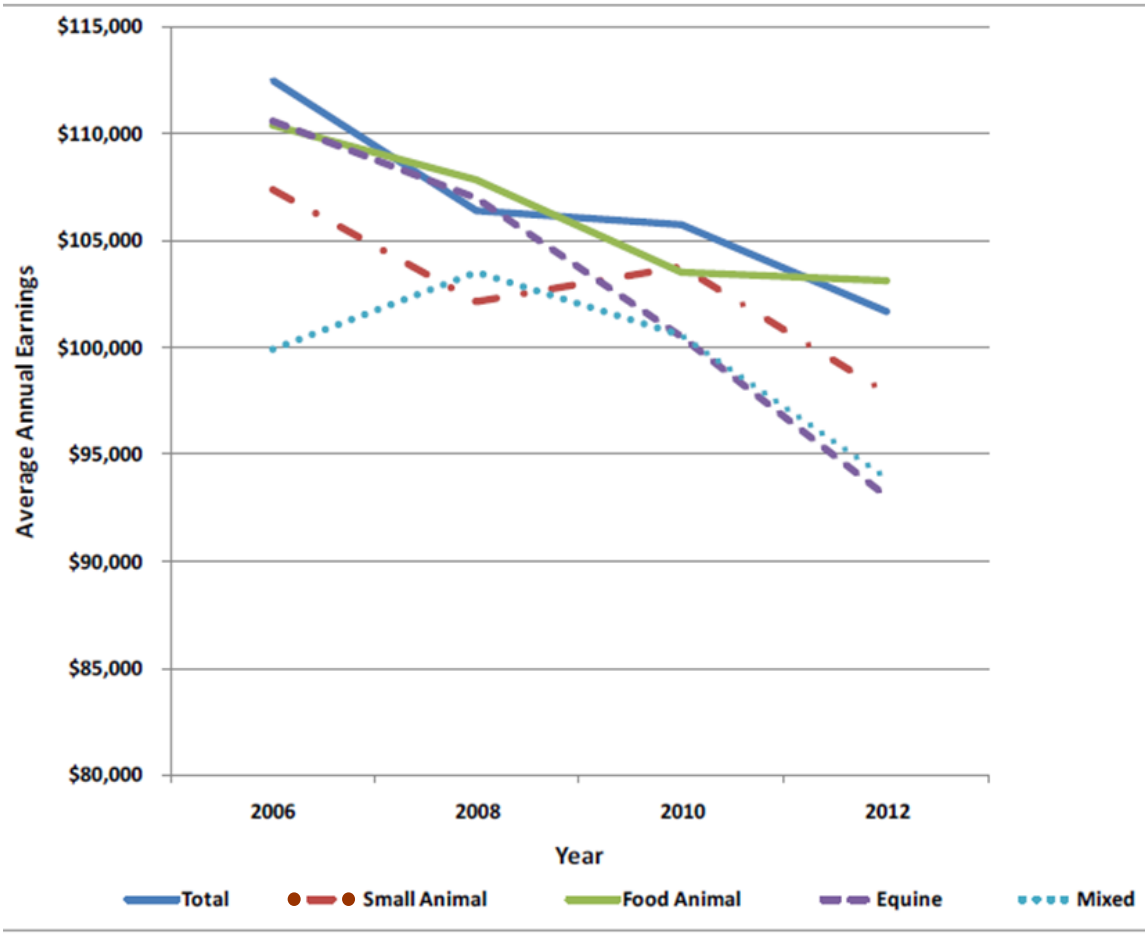


**Figure 4**

*Average Annual Salaries of Veterinarians in Clinical Practice, 2006-2012* (IHSH & CHWS, 2013)




## Professional Expectations and Occupational Stress in Veterinary Medicine

Increasing rates of practice-related stress, depression, and suicide have been reported for the veterinary profession and at levels substantially higher than the U.S. population overall. In a study that captured the responses of 11,627 U.S. veterinarians, 9.3% of the respondents reported currently experiencing serious psychological distress, 31.4% reported depressive episodes, 16.8% experienced suicidal ideation, and 157

veterinarians reported to have attempted suicide (Nett et al., 2015). Respondents to the study were demographically representative of practicing veterinarians in the United States, including 68.8% female and 31.2% male, a range of 10 to 19 years of practice experience, and an age span of 30 to 39 years (Nett et al., 2015). In comparison, the average rate of psychological distress for U.S. adults 18 years and older from 1997 to 2017 was reported to be lower than 4.0% (Norris et al., 2017). Rate of self-reported depression among U.S. adults 20 and older from 2013 to 2016 was 8.1% (Brody et al., 2018). Moreover, in 2017, only 4.3% of U.S. adults 18 years and older reported thoughts of suicide and 0.6% reported a suicide attempt (National Institute of Mental Health, 2019). Similar statistics associated with the veterinary profession have been reported in other countries (Bartram & Baldwin, 2010; Chan, 2019).

Job management, long work hours, heavy workloads, poor work-life balance, dealing with clients, performing euthanasia, and student debt have been reported as triggering factors associated with the distress, job dissatisfaction, and suicidal thoughts and ideations of veterinary students and veterinarians (Platt et al., 2012, Strand et al., 2005; Tomasi et al., 2019). For example, student debt has been reported as one of the main triggers associated with distress, as well as suicidal thoughts and ideations of U.S. veterinary students and veterinarians (Platt et al., 2012, Strand et al., 2005; Tomasi et al., 2019).

The average educational debt for veterinarians who graduated in 2017, including those with zero debt, was $143,757.82; the average for only those with debt was $167,534.89, and more than 20.0% had at least $200,000 of such debt (AVMA, 2017). The average student debt of a college graduate in the United States for the 2019 graduate

cohort was $28,950 (Schak et al., 2020). However, for medical school, Youngclaus and Fresne (2020) reported that 73.0% of students graduated with debt in 2019 and the average amount was $200,000, but the future of human medicine, at least regarding earnings, may be more promising than veterinary medicine. IHSH and CHWS (2013) estimated that given the current student debt loads and stagnant or, in some cases, declining incomes of veterinarians (see Figure 4), their workloads will continue to be similar in the future and they will likely retire at an older age than the average U.S. population. Moreover, tuition costs for schools of veterinary medicine have been increasing and are projected to continue escalating in the next few years (Chan, 2019; IHSH & CHWS, 2013; Lau, 2018; National Research Council, 2013).

Veterinarians also may be at increased risk of dying by suicide compared to the general U.S. population. In a longitudinal study that analyzed suicides among veterinarians in the United States from 1979 to 2015, the results indicated veterinarians were about three times more likely to die by suicide compared to the U.S. population overall (Tomasi et al., 2019). Moreover, Tomasi et al. (2019) reported important gender differences in suicidal rates among veterinarians; male veterinarians were 2.1 times more likely to die by suicide compared to the U.S. population overall, but female veterinarians were 3.5 times more likely to decease by suicide, especially those new to the profession (Platt et al., 2012; Tomasi et al., 2019). This number contradicts gender differences for suicide rates in the United States where male suicide has remained about four times higher than female suicide for the last two decades (National Institute of Mental Health, 2019; Stone et al., 2018). Female veterinarians are not only at higher suicidal risk; actual

cases of suicide have steadily increased among women in the veterinary profession since 2000 (Tomasi et al., 2019).

This difference in suicidal risk and increasing numbers of suicide cases of female veterinarians deserves special attention considering the current number and increasing rates of female veterinary students and female veterinarians in the profession (AAVMC, 2019; AVMA, 2020). Female veterinarians constitute about 50.0% of the current workforce and are projected to grow to approximately 70.0% by 2030 (IHSH & CHWS, 2013). Moreover, suicidal risk also varies by type of practice. For example, Tomasi et al. (2019) reported that 78.6% of the suicide cases analyzed in their study had an occupational position classified as clinical and 16.8% were nonclinical practitioners. From the clinical occupation cases, 75.3% worked exclusively or predominantly with companion animals, and most were female veterinarians (Tomasi et al., 2019). Companion animals as a share of all practice options in veterinary medicine is projected to increase in the future; it currently employs about one-half of all practicing veterinarians, of which about two-thirds are female (AVMA, 2020).

The various issues related to the practice of veterinary medicine, which for many veterinarians may be significant sources of distress and unhappiness, are strong rationale for expanding pre-vet students' access to learning opportunities intended to better inform them about the realities of veterinary medicine, especially earlier during the pre-vet education experience (Edwards et al., 1998; Kuh et al., 2006; Kuh, 2008; Nett et al., 2015; Rauthmann, 2021). Study abroad courses may play an important role in this regard.

## Study Abroad as a Career-Related Learning Experience for Undergraduate Students in the United States

Abrams (1979) opined that study abroad is better defined as *learning through experience abroad*. Studies have reported several benefits of studying abroad for U.S. college students. In a retrospective study of more than 6,000 former college students from 1960 to 2005, Paige et al. (2009) concluded that studying abroad had a positive impact on participants' civic engagement, knowledge production, philanthropy, social entrepreneurship, as well as their educational and career choices.

Paige et al. (2009) study's participants indicated that studying abroad helped them to realize and better understand their educational opportunities and potential career choices. Regarding education, 60.5% of the participants enrolled in one or more advanced degree programs after completing their bachelor's degrees (Paige et al., 2009). Of those in graduate education, 35.0% indicated pursuing an internationally oriented degree (Paige et al., 2009). Concerning their careers, 35.2% of the participants perceived that studying abroad in college had helped their careers to a large degree, and 37.7% of the respondents' career choices were internationally oriented (Paige et al., 2009). Jon et al. (2018) also reported a positive effect of short-term, study abroad courses on a university's alumni who had studied abroad in a range of countries at different times. A significant number of participants in the study chose their careers based on the understanding the study abroad experiences provided them about themselves by being exposed to different cultures (Jon et al., 2018). In addition, Geyer et al. (2017) also found a significant positive impact of short-term, study abroad courses on students' leadership and career development.

Moreover, Kronholz and Osborn (2016) reported that participation in study abroad courses significantly impacted college students' self-knowledge, including interests, values, and skills. Almost four-fifths of their study's participants reported a direct connection between studying abroad, vocational identity, and career decision-making abilities (Kronholz, & Osborn, 2016). They concluded that students were able to relate their self-knowledge to career options by having a more positive view of such and had a clearer picture of their professional goals, interests, talents, and vocational identities, as well as their fit in the global marketplace (Kronholz, & Osborn, 2016). Furthermore, in their exhaustive literature review on career self-efficacy, Arghode et al. (2020) reported important relationships between the development of competencies and education abroad experiences. The researchers described gains in participants' perceptions of readiness for international work, value associated with studying abroad regarding career development, acquisition of transferable skills, and understanding of workforce demand for global-ready college graduates, among other learning acquisitions (Arghode et al., 2020). Studying abroad may be an important learning experience that helps students explore potential careers and understand their fitness for such (Arghode et al., 2020; Paige et al., 2009; Geyer et al., 2017; Jon et al., 2018; Kronholz & Osborn, 2016).

## Career Motivation

London (1983) identified interactions between individuals' personal characteristics, career decisions and behaviors, and situational characteristics as important variables impacting their career choices. London (1983) conceptualized career motivation as "a multidimensional construct internal to the individual, influenced by the

situation, and reflected in the individual's decisions and behaviors" (p. 620). London (1993) also highlighted the value of empowerment and support for career development on a person's career motivation. He stated:

> Employees who believe they are empowered and that their supervisor supports their career development may behave in ways that suggest they are high in resilience, insight and identity. . . . Further, career motivation may be influenced by the characteristics of the organization's career management system (e.g. the information provided by the organization about career paths; existence of developmental appraisal systems). (1993, p. 67)

These career-related, decisional constructs may also apply to pre-vet students. The students may find and understand better their motivations by exploring opportunities to affirm or disconfirm career aspirations. Regarding motivations driving pre-vet students to pursue careers in veterinary medicine, research suggests that the main influencers toward veterinary career choice were exposure to animals during their formative years, perceptions of veterinarians as role models, desires to work with animals, and owning animals (Cake et al., 2019; Tomlin et al., 2010).

Type of veterinary practice experience also has a significant effect on the focus areas veterinary students select in schools of veterinary medicine and the practice options they pursue after graduation (Amass et al., 2011; Daly & Erickson, 2012; Ilgen et al., 2003; Lenarduzzi et al., 2009). Amass et al. (2011) identified veterinary practice experience as a seminal turning point or decision-juncture for applicants to schools of veterinary medicine regarding their choices to pursue careers in veterinary medicine. Ilgen et al. (2003) reported that working with a veterinarian was an important influence

on career selection for applicants to schools of veterinary medicine. Lenarduzzi et al. (2009) concluded that working with large and mixed animal practitioners was one of the main factors predicting veterinary students' and recent veterinary graduates' interests for practice with large and mixed animal species. In their longitudinal study of undergraduate students enrolled in two required courses for admission to schools of veterinary medicine, Daly and Erickson (2012) found that students' desired practice types correlated strongly with their previous animal experiences.

Helping pre-vet students affirm their career motivations may have a positive impact not only on the veterinary profession but also regarding the important impact veterinarians provide the United States from a human capital perspective. The veterinary profession generates more than 820,000 jobs among direct, indirect, and induced employment and its annual contribution to the U.S. economy is calculated to be more than $38 billion (Ouedraogo, 2018). For example, the veterinary profession provides vital services to the U.S. beef industry, which represents about 20.0% of the cash receipts for agricultural commodities or more than $66 billion per annum (USDA, 2020).

## Conceptual and Theoretical Frameworks of the Study

### Human Capital Theory (HCT)

The beginning of human capital theory can be traced back to Adam Smith. For Smith, useful abilities acquired by individuals through formal education or apprenticeship was a fixed capital asset that could impact their well-being, especially due to the economic revenue they could gain due to acquiring and exercising such abilities (Smith, 1776). According to Smith (1776), a nation's total value of goods included three types of capital: 1) immediate consumption; 2) circulation; and 3) fixed capital (Smith, 1776).

Within fixed capital, he highlighted four types: 1) useful machines or instruments; 2) buildings; 3) land improvement; and 4) abilities of individuals (Smith, 1776). Regarding the abilities of individuals, Smith (1776) stated:

> . . . Fourthly, of the acquired and useful abilities of all the inhabitants or members of the society. The acquisition of such talents, by the maintenance of the acquirer during his education, study, or apprenticeship, always costs a real expence [*sic*], which is a capital fixed and realized, as it were, in his person. Those talents, as they make a part of his fortune, so do they likewise of that of the society to which he belongs. The improved dexterity of a workman may be considered in the same light as a machine or instrument of trade which facilitates and abridges labour, and which, though it costs a certain expence [*sic*], repays that expence [*sic*] with a profit. (p. 11)

Gary Becker (1962) popularized the concept of human capital in the early 1960s with his theoretical analysis about the expected returns on investments in such. Becker (1962) demonstrated that investments in human capital could affect an individual's income or a company's revenues and he hypothesized that higher individual earnings were associated with greater investments in human capital. Becker (1962) concluded that "[m]ost investments in human capital both raise observed earnings at older ages, because returns are added to earnings then, and lower them at younger ages, because costs are deducted from earnings then" (p. 48). More than three decades later, Becker (1994) reaffirmed his position:

> One might, nevertheless, get discouraged were it not for the fact that peoples of the world differ enormously in productivity, that these differences are in turn

> largely related to environmental factors, and that the latter are in turn related to the accumulation of knowledge and the maintenance of health. *The concept of investment in human capital simply organizes and stresses these basic truths* [emphasis added]. Perhaps they are obvious, but obvious truths can be extremely important. Indeed, I would venture the judgment that human capital is going to be an important part of the thinking about development, income distribution, labor turnover, and many other problems for a long time to come. (p. 251)

Students preparing for admission to and, thereafter, successfully attending and graduating from a school of veterinary medicine represents the ultimate human capital investment aspiring veterinarians can make in themselves regarding the likelihood of career entry and effective job performance.

**Interest and Its Relationship to Motivation**

Dewey (1913) made several assertions about an individual's *interest* with implications for a person's intrinsic motivation:

> The genuine principle of interest is the principle of the recognized identity of the fact to be learned or the action proposed with the growing self; that it lies in the direction of the agent's own growth, and is, therefore, imperiously demanded, if the agent is to be himself [or herself]. Let this condition of identification once be secured, and we have neither to appeal to sheer strength of will, nor to occupy ourselves with making things interesting. (p. 7)

*Interest* was operationalized in this study according to Krapp et al. (1992) postulate:

> Interest can be conceptualized in a variety of ways, each of which reflects the theoretical orientation of the research questions being asked and methods being used. In spite of their differences, common to most of this work is the assumption that interest is a phenomenon that emerges from an individual's interaction with his or her environment. (p. 5)

Moreover, Krapp et al. (1992) suggested dimensions of *interest*:

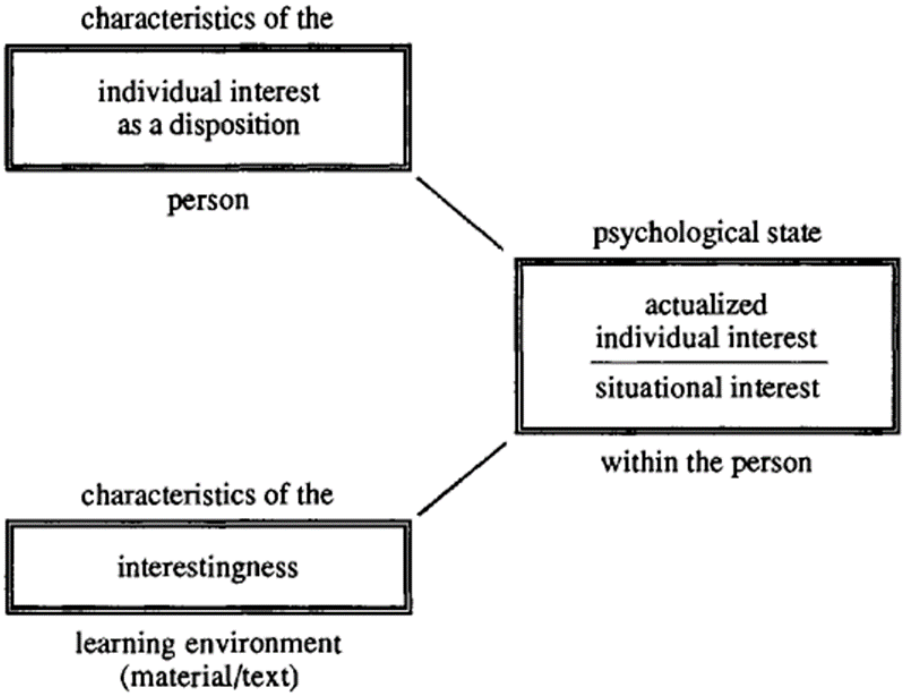
> Although most investigators acknowledge that interest always originates in some form of person-environment interaction, researchers assign differing significance to the two components. Specifically, there have been two distinct areas of focus. One body of research has emphasized variations in individual or personal interests, including their origins and their effects, with special emphasis being given to the effect of interest on some categories of cognitive performance, such as learning. Another group of investigators has concentrated more on the specific characteristics of any learning environment that captures the interest of many individuals (e.g., interestingness of a text). Interest as a psychological state, and situation-specific factors that bring about interest, then, reflect two distinct research approaches for investigating the role of interest in learning and development. . . . Generally, researchers liken them to dispositions that develop over time. Individual interests are considered to be relatively stable and are usually associated with increased knowledge, positive emotions, and increased reference value. Situational interests, on the other hand, are generated by certain stimulus characteristics (e.g., life themes, novelty) and tend to be shared among individuals. Because this type of interest may be evoked suddenly by something

in the environment, it often has only a short-term effect and marginal influence on the subject's knowledge and reference system. It may, however, have a more permanent effect and serve as the basis for the emergence of individual interests. (pp. 5-6)

Krapp et al. (1992) summarized these dimensions as *personal interest* and *situational interest* and highlighted that the interaction of these two dimensions of interest could lead to an actualized state of interest within an individual (see Figure 5). They stated that "[b]oth individual interest, in the sense of relatively stable preferences [or personal interest], and interestingness [situational interest] can bring about experiences and psychological states in an individual that are generally referred to as interest [or an actualized stage of personal interest]" (Krapp et al., 1992, p. 9).

**Figure 5**

*Three Approaches to Interest* (Krapp et al., 1992, p. 10)



**Interest-Based Motivation Theory (IBMT)**

Several studies have reported suggestive results and implications when operationalizing the IBMT (Ainley et al., 2002; Chen & Darst, 2002; Hammann et al., 2020; Shen et al., 2003). Shen et al. (2003) reported that high situational interest helped boys overcome their low personal interest in dance lessons. By offering a novel curriculum, the teachers were able to get better participation from boys in the dance lessons, even when girls had higher personal interest (Shen et al., 2003). Similar findings were reported by Chen and Darst (2002) when they compared differences in the learning of motor skills between middle school boys and girls. Overall, participants were able to learn more skills in gender-specific activities, which reflected their personal interest, but no gender differences were found when the researchers compared the learning achieved by those who were highly engaged in the activities, which represented situational interest (Chen & Darst, 2002). Moreover, Ainley et al. (2002) found that situational interest influenced students learning of reading skills. Students showed higher levels of learning when the topic of the text was more attractive to them. Furthermore, Hammann et al. (2020) reported better participation from high school students when learning activities in plant science included plants that interested them more, i.e., Cannabis. The students also exhibited higher motivation for learning scientific readings, which was their least popular learning activity, when the readings were related to Cannabis (Hammann et al., 2020). In this study, it was posited that the interaction of *personal interest*, as represented by the students' career aspirations to become veterinarians, and *situational interest* as operationalized by the students' participation in the study abroad course, could lead to

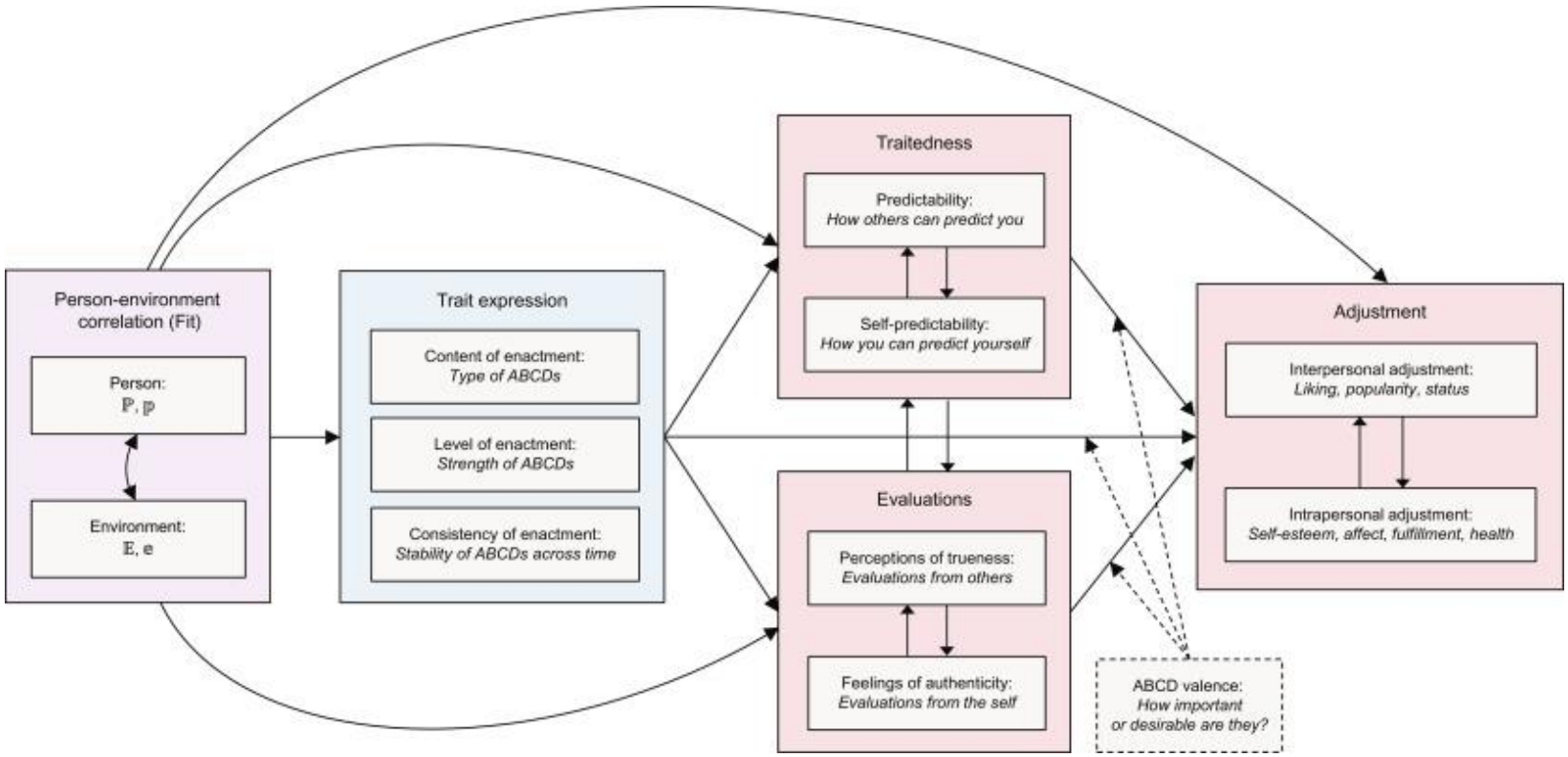
them actualizing either affirmation or disconfirmation of their career interests to become veterinarians.

**Person Environment Fit Theory (P-E Fit)**

Similar to IBMT, in P-E Fit theory, the interaction of and individual characteristics and environmental factors has an effect on the person's motivation and behavior (see Figure 6). P-E Fit evolved from a model intended to hypothesize the relationship between organizational stress and employee wellbeing to a theory useful in a range of disciplines (Edwards et al., 1998; Rauthmann, 2021). According to Edwards et al. (1998), "[t]he core premise of P-E fit theory is that stress arises not from the person or environment separately, but rather by their fit or congruence with one another" (p. 2) [see Figure 6]. For Holmbeck (2008), "[p]erson-environment fit theory focuses on the interaction between characteristics of the individual and the environment, whereby the individual not only influences his or her environment, but the environment also affects the individual" (p. 33) [see Figure 6]. Therefore, P-E-Fit theory was deemed an appropriate and complementary theoretical lens to couple with IBMT to understand and interpret the study's findings.

**Figure 6**

*Process Model of Person-Environment Fit and Its Consequences* (Rauthmann, 2021, p. 168)



## Summary

Veterinary medicine is a competitive and demanding profession (AVMA, 2020; Bierer, 1955; Peters, 2007; Smithcors, 1963). Veterinarians represent an important human capital component of the U.S. agricultural industry and the nation's overall economy (Ouedraogo, 2018; USDA, 2020). Thousands of aspiring veterinarians apply to schools of veterinary medicine in the United States each year. Although graduating from college is not a requirement to apply to schools of veterinary medicine, most applicants obtain a college degree before applying and they usually enroll in a pre-veterinary curriculum concentration option, i.e., pre-vet. These pre-vet students spend significant amounts of time, effort, and money trying to fulfill application requirements to schools of veterinary medicine during their time in college, but most will not gain admission (AAVMC, 2020a; AAVMC & Dabdub, 2020). Opportunities to better understand admission requirements, practice options, and professional expectations of veterinary medicine are major challenges faced by many aspiring veterinarians as they seek to confirm their career aspirations during college. Study abroad courses can support students' learning and may be a good way to help pre-vet students affirm or disconfirm their career aspirations (Abrams; 1979; 2002; Amass et al., 2011, Paige et al., 2009; Shen et al., 2003; Smith, 1776; Tomlin et al., 2010).

This case study, as undergirded by HCT, IBMT, and P-E Fit theory, aimed to contextualize and explore the relevance of a study abroad course as a way for students to better understand the veterinary profession and to gauge its appropriateness as their career choice. A group of 25 students who participated in the study abroad course *AG 3803: International Study Tour in Agricultural Sciences and Natural Resources: Mexico*

(see Appendix A) during the summer of 2019 were the subjects of this investigation's case and source of its data. The study abroad course's activities were purposefully intended to expose students not only to hands-on learning experiences, tours, places of interest, and presentations but also to other veterinary students and practicing veterinarians from OSU and Mexico. The course also included unique cultural aspects of veterinary practice in Mexico and Mexican society more widely.

# CHAPTER III

# METHODOLOGY

Chapter III provides an overview of the methodological procedures used in this investigation. The chapter has five sections. The first section includes the purpose of the study, research questions, and institutional review board compliance. Considerations for high quality research and discovery, including the researcher's reflexibility statement, are provided in the second section. The third section outlines the study's research design, including its main and complementary research procedures. A description of the operation of the study's research design is offered as a fourth section, and a summary of this chapter is the final section.

## Purpose of the Study

Overall, this mixed methods case study sought to explore, understand, and interpret the impact of a study abroad course on pre-vet students' aspirations to become veterinarians. In addition, the study strove to describe pre-vet students' views on the influence of local culture and the overall practice of veterinary medicine in Mexico. The investigation identified specific factors associated with the study abroad course that appeared to help students either affirm or disconfirm their career aspirations to become veterinarians.

Rule and John (2015) concluded:

> Case study is a widely prevalent approach within educational research but has been criticized for its lack of theoretical depth and rigor. . . . [However, i]n the recursive practice of research, case study can involve a dialogic relation between theory and research, and case study might engage with theory in different ways at different stages of the study. (p. 7)

The pre-vet students who participated in the study abroad course *AG 3803: International Study Tour in Agricultural Sciences and Natural Resources: Mexico* (see Appendix A) during the summer of 2019 were the subjects of this investigation's case and source of its data.

## Research Questions

Three research questions guided this study:

1. What were the perceptions of students who participated in the study abroad course *AG 3803: International Study Tour in Agricultural Sciences and Natural Resources: Mexico* regarding the practice of veterinary medicine in Mexico?
2. What were the AG 3803 students' perceptions regarding the influence of culture on the practice of veterinary medicine in Mexico?
3. How did the study abroad course *AG 3803: International Study Tour in Agricultural Sciences and Natural Resources: Mexico* impact students' decisions to affirm or disconfirm their career aspirations to become veterinarians?

## Institutional Review Board

Federal regulations in the United States and institutional policies at Oklahoma State University (OSU) require all research involving human subjects be reviewed and

approved by OSU's Institutional Review Board (IRB). The researcher submitted the research proposal, which included the purpose statement, recruitment script, participants' consent form, and the interview protocol (see Appendix B), for IRB approval. The IRB request was for the use of existing data derived from the study abroad course's evaluation and new data from follow up interviews of participating students. The proposal was reviewed by IRB and met all the guidelines required for research involving human subjects. Permission for the investigation was granted on January 21, 2021 and the study's IRB number was designated IRB-21-23 (see Appendix B).

## Considerations for High Quality Research and Discovery

### Qualitative Research

Tracy (2010) recommended eight *big-tent criteria* for achieving excellent quality in qualitative research. The criteria include 1) worthy topic, (2) rich rigor, (3) sincerity, (4) credibility, (5) resonance, (6) significant contribution, (7) ethics, and (8) meaningful coherence (Tracy, 2010).

#### *Worthy Topic*

According to Tracy (2010), "worthy studies are interesting and point out surprises-issues that shake readers from their common-sense assumptions and practices. This is why studies of little-known phenomena or evocative contexts are intrinsically interesting" (p. 841). Moreover, "good qualitative research is relevant, timely, significant, interesting, or evocative" (Tracy, 2010, p. 840). Considering the limited research about the overall state of the veterinary profession (AAVMC, 2019, 2020a; AVMA, 2020; National Research Council; 2013; Sprecher, 2004), pre-vet students' motivations to choose the veterinary pathway (Cake et al., 2019), and their career exploration by

studying abroad (Arghode et al., 2020), this study satisfied the criterion of a *worthy topic*. The number of students enrolled in the study abroad course, their high submission rates of course assignments, and high response rate to the optional course evaluation, and participation in follow up interviews also supported the topic's worthiness as an object of investigation. In addition, the study's problem statement and significance reinforce its fulfillment as a *worthy topic.*

***Rich Rigor***

Rigor in qualitative research refers to "sufficient, abundant, appropriate, and complex [t]heoretical constructs, [d]ata and time in the field, [s]ample(s), [c]ontext(s), [and] [d]ata collection and analysis processes" (Tracy, 2010, p. 841). However, Tracy (2010) further stated:

> Qualitative methodology is as much art as it is effort, piles of data, and time in the field. And just like following a recipe does not guarantee perfect presentation, or completing a vigorous training plan does not guarantee race-day success, rigor does not guarantee a brilliant final product. That being said, rigor does increase the odds for high quality, and the methodological craft skills developed through rigorous practice transcend any single research project, providing a base of qualitative fitness that may enrich future projects. (p. 841)

This study's investigator spent numerous hours planning, designing, teaching, administering, and evaluating the study abroad course, i.e., the phenomenon examined, and the findings derived from an analysis of it. An abundance of data was collected from different student-provided sources and several research procedures were used to analyze

such. The investigator's goal was to achieve a balance between quality and quantity of data to interpret and present the study's findings, conclusions, and recommendations.

### *Sincerity*

The investigator recorded information related to his subjective values, biases, inclinations, assumptions, and limitations that arose throughout the study's data collection, analysis, and reporting processes (Tracy, 2010). This is evident in the study's assumptions and limitations, and throughout its written report. In addition, the investigation's research procedures were thoroughly described, and an abundance of related literature was sourced and cited to illuminate and contextualize the phenomenon, including 161 different citations. These included several longitudinal studies and comprehensive reviews of literature. The sources were referenced again in the conclusions and recommendations sections of this report, aiming to connect this study's research contributions with literature related to the topic of inquiry.

Tracy (2010) stated:

> I do not mean to suggest a single (authentic, genuine) reality or truth. Sincerity means that the research is marked by honesty and transparency about the researcher's biases, goals, and foibles as well as about how these played a role in the methods, joys, and mistakes of the research. (p. 840)

### *Credibility*

"Credibility refers to the trustworthiness, verisimilitude, and plausibility of the research findings" (Tracy, 2010, p. 842). Explicit as well as tacit evidence was provided by the study's findings, e.g., Photovoice was used as a complementary research procedure for "showing rather than telling" (Tracy, 2010, p. 840). Incremental research

phases, different sources of data collection and research procedures were used to ensure triangulation and crystallization of data, multivocality, and member checking (Tracy, 2010). In addition, students expressed their perspectives in meetings before and during the study abroad experience, and through their assignments, course evaluations, and follow up interviews. All these actions contributed to informing the researcher's understanding and interpretation of the phenomenon, which increased the likelihood of the study's findings and related outcomes being credible.

### *Resonance*

Tracy (2010) stated that resonance is the "research's ability to meaningfully reverberate and affect an audience" (p. 844). Further, "[r]esonance can be achieved through aesthetic merit, evocative writing, and formal generalizations as well as transferability. Not every qualitative study must achieve resonance in the same way, but all high-quality qualitative reports must have impact" (Tracy, 2010, pp. 844-845). The researcher underwent a meticulous writing process to better distill the significance of the study and provide enough context for readers to create their own meanings of what he elucidated. According to Tracy (2010), "readers make choices based on their own intuitive understanding of the scene, rather than feeling as though the research report is instructing them [about] what to do" (p. 845), which may lead to genuine and authentic transference by readers to other relevant contexts.

### *Significant Contribution*

Tracy (2010) also asserted that qualitative research should aim to significantly contribute conceptually, theoretically, methodologically, practically, morally, and heuristically to the body of knowledge. This study's findings, conclusions, and

recommendations for future practice and research contribute to the limited literature on the impact of study abroad courses on pre-vet students' career affirmations, a gap identified by the investigator, as well as the influence of cross-cultural experiences in professional and informal settings. Using a mixed methods case study research design, along with complementary methodologies, was an insightful way to inquire about the phenomenon. The investigator posited that the study's results would be significant for undergraduate students, their academic advisors, their institutions, and the profession of veterinary medicine.

***Ethical***

Tracy (2010) further opined that "[j]ust as multiple paths lead to credibility, resonance, and other markers of qualitative quality, a variety of practices attend to ethics in qualitative research, including procedural, situational, relational, and exiting ethics" (pp. 846-847). This study complied with IRB procedures at OSU regarding human subjects research, i.e., procedural ethics according to Tracy (2010). In addition to being honest about the research process and reporting of the study's findings, I, the researcher and course instructor, paid special attention to ethical aspects related to students' participation in the study abroad course, including the learning activities conducted before, during, and after its travel period.

Regarding situational ethics, three pre-trip meetings about travel preparation, the Mexican culture, and the practice of veterinary medicine in Mexico were conducted before traveling to the country. In addition, daily meetings occurred during the trip component of the study abroad course to reflect on the learning experiences and address issues confronted by students during their stay in Mexico, e.g., topics related to health,

food, lodging, the language, and so forth; or, for some, what may have been instances of culture shock (Mumford, 1998; Oberg, 1960). Tracy (2010) stated:

> Certainly, there are no easy answers, but a situational ethic asks that we constantly reflect on our methods and the data worth exposing. In short, this approach suggests that ethical decisions should be based on the particularities of a scene [or context]. (p. 847)

Further, according to Tracy (2010),

> [r]elational ethics involve an ethical self-consciousness in which researchers are mindful of their character, actions, and consequences on others. . . . Relationally ethical investigators engage in reciprocity with participants and do not co-opt others just to get a 'great story.'. . . Those who follow such a model keep their promises, provide readers with a moral compass, and concern themselves with human flourishing. They do so not only in the process of engaging research but also in returning to the scene and sharing their findings. (p. 847)

Tracy (2010) also highlighted the concept of *feminist communitarianism* (Christians, 2005, as cited in Tracy, 2010), which emphasizes the importance of relationships, compassion, nurturance, affection, promise keeping, and intimacy in research. In this study, the investigator established a relationship of mutual growth and development with students before, during, and after the study abroad course, which allowed them to participate in its design, administration, and evaluation. For example, the course's travel itinerary was complemented with suggestions provided by students during the pre-trip meetings before traveling to Mexico. As a result, a second field day was added to the course's activities. Changes were also made during the trip based on

students' feedback, e.g., time was extended for some visits to places while in Mexico. The study's investigator also consulted students about the most effective way to get responses to the course's evaluation process. The original plan was to evaluate the course through an in-person group meeting, but instead an anonymous online post-course survey questionnaire was sent to students based on their request for that procedure.

Another important ethical component of qualitative research involves considerations related to the way research may be misread, misappropriated, or misused (Tracy, 2010). Tracy (2010) warned that "[s]tories about people who are poor, stigmatized, abused, or otherwise marginalized can serve to further negatively portray such people-even if that is not the intent of the author" (p. 847). Tracy (2010), therefore, recommended that authors

> . . . publish a 'Legend of Cautions' that warns readers about the ways that the research analyses may be misread, misappropriated, or misused. Although it is rare to see such a formal legend, researchers can take care to present findings so as to ward off victim blaming and their unjust appropriation. (p. 848)

As such, the study's investigator offered this guidance:

*Legend of Caution to the reader about the study "Impact of a Study Abroad Course on Helping Pre-Vet Students Affirm their Career Aspirations to Become Veterinarians: A Mixed Methods Case Study." Because the study abroad course's activities involved different cultural settings, such as working with animals and people from rural communities in Mexico, students were often reminded to keep an open mind and make an effort to understand their perceived differences in culture or the practice of veterinary*

*medicine compared to what they may have experienced in the United States. The investigator also cautions readers of this dissertation to consider the same.*

### *Meaningful Coherence*

Tracy (2010) also described how "studies that are meaningfully coherent eloquently interconnect their research design, data collection, and analysis with their theoretical framework and situational goals" (p. 848). The achievement of meaningful coherence was considered deeply while planning and implementing this study's methodological design and procedures (see Figures 7, 8, & 9). And further, a comprehensive explication appears below as Figure 10. In addition, Tracy (2010) posited that '[b]y the end, the reader should feel as though the piece lived up to what was promised" (p. 848), which was an expectation shared by the investigator.

## Quantitative Research Data

To assure quality of the quantitative research phase of the study, indicators of objectivity, as well as internal and external validity were considered (Creswell & Creswell, 2018; Creswell & Plano Clark, 2011; Gertler et al., 2016). Objectivity was achieved by anonymizing respondents' identities in the retrospective evaluation, providing an explanation for non-responses, and analyzing data and presenting results in aggregate for the group of respondents (Gertler et al., 2016). To address internal validity, the learning conditions were standardized as much as possible for the study abroad course to have a consistent learning effect on its participants. Measurable learning objectives, course activities, and evaluation procedures were clearly outlined and connected with one another. It was assumed that changes in the affirmation of students' aspirations to become veterinarians after the study abroad course may have resulted from their participation in

it. In this way, the course experience was an *intervention* or *treatment*. For external validity, the study abroad course was designed, promoted, administered, taught, and evaluated taking into consideration the existing literature related the aspirations of U.S. undergraduate students to become veterinarians. The course was designed in a systematic way to allow for replication in future years. Abundant information was collected about the administration of the study abroad course to facilitate such replication. Also, quantitative data were collected through an anonymous online survey that also could be used with participants of the study abroad course in the future. It was assumed that the results derived from the quantitative component of the study may be generalizable to the extent appropriate to other pre-vet undergraduate students at OSU and similar institutions (Oliver & Hinkle, 1982).

**Researcher's Reflexivity**

"One model [of reflexivity] is to include a separate section in which authors declare their position" (Shaw, 2010, p. 241). Therefore, to reveal the researcher's potential personal bias in relation to conducting and reporting on this investigation, the following reflexivity statement is offered:

The study abroad course *AG 3803 International Study Tour in Agricultural Sciences and Natural Resources: Mexico* was mainly designed, promoted, administered, taught, and evaluated by the researcher. The researcher's level of involvement could have influenced understanding of and reporting on the phenomenon. Therefore, the researcher maintained a reflexive approach during the collection, analysis, and reporting of the study's data to inform and guide the research process (Shaw, 2010), and introspectively examined his actions and decisions throughout it. The researcher's interactions with

student participants during the marketing and recruiting phases of the study abroad course, the enrollment process, and the travel period may have influenced the course's participation and the information provided by students in their assignments, course evaluations, and follow up interviews.

The researcher is a citizen of Mexico and had previous professional relationships with most of the local contacts in the places visited during the study abroad course. The researcher is also employed by the Ferguson College of Agriculture at OSU and part of his job appointment is to design, administer, and evaluate study abroad courses. Although the researcher did not intimately know many of the places visited during the travel period of the study abroad course, he was somewhat familiar with most from a regional perspective. The researcher grew up in the state of Veracruz, obtained a bachelor's degree in agriculture from the Universidad Autónoma Chapingo near Mexico City, and a master's degree in Agrobusiness from the Universidad Popular Autónoma del Estado de Puebla (UPAEP) in Puebla, Mexico.

Because of the researcher's intensive involvement in the study abroad course, his personal bias may have influenced the collection, analysis, and interpretation of data, as well as presentation of findings, especially regarding the qualitative phases of the study, i.e., the investigator is the research instrument in qualitative research (Denzin & Lincoln, 2008). Also, because the first phase, i.e., qualitative, informed analysis of the study's two subsequent phases, quantitative and qualitative, respectively, the researcher's biases may have been carried from one research phase to the next. In the second phase of the study, quantitative, the statistical procedures used may have somewhat minimized the effects of

his personal biases in the investigatory process (Punch, 2013). However, the researcher's personal biases may still have influenced interpretation of the study's quantitative results.

The researcher made a conscious effort at *bracketing* throughout the research process. According to Tufford and Newman (2012),

> [b]racketing is a method used by some researchers to mitigate the potential deleterious effects of unacknowledged preconceptions related to the research and thereby to increase the rigor of the project. Given the sometimes close relationship between the researcher and the research topic that may both precede and develop during the process of qualitative research, bracketing is also a method to protect the researcher from the cumulative effects of examining what may be emotionally challenging material. A lengthy research endeavor on an emotionally challenging topic can infuse the researcher with its inherent challenges, render continuing research an arduous endeavor and, in turn, skew the results and interpretations. While bracketing can mitigate adverse effects of the research endeavor, importantly it also facilitates the researcher reaching deeper levels of reflection across all stages of qualitative research: selecting a topic and population, designing the interview, collecting and interpreting data, and reporting findings. The opportunity for sustained in-depth reflection may enhance the acuity of the research and facilitate more profound and multifaceted analysis and results. (p. 81)

Moreover, Tufford and Newman (2012) highlighted the value of interviews with outside sources to help uncover and address researchers' preconceptions and biases. The researcher's doctoral dissertation committee, especially the chair and advisor, served as

an outside source to help the researcher become aware of the influence of his worldview and minimize its effects on the study. The researcher's doctoral dissertation committee spent several hours discussing aspects related to the research process. Furthermore, Tufford and Newman (2012) concluded the following about the value of investigators bracketing while conducting interpretive research:

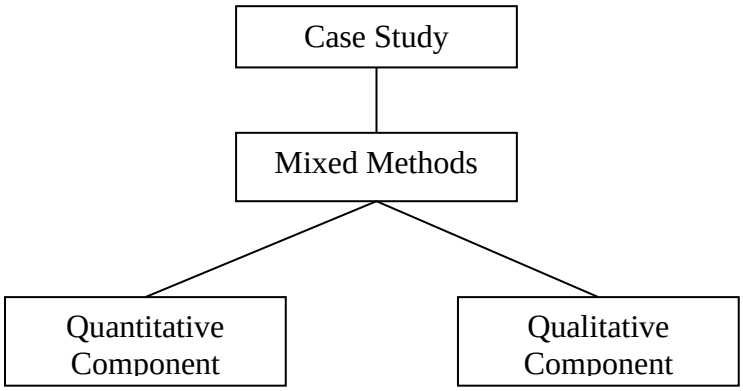
> Bracketing enables a deeper level of researcher engagement and integration throughout all aspects of the qualitative research endeavor . . . . bracketing can support social science researchers in stretching beyond the constraints of egocentrism and ethnocentrism to facilitate innovation and renewed insights into the pressing social phenomena of our time. (pp. 93-94)

## Research Design

This investigation used a case study, mixed methods design [CS-MM] (Guetterman & Fetters, 2018) as its overall research approach (see Figure 7). "In a case study–mixed methods design (CS-MM), researchers employ a parent case study that includes a nested mixed methods design" (Guetterman & Fetters, 2018, p. 902). This single case study included a programmatic evaluation of the study abroad course that used a retrospective then-post design (Howard et al., 1979; Rohs, 1999). Guetterman and Fetters (2018) stated that "[i]nvestigators are increasingly combining case studies and mixed methods [research paradigms], which, if conducted systematically and thoughtfully, can yield a more complete understanding [of a phenomenon]" (p. 901). Due to the readily available qualitative and quantitative data about the course, the researcher opted to use a mixed methods research approach.

**Figure 7**

*Case Study-Mixed Methods Design* (CS-MM) [Guetterman & Fetters, 2018]

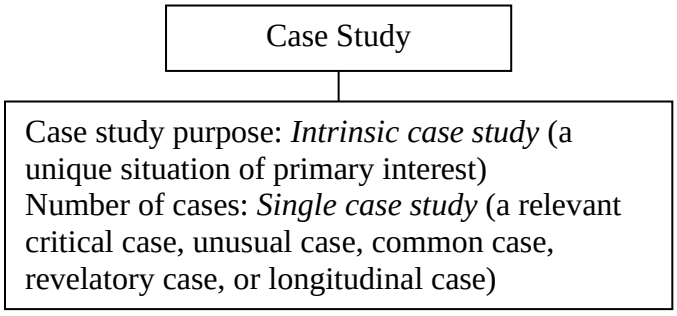



**Case Study Component**

The investigation's case study component involved an intrinsic single case study design (Guetterman & Fetters, 2018; Stake, 1995) [see Figure 8]. "[A]n intrinsic case study is the study of a case (e.g., person, specific group, occupation, department, organization) where the case itself is of primary interest in the exploration" (Mills et al., 2010, p. 511). Moreover, "[i]ntrinsic case studies may be particularly applicable to program evaluations" (Guetterman & Fetters, 2018, p. 904). Regarding this inquiry, the students' experiences in a career-themed, study abroad course to Mexico was the *program* or *intervention* evaluated.

**Figure 8**

*Intrinsic Case Study Design* (Guetterman & Fetters, 2018; Stake, 1995; Yin, 2014)



**Mixed Methods Component**

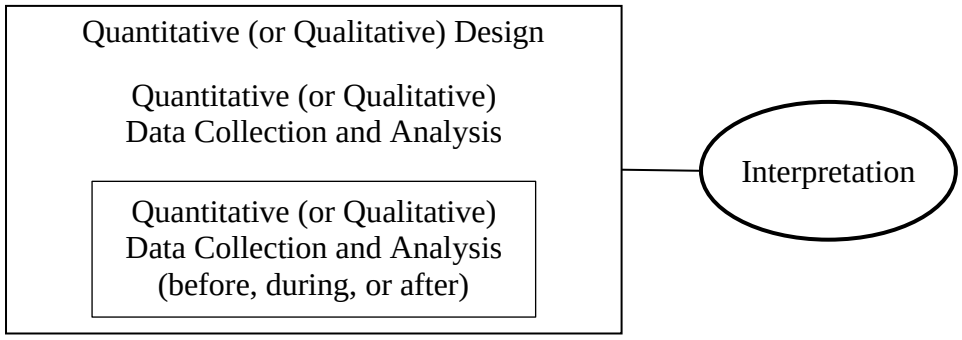
For the mixed methods component of this study, an embedded design with priority given to the qualitative phase was used, i.e., Qual → Quan → Qual (Creswell & Plano Clark, 2011) [see Figure 10]. Creswell and Plano Clark (2011) defined a mixed methods embedded design:

> In an embedded [mixed methods] design, the researcher may add a qualitative phase within a quantitative design, such as an experiment, or add a quantitative phase within a qualitative design, such as a case study. In the embedded design, the supplemental phase is added to enhance the overall design in some way. (pp. 71-72)

In this study, a quantitative supplemental phase was added to the qualitative phases to enhance its overall research design and support a triangulated understanding and interpretation of the findings.

**Figure 9**

*The Embedded Mixed Methods Design* (Creswell & Plano Clark, 2011)



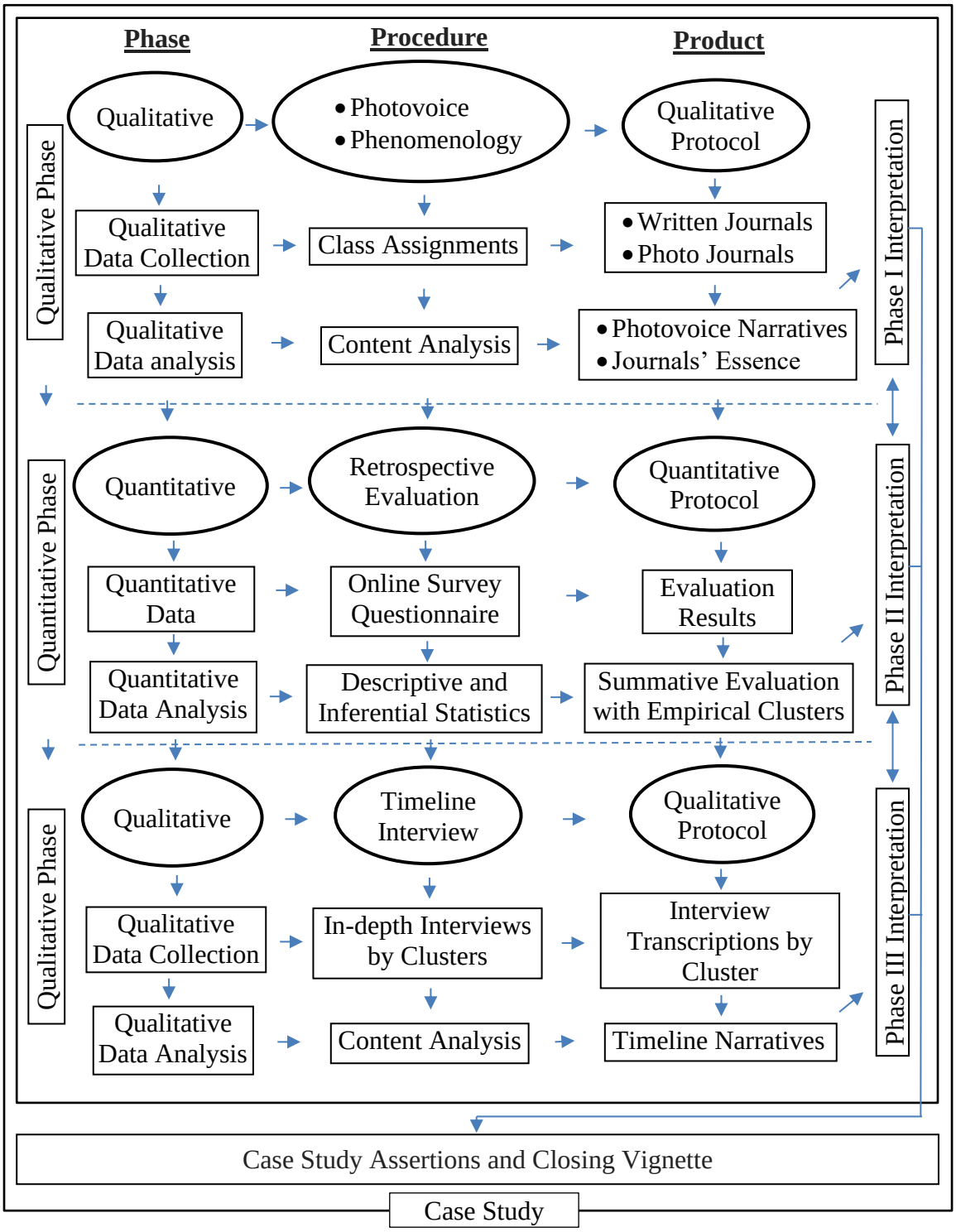

**Complementary Research Components**

Several methods complemented the study's research procedures aiming to further enhance its overall design and deepen an understanding of the phenomenon (see Figure

10), including content analysis (Creswell & Poth, 2018; Janesick, 1999; Leech & Onwuegbuzie, 2007; Saldaña, 2016; Sandelowski, 2001), phenomenological research procedures (Creswell & Creswell, 2018; Moustakas, 1994), photovoice (Delgado, 2015; Tsang, 2020; Wang, 1999; Wang & Burris, 1997; Wang et al., 1998), retrospective evaluation (Howard et al., 1979; Rohs, 1999) and timeline interview (Adriansen, 2012; Banks, 2007; Berends, 2011). Leech and Onwuegbuzie (2007) highlighted the importance of utilizing more than one type of analysis in qualitative research to enhance data triangulation and overall quality in such research. Moreover, the results of a case study inquiry are organized by "[p]roviding first extensive description of the case followed by key issues [important themes or aspects] in the case" (Creswell & Creswell, 2018, p. 106). And the concluding format of such an investigation is about "[m]aking case study assertions and advancing a closing vignette" (Creswell & Creswell, 2018, p. 106). These principles guided the reporting of this investigation's findings and related interpretation (see Figure 10).

**Figure 10**

*Diagram of the Study's Design, Methodology, and Analytical Procedures*



### *Content Analysis*

Content analysis is the study of documents, records, or other artifacts somehow related to the phenomenon of interest (Creswell & Poth, 2018; Neuendorf, 2017). Content analysis has been used by social scientists to systematically examine patterns in data to conduct research framed with a holistic perspective or lens (Creswell & Poth, 2018; Neuendorf, 2017). In this study, the researcher analyzed course assignments, course evaluations, and interviews from a group of student participants in a career-themed study abroad course to Mexico during the summer of 2019. The written assignments consisted of written journals and photo journals with descriptions the students created during the study abroad experience. Follow up interviews were added as part of the research protocol during the last phase of the study to expand the researcher's understanding of the phenomenon. Content analysis was used as an overall analytical approach throughout the study, especially during its qualitative phases. Open, axial, and selective coding were used as tools in the analysis of written text, photos, photo captions, interview transcriptions, and the researcher's field notes (Creswell & Poth, 2018; Janesick, 1999; Leech & Onwuegbuzie, 2007; Saldaña, 2016; Sandelowski, 2001; Tsang, 2020). Content analysis allowed the researcher to derive significant statements and to cluster such by meaningful themes.

### *Journal Writing*

Journal writing allows individuals to reflect on and to more deeply understand the phenomena they experience (Janesick, 1999). It helps the qualitative researcher to make interpretations in a dialogical manner, enhances data triangulation, and serves to member check the thinking reflected in participants' writings (Janesick, 1999). Moreover, a range

of different written materials and artifacts allow the researcher to identify key elements in the data to understand the phenomena more holistically, e.g., codes, word frequencies, and the overall use of meaningful counting in qualitative research (Saldaña, 2016; Sandelowski, 2001; Tsang, 2020).

### *Phenomenology*

Phenomenology is a qualitative research approach that allows researchers to understand the *essence* of a shared experience as described by its participants (Creswell & Creswell, 2018; Creswell & Plano Clark, 2011; Creswell & Poth, 2018; Merriam, 2009; Moustakas, 1994). Data analysis in phenomenology focuses on identifying significant statements, meaning units, and textural and structural descriptions about the phenomenon as clustered in themes of information. These themes contextualize the *essence* of the shared experience manifested by a phenomenon, which is usually reported in the form of a written statement (Creswell & Creswell, 2018; Creswell & Plano Clark, 2011; Creswell & Poth, 2018; Merriam, 2009; Moustakas, 1994). Through their phenomenology study, Mukembo et al. (2017) were able to investigate the experiences of young, aspiring female agriculturists from Uganda who were members of young farmers' clubs. Their findings indicated that participation in the clubs' activities had transformative impacts on students regarding their choices to study agriculture (Mukembo et al., 2017).

As in most qualitative research, findings derived from a phenomenology study *may be* transferable to other groups experiencing a similar phenomenon (Lincoln & Guba, 1985; Tracy, 2010). Transferability "is achieved when readers feel as though the

story of the research overlaps with their own situation and they intuitively transfer the research to their own action" (Tracy, 2010, p. 845).

### *Photovoice*

Photovoice was used as another qualitative research tool during the first data collection phase of this study (see Figure 10). Photovoice is a data collection method involving photography that empowers people to more openly express themselves and more fully tell *their stories* (Delgado, 2015; Wang, 1999; Wang & Burris, 1997; Wang et al., 1998). Photos can enhance and enrich our understanding of social phenomena (Harper, 1988). In their extensive review of peer-refereed literature about photovoice, Catalani and Minkler (2010) concluded that it can help researchers "to reach hard-to-reach communities and engage them in a meaningful, action-oriented research process" (p. 448). For instance, Uscanga et al. (2019) reported that photovoice allowed the researchers "to gain in-depth information from students who expressed in images what may have been difficult to explain in words" (p. 26). The high school students in their research recognized different agribusiness opportunities linked to various socioeconomic contexts in Nicaragua, as expressed through photos documenting local assets and materials (Uscanga et al., 2019). Also, a higher level of credibility can be expected in research involving photos compared with only words because photos are more about *showing* than *telling,* and their content may be more difficult to modify (Delgado, 2015; Tracy, 2010).

### *Retrospective Evaluation*

A typical approach to evaluate training interventions has been to use a pretest-posttest evaluation design, where participants self-report its effectiveness before and after

the intervention (Howard et al., 1979; Rohs, 1999). However, a participant's standards or metrics for measuring the learning content they experience may change between pretest and posttest observations as a result of factors not controlled for as part of the intervention, thereby, presenting potential confounding variables and threats to the study's internal validity (Howard et al., 1979; Rohs, 1999). In addition, the intervention itself may shift the participant's self-evaluation perspective, i.e., response shift bias (Howard et al., 1979; Rohs, 1999). To enhance internal validity when self-report instruments are used for measuring attitudinal and behavioral change, Howard et al. (1979) suggested a *retrospective pretest-posttest* design as an alternative approach to traditional pretest-posttest procedures. In a *retrospective pretest-posttest design*, participants self-report both perspectives but only after the intervention, e.g., they are asked to respond twice to each item on the self-report measure; their understanding or perspective before the intervention and their understanding or view after the intervention. A *retrospective pretest-posttest design* was used as a research approach in the second methodological phase of this study.

***Timeline Interview***

Visual timelines are one approach to data representation in qualitative research (Banks, 2007). Visual methods such as timelines have been frequently used with in-depth interviews to complement and enrich the understanding of phenomena (Adriansen, 2012; Banks, 2007; Berends, 2011). According to Rhodes and Fitzgerald (2006),

> A failure to fully realise the potential of visual data leads to an over-reliance on words as a means of generating description of behaviours and contexts and their related symbolic meanings, when visual data may do this at least as well. (p. 349)

Timelines visually illustrate participants' perspectives in the order they experience life events. Adriansen (2012) concluded that "[t]he [timeline interview] method allows the interviewee to participate in the reporting of the interview which may give rise to ownership and sharing of the analytical power in the interview situation" (p. 53). Adriansen (2012) added that "[i]t provides an opportunity for linking the story with the wider social, political and environmental context during the interview" (p. 53).

Berends (2011) highlighted the benefit of using contextual data such as informational vignettes and direct quotes derived from participants' interviews. In this regard, Berends (2011) posited:

> Using timelines and text vignettes based on individual experiences may create a more comprehensive, in-depth account with scope to incorporate feelings and reflections expressed by participants. Using a small number of pertinent quotes to illustrate critical events may ensure the participant's voice is not lost. (p. 7)

However, ". . . the timeline in itself does not tell the reader very much. The drawing and the notes along the timeline are by no means the full extent of the information derived from the interview" (Adriansen, 2012, p. 47). Therefore, in-depth interviews were conducted with six students during the third phase of this study and timeline interview was used as a complementary visualization tool. In other words, visual timelines reflecting students' stages and potential fluctuations in levels of aspirations to become veterinarians were created based on the information they provided during the interviews. Contextual information in the form of direct quotes derived from the students' interviews complemented the visual timelines (Berends, 2011). Moreover, Kolar et al. (2015) reported that visual timelines helped them to supplement their understanding of resilience

and situate semi-structured interviewing with marginalized groups, especially regarding the empowerment of interviewees. They concluded:

> When combined with power-conscious epistemologies and a research focus that facilitates critical engagement with the representation of experiences of coping and success of marginalized groups, timeline methods may greatly supplement [the] investigation of complex constructs through a life-story approach, the use of visual aspects, and increased participant control of the interview. (Kolar et al., 2015, p. 30)

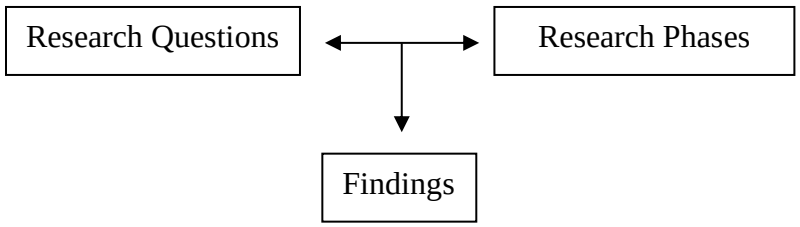
## Operationalization of the Study's Research Design

The participants, i.e., students, in the study abroad course *AG 3803 International Study Tour in Agricultural Sciences and Natural Resources: Mexico* comprised the group of interest for this investigation, and the course itself was the study's intrinsic single case study (Mills et al., 2010). The three components comprising the study's embedded, mixed methods design were sequential and delimited qualitative, quantitative, and qualitative investigatory phases in order and scope (Creswell & Plano Clark, 2011; see Figure 10). Furthermore, the investigator used different research methods to complement data collection and analysis within each phase of the investigation, and, thereby, the results from each phase informed analysis of the subsequent phase (see Figure 10). An interpretation is presented at the end of each phase explaining how its findings complemented the others. The investigator also presented an overall explanation of the case study based on an interpretation derived from each of the study's phases. In addition, this explanation was used to report the case study's assertions and closing vignette (see Figure 8). An important consideration regarding operationalization of the study's

research design was the investigator's ongoing reflection about how each of the research phases helped in answering the research questions, generally and specifically (see Figure 11).

**Figure 11**

*Influence of the Study's Research Questions and Phases on Its Findings*




**Description of the Student Participants**

This study's population consisted of 25 undergraduate students from OSU. All participants traveled to Mexico and returned to the United States during the scheduled travel days of the study abroad course, June 16 through June 25, 2019. Five students experienced flight delays from the United States to Mexico City and were not able to participate in the course activities of the first day and part of the second day, as scheduled. One participant missed about two hours of course activities for one day because of a medical appointment. The remainder of the students participated in all the course activities. All students returned to the United States on their respective scheduled flight times, and, although some of their connecting flights in the United States were delayed, that did not affect their involvement in the study abroad course. One participant did not submit either of the course's required assignments, and another student submitted only one assignment. The other 23 participants submitted all their assignments. The study's retrospective impact evaluation consisted of three components: academic

motivation, curriculum structure, and course activities (see Appendix C). All 25 participants responded to the first component, 24 to the second, and 22 to the third. The recruitment of the students for the study abroad course consisted of different approaches. Students received information about the course at five OSU, Stillwater campus events, during two informational sessions, through the Ferguson College of Agriculture's website, from flyers posted on several bulletin boards in different buildings on campus (see Appendix D), and via electronic mail messages sent to students enrolled in the pre-vet options offered at OSU (see Appendix E). Relevant student characteristics are provided in Table 4.

**Table 4**

*Selected Personal Characteristics of Students Enrolled in the Study Abroad Course AG 3803 International Study Tour in Agricultural Sciences and Natural Resources: Mexico during 2019*

| Personal Characteristics | *F* | *%* |
|---|---|---|
| Gender | | |
| Female | 19 | 76.0 |
| Male | 6 | 24.0 |
| Age | | |
| 18 | 4 | 16.0 |
| 19 | 5 | 20.0 |
| 20 | 9 | 36.0 |
| 21 | 7 | 28.0 |
| Race/Ethnicity | | |
| African American | 2 | 8.0 |
| Hispanic | 5 | 20.0 |
| Multiracial | 3 | 12.0 |
| Native American | 3 | 12.0 |
| White | 12 | 48.0 |
| Student Classification | | |
| Freshman | 9 | 36.0 |
| Sophomore | 6 | 24.0 |

| | | |
|---|---|---|
| Junior | 7 | 28.0 |
| Senior | 3 | 12.0 |
| Major | | |
| Agribusiness | 1 | 4.0 |
| Animal Science | 21 | 84.0 |
| Biochemistry and Molecular Biology | 2 | 8.0 |
| Zoology | 1 | 4.0 |
| Pre-Vet Option | | |
| No | 1 | 4.0 |
| Yes | 24 | 96.0 |
| Type of Admission to OSU | | |
| Freshman | 20 | 80.0 |
| Transfer | 5 | 20.0 |
| First Generation College Student | | |
| No | 20 | 80.0 |
| Yes | 5 | 20.0 |
| Travelled Internationally before Summer of 2019 | | |
| No | 14 | 56.0 |
| Yes | 11 | 44.0 |

*Note.* All data were self-reported by the students.

**First Research Phase: Qualitative**

Photovoice (Delgado, 2015; Wang & Burris, 1997) and phenomenology (Creswell & Poth, 2018; Groenewald, 2004; Guba, 1981; Moustakas, 1994) were used as research procedures to operationalize data collection and analysis in the first phase of the study (see Figure 10). Two course assignments were the sources of data for this phase: students' photo journals and written journals. The photo journals were analyzed using photovoice procedures and the written journals were examined according to Saldaña's (2016) coding suggestions for the constant comparative method to derive significant statements, themes, and an essence of the students' written journals (Creswell & Poth, 2018; Groenewald, 2004; Guba, 1981; Moustakas, 1994). Results of this analysis were interpreted from photovoice and phenomenological research perspectives, and as an

overall initial qualitative phase viewpoint. The results of this phase were mainly used to answer research questions one and two of the study. These interpretations also informed the study's second phase, its quantitative component (see Figure 10).

### *Qualitative Data Collection*

For the written journals, the students were required to choose topics of interest related to culture, the veterinary profession, or another related topic before traveling to Mexico for the study abroad experience. They were instructed to collect information during the trip and submit a written journal of at least five pages in length within two weeks after the trip ended (see Appendix A).

Regarding the photo journals, the students were required to submit at least 10 photos related to culture and/or the veterinary profession in the context of Mexico that included a written description of what each photo represented (see Appendix A). Because the assignment was part of the course's evaluation, the topics of the photos were circumscribed to Mexico's culture and its veterinary profession, but the investigator did not intend to condition the students' *expressibility* (Delgado, 2015). No other guidelines or examples for taking and submitting the students' photos or writing the descriptions were provided (see Appendix A). They were only encouraged to *compare and contrast* the cultures and the veterinary professions of Mexico and the United States while taking and choosing their photos for submission and writing the descriptions.

### *Qualitative Data Analysis*

For the students' written journals, the content was analyzed from different perspectives. The first step was to determine the number of journal submissions focused on culture, veterinary medicine, or a mix of both. The investigator differentiated between

the three different foci based on the journals' contents, e.g., journal entries that did not mention anything related to veterinary medicine were classified as culture. As a second step, a word frequency analysis was conducted on the content of students' written journals using the online site Browserling (n.d.) to identify the more frequent words written by students in the aggregated text of all their journals. According to Sandelowski (2001), qualitative researchers may uncover more meaning of a phenomenon by obtaining counts of words in addition to narrative descriptions. More frequently used words served as qualitative data *codes* for analysis of the students' journals. "A code in qualitative inquiry is most often a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data" (Saldaña, 2016, p. 4).

As a third step, significant words used with a frequency of more than 10 times in the aggregated text, including grammatical variations, e.g., plural, or singular, were identified by the researcher. These words were assessed to determine their contextual relevance and significant statements were identified in the journals to give meaning to the students' most frequent written words. These significant statements were initially highlighted according to their fitness for answering the study's research questions, i.e., the statements were grouped together to support the emergence of themes. These themes served to derive the students' *lived experiences* based on their written journal entries, i.e., a distillation of the phenomenon's *essence* (Moustakas, 1994).

Regarding the students' photo journals, the investigator used the strategy postulated by Tsang (2020) for photovoice data analysis. Tsang (2020) proposed four stages in photovoice data analysis: 1) a photograph analysis based on the researcher's

interpretations; 2) a photograph analysis based on the participants' interpretations; 3) a cross-comparison between the researcher's and participants' interpretations; and 4) a theorization of themes developed during the cross-comparison stage.

For the first stage interpretation, the investigator coded the photos according to three categories: a) culture; b) veterinary profession; or c) other. The investigator then grouped the photos by their visual similarities, e.g., horses, and developed a preliminary explanation of the students' visual representations. To minimize distortion of the photo interpretation procedures, the investigator did not use the photo narratives as a reference during this stage (Tsang, 2020). Rather, the investigator created initial themes of the visual images. For the second stage, the researcher conducted a word frequency count of the photo descriptions (Leech & Onwuegbuzie, 2007) using Browserling (n.d.). The most frequent words found in the narratives were used to outline potential themes, i.e., as based on the students' interpretations of their photos. Next, both sets of themes were cross-compared and contextual information was added to support the emergent themes (Tsang, 2020). Photovoice interpretations consisting of visual themes and their respective narratives were reported as a result of the study's photo journal analysis.

Constant comparative analysis, keywords in context, word counts, and classical context analysis were among the techniques used to give meaning to word clusters appearing in the students' written journals and photo journals during the overall qualitative analysis (Leech & Onwuegbuzie, 2007). The researcher reviewed the data several times and refined and rearranged significant statements and themes as needed, similar to *lean coding* where significant codes and information expand as review and re-review of the data continues (Creswell & Poth, 2018).

Several other culturally relevant statements were identified by the researcher through the analysis of the students' written and photo journals. Any significant statements not pertaining to the study's research questions were reported as *other culturally relevant findings* and similar analysis procedures applied.

### *Interpretation of Research Phase One*

Data from the students' written and photo journals were used to arrive at findings based on phenomenological and photovoice methodologies and cross-compared as an overall first phase interpretation. This procedure informed and guided the study's second phase which was quantitative (see Figure 10). These findings were included as part of Chapter IV.

## Second Research Phase: Quantitative

Quantitative findings in phase two complemented the phase one findings and aimed to better answer the investigation's research questions, especially those for which the initial qualitative results did not provide enough context. In particular, regarding research question three: How did the study abroad course *AG 3803: International Study Tour in Agricultural Sciences and Natural Resources: Mexico* impact students' decisions to affirm or disconfirm their career aspirations to become veterinarians? A retrospective then-post evaluation procedure (Howard et al., 1979) guided this data collection and its analysis during the study's second phase (see Figure 10).

### *Quantitative Data Collection*

The responses to a course evaluation in the form of an online survey questionnaire (see Appendix C) sent to students after the study abroad course was the source of data for this phase. The course evaluation consisted of three components (see Appendix C): 1)

academic motivation, 2) curriculum evaluation, and 3) activities evaluation. Only the academic motivation component of the course evaluation was used in this study because of its relevance in answering the research questions. However, the other two components of the course evaluation instrument are presented as part of Appendix X.

The academic motivation component consisted of eight questions: 1) What was your student classification in college during the 2018-2019 academic year? (EQ1); 2) What is your gender? (EQ2); 3) Before the trip and now that you've returned, how motivated were/are you to become a veterinarian? (EQ3); 4) Before the trip and now that you are back, how likely were/are you to drop the pre-veterinarian option? (EQ4); 5) Before the trip and now that you are back, how certain were/are you about your focus in veterinary medicine (small, large, exotic animals; wildlife)? (EQ5); 6) Before going on this trip and now that you have returned, how certain were/are you that you would attend veterinary school? (EQ6); 7) Comparing what you learned on the trip and what you knew before, how knowledgeable did/do you feel about the veterinary profession? (EQ7); and 8) Before the trip and now that you've returned, how motivated were/are you to get good grades in college? (EQ8).

***Quantitative Data Analysis***

Descriptive statistics, including frequencies, percentages, means, standard deviations, and skewness and kurtosis, were reported for data collected in the course evaluation. Inferential testing consisted of conducting the Wilcoxon Signed-Ranks Test using data collected for each of the questions in the academic motivation portion of the course evaluation (see Appendix C). The Wilcoxon Signed-Ranks Test is a non-parametric statistical test used to assess mean differences of two related samples,

matched samples, or repeated measures of a single sample (Field, 2013). The Wilcoxon Signed-Ranks Test has been used as an alternative to the paired sample *t*-test for non-normally distributed data (Field, 2013). All quantitative data were analyzed using the IBM® SPSS® data analysis software version 22 for Microsoft Windows. Potential clusters based on the students' affirmation or disconfirmation of veterinary medicine career aspirations were identified from the quantitative data analysis.

### *Interpretation of Research Phase Two*

An overall interpretation of the findings derived from the study's second research phase informed and guided its third phase. This phase was the second of the study's two qualitative phases (see Figure 10). These findings were included as part of Chapter IV.

## Third Research Phase: Qualitative

A timeline interview approach (Adriansen, 2012; Banks, 2007; Berends, 2011) was followed as the research procedure to operationalize data collection and analysis in the third phase of the study (see Figure 10). Findings from one-on-one interviews with purposefully selected students were the sources of data for this phase. Qualitative findings in phase three complemented the quantitative findings from phase two and aimed to better answer research question three: How did the study abroad course *AG 3803: International Study Tour in Agricultural Sciences and Natural Resources: Mexico* impact students' decisions to affirm or disconfirm their career aspirations to become veterinarians?

### *Qualitative Data Collection*

A group of six students from the 25 who participated in the study abroad course *AG 3803 International Study Tour in Agricultural Sciences and Natural Resources:*

*Mexico* were interviewed for the third phase of the study. Three students who had dropped the pre-vet option after the study abroad course and three students who continued with their aspirations to become veterinarians were interviewed. Creswell and Poth (2018) recommended one to two cases for narrative inquiries, or three to 10 participants for phenomenological studies to elucidate the specifics of a phenomenon. Moreover, Morse (1994) suggested six participants to understand the essence of a shared experience. Karamustafaoglu (2009) chose to interview a subsample of six teachers from a case study consisting of 40 educators. According to Guetterman (2015), what matters about sample size in qualitative research is not only size but also appropriateness of the sample, especially regarding data saturation. "Data saturation is reached when there is enough information to replicate the study, when the ability to obtain additional new information has been attained, and when further coding is no longer feasible" (Fusch & Ness, 2015, p. 1408). In the view of the researcher, data saturation for the follow up interviews during phase three of this study was reached by the third interview.

These follow up interviews were conducted to identify significant stages or changes in the students' levels of aspiration to become veterinarians and to learn about how specific course features may have helped them affirm or disconfirm their career choices. These students were purposively selected using a form of snowball sampling (Creswell & Creswell, 2018; Patton, 1990; Teddlie & Yu, 2007). The researcher interacted with a student who shared having dropped the pre-vet option after the study abroad course and knowing of others who had done that, and some who had continued with the option. The investigator contacted these students regarding interviews.

The interviews were conducted via Zoom during the spring semester of 2021 and all interviewees agreed to be video recorded. Deakin and Wakefield (2014) stated: "Video calling provides the researcher with an opportunity to not just talk to the respondent but to see them in real time" (p. 4). A semi-structured interview protocol with overarching questions (see Appendix B) was used to guide the interviews (Creswell & Creswell, 2018; Lincoln & Guba, 1985; Yin, 2014). The participants were also asked probing questions during the interviews to gain further insight and descriptions of their experiences (Creswell & Poth, 2018; Yin, 2014). Notes (memos) were taken by the researcher during the interviews to highlight key information points provided by the students. Groenewald (2004) explained that memos may include "field notes recording what the researcher hears, sees, experiences and thinks in the course of collecting and reflecting on the [research] process" (p. 13). Each interview lasted from 45 to 60 minutes.

### *Qualitative Data Analysis*

The interviews were transcribed verbatim and the interviewees' identities were replaced in the transcription process with pseudonyms to protect their anonymity and ensure confidentiality. A visual timeline showcasing potential stages or changes in the levels of aspiration to become a veterinarian was drawn for the students interviewed who had either continued or discontinued pursuing a pre-vet option. Text vignettes and pertinent quotes were used to describe significant stages and critical events impacting students' career aspirations. Significant patterns of information identified in the students' interview transcriptions were also presented as part of the findings derived from this last phase of the investigation to allow comparison within and between the two groups of students who provided the interviews.

### *Interpretation of Research Phase Three*

An interpretation of the findings derived from the study's third research phase, i.e., the follow up interviews with six students, was provided (see Figure 10). This interpretation combined with that of phases one and two served in the development of a closing vignette for the study, as presented in Chapter V.

### Case Study Assertions and Closing Vignette

In case study research, an entry vignette is usually offered to introduce the case in a written report, then it expands based on central features of the case in the form of assertions (Creswell & Creswell, 2018). Case study research focuses on an in-depth exploration of the case through extensive data collection (Yin, 2014). Research outcomes are usually organized by an extensive description of the case, followed by key issues in the case, e.g., emergent themes (Creswell & Creswell, 2018). The major findings of this study were presented as assertions that contextualized the case study's overall closing vignette.

## Summary

Permission to conduct this investigation was granted by OSU's IRB (see Appendix B). This investigation was a case study with an embedded mixed methods design (CS-MM) [Guetterman & Fetters, 2018]. The case was a career-themed study abroad course to Mexico in the summer of 2019 consisting of 25 undergraduate students from OSU with aspirations to become veterinarians. The case was categorized as an intrinsic case study within the overall research design (see Figure 10). An intrinsic case study depicts a unique, relevant, critical, and unusual situation (Guetterman & Fetters, 2018).

An embedded, mixed methods design prioritized the study's first qualitative phase (Creswell & Plano Clark, 2011). The study's methodology included three research phases in all, and phases one and two informed the subsequent phases, respectively. The first phase involved qualitative procedures, including phenomenology and photovoice (see Figure 10). The sources of data for the first qualitative phase were students' written journals and photo journals collected during the study abroad course. The second phase of the study involved quantitative methods and the main source of data was a retrospective course evaluation. The third and final phase of the study involved in-depth interviews of selected students.

The eight *big-tent criteria* for achieving excellent quality in qualitative research recommended by Tracy (2010) guided the interpretive aspects of this study, including a researcher's reflexivity statement and recognition of his potential biases (Shaw, 2010), as well as *bracketing* measures to address such (Tufford & Newman, 2012). Regarding the study's quantitative phase, practicing objectivity and limiting potential threats to internal and external validity were addressed by standardizing the course's learning conditions, ensuring participants' confidentiality, collecting ample information, and presenting results of descriptive and inferential analyses in aggregate ways (Creswell & Creswell, 2018; Creswell and Plano Clark, 2011; Gertler et al., 2016). The study's retrospective evaluation approach also reduced the likelihood of threats to internal validity, especially regarding the respondents having sufficient knowledge of what was assessed (Gertler et al., 2016; Howard et al., 1979; Rohs, 1999). Overall, the course was designed, administered, taught, and evaluated to have a consistent learning effect on its participants or future pre-vet student participants from OSU or similar institutions, i.e., the course's

fidelity as the study's *intervention* or *treatment*. The interpretations derived from these research phases are presented in Chapter V.

# CHAPTER IV

# FINDINGS

Chapter IV presents findings derived from the study's three research phases, i.e., qualitative, quantitative, and qualitative. The qualitative findings from phase one are presented first followed by findings from a second quantitative phase that added to the qualitative findings of phase one. As quantitative findings, frequencies, percentages, means, and standard deviations are presented. A third qualitative phase supplemented findings from phases one and two.

## Purpose of the Study

Overall, this mixed methods case study sought to explore, understand, and interpret the impact of a study abroad course on pre-vet students' aspirations to become veterinarians. In addition, the study strove to describe pre-vet students' views on the influence of local culture and the overall practice of veterinary medicine in Mexico. The investigation identified specific factors associated with the study abroad course that appeared to help students either affirm or disconfirm their career aspirations to become veterinarians.

Rule and John (2015) concluded:

> Case study is a widely prevalent approach within educational research but has been criticized for its lack of theoretical depth and rigor. . . . [However, i]n the recursive practice of research, case study can involve a dialogic relation between

> theory and research, and case study might engage with theory in different ways at different stages of the study. (p. 7)

The pre-vet students who participated in the study abroad course *AG 3803: International Study Tour in Agricultural Sciences and Natural Resources: Mexico* (see Appendix A) during the summer of 2019 were the subjects of this investigation's case and source of its data.

## Research Questions

Three research questions guided this study:

1. What were the perceptions of students who participated in the study abroad course *AG 3803: International Study Tour in Agricultural Sciences and Natural Resources: Mexico* regarding the practice of veterinary medicine in Mexico?
2. What were the AG 3803 students' perceptions regarding the influence of culture on the practice of veterinary medicine in Mexico?
3. How did the study abroad course *AG 3803: International Study Tour in Agricultural Sciences and Natural Resources: Mexico* impact students' decisions to affirm or disconfirm their career aspirations to become veterinarians?

## Findings Associated with Research Phase One: Qualitative

### Word Analysis of Students' Written Journals

Twenty three of the 25 students in the study abroad course submitted written journals. Three of those 23 students did not give their journals a name. The investigator named these journals based on their content to facilitate the data analysis process and reporting of findings. Of the 23 journals submitted, 18 featured a mix of the students'

observations on culture and veterinary medicine, and five focused solely on culture (see Table 5).

**Table 5**

*Names and Foci of Students' Written Journals (N = 23)*

| Students | Journal Names | Foci |
|---|---|---|
| 1 | Advances in Bovine Reproduction | Mixed |
| 2 | Rural Veterinary Medicine in Mexico | Mixed |
| 3 | Rural Veterinary Practice | Mixed |
| 4 | Did Not Submit a Journal | n/a |
| 5 | Culture and Animal Agriculture | Mixed |
| 6 | No Name [Cultural Differences in the Veterinary Profession and Horse Community] | Mixed |
| 7 | The History of Mexican Culture | Culture |
| 8 | Did Not Submit a Journal | n/a |
| 9 | Equid Veterinary Care | Mixed |
| 10 | Cultural Differences in Mexico | Culture |
| 11 | Rural Life in Mexico | Mixed |
| 12 | Authentic or American - Cracking Mexican Cuisine Wide Open | Culture |
| 13 | Rural Culture and Veterinary Practices of Mexico | Mixed |
| 14 | Companion Animals in the United States and Mexico: Difference[s] in Treatment | Mixed |
| 15 | The Use of Entomopathogenic Nematology on *Rhipicephalus microplus* in Latin America | Mixed |
| 16 | Equids Role in Mexican Society | Mixed |
| 17 | Conditions in Mexico | Mixed |
| 18 | Equine Importance | Mixed |
| 19 | No name [Large Animal Veterinarians in Mexico and the United States] | Mixed |
| 20 | No name [Animal Agriculture] | Mixed |
| 21 | Veterinary Students and the Benefits of Community Service in the Transition from University to Clinical Practice | Mixed |
| 22 | Welfare of Equids in Mexico | Mixed |
| 23 | Mexican Cuisine | Culture |
| 24 | Food and Culture of Mexico | Culture |
| 25 | The World of Farm/Production Animals | Mixed |

*Note.* The names of students' journals enclosed with brackets were assigned by the researcher.

At least 180 words, used with a frequency of more than 10 times, were identified in the aggregated text of students' written journals (see Appendix A). The top 50 most frequently written words, ranging from 233 to 28 occurrences, are presented in Table 6. And after accounting for morphological variations, 39 related word clusters were identified, and presented in Table 7.

**Table 6**

*Top 50 most frequently used Words found in the Aggregated Text of the Students' Written Journals*

| Number | Words | *f* | Frequency Rank[a] |
|---|---|---|---|
| 1 | Mexico | 233 | 1 |
| 2 | animals | 229 | 2 |
| 3 | animal | 156 | 3 |
| 4 | people | 130 | 4 |
| 5 | horses | 110 | 5 |
| 6 | horse | 97 | 6 |
| 7 | community | 95 | 7 |
| 8 | work | 91 | 8 |
| 9 | Mexican | 90 | 9 |
| 10 | day | 89 | 10[t] |
| 11 | students | 89 | 10[t] |
| 12 | food | 88 | 12 |
| 13 | different | 87 | 13 |
| 14 | United States | 82 | 14 |
| 15 | time | 72 | 15 |
| 16 | veterinary | 71 | 16 |
| 17 | culture | 69 | 17[t] |
| 18 | care | 69 | 17[t] |
| 19 | trip | 67 | 19 |
| 20 | donkeys | 65 | 20 |
| 21 | city | 64 | 21 |
| 22 | experience | 49 | 22 |
| 23 | equids | 47 | 23 |
| 24 | America | 46 | 24[t] |
| 25 | rural | 46 | 24[t] |
| 26 | communities | 45 | 26 |
| 27 | days | 44 | 27 |

| | | | |
|---|---|---|---|
| 28 | help | 41 | 28 [t] |
| 29 | welfare | 41 | 28 [t] |
| 30 | learned | 40 | 30 |
| 31 | vet | 39 | 31 |
| 32 | group | 38 | 32 |
| 33 | authentic | 37 | 33 |
| 34 | owner | 36 | 34 [t] |
| 35 | agriculture | 36 | 34 [t] |
| 36 | owners | 36 | 34 [t] |
| 37 | dogs | 36 | 34 [t] |
| 38 | school | 35 | 38 [t] |
| 39 | teeth | 35 | 38 [t] |
| 40 | cattle | 34 | 40 [t] |
| 41 | donkey | 34 | 40 [t] |
| 42 | ranch | 33 | 42 [t] |
| 43 | differences | 33 | 42 [t] |
| 44 | country | 30 | 44 [t] |
| 45 | Puebla | 30 | 44 [t] |
| 46 | world | 29 | 46 |
| 47 | veterinarians | 28 | 47 [t] |
| 48 | opportunity | 28 | 47 [t] |
| 49 | difference | 28 | 47 [t] |
| 50 | Tex-Mex | 28 | 47 [t] |

*Note.* [a]Tied ranks reflect words that appeared the same number of times in students' journals. [t]Tied ranking.

**Table 7**

*The most frequently used Words found in the Aggregated Text of the Students' Written Journals, including by Clusters*[a]

| **Words/Word Clusters**[a] | ***f*** | **Frequency Rank**[b] |
|---|---|---|
| animal, animals | 385 | 1 |
| Mexico | 233 | 2 |
| horse, horses | 207 | 3 |
| care, medicine, practices, practice, veterinary | 190 | 4 |
| difference, differences, different | 148 | 5 |
| communities, community | 140 | 6 |
| day, days | 133 | 7 |
| people | 130 | 8 |
| donkey, donkeys | 99 | 9 |
| student, students | 97 | 10 |

| | | |
|---|---|---|
| time, times | 94 | 11 |
| work | 91 | 12 |
| Mexican | 90 | 13 |
| food | 88 | 14 |
| America, American, Americans, Americas | 87 | 15 |
| vet, veterinarians, vets | 84 | 16 |
| United States | 82 | 17[t] |
| cities, city | 82 | 17[t] |
| owner, owners | 72 | 19 |
| trip, trips | 70 | 20 |
| culture | 69 | 21 |
| experience, experiences | 60 | 22 |
| equid, equids | 57 | 23 |
| rural | 46 | 24[t] |
| countries, country | 46 | 24[t] |
| dog, dogs | 45 | 26 |
| help | 41 | 27[t] |
| welfare | 41 | 27[t] |
| learned | 40 | 29 |
| group | 38 | 30[t] |
| school, schools | 38 | 30[t] |
| teeth, tooth | 38 | 30[t] |
| authentic | 37 | 33 |
| agriculture | 36 | 34 |
| cattle | 34 | 35 |
| ranch | 33 | 36 |
| Puebla | 30 | 37 |
| world | 29 | 38 |
| opportunity | 28 | 39 |

*Note.* [a]The frequently used words were clustered according to their contextual relevance, i.e., singular and plural versions and related variations were combined. [b]Tied ranks reflect words/word clusters that appeared the same number of times. [t]Tied ranking.

**Word Analysis of the Students' Photo Journals**

Twenty four of the 25 students in the study abroad course submitted a photo journal. The journals included 241 photographs and related written descriptions. Twenty-three students submitted 10 photographs and one student submitted 11. For all the photographs, 65.98% were related to veterinary medicine, 26.14% to culture, and 7.88% to other related topics, i.e., a total of 159, 63, and 19 photos, respectively (see Table 8).

**Table 8**

*Classification of Photographs in the Students' Photo Journals (N = 241)*

| Student | Photos | | | | | | | | | | | Totals | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | P1 | P2 | P3 | P4 | P5 | P6 | P7 | P8 | P9 | P10 | P11 | vm | c | o |
| S1 | vm | c | vm | vm | vm | vm | vm | Vm | vm | vm | n/a | 9 | 1 | 0 |
| S2 | vm | c | vm | vm | c | vm | vm | Vm | vm | o | n/a | 7 | 2 | 1 |
| S3 | vm | vm | vm | vm | vm | vm | vm | Vm | vm | c | n/a | 9 | 1 | 0 |
| S4 | c | vm | vm | vm | vm | vm | o | O | o | o | n/a | 5 | 1 | 4 |
| S5 | vm | vm | vm | vm | vm | c | o | Vm | vm | vm | n/a | 8 | 1 | 1 |
| S6 | vm | vm | vm | vm | vm | vm | vm | Vm | vm | o | n/a | 9 | 0 | 1 |
| S7 | c | vm | vm | c | c | c | vm | Vm | vm | vm | n/a | 6 | 4 | 0 |
| S8 | did not submit a photo journal | | | | | | | | | | | 0 | 0 | 0 |
| S9 | vm | c | c | c | vm | vm | vm | C | c | vm | n/a | 5 | 5 | 0 |
| S10 | c | c | c | c | c | c | c | C | vm | c | n/a | 1 | 9 | 0 |
| S11 | vm | o | c | c | c | c | vm | Vm | vm | vm | n/a | 5 | 4 | 1 |
| S12 | vm | vm | vm | vm | vm | vm | vm | Vm | vm | vm | n/a | 10 | 0 | 0 |
| S13 | c | c | vm | vm | vm | vm | vm | Vm | vm | vm | n/a | 8 | 2 | 0 |
| S14 | o | c | vm | vm | vm | vm | vm | Vm | o | o | n/a | 6 | 1 | 3 |
| S15 | c | o | c | c | c | c | c | C | c | c | n/a | 0 | 9 | 1 |
| S16 | c | c | vm | vm | vm | vm | vm | Vm | vm | o | n/a | 7 | 2 | 1 |
| S17 | o | c | c | c | c | c | vm | Vm | vm | vm | n/a | 4 | 5 | 1 |
| S18 | c | vm | vm | vm | c | vm | vm | Vm | vm | vm | n/a | 8 | 2 | 0 |
| S19 | c | c | c | c | c | vm | vm | Vm | vm | o | n/a | 4 | 5 | 1 |
| S20 | vm | c | vm | o | vm | vm | vm | Vm | vm | vm | n/a | 8 | 1 | 1 |
| S21 | vm | c | vm | vm | vm | c | vm | Vm | vm | vm | n/a | 8 | 2 | 0 |
| S22 | c | c | vm | vm | vm | vm | vm | Vm | vm | o | n/a | 7 | 2 | 1 |
| S23 | vm | vm | vm | vm | vm | vm | c | Vm | vm | vm | o | 9 | 1 | 1 |
| S24 | vm | vm | vm | vm | vm | vm | vm | Vm | vm | c | n/a | 9 | 1 | 0 |
| S25 | vm | vm | vm | vm | vm | c | c | O | vm | vm | n/a | 7 | 2 | 1 |
| **Total by Classification** | | | | | | | | | | | | 159 | 63 | 19 |

*Note.* c = Culture; o = Other; vm = Veterinary Medicine

More than 100 words, used with a frequency of more than 10 times, were identified in the aggregated text of the students' written descriptions of their photographs (see Appendix A). The top 50 most frequently written words, ranging from 118 to 15 occurrences, are presented in Table 9. And after accounting for morphological variations, 42 related word clusters were identified, as presented in Table 10.

**Table 9**

*Top 50 most frequently used Words found in the Aggregated Text of the Students' Written Descriptions of their Photographs*

| Number | Word | *f* | Frequency Rank[a] |
|---|---|---|---|
| 1 | Mexico | 118 | 1 |
| 2 | people | 73 | 2 |
| 3 | animals | 67 | 3 |
| 4 | cattle | 63 | 4 |
| 5 | photo | 57 | 5 |
| 6 | UNAM[b] | 52 | 6 |
| 7 | work | 48 | 7 |
| 8 | picture | 48 | 7 |
| 9 | students | 46 | 9 |
| 10 | horse | 42 | 10[t] |
| 11 | animal | 42 | 10[t] |
| 12 | community | 41 | 12 |
| 13 | horses | 38 | 13[t] |
| 14 | ranch | 38 | 13[t] |
| 15 | elephants | 37 | 15 |
| 16 | different | 35 | 16[t] |
| 17 | United States | 35 | 16[t] |
| 18 | culture | 31 | 18[t] |
| 19 | Veracruz | 31 | 18[t] |
| 20 | donkey | 28 | 20 |
| 21 | cow | 27 | 21 |
| 22 | vet | 25 | 22 |
| 23 | veterinary | 24 | 23[t] |
| 24 | city | 24 | 23[t] |
| 25 | bull | 23 | 25 |
| 26 | trip | 22 | 26 |
| 27 | important | 21 | 27[t] |
| 28 | working | 21 | 27[t] |
| 29 | donkeys | 21 | 27[t] |
| 30 | America | 21 | 27[t] |
| 31 | Puebla | 20 | 31[t] |
| 32 | interesting | 20 | 31[t] |
| 33 | research | 20 | 31[t] |
| 34 | school | 20 | 31[t] |
| 35 | field | 20 | 31[t] |
| 36 | safari | 19 | 36[t] |
| 37 | Mexican | 19 | 36[t] |

| | | | |
|---|---|---|---|
| 38 | vanilla | 19 | 36 [t] |
| 39 | turtles | 18 | 39 [t] |
| 40 | UPAEP[c] | 18 | 39 [t] |
| 41 | facility | 18 | 39 [t] |
| 42 | cows | 17 | 42 [t] |
| 43 | years | 17 | 42 [t] |
| 44 | owner | 16 | 44 |
| 45 | case | 15 | 45 [t] |
| 46 | part | 15 | 45 [t] |
| 47 | veterinarians | 15 | 45 [t] |
| 48 | shows | 15 | 45 [t] |
| 49 | stadium | 15 | 45 [t] |
| 50 | mural | 15 | 45 [t] |

*Note.* [a]Tied ranks reflect words that appeared the same number of times in the aggregated text of the students' written descriptions of their photographs. [b]Universidad Nacional Autónoma de México. [c]Universidad Popular Autónoma del Estado de Puebla. [t]Tied ranking.

**Table 10**

*The most frequently used Words found in the Aggregated Text of the Students' Written Descriptions of their Photographs, including Clusters*[a]

| **Words/Word Clusters**[a] | ***f*** | **Frequency Rank**[b] |
|---|---|---|
| Mexico | 118 | 1 |
| animal, animals | 109 | 2 |
| cattle, cow, cows | 107 | 3 |
| horse, horses | 80 | 4 |
| vet, vets, veterinarian, veterinarians, veterinary | 75 | 5 |
| people | 73 | 6 |
| photo | 57 | 7 |
| picture, pictures | 56 | 8 |
| difference, differences, different, differently | 54 | 9 |
| UNAM[c] | 52 | 10 |
| donkey, donkeys | 49 | 11 |
| work | 48 | 12 |
| students | 46 | 13 |
| community | 41 | 14 |
| ranch | 38 | 15 |
| elephants | 37 | 16 |
| United States | 35 | 17 |
| culture | 31 | 18 [t] |
| Veracruz | 31 | 18 [t] |

| | | |
|---|---|---|
| America, American, Americans | 30 | 20 |
| facilities, facility | 25 | 21[t] |
| show, shows | 25 | 21[t] |
| city | 24 | 23 |
| bull | 23 | 24 |
| trip | 22 | 25 |
| important | 21 | 26[t] |
| working | 21 | 26[t] |
| school, schools | 21 | 26[t] |
| Puebla | 20 | 29[t] |
| interesting | 20 | 29[t] |
| research | 20 | 29[t] |
| field | 20 | 29[t] |
| Mexican, Mexicans | 20 | 29[t] |
| owner, owners | 20 | 29[t] |
| safari | 19 | 35[t] |
| vanilla | 19 | 35[t] |
| case, cases | 19 | 35[t] |
| turtles | 18 | 38[t] |
| UPAEP[d] | 18 | 38[t] |
| part, parts | 18 | 38[t] |
| years | 17 | 41 |
| stadium | 15 | 42[t] |
| mural | 15 | 42[t] |

*Note.* [a]The frequently used words were clustered according to their contextual relevance, i.e., singular and plural versions and related variations were combined. [b]Tied ranks reflect words/word clusters that appeared the same number of times. [c]Universidad Nacional Autónoma de México. [d]Universidad Popular Autónoma del Estado de Puebla. [t]Tied ranking.

**Findings Associated with Research Question One**

Ten themes emerged from the students' written journals and written descriptions of their photographs as related to research question one: What were the perceptions of students who participated in the study abroad course *AG 3803 International Study Tour in Agricultural Sciences and Natural Resources: Mexico* regarding the practice of veterinary medicine in Mexico? The themes are presented in alphabetical order (see Tables 11, 12, & 13).

**Table 11**

*Emergent Themes, Source(s) of Emergent Themes, Number of Assignments from which Emergent Themes Arose, and the Number of Significant Statements in Students' Assignments related to Research Question One*

| Emergent Themes | Source(s) of Emergent Themes | | Number of Students' Assignments from which Significant Statements were Derived | | Significant Statements in the Students' Assignments | |
|---|---|---|---|---|---|---|
| | Written Journals | Photo Journals | Written Journals | Photo Journals | Written Journals | Photo Journals |
| **Access to Care** | Yes | Yes | 7 | 4 | 10 | 6 |
| **Animal Condition** | Yes | Yes | 7 | 12 | 14 | 15 |
| **Animal Productivity** | No | Yes | 0 | 7 | 0 | 7 |
| **Climate Influence** | Yes | Yes | 6 | 6 | 7 | 11 |
| **Comparison with the United States** | Yes | Yes | 9 | 14 | 14 | 27 |
| **Humane Treatment** | No | Yes | 0 | 9 | 0 | 9 |
| **Mexican Schooling** | Yes | Yes | 6 | 8 | 9 | 8 |
| **Range of Veterinary Procedures** | Yes | Yes | 8 | 15 | 12 | 39 |
| **Socioeconomic Influence** | Yes | No | 10 | 0 | 16 | 0 |
| **Work Settings for Veterinary Practice** | Yes | Yes | 3 | 6 | 7 | 9 |

**Table 12**

*Words in Students' Assignments Supporting Emergent Themes related to Research Question One*

| Emergent Themes | Supporting Words |
|---|---|
| Access to Care | access, afford, animals, care, clinic, economical, free, healthy, help, husbandry, injuries, isolated, limited, maintenance, manage, medical, minimum, money, poor, rural, situation, transport, treatment(s), villagers |
| Animal Condition | anhidrosis, animals, better, breed, communities, community, compare, comparison, condition(s), cuts, exercise, fat, free, genetics, good, habitat, harnesses, hooves, improper, infected, injuries, malnourished, manners, nicer, poor, poorly, problem(s), roam, rural, saddles, scars, shape, show, size, skin, sores, stimulated, tame, ticks, underweight, unproper, untreated, weight, welfare |
| Animal Productivity | afford, cheese, environment, feed, income, life, material, milk, milking, money, produce, profit, ranchers, resources |
| Climate Influence | adapt, atmospheric, beef, *Bos indicus*, *Bos taurus*, breed(s), calving, central, climate, conditions, crossing, disease, energy, environment, extreme, Gyr, heat, Hereford, Holstein, hot, humid, insects, issues, meat, Mexico, milk, muscle, parasites, pest, production, productive, reproduction, resistant, season, southern, summer, tolerant, tropical, weather, Zebu |
| Comparison with the United States | amount, animals, attractions, both, breeds, care, companion, compare, compared, comparison, conservation, contrast, difference(s), different, differently, equipment, facilities, hospital(s), important, industry, larger, like, livestock, milk, normally, on[-]par, OSU, OSU[-]CVHS, patients, plans, practices, processes, profession, rarely, room, routine, sector, separate, similar, similarities, similarity, situation, together, tuition, uncommon, United States, unlike, veterinary, welfare, wide, wildlife |
| Humane Treatment | comfort, commands, cooperate, dedication, elephants, exercises, focused, handlers, positive[-]reinforcement, safe, trainers, training, trust, verbal, work |
| Mexican Schooling | access, avian, book, buildings, campus, cattle, chickens, classroom, clinics, college, consultation, degree, education, equine, exotics, experiences, facilities, hands-on, horses, hours, inclusivity, inexpensive, job, knowledge, laboratory, learning, library, life, mascot, Mexico, monuments, peer, people, practical, professors, public, Puebla, service, sheep, students, training, tuition, Veracruz |
| Range of Veterinary Procedures | abscesses, administer, anesthesia, anhidrosis, animals, antibiotics, beetles, bites, breed(s), calf, calves, case, castration, cattle, chute, clean, concept, conservation, contraption, cut(s), cyst, deficiencies, develop, dewormed, diets, drops, eggs, elephants, emasculator, embryo[-]transfer, farming, feed, |

| | |
|---|---|
| | fibrotic, fish, floating, flush, fungi, gender, granular, Gyr, handle, hatch, hay, heal, hematoma, honey, hoof, hooves, hydrotherapy, in[-]vitro, in[-]vivo, infection, itching, labs, lameness, live[-]cover, mare, neuter, nostril, open, padding, pain, parasites, parasitic, pests, plants, pregnancy, probe, procedure, production, raise, rehabilitation, reinforcement, release, research, scalpel, scratching, sedative, sheep, signs, sinuses, steroids, stitch, students, surgical, suturing, teeth, testosterone, ticks, tilapia, tissue, trainers, training, treating, treatment, trim, ulcer, ultrasound, UNAM, UPAEP, vitamin(s), watched, weight, welfare, work, worm, wound(s) |
| Socioeconomic Influence | afford, areas, condition, contrast, diet, electricity, fleshy, food, malnourished, Mexico City, money, overworked, poor, poverty, Puebla, resources, rough, rural, slums, struggle, variety, Veracruz |
| Work Settings for Veterinary Practice | animals, area, day, door, electricity, environment, established, field, gate, holding, hot, humid, improvise, inside, limited, manual, manually, operation, options, outside, people, procedure, safety, standing, surgery, work |

**Table 13**

*Emergent Themes and Representative Written Journal Entries and/or Photo Journal Entries with Students' Descriptive Statements related to Research Question One*

| Emergent Themes | Representative Statements from the Students' Written Journals | Representative Photographs and Descriptive Statements from the Students' Photo Journals |
|---|---|---|
| Access to Care | Student 13: Another difference in the medical practices of rural Mexico and the cities of Mexico is the basic care given to the animals. What is considered basic care typically is only food and shelter, the underlying basic care such as hoof trimming, brushing, and proper exercise is often overlooked in the rural communities. The exercise for most of the animals comes from working on the farm and pulling carts. |  S21P8: The local people of the village . . . patiently await their turn for a veterinarian or veterinary student to evaluate and treat their equids. This clinic provides much needed free veterinary care for these animals that their owners could not travel [for] or afford to receive . . . . |

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|---|---|---|
| Animal Condition | Student 13: Many of the equids at the hands-on community days were lame and had open wounds on their legs and had untrimmed hoofs. In the city at the UNAM[a] Equine hospital the animals looked to be in good health other than their current condition. |  <br>S12P2: [The veterinarian from OSU] is palpating a Brown Swiss cow at the UPAEP[b] Vet School Ranch. She has an ultrasound probe, trying to see if this cow is pregnant or not. The cattle on this ranch were a little over conditioned and they had had problems getting them pregnant. The Ranch does all of their work under the five animal welfare needs. These needs include the need for a suitable diet, the need for a suitable environment, the need to exhibit normal behavior patterns, the need to be housed with or apart from other animals, and the need to be protected from pain, suffering and disease. |

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|---|---|---|
| Animal Productivity | n/a |  <br>S5P5: . . . This dairy farm only milks the cows once a day and has a very low production of milk per cow. This may be due to lack of nutrition since they have different grasses than we do in the United States, as well lack of funds to provide them enough grain . . . . |

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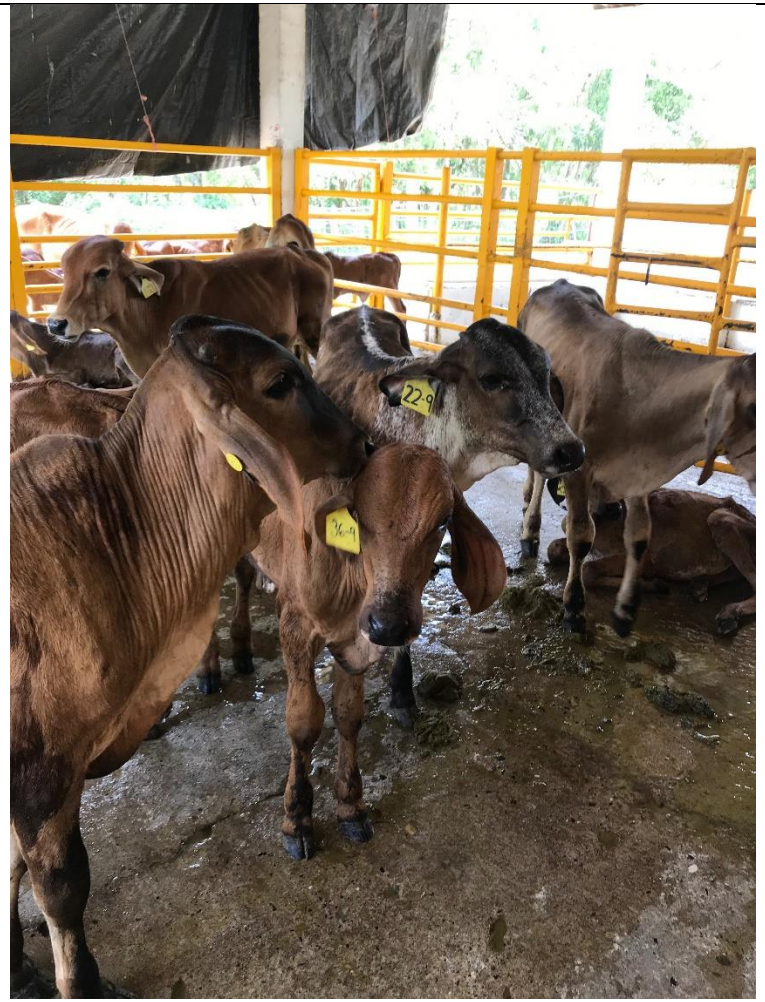
|---|---|---|
| Climate Influence | Student 17: The breeds that they raise on the university farms in Mexico are totally different than [most of the] breeds that we tend to raise in America. I think that this is mostly due to the difference in the climate, especially in coastal Mexico with high heat and tropical humidity making the weather extreme. |  <br>S14P8: . . . [the veterinarian] told us about the cannicula [heatwave], which is the hottest month of the year. Since studies have come out advising against breeding during this time, this cow will not be bred until after August 11th. |

| | | |
|---|---|---|
| Comparison with the United States | Student 14: In the US, community days like we were a part of in Mexico are not legal because the risks associated with malpractice and the lack of knowledge from students performing the requested task or action. |  S24P2: This photo from the UNAM[a] Farm, shows many similarities and differences in the veterinary profession between Mexico and the United States. The practice of removing calves from dairy cows shortly after birth is apparent in both countries. However, it's [sic] use is more widespread in the United States than it is in Mexico . . . . |

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|---|---|---|
| Humane Treatment | n/a |  <br>S7P7: Some of the Asian elephants we had worked on earlier were rescued from the circus, where they had proven to be problematic, as they had killed many people. However, the people working with these animals at the safari park have been able to retrain them to do all the tasks required for treatment only by using vocal commands and positive reinforcement by offering fruit when they are cooperative. |

| | | |
|---|---|---|
| Mexican Schooling | Student 5: The students here [at UNAM[a] in Mexico] come to the vet school out of high school, instead of obtaining their undergrad like we do here in the US. |  <br>S14P3: . . . UPAEP[b] has a few more horses for students to practice on, as well as cows, goats, and chickens. These students get to go straight into vet school from high school, and since most students are from the city, they need to get comfortable with large animals. |

| | | |
|---|---|---|
| Range of Veterinary Procedures | Student 3: For many of the lesions, we would wash the wounds and use a paste to help heal them up as well as deflect the flies away from the area. Some donkeys with extreme weight loss ended up needing their teeth to be floated. |  <br>S19P7: If the animal was wounded the students would clean and treat the wounds. The owner would be sent home with the paste made for wounds or antibiotics and antinflammatory medicine if needed. If the donkey or horse had dental problems the veterinarians would float their teeth to make eating less painful. |
| Socioeconomic Influence | Student 18: The village was living in extreme poverty, and many of their animals reflected their economic status. We saw some very serious and [likely] fatal injuries. | n/a |

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|---|---|---|
| Work Settings for Veterinary Practice | Student 5: The field days really demonstrated how important it is to be flexible in the area of veterinary medicine. The day was long and hot, animals kept coming to be treated, but they [, the veterinarians,] never once stopped to complain; the vets went with the flow even when they were tired. |  <br>S3P7: . . . This picture also shows that despite being within a rural environment, a surgery could be successfully completed. We took all measures possible to be safe and clean; however, you are still outside of a sterile environment . . . . |

*Note.* [a]Universidad Nacional Autónoma de México. [b]Universidad Popular Autónoma del Estado de Puebla.

**Findings Associated with Research Question Two**

Eight themes emerged from the students' written journals and written descriptions of their photographs as related to research question two: What were the AG 3803 students' perceptions regarding the influence of culture on the practice of veterinary medicine in Mexico? The themes are presented in alphabetical order (see Tables 14, 15, & 16).

**Table 14**

*Emergent Themes, Source(s) of Emergent Themes, Number of Assignments from which Emergent Themes Arose, and the Number of Significant Statements in Students' Assignments related to Research Question Two*

| Emergent Themes | Source(s) of Emergent Themes | | Number of Students' Assignments from which Significant Statements were Derived | | Significant Statements in the Students' Assignments | |
|---|---|---|---|---|---|---|
| | Written Journals | Photo Journals | Written Journals | Photo Journals | Written Journals | Photo Journals |
| **Animal Caretakers** | Yes | Yes | 4 | 1 | 4 | 1 |
| **Animals for Work** | Yes | Yes | 13 | 4 | 20 | 8 |
| **Animal Functionality** | Yes | No | 6 | 0 | 6 | 0 |
| **Context-based Welfare Practice** | Yes | Yes | 10 | 7 | 20 | 9 |
| **Give-back to the Community** | | | | | | |
| **Tradition** | Yes | Yes | 5 | 4 | 12 | 6 |
| **Naming Animals** | Yes | Yes | 2 | 4 | 3 | 5 |
| **Presence of Animals** | No | Yes | 0 | 4 | 0 | 4 |
| **Traditional Practices** | Yes | Yes | 8 | 2 | 17 | 2 |

**Table 15**

*Words in Students' Assignments Supporting Emergent Themes related to Research Question Two*

| Emergent Themes | Supporting Words |
|---|---|
| Animal Caretakers | children, donkeys, elderly, family, farm, feeding, horses, livestock, managing, mules, owners, people, villages, wives, women |
| Animals for Work | aggression, animals, attack, bones, bovine, carry, carts, communities, community, contact, crops, culture, dogs, donkeys, draft, equids, equipment, ethic, exotic, farm, farming, farms, feed, field, fruits, goods, graying, guard, handmade, harness, heavy, help, herding, home, horses, injuries, labor, livelihood, logs, materials, mules, necessity, nutrition, ovine, people, plow, police, property, protect, protection, pull, ranching, religious, ridding, rodent, role, scarred, service, society, species, spine, spiritual, swine, transport, transportation, underweight, vital, wood, work(ing) |
| Animal Functionality | accomplish, born, condition, different, difficulties, healing, operate, option, owners, performance, plow, situation, welfare, work |
| Context-based Welfare Practice | abuse, animal, awfully, back, bother, care, children, clash, communities, controlled, crippled, culture, cuts, dogs, donkey, fit, hand, harness, harnesses, hips, hitting, hobble, hop, horse, hurt, innocent, issues, kick(ing), laws, livelihood, marks, mistreated, necessities, normal, overweight, owners, pebbles, poorly, prominent, protect, provide, punish, regulations, rock(s), rope, rubbing, saddles, slimmer, strike, tails, throwing, tools, treatment, underweight, vary, welfare, withers, worth |
| Give-back to the Community Tradition | afford, communities, cultural, discounted, encouragement, expectation, expected, expertise, free, give[-]back, giving[-]back, grow, help, humbling, Mexico, mindset, need, norm, others, people, rural, services, tuition, willing, working |
| Naming Animals | Albert, animals, Canela, Julio, life, Midas, named, turtle, work |
| Presence of Animals | animals, culture, incorporated, maintain, option, outside, practical, restaurant, rode |
| Traditional Practices | belief, believe, blanket, canines, carts, castrate, castrating, castration, communities, culture, different, equipment, fence, grazing, highway, ideology, neutered, owners, permission, procedure, Puebla, relationship, rural, saddle, spayed, stray, tails, tarps, tradition, twist, typical |

**Table 16**

*Emergent Themes and Representative Written Journal Entries and/or Photo Journal Entries with Students' Descriptive Statements related to Research Question Two*

| Emergent Themes | Representative Statements from the Students' Written Journals | Representative Photographs and Descriptive Statements from the Students' Photo Journals |
|---|---|---|
| Animal Caretakers | Student 18: Women were the caretakers of many of the animals, they are in control of the household therefore the animals are many times the women[‘s] and children's responsibility. |  S2P3: . . . In the background you can see her owner, many of the donkeys and horses were accompanied by kids due to the parents needing to stay home and work. In the United States this would never had happened especially [children] by themselves [presenting the animals for veterinary care]. |

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|---|---|---|
| Animals for Work | Student 19: When visiting Mexico, I noticed that practically everyone that lived in the rural communities owned livestock animals which they used for work purposes. |  <br>S3P2: . . . Horses and donkeys are both usually working animals that perform very similar jobs. The dogs; however, are usually thought of as mostly companion animals. Even though working dogs are not rare. The dogs in Mexico are more part of the work ethic. They protect the donkeys, horses, and mules. They even act as herding dogs. |
| Animal Functionality | Student 16: It was quite hard to put aside my ideas of what a healthy animal should look like based on my experiences in the U.S. and realize that while skinny and scarred, these animals can work day in and day out in difficult terrain. | n/a |

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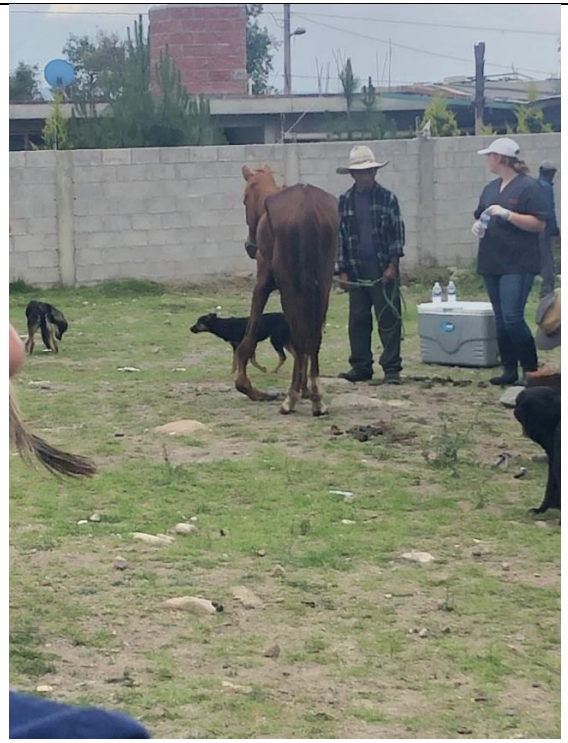
|---|---|---|
| Context-based Welfare Practice | Student 2: The problem in Mexico is that the welfare of the animal is often tossed out the window due to the need to work. |  <br>S12P1: This horse has been like this for fifteen years. She has been able to work with her leg like this for the entire fifteen years. We would think that this horse needs surgery when we would see this. However, to the owner, she is fine. The owner doesn't see a problem because she is still able to work. Since she has been like this for fifteen years, there was really no point in talking about surgery. |

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|---|---|---|
| Give-back to the Community Tradition | Student 24: One of my favorite parts of this trip was getting to experience and see firsthand the importance placed on giving back to one's community. The fact that it is not only encouraged and supported but that it is expected is huge. In the United States I feel that we often get caught up in doing what is best for us and completing things on our list or in school so we can go on and be successful and forget to give back to those around us . . . . |  <br>S20P5: This is a rural community outside Puebla. This was one of the community days that we attended. The animals in the photo are al[l] receiving medical care from the [veterinarians and] students of UPAEP[b] [and UNAM[a]] for free. This is part of the community service that the students perform to give back for their education. The animals seen in the photo are working animals used by the people of the community. The people rely on the free treatment from the students to ensure that their animals remain healthy. |

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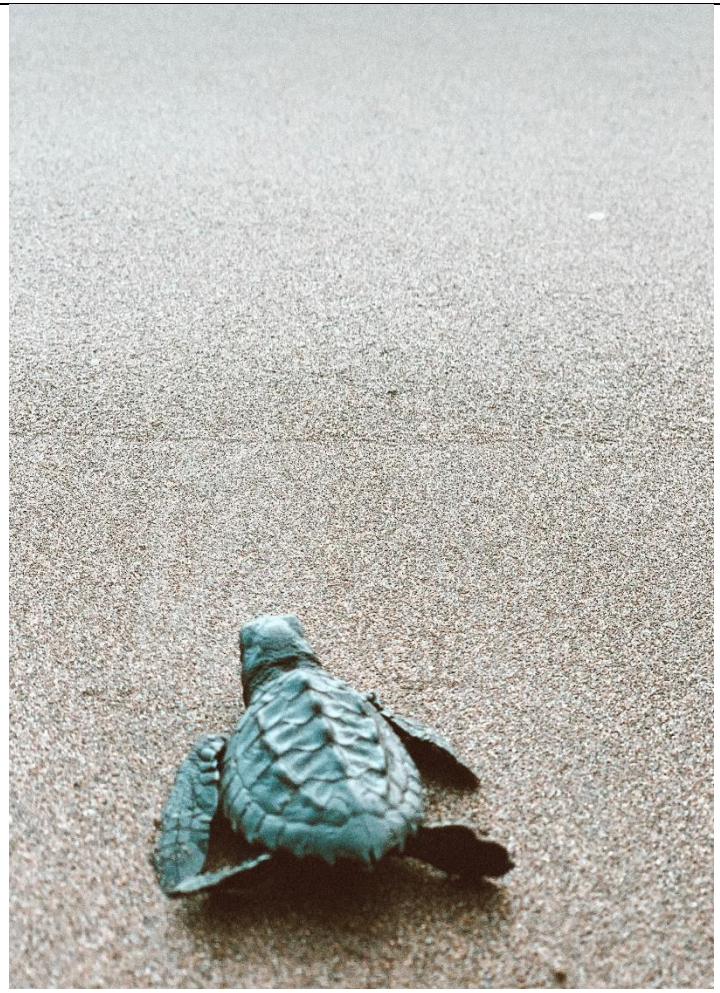
|---|---|---|
| Naming Animals | Student 16: . . . Many of the animals often are not named because they are strictly used for work . . . . |  <br>S2P7: This is my turtle, Julio, that got released to the sea while [we were] in Veracruz, Mexico . . . |

| | | |
|---|---|---|
| Presence of Animals | n/a |  <br>S11P6: These horses were right outside of our restaurant as we walked out from dinner. As Americans we were amazed at how incorporated animals are into the culture. Horses in a city is unusual in America unless they are police horses. |

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|---|---|---|
| Traditional Practices | Student 3: The horse was also not castrated. This is extremely common in Mexico. They do not castrate majority of the time because they believe in tradition. If the horse were to be castrated, we would be taking away from him. They believe they were made to be like that, and that's simply how it should be. There were valid reasons to everything according to the owner. |  <br>S3P5: . . . This work matched with the equipment used resulted in a lot of lesions in very specific areas on all of the donkeys. These traditions [of animal use] and injuries are very different from America, but in the sense they are having the donkeys treated and cared for in return for working can be similar. |

*Note.* [a]Universidad Nacional Autónoma de México. [b]Universidad Popular Autónoma del Estado de Puebla.

**Findings Associated with Research Question Three**

Six themes emerged from the students' written journals and written descriptions of their photographs as related to research question three: 3. How did the study abroad course *AG 3803: International Study Tour in Agricultural Sciences and Natural Resources: Mexico* impact students' decisions to affirm or disconfirm their career aspirations to become veterinarians? The themes are presented in alphabetical order (see Tables 17, 18, & 19).

**Table 17**

*Emergent Themes, Sources of Emergent Themes, Number of Assignments from which Emergent Themes Arose, and Number of Significant Statements in Students' Assignments related to Research Question Three*

| Emergent Themes | Sources of Emergent Themes | | Number of Students' Assignments from which Significant Statements were Derived | | Significant Statements in the Students' Assignments | |
|---|---|---|---|---|---|---|
| | Written Journals | Photo Journals | Written Journals | Photo Journals | Written Journals | Photo Journals |
| **Broadening of Career Perspectives** | Yes | Yes | 1 | 2 | 1 | 3 |
| **Hands-on Learning Experiences** | Yes | Yes | 8 | 4 | 13 | 4 |
| **Learning of Medical Judgement** | Yes | Yes | 5 | 6 | 6 | 6 |
| **Learning on a Range of Veterinary Procedures** | Yes | Yes | 11 | 18 | 34 | 39 |
| **Recommended Unique Learning Opportunity** | Yes | Yes | 5 | 6 | 5 | 7 |
| **Unique Learning Opportunities** | Yes | Yes | 7 | 13 | 15 | 28 |

**Table 18**

*Words in Students' Assignments Supporting Themes related to Research Question Three*

| Emergent Themes | Supporting Words |
|---|---|
| Broadening of Career Perspectives | animals, considering, educational, exposure, goals, handle, overall, practice, sizes, specialist, specialize, veterinarian, well-rounded |
| Hands-on Learning Experiences | activities, apply, case, clinic, compare, confidence, curriculum, feel, feeling, hands-on, learn, learning, opportunity, participate, practice, prepare, procedure, trip, understanding, utilize |
| Learning of Medical Judgement | ability, affect, animal(s), care, case, clinic, common, community, concept, concerns, condition, consideration, decision, experience, field, fix, hard, important, impoverished, interesting, issue, judge, judgement, lesson, lives, living, money, neglect, owners, people, perform, perspective, practice, quality, responsibility, rural, simple, situation, suffering, tools, treating, welfare, work, working |
| Learning on a Range of Veterinary Procedures | administer, aging, anatomy, animals, antibiotics, apply, approach, assisting, back, balance, behavior, blood, body, bone, *Bos indicus*, *Bos taurus*, bugs, cases, castration, cattle, checking, cheeks, circulation, clean(ing), combine, commands, compare(d), condition, cut(s), demonstrated, dental, developing, dewormer, digesting, donkey(s), eating, eggs, elephant, equids, equine, exam, examining, experiences, faces, feel, fetus, field, float(ed), fluid, follicle, foot, gash, girth, gland, gonads, handling, harvest, heal(ing), healthcare, heart, height, hooves, horse(s), hypothalamus, identify, infected, infection, injury, insert, inspect, interact, intern, intestines, irritation, knots, lameness, learn(ed), leg, livestock, looked, looking, maintenance, management, mastication, measuring, medication, minor, molars, monitor, mouth, movement, moving, mules, nail, nasal, neck, nervous, neutering, nostrils, operation, opportunity, ovary, owner, palate, palpate, palpation, paste, people, perform(ing), pituitary, placentome, pregnancy, pregnant, pressure, procedure(s), process, prolapse, proper, properly, pull, ranch(es), rating, reproductive, respiration, rubbing, scar, score, scoring, scrapes, screen, scrub, sedated, see, shoes, shoulder, show, skin, speculum, steps, stethoscope, stitch, straight, supplement, surface, surgery, swallow, swelling, syringe, taping, taught, teach, techniques, teeth, tendon, testicle, thickness, thumb, tongue, touch, touching, TPR [Temperature, Pulse, Respiration], treating, treatment(s), ultrasound, understanding, uterine, vessel, vitals, vitamin(s), watch, weight, work, wound(s) |

| | |
|---|---|
| Recommended Learning Opportunity | amazing, classroom, considering, experiences, exposed, favorite, fun, future, granted, knowledge, life, lifetime, listening, moment, observing, ocean, opportunity, real, recommend, situations, trip, unique, veterinarians, working, worthwhile, |
| Unique Learning Opportunities | action, back, background, behind[-]the[-]scenes, being, care, cases(s), cattle, chance, city, cleanliness, clinic(s), community, condition, controversial, curious, daily, day, determine, different, discussion, environment, experience(s), explore, faculty, field, figure, find, firsthand, fish[-]farm, flexible, frustrated, happen, helping, illnesses, informative, interesting, investigate, learn, lesson, life, lifestyle, means, medical, Mexico, nerve[-]racking, opportunity, people, perspective, pet, plan, question, ranch, reality, relationship, research, rural, see, seen, situation, structure, surprising, thankful, thoughts, traditions, treatments, understand, United States, Veracruz, viable, welfare, working, world |

**Table 19**

*Emergent Themes and Representative Written Journal Entries and/or Photo Journal Entries with Students' Descriptive Statements related to Research Question Three*

| Emergent Themes | Representative Statements from the Students' Written Journals | Representative Photographs and Descriptive Statements from the Students' Photo Journals |
|---|---|---|
| Broadening of Career Perspectives | Student 18: Needless to say, [after watching the veterinarians work with the elephants] I walked away seriously considering becoming an elephant specialist. |  S1P5: The visit to the tilapia research portion of the ranch was a very pleasant surprise to me. I think that as students with interest in veterinary medicine, we forget that our job doesn't just lie within dogs, cats, horses and cattle. Veterinarians do so much more than clinical work. |

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| Hands-on Learning Experiences | Student 11: I have worked in a shelter before and I did more hands-on training in Mexico than I have ever done in America. |  <br>S4P3: This was my fifth day in Mexico, also one of my favorite days in which we were hands on. This is a picture of me checking the upper molars after the teeth were floated. The teeth had to be floated because they can cause an array of health issues. Before the procedure the teeth were sharp and pointy and cause lesions inside the mouth and on the tongue. After floating, the teeth were back to proper anatomical shape and no longer posed an issue to the equid. |

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| Learning of Medical Judgement | Student 25: The important thing here was empathy and not making any judgement toward owners. Since these communities were not as wealthy as most horse families or communities back in the United States, it was important to understand that they would sometimes have to make hard choices. |  <br>S2P6: I had a difficult time coming to terms with letting this horse limp away, but I have to realize that this is not the same circumstances as the United States. |

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| Learning on a Range of Veterinary Procedures | Student 19: Our group [of students from OSU] and the students [from Mexico] were taught to check the animal's behavior, nutrition, body condition, movement, and disease. Throughout this process we learned how to check the respiratory and heart rate using a stethoscope, take rectal temperature, guess the age using teeth, check for lameness, and administer medication. |  <br>S5P3: Even with the language barrier, I was still able to learn the correct process for castrating a horse which will serve as a good foundation later on in my career. |

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| Recommended Learning Opportunity | Student 6: All together the Pre-Vet trip was extremely eye opening and I will forever appreciate all that we got to participate in. I enjoyed the culture, learning about veterinary medicine and working hands on with animals of the community. I would highly recommend this opportunity to anyone who even has a slight interest in a veterinary career because there is lots to gain and nothing to lose with a trip like this. |  <br>S17P9: Releasing the sea turtles was an incredible experience for me. This is the first time I've ever been able to be up close to a sea animal like this and I will truly never forget it . . . . |

| | | |
|---|---|---|
| Unique Learning Opportunities | Student 2: The trip to Mexico was not only a culture immersion but it was also a different way to see veterinary medicine and practices. The way the rural communities run and how they differ so much from that of the United States is mind boggling and definitely something that everyone should experience or at least pay attention to. |  <br>S16P4: . . . Having not been granted access to something like this [behind the scene observation of elephant care] in the U.S., it was very cool to see just how these large animals were cared for. Who knew there were chutes large enough to restrain elephants! |

**Other Findings Related to Culture**

Thirteen other themes related to culture emerged from the students' written journals and written descriptions of their photographs. The themes are presented in alphabetical order (see Tables 20, 21, & 22).

**Table 20**

*Emergent Themes, Source(s) of Emergent Themes, Number of Assignments from which Emergent Themes Arose, and the Number of Significant Statements in Students' Assignments related to Other Culturally Relevant Findings*

| Emergent Themes | Source(s) of Emergent Themes | | Number of Students' Assignments from which Significant Statements were Derived | | Significant Statements in the Students' Assignments | |
|---|---|---|---|---|---|---|
| | Written Journals | Photo Journals | Written Journals | Photo Journals | Written Journals | Photo Journals |
| **Cultural Comparisons with the United States** | Yes | Yes | 9 | 4 | 16 | 11 |
| **Culturally influenced Architecture** | Yes | Yes | 6 | 10 | 8 | 14 |
| **Driving Traditions** | Yes | No | 4 | 0 | 4 | 0 |
| **Family Traditions** | Yes | No | 4 | 0 | 5 | 0 |
| **Food Traditions** | Yes | Yes | 5 | 3 | 16 | 3 |
| **Murals and Wall Art** | Yes | Yes | 3 | 11 | 3 | 13 |
| **Reflective Learning through Culture** | Yes | Yes | 8 | 4 | 13 | 6 |
| **Religion** | No | Yes | 0 | 6 | 0 | 6 |
| **Roadways and Infrastructure Differences** | Yes | No | 4 | 0 | 4 | 0 |
| **Socio-Cultural Traditions** | Yes | Yes | 8 | 9 | 13 | 10 |
| **Street Vendors** | Yes | No | 4 | 0 | 4 | 0 |
| **UNAM[a] Stadium** | No | Yes | 0 | 6 | 0 | 6 |
| **Unique Cultural Travel Opportunity** | Yes | Yes | 7 | 6 | 9 | 6 |

*Note.* [a]Universidad Nacional Autónoma de México

**Table 21**

*Words in Students' Assignments Supporting Emergent Themes related to Other Culturally Relevant Findings*

| Emergent Themes | Supporting Words |
|---|---|
| Cultural Comparisons with the United States | areas, candy, colors, compared, concept, connection, corn, creative, culture, difference(s), different, drinks, drivers, eat, elegant, evening, exact, familiar, flour, food, history, language, late, like, menu, Mexico, negotiate, obvious, Oklahoma, pay, people, piñata, planning, queso, regional, resemblance, salsa(s), same, schedules, similar, similarities, society, space, students, taste, texture, tortillas, tradition, traffic, typically, United States, unlike, version, walking, walkways, whereas |
| Culturally influenced Architecture | architecture, artwork, building, campus, cathedral, catholic, church, city, color(s), culture, decorate, details, French, heritage, history, intricate, native, over[-]bridge, people, portray, pyramid, sculptures, section, stairs, statue(s), store[-]fronts, stories, symbolism, temples, times, together, tunnel, view, walls, zócalo |
| Driving Traditions | accident, crazy, crowding, drive, driving, laws, speed, traffic |
| Family Traditions | center, culture, extended, families, family, food, history, importance, life, traditions, walking |
| Food Traditions | authentic, beans, cactus, carnitas, cheese, chile, cilantro, coffee, corn, delicious, enchiladas, flour, fresh, fruits, goods, limes, meal, meats, onions, peppers, pork, refills, salad, salsa(s), sharing, shop, smell, spices, spicy, street, taste, tortilla(s), traditional |
| Murals and Wall Art | archeological, artist, artistic, Aztec, backdrop, campus, celebration, Christianity, colonial, colorful, culture, depict(s), detail, embrace, embracing, European, events, expression, galaxy, generation, glass[-]ceilings, glass[-]work, Hispanic, history, intellect, intricate, library, meanings, mixture, modern, mural(s), past, people, present, Spanish, stones, symbolize, symbols, times, Tlaloc, UNESCO, University, walls |
| Reflective Learning through Culture | attempt, authentic, bother, care, comfort, community, condition, contribute, culturally, culture, definition, destroy, discover, earthquakes, economically, emotional, experience, figure, heritage, history, imagine, immerse, impact, important, interesting, interpret, learn, living, locations, mind, navigate, popular, privilege, proud, realize, reason, reflect, remind, rewarding, seen, sight, story, suffer, understanding, variations, visit, volcanoes |
| Religion | artistic, Aztecs, cathedrals, catholic, catholicism, churches, cross, culture, decorations, heaven, hill, honor, importance, religion, sacrifice, saint, Spanish, statues, virgin, volcano |

| | |
|---|---|
| Roadways and Infrastructure Differences | areas, bridges, city, condition, design, develop, exits, extreme, intersections, overwhelming, people, roads, sidewalks, streets, traffic, turns, walk |
| Socio-Cultural Traditions | bands, bikes, clothes, colorful, community, dance, dancing, decorated, distinctive, dress, drink, eating, experiences, family, friendly, fulfilling, group, hair, hibiscus, interactions, live[-]band, loud, music, night, people, personal[-]space, proximity, ribbons, rush, share, together, transportation, vocal, walk, welcoming |
| Street Vendors | booths, corner, drinks, drivers, flowers, food, highway, jackets, outside, snacks, space, street, things, vendors, walk, washing, windshields |
| UNAM[a] Stadium | altitude, athletes, award, backwards, black[-]power, ceremony, endurance, female, historical, history, jump, Olympics, pose, protests, records, run, size, stadium, technique, torch |
| Unique Cultural Travel Opportunity | animals, authentic, beach, cool, culture, dress, experience, exploring, friends, fun, heritage, international, lifetime, morning, nature, ocean, opportunity, people, proud, relaxing, resort, sunrise, swimsuit, travel, trip, visit, wild |

*Note.* [a]Universidad Nacional Autónoma de México

**Table 22**

*Emergent Themes and Representative Written Journal Entries and/or Photo Journal Entries with Students' Descriptive Statements related to Other Culturally Relevant Findings*

| Emergent Themes | Representative Statements from the Students' Written Journals | Representative Photographs and Descriptive Statements from the Students' Photo Journals |
|---|---|---|
| Cultural Comparisons with the United States | Student 17: In conclusion, there are so many differences in the way that cities and villages in Mexico are as compared to here in the United States. From the simple things like airports, the people on the streets, the graffiti on the walls, the power lines, the barbed wire everywhere, and the people who sleep on the streets to things as complex as the meals and dishes served and the types of livestock they raise. |  S15P9: In this photo, you can see a cemetery. However, at first I didn't realize it was a cemetery because in America ours are [not] as full of decorations nor are they in the middle of town. In America, most of the cemeteries are on the outer edges of town and they hardly have anything placed on the graves . . . . |

| | | | |
|---|---|---|---|
| Culturally influenced Architecture | Student 13: The culture took so much pride in their buildings, everything was full of murals with meanings of family and the history. It was amazing that they embraced every aspect of their history from the Spanish conquistadors to family life. |  S17P6: This is a photo of the cathedral over the pyramids is Cholula, Puebla. This cathedral is said to be built on top of three pyramids. The first was built by the Aztecs, who were conquered by new settlers who built a new pyramid atop the existing. This cycle then repeated itself totaling three pyramids built atop each other. Finally, Spanish settlers conquered the latest settlers, and instead of a pyramid built a cathedral atop of the three pyramids. | n/a |

| | | |
|---|---|---|
| Driving Traditions | Student 10: Personally, I was very nervous during the taxi ride from the airport to the hotel the first day we were in Mexico. I immediately noticed that cars were packed like sardines throughout the roads, and there seemed to be a lot of cars weaving in and out of traffic (especially without their turn signals) . . . I was very curious has [sic] to how there didn't seem to be that many car wrecks, because we had only passed by one wreck the entire trip. I was told that since the speed limit is on the lower side and the recklessness behavior is expected by most drivers, drivers already knew to be aware at all times. | |
| Family Traditions | Student 6: One thing I noticed about the people of the community is that they seemed to all be in large family groups, it seemed that all time was family time, and in the US you hardly see many whole families out and about together. | n/a |
| Food Traditions | Student 12: Have you ever wondered why most Mexicans are not a fan of the Mexican restaurants in the United States? This is because it is not what they are used to. Just as most Americans aren't a fan of authentic Mexican food, Mexicans aren't a huge fan of Tex-Mex. |  <br>S9P9: The food in Mexico was very good, but very different from what I was used to. There were several |

| | | |
|---|---|---|
| | | times when I wasn't completely sure what I was eating, but I ate it anyways [sic]. The food was usually more seasoned and spicier than traditionally [sic] American food. |
| Murals and Wall Art | Student 10: One thing that had caught my eye during the trip, especially in Mexico City, was the abundance of graffiti all over the cities. . . . Coming into this trip, I knew Mexico City was a huge and popular city in Mexico, and I initially thought that the masses of graffiti were degrading for the city. In the United States, graffiti is looked as a hoodlum and juvenile act that is typically punishable. Mexico City was covered in graffiti, and it seemed as if everyone had embraced it. There didn't seem to be any act of trying to cover or clean any of the graffiti, it just seemed to grow throughout the city (in very interesting and at times hard to reach places). I was told later on that graffiti is encouraged in Mexico because it brings out the color and the personality of the people and the culture. |  <br>S10P4: One of the things I really enjoyed about the Mexican culture is their artwork. Mexico is filled with murals and sculptures, and many times they have a story to go with it that explains their heritage. I thought this mural was so unique, because it was both a mural and a sculpture. |

| | | |
|---|---|---|
| Reflective Learning through Culture | Student 24: On most trips I have been on there is a group that will gravitate towards American chains, restaurants, and food instead of branching out and trying the local food. While there is absolutely nothing wrong with choosing something you know, it is always interesting to me that [A]mericans as a whole tend to stick with what they know and will often choose familiarity over branching out. A perfect example of this was in Puebla, when dinner was on our own and everyone had the opportunity to choose where to eat. A large group chose Chili's, some went more than one night, rather than attempting to find something local and authentic. |  <br>S7P1: In our first morning in Mexico City, the view from the hotel seeing the city truly blew me away. I did not grasp until flying in how truly massive this city is, and how all the building[s] tie together with their history and fit into the Mexican culture. Being able to witness first hand all of the culture that this country possesses has been a wonderful learning experience for me as I broaden my horizons. . . . |

| | | |
|---|---|---|
| Religion | n/a |  <br>S21P6: . . . Mexico has a rich history of a mixed culture between Christianity brought by the Spanish and the Native culture steeped in superstition and magic strengthened by nature. |
| Roadways and Infrastructure Differences | Student 5: Mexico City does not have a grid system for their roads, so none of the roads matched up and some would just stop and start randomly. As we drove to the hotel, we would go through underground tunnels that were like on and off ramps to the highways to get on different streets. I also noticed that instead of just a grass median like we have here in Oklahoma, in Mexico City they had parks that sat between the lanes of traffic. They had huge trees towering over to provide shade over swings and basketball courts while families filled the park. | n/a |

| | | |
|---|---|---|
| Socio-Cultural Traditions | Student 23: An observation I made about this restaurant, as well as most others we visited, is that eating a meal out is a bigger deal than it is here in the U.S. . . . A meal there is meant to be slow paced and savored rather than shoveled into your mouth to be on time to the next thing you have to go to. |  <br>S1P2: A large part of the culture in not just Mexico, but a lot of foreign countries is the café style coffee and pastry shops. . . . These shops serve as a place for people to congregate and enjoy a cup of coffee or a sweet treat and catch up. We witnessed couples, friends, business partners, and even people taking promotional pictures for the cafe itself. The coffee shops were always open late, so people seemed to go after dinner or work as a way to wind down and relax. |
| Street Vendors | Student 17: There were also street vendors everywhere you looked. Most of these vendors were selling food items like fresh fruits, or | n/a |

| | | | |
|---|---|---|---|
| | some food that was cooked, possibly some kind of ground beef mixture with corn and other vegetables. | | |
| UNAM[a] Stadium | | n/a |  S25P6: *Estadio Olimpico Universitario* [Olympic University Stadium] was the place where the 1968 Olympics were held. Sixteen records were broken during these summer games. People believe the reasoning behind this is because of the high altitude of the stadium, which allowed jumpers to jump higher and even change the technique with which they performed their jumps. The sprinters as well also set records, the most important one being that someone ran the 100-meter dash in 9.95 seconds which proved that humans could run ten meters in under one second. Although all of these athletic feats are amazing, the most memorable part of the 1968 Olympics was when Tommie Smith and John Carlos did the [B]lack power salute during the United States national anthem after getting first and third in their race. This was, and still is, thought of as a huge sacrifice they made in order to protest the unjust treatment of Black people. |

| | | |
|---|---|---|
| Unique Cultural Travel Opportunity | Student 16: The trip to Mexico was an eye-opening one to me. Having never before left the country and not being exposed to such impoverished conditions, I gained a new respect and appreciation for what I have. |  <br>S6P10: On [the] 9th day during the trip back to [a] Mexico City hotel we stopped at a vanilla plant and I was never familiar with how vanilla plants were grown or harvested! I have made my own vanilla extract before but I was always curious how the bean was grown. We went to the grove and it was crazy to [see] how high the plant grew up the tree! Another interesting fact about the plant is that to increase their growth and production rates each plant is pollinated by hand. |

*Note.* [a]Universidad Nacional Autónoma de México

## Findings Associated with Research Phase Two: Quantitative

Quantitative findings from phase two of the study aimed to more fully answer research question three: How did the study abroad course *AG 3803: International Study Tour in Agricultural Sciences and Natural Resources: Mexico* impact students' decisions to affirm or disconfirm their career aspirations to become veterinarians? Descriptive and inferential statistics are reported based on analysis of the participants' responses to the academic motivation component of the evaluation for the study abroad course *AG 3803 International Study Tour in Agricultural Sciences and Natural Resources: Mexico*. The academic motivation component of the online questionnaire consisted of eight questions: 1) What was your student classification in college during the 2018-2019 academic year? (EQ1); 2) What is your gender? (EQ2); 3) Before the trip and now that you've returned, how motivated were/are you to become a veterinarian? (EQ3); 4) Before the trip and now that you are back, how likely were/are you to drop the pre-veterinarian option? (EQ4); 5) Before the trip and now that you are back, how certain were/are you about your focus in veterinary medicine (small, large, exotic animals; wildlife)? (EQ5); 6) Before going on this trip and now that you have returned, how certain were/are you that you would attend veterinary school? (EQ6); 7) Comparing what you learned on the trip and what you knew before, how knowledgeable did/do you feel about the veterinary profession? (EQ7); and 8) Before the trip and now that you've returned, how motivated were/are you to get good grades in college? (EQ8). Evaluation items three through eight were analyzed and reported as results, and answers to questions one and two (see Appendix C) described selected characteristics of the student participants, as reported in Chapter 3.

### Descriptive Statistics

Means, standard deviations, skewness, and kurtosis were reported based on the participants' responses. These findings are displayed in Tables 23 and 24.

**Table 23**

*Means, Standard Deviations, Skewness, and Kurtosis for All Participants (N=25) by Question from the Academic Motivation Component of the Course Evaluation*

| | | Pre-Course | | | | Post-Course | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Item** | ***f*** | ***M*** | ***SD*** | **Skewness** | **Kurtosis** | ***M*** | ***SD*** | **Skewness** | **Kurtosis** |
| EQ3 | 25 | 4.20 | 1.08 | -1.51 | 2.08 | 4.28 | 1.27 | -1.75 | 2.02 |
| EQ4 | 25 | 1.92 | 1.22 | 0.91 | -0.86 | 1.72 | 1.21 | 1.82 | 2.71 |
| EQ5 | 25 | 3.36 | 1.32 | -0.26 | -1.17 | 3.96 | 0.89 | -0.30 | -0.84 |
| EQ6 | 25 | 3.84 | 1.43 | -0.80 | -0.87 | 4.04 | 1.31 | -1.17 | 0.37 |
| EQ7 | 25 | 3.64 | 0.95 | -0.75 | 1.21 | 4.20 | 0.58 | 0.00 | -0.02 |
| EQ8 | 25 | 4.64 | 0.64 | -1.62 | 1.64 | 4.84 | 0.47 | -3.14 | 9.97 |

***Distribution of Responses to the Course Evaluation***

For question three — Before the trip and now that you've returned, how motivated were/are you to become a veterinarian? — Responses were assessed using a Likert-type scale ranging from *1 = Very Unmotivated* to *5 = Very Motivated*. The respondents' overall mean scores before and after the course were 4.20 (*SD* = 1.08) and 4.28 (*SD* = 1.27), respectively (see Table 23). Fifty-two percent (*f* = 13) of the respondents selected *very motivated* before the course which increased to 68.00% (*f* = 17) after the course. Also, the number of respondents who selected *somewhat motivated* decreased from 28.00% before the course (*f* = 7) to 12.00% (*f* = 3) after the course. Moreover, the respondents who selected *very unmotivated* increased from 4.00% (*f* = 1) before the course to 8.00% (*f* = 2) after the course (see Table 24).

For question four — Before the trip and now that you are back, how likely were/are you to drop the pre-veterinarian option? — Responses were assessed using a

Likert-type scale ranging from *1 = Very Unlikely* to *5 = Very Likely*. The respondents' overall mean scores before and after the course were 1.92 (*SD* = 1.22) and 1.72 (*SD* = 1.21), respectively (see Table 23). Fifty-six percent (*f* = 14) selected *very unlikely* before the course which increased to 64.00% (*f* = 16) after the course. Also, the respondents who selected *somewhat likely* decreased from 20.00% (*f* = 5) before the course to 0.00% (*f* = 0) after the course. Moreover, those who selected *very likely* before the course was 0.00% (*f* = 0) but increased to 8.00% (*f* = 2) after the course (see Table 24).

Regarding question five — Before the trip and now that you are back, how certain were/are you about your focus in veterinary medicine (small, large, exotic animals; wildlife)? —Responses were assessed using a Likert-type scale ranging from *1 = Very Uncertain* to *5 = Very Certain*. The respondents' overall mean scores before and after the course were 3.36 (*SD* = 1.32) and 3.96 (*SD* = 0.89), respectively (see Table 23). Twenty-four percent (*f* = 6) selected *very certain* before the course which increased to 32.00% (*f* = 8) after the course. Also, the respondents who selected *somewhat uncertain* decreased from 24.00% (*f* = 6) to 4.00% (*f* = 1) after the course. Furthermore, those who selected *very uncertain* before the course was 8.00% (*f* = 2) which decreased to 0.00% (*f* = 0) after the course (see Table 24).

Regarding question six — Before going on this trip and now that you have returned, how certain were/are you that you would attend veterinary school? — Responses were assessed using a Likert-type scale ranging from *1 = Very Uncertain* to *5 = Very Certain*. The respondents' overall mean scores before and after the course were 3.84 (*SD* = 1.43) and 4.04 (*SD* = 1.31), respectively (see Table 23). Fifty-two percent (*f* = 13) selected *very certain* before the course which increased to 56.00% (*f* = 14) after the

course. Moreover, those who selected *somewhat uncertain* decreased from 16.00% (*f* = 4) to 4.00% (*f* = 1) after the course (see Table 24).

For question seven — Comparing what you learned on the trip and what you knew before, how knowledgeable did/do you feel about the veterinary profession? — Responses were assessed using a Likert-type scale ranging from *1 = Very Clueless* to *5 = Very Knowledgeable*. The respondents' overall mean scores before and after the course were 3.64 (*SD* = 0.95) and 4.20 (*SD* = 0.58), respectively (see Table 23). Sixteen percent (*f* = 4) selected *very knowledgeable* before the course which increased to 28.00% (*f* = 7) after the course. Also, the respondents who selected *somewhat knowledgeable* increased from 44.00% (*f* = 11) before the course to 64.00% (*f* = 16) after. In addition, those who selected *neither knowledgeable nor clueless* decreased from a 32.00% (*f* = 8) before the course to 8.00% (*f* = 2) after the course. Furthermore, those who selected either *somewhat clueless* or *very clueless* decreased from 4.00% (*f* = 1) before the course to 0.00% (*f* = 0) after the course, respectively (see Table 24).

Regarding question eight — Before the trip and now that you've returned, how motivated were/are you to get good grades in college? — Responses were assessed using a Likert-type scale ranging from *1 = Very Unmotivated* to *5 = Very Motivated*. The respondents' overall mean scores before and after the course were 4.64 (*SD* = 0.64) and 4.84 (*SD* = 0.47), respectively (see Table 23). Seventy-two percent (*f* = 18) selected *very motivated* before the course which increased to 88.00% (*f* = 22) after the course. Also, those who selected *somewhat motivated* decreased from 20.00% (*f* = 5) before the course to 8.00% (*f* = 2) after the course (see Table 24).

**Table 24**

*Distribution of Students' Responses to a Retrospective Evaluation of the Study Abroad Course AG 3803 International Study Tour in Agricultural Sciences and Natural Resources: Mexico, Summer of 2019 (N = 25)*

| **Items** | | **Descriptive Statistics** | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **Likert-type Scale Responses** | **Scale Anchor Value** | **Pre-Course** | | | | **Post-Course** | | | |
| | | | ***f*** | ***%*** | ***M*** | ***SD*** | ***f*** | ***%*** | ***M*** | ***SD*** |
| EQ3 | Very Motivated | 5 | 13 | 52.00 | | | 17 | 68.00 | | |
| | Somewhat Motivated | 4 | 7 | 28.00 | | | 3 | 12.00 | | |
| | Neither Motivated nor Unmotivated | 3 | 3 | 12.00 | | | 2 | 8.00 | | |
| | Somewhat Unmotivated | 2 | 1 | 4.00 | | | 1 | 4.00 | | |
| | Very Unmotivated | 1 | 1 | 4.00 | | | 2 | 8.00 | | |
| | Item Total | | 25 | 100.00 | 4.20 | 1.08 | 25 | 100.00 | 4.28 | 1.27 |
| EQ4 | Very likely | 5 | 0 | 0.00 | | | 2 | 8.00 | | |
| | Somewhat likely | 4 | 5 | 20.00 | | | 0 | 0.00 | | |
| | Neither likely nor unlikely | 3 | 2 | 8.00 | | | 3 | 12.00 | | |
| | Somewhat unlikely | 2 | 4 | 16.00 | | | 4 | 16.00 | | |
| | Very unlikely | 1 | 14 | 56.00 | | | 16 | 64.00 | | |
| | Item Total | | 25 | 100.00 | 1.92 | 1.22 | 25 | 100.00 | 1.72 | 1.21 |
| EQ5 | Very certain | 5 | 6 | 24.00 | | | 8 | 32.00 | | |
| | Somewhat certain | 4 | 7 | 28.00 | | | 9 | 36.00 | | |
| | Neither certain nor uncertain | 3 | 4 | 16.00 | | | 7 | 28.00 | | |
| | Somewhat uncertain | 2 | 6 | 24.00 | | | 1 | 4.00 | | |
| | Very uncertain | 1 | 2 | 8.00 | | | 0 | 0.00 | | |
| | Item Total | | 25 | 100.00 | 3.36 | 1.32 | 25 | 100.00 | 3.96 | 0.89 |
| EQ6 | Very certain | 5 | 13 | 52.00 | | | 14 | 56.00 | | |
| | Somewhat certain | 4 | 3 | 12.00 | | | 3 | 12.00 | | |
| | Neither certain nor uncertain | 3 | 3 | 12.00 | | | 5 | 20.00 | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Somewhat uncertain | 2 | 4 | 16.00 | | | 1 | 4.00 | | |
| | Very uncertain | 1 | 2 | 8.00 | | | 2 | 8.00 | | |
| | Item Total | | 25 | 100.00 | 3.84 | 1.43 | 25 | 100.00 | 4.04 | 1.31 |
| EQ7 | Very knowledgeable | 5 | 4 | 16.00 | | | 7 | 28.00 | | |
| | Somewhat knowledgeable | 4 | 11 | 44.00 | | | 16 | 64.00 | | |
| | Neither knowledgeable nor clueless | 3 | 8 | 32.00 | | | 2 | 8.00 | | |
| | Somewhat clueless | 2 | 1 | 4.00 | | | 0 | 0.00 | | |
| | Very clueless | 1 | 1 | 4.00 | | | 0 | 0.00 | | |
| | Item Total | | 25 | 100.00 | 3.64 | 0.95 | 25 | 100.00 | 4.20 | 0.58 |
| EQ8 | Very Motivated | 5 | 18 | 72.00 | | | 22 | 88.00 | | |
| | Somewhat Motivated | 4 | 5 | 20.00 | | | 2 | 8.00 | | |
| | Neither Motivated nor Unmotivated | 3 | 2 | 8.00 | | | 1 | 4.00 | | |
| | Somewhat Unmotivated | 2 | 0 | 0.00 | | | 0 | 0.00 | | |
| | Very Unmotivated | 1 | 0 | 0.00 | | | 0 | 0.00 | | |
| | Item Total | | 25 | 100.00 | 4.64 | 0.64 | 25 | 100.00 | 4.84 | 0.47 |

**Statistical Significance of Selected Quantitative Findings**

Because the data derived from the students' responses to question three — Before the trip and now that you've returned, how motivated were/are you to become a veterinarian? — were skewed (see Table 25); a Wilcoxon Signed-Ranks Test was conducted. The results indicated that the post-test scores were not statistically significantly higher ($p < .05$) than pre-test scores, $Z = 27.000$, $p < .564$ (see Table 25).

Because the data derived from students' responses to question four — Before the trip and now that you are back, how likely were/are you to drop the pre-veterinarian option? — were skewed (see Table 25); a Wilcoxon Signed-Ranks Test was conducted. The results indicated that the post-test scores were not statistically significantly higher ($p < .05$) than the pre-test scores, $Z = 12.000$, $p < .190$ (see Table 25).

The data derived from students' responses to the evaluation question five — Before the trip and now that you are back, how certain were/are you about your focus in veterinary medicine (small, large, exotic animals; wildlife)? — were also skewed (see Table 25); a Wilcoxon Signed-Ranks Test was conducted. The results indicated that the post-test scores were statistically significantly higher ($p < .05$) than the pre-test scores, $Z = 85.500$, $p < .003$ (see Table 25).

Due to the data derived from students' responses to evaluation question six — Before going on this trip and now that you have returned, how certain were/are you that you would attend veterinary school? — being skewed (see Table 25), a Wilcoxon Signed-Ranks Test was conducted. The results indicated that the post-test scores were not statistically significantly higher ($p < .05$) than the pre-test scores, $Z = 18.000$, $p < .096$ (see Table 25).

And because the data derived from students' responses to the evaluation question seven — Comparing what you learned on the trip and what you knew before, how knowledgeable did/do you feel about the veterinary profession? — were also skewed (see Table 25), a Wilcoxon Signed-Ranks Test was run. The output indicated that post-test scores were statistically significantly higher ($p < .05$) than pre-test scores, $Z = 78.000$, $p < .001$ (see Table 25).

Because the data derived from students' responses to evaluation question eight — Before the trip and now that you've returned, how motivated were/are you to get good grades in college? — were skewed(see Table 25), a Wilcoxon Signed-Ranks Test was conducted. The results indicated that the post-test scores were statistically significantly higher ($p < .05$) than the pre-test scores, $Z = 15.000$, $p < .025$ (see Table 25).

**Table 25**

*Wilcoxon Signed-Ranks Test Results for Portions of the Students' Evaluation of the Course AG 3803 International Study Tour in Agricultural Sciences and Natural Resources: Mexico, Summer of 2019*

| Questions | *Z* | *p* |
|---|---|---|
| EQ3. Before the trip and now that you've returned, how motivated were/are you to become a veterinarian? | 27.000 | .564 |
| EQ4. Before the trip and now that you are back, how likely were/are you to drop the pre-veterinarian option? | 12.000 | .190 |
| EQ5. Before the trip and now that you are back, how certain were/are you about your focus in veterinary medicine (small, large, exotic animals, wildlife)? | 85.000 | .003* |
| EQ6. Before going on this trip and now that you have returned, how certain were/are you that you would attend veterinary school? | 18.000 | .096 |
| EQ7. Comparing what you learned on the trip and what you knew before, how knowledgeable did/do you feel about the veterinary profession? | 78.000 | .001* |
| EQ8. Before the trip and now that you've returned, how motivated were/are you to get good grades in college? | 15.000 | .025* |

*Note.* *Statistically significant at $p < .05$

## Findings Associated with Research Phase Three: Qualitative

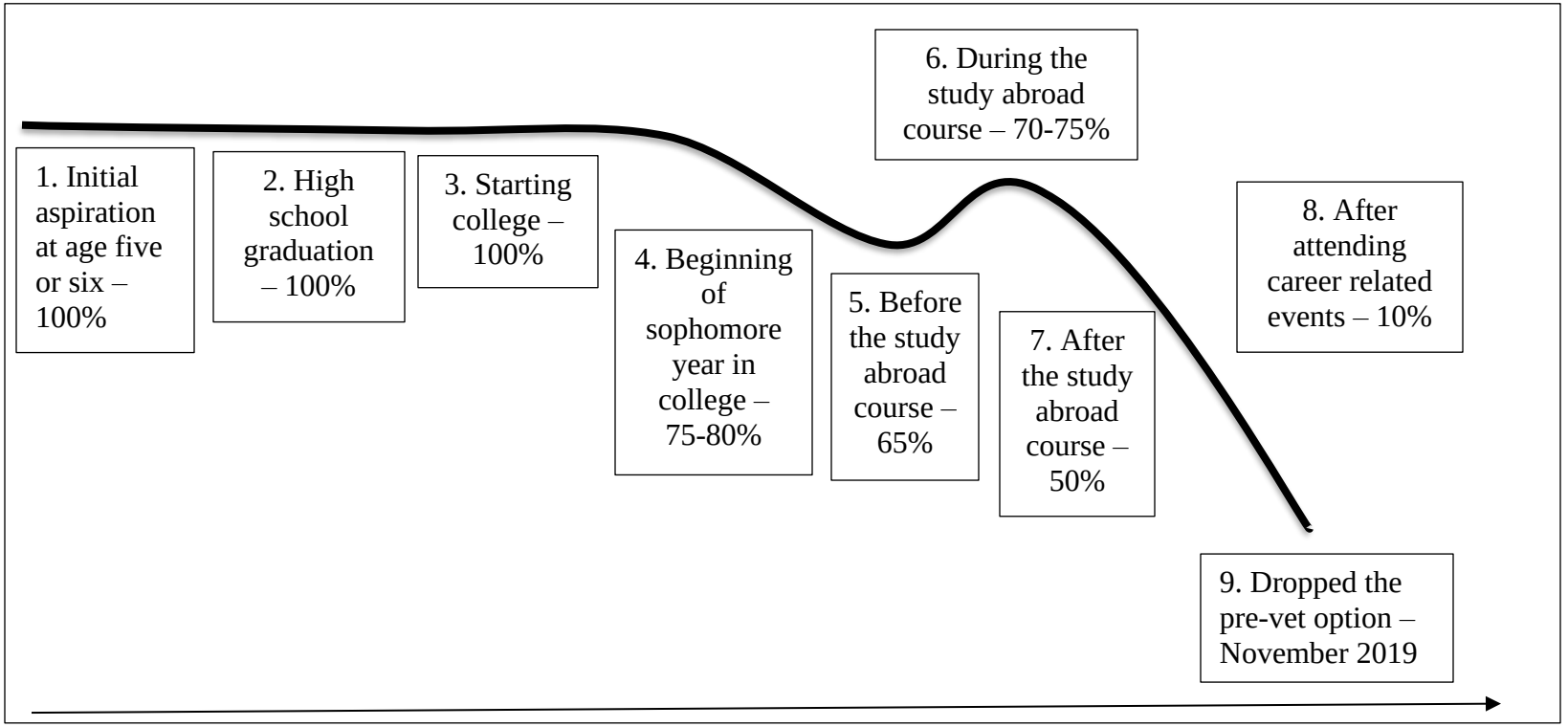
Qualitative findings from phase three of the study complemented the phase two findings and aimed to more fully answer research question three: How did the study abroad course *AG 3803: International Study Tour in Agricultural Sciences and Natural Resources: Mexico* impact students' decisions to affirm or disconfirm their career aspirations to become veterinarians? As a result of the follow up interviews with three students who had continued with their aspirations to become veterinarians and three students who had discontinued such aspirations after the study abroad course, visual timelines depicting potential stages or changes in the students' levels of aspiration were drawn. Text vignettes and pertinent quotes were used to describe significant stages and

critical events impacting students' career aspirations. Significant patterns of information identified in the students' interview transcriptions were also presented as part of the findings derived from this last phase of the investigation to allow comparison within and between the two groups of students (see Figure 10 & Table 26).

**Students' Stages of Aspiration to Become a Veterinarian Before and After the Course AG 3803: International Study Tour in Agricultural Sciences and Natural Resources: Mexico during the Summer of 2019**

**Figure 12**

*Stages of Aspiration to Become a Veterinarian: Student A*



***Stages of Aspiration to Become a Veterinarian: Student A***

The aspiration to become a veterinarian stayed the same for Student A since a young age until the start of college (stage: 1. Initial aspiration, 2. High school graduation, and 3. Starting college; see Figure 12). Student A said:

> . . . when I was really really young, like from whenever you're like five or six and then they ask like okay then you want to be, I quite literally was like, I love animals and I will take care of animals when I get older, that didn't change throughout elementary, middle school, [and] high school [where] I was even part of a two-year program when I got my veterinary assistant certificate.

After starting college, Student A realized his aspiration to become a veterinarian began to decline (4. Beginning of sophomore year in college; see Figure 12) when he realized it was influenced not only by his desire but the expectations of his social circle as a child and adolescent. Student A stated:

> . . . coming into college and, I think it was still, I'd say up until maybe like the end of my freshman year, or the beginning of my sophomore year, it might had been when I started questioning like, I think I was like 90% or 85% my aspirations and then 10-15% being like, oh, the people from back home like, you know, I can't let them down like I had to become a vet . . . ."

Regarding the social pressure of his community, Student A added:

> . . . growing up where I did it was a very high-pressure community, to achieve success and what that looked like at OSU, you become a doctor, you become a layer, later you become someone high in education, you earn a lot of money after you go to college, first of all you go to college and second of all you earn a lot of

money, or you go to grad school and you earn a lot of money. So, that was pretty much the community [in which] I grew up . . . .

For Student A, getting involved in leadership positions in college provided more options and his aspiration to become a veterinarian continued to decline during his sophomore year before the study abroad course (5. Before the study abroad course; see Figure 12). To this end, Student A said:

> My aspiration was always really high, the percentage that I thought that I wanted to be a vet was always super high, sophomore year it started to drop a little bit, and it kept dropping the more I was, the more I became more involved with Ambassadors and with the intramural program, and then like I said, that's where I started in getting those customer service skills that I noticed that I didn't have [before]. At that point, it was, my aspiration to become a vet started dropping I'd say it was about the spring of 2019 when I went on the trip it was maybe like 65% and then 35% like these people [from my community], like they are supporting you to become a vet and things like that.

However, during the trip portion of the study abroad course, Student A's aspiration to become a veterinarian increased compared to his level of aspiration before the study abroad course (6. During the study abroad course; see Figure 12). Student A shared:

> And then when I was on the trip as well, I'd say it rose back up a little bit like to 70-75% when I was on the trip because being in that environment talking to the Vet Techs and talking to students from UPAEP, I'm glad I remember that, I don't know how but, so, being in that environment it definitely rose back to a 75% I'd say, just being around the culture and seeing like oh yeah, this is why since a

young age I wanted to be this and the like 25% was still there being like hey yeah, you still want to do this but you also don't want to let these people down [from my community].

After the study abroad course, Student A continued to take on leadership positions outside of the veterinary pathway and his aspiration to become a veterinarian dropped again (7. After the study abroad course; see Figure 12). Student A described this:

> And then when I came into school my junior year so Fall of 2019 it's where I really started to being like, my aspiration really started dropping. Um, I'd say like in August when I was like, I was treasurer of Ambassadors taking that leadership role, trying to do as many businesses as possible, it probably dropped down to 45-50% . . . .

For Student A, his aspiration to become a veterinarian declined significantly after attending two events when he learned more about different career pathways (8. After attending career related events; see Figure 12). Student A said:

> . . . then in New Mexico it started dropping even more because I learned about different careers that were within Ag business and within Ag Econ. And then [at the] National FFA [Convention] as well it continues dropping when I was talking to Merck, and Elanco, about possible internships that will come in the summer. . . . And I think that between New Mexico and National FFA [Convention] in Indianapolis, I think it was where it started to sinking to probably 10% if you want to go that low and then like 90% was like you still need to go get that DVM on your tag, on your name because this is what everyone else is expecting of you. And apparently my Mom sensed the change in my mood from

> when, I guess when that was happening, so I had that 90% of not letting other people down, went a month and then switched it and apparently my mood just completely changed after that.

Student A finally decided to drop the Pre-Vet option after consulting with his family (9. Dropped the pre-vet option; see Figure 12). He stated:

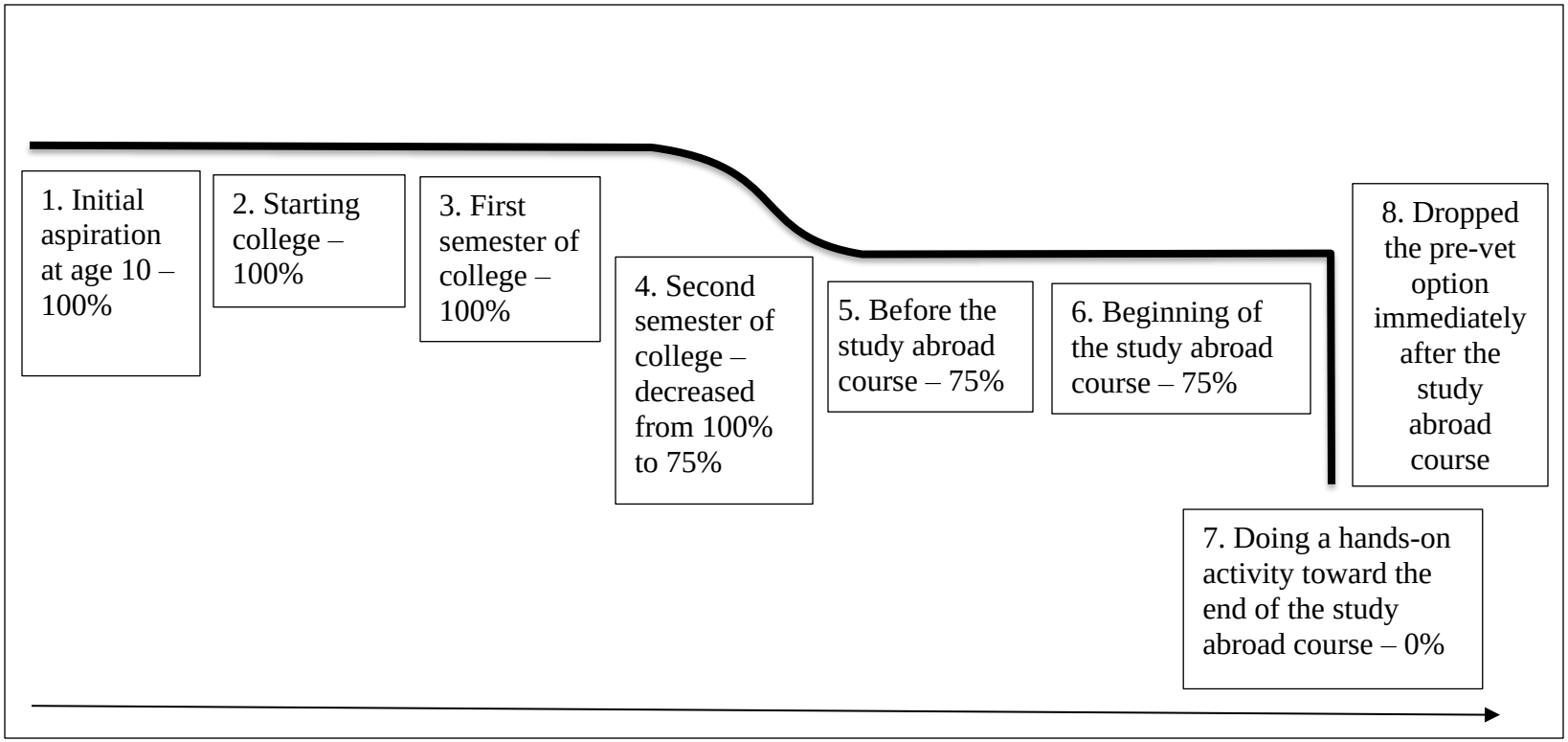
> . . . it was in November [of 2019]. I know for a fact it was November. I went to New Mexico in September, that was when I really started thinking about it and everything, and yeah, in November was when I made the switch.

Student A also said: ". . . I felt like a weight had been lifted off my shoulders after I dropped it." He provided some information related to his family's involvement in his decision to drop the Pre-Vet option:

> My Mom, when I called her and, so we had talks and then after I went to my advisor, I called her and afterwards and told her what I had done and everything and apparently I sounded different, I sounded happy, I sounded more relatable that I hadn't been like in a month or so.

**Figure 13**

*Stages of Aspiration to Become a Veterinarian: Student B*



### *Stages of Aspiration to Become a Veterinarian: Student B*

The aspiration to become a veterinarian stayed the same for Student B since a young age until her first semester of college (Stage: 1. Initial aspiration, 2. Starting college, and 3. First semester of college; see Figure 13). Regarding her initial aspiration, Student B mentioned:

> So, I think it was always a dream of mine, I've always loved being with, around animals and I thought being a vet was the only way to do that, I want to say by at least age 10, I was pretty set on being a, becoming a veterinarian . . . . I was showing goats at this time, I think it was, and my goat had actually broke its leg, and we were, my mom was like, no, no, no, like it's not broken, and I was like no it's broken right here in these many spots like whatever, the vet came out and looked at it and he was like yeah she's right, and so then I was like ha-ha I could do this, and so that's kind of where it started.

During her second semester of college, Student B's aspiration to become a veterinarian declined and she decided to use the course experience to see if she wanted to continue the Pre-Vet path. Student B said:

> . . . so it was like 100% coming into freshman year, spring semester of freshman year it had dropped like 75[%] which I had a lot of other things going on and so that's why I took the trip to be like okay like we're going to try our hardest, you know we're going to go through all these classes, do what we got to do to get there if that's really what we want to do, if not, we got to figure this out before we waste that money, all that time, all that stress.

Some personal situations contributed to Student B's decline from 100 to 75% in her aspiration to become a veterinarian during her second semester of college, but the academic rigor of the prerequisite courses also contributed to the decline (Stage 4. Second semester of college; see Figure 12). Student B stated: " I hit some chemistry classes that were ripping my tail and I just felt idiotic and like I didn't know what I was doing, I was like why am I here, why am I having to take these classes."

Student B's aspiration to become a veterinarian was 75% before the study abroad course and during most of the trip portion of the study abroad course (Stage: 5. Before the study abroad course and 6. Beginning of the study abroad course; see Figure 13). It was toward the end of the trip portion of the study abroad course when student B had the opportunity to do a hands-on activity that she realized the veterinary profession was not something she really wanted to pursue (Stage 7. Doing a hands-on activity toward the end of the study abroad course; see Figure 13). Student B commented:

> . . . so during the week of all the other work days I was bored, like my group really didn't get to do very much hands on things, everybody else's group was like oh, we did this, we did this, and I was like, I literally wrote numbers down all day long, like I was bored on workdays and so, um, when I finally did, did do something hand, hands on I was like oh ha-ha, no.

Student B experienced a moment of realization at the end of the hands-on activity and her aspiration to become a veterinarian went from 75% to 0%, she immediately realized that she needed to switch her option (Stage: 7. Doing a Hands-on Activity toward the End of the Study Abroad Course and 8. Dropped the Pre-Vet Option Immediately after the Study Abroad Course; see Figure 13). She further mentioned:

> . . . Zero [aspiration to become a veterinarian after the hands-on activity]. It was, it was, I, I had scheduled the meeting, I had emailed [my advisor] and like scheduled the meeting before we even left Mexico, like, I think it was, as we were leaving that work site, I emailed [my advisor] and I was like bro we got to do something here.

Student B added:

> I did a castration in the middle of Mexico, in the middle of Veracruz, Mexico, I still have no idea where we were at, there's a language barrier, you know it was so cool, one of the most coolest experiences I'll ever experienced in my life, I think, and I stood up from it, and I was like huh, that was cool but I don't want to do this for the rest of my life, and so I, we literally landed, I think on a Thursday, I don't know whatever day we got back, the next day I was in [my advisor's] office switching my major, switching my option to production.

Student B explained that she would have stayed longer in the Pre-Vet option if she had not participated in the study abroad course. She said:

> I don't think I would have had the realization that I did, and so I would, because I wouldn't have that experience you know there's some, standing up and the light bulb going off, and so I think I'd still, would be pursuing, be pursuing a career that I, my heart wasn't in.

Student B also highlighted the social pressure students feel to stay faithful to their early career aspirations even after they change their minds. When asked if she would have continued under the Pre-Vet option if the study abroad course had not happened, she answered:

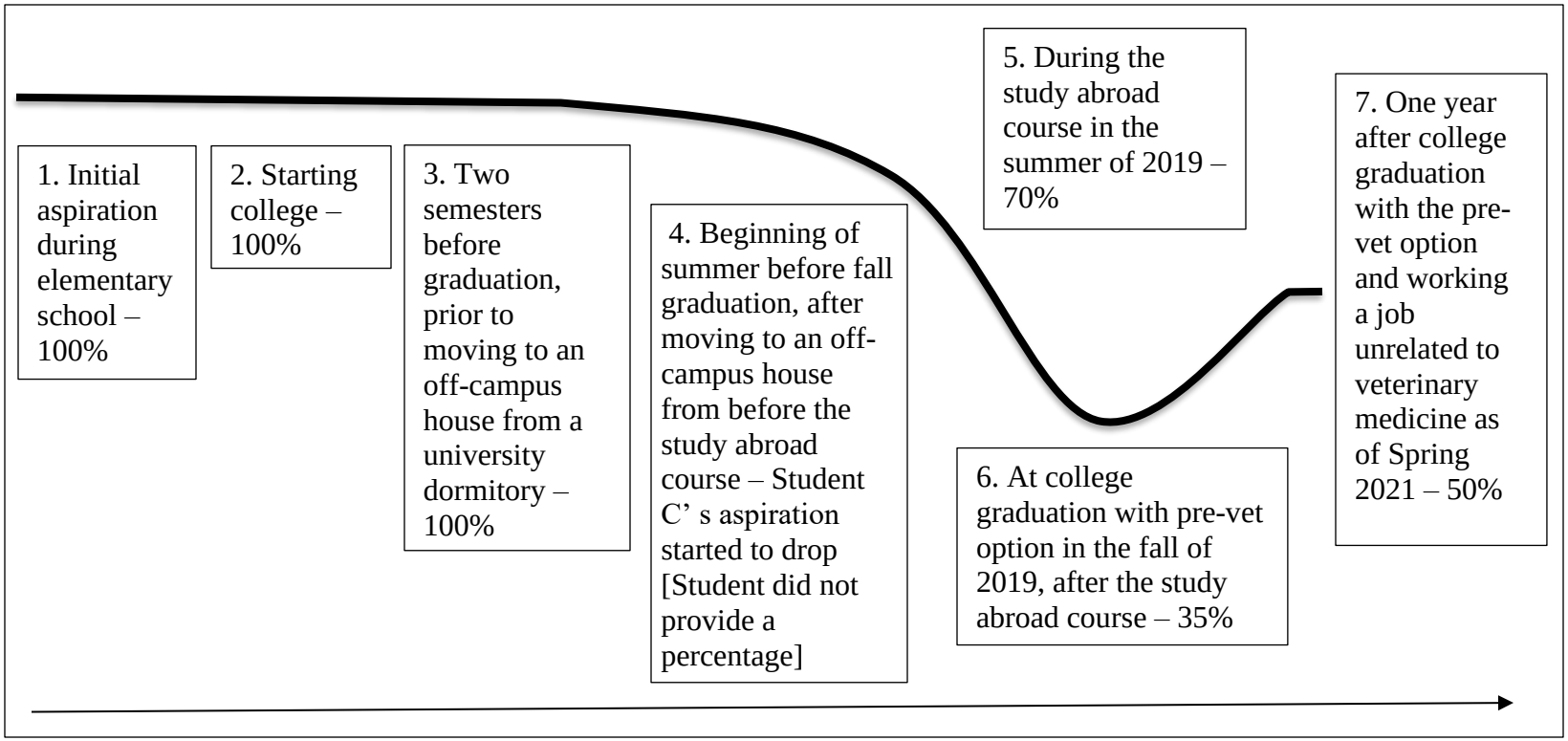
> Yeah because that's what my family wanted me to do, like I had said that since I was 10, and so I still have family members that are like oh you're still going to be a vet at some point, and I'm like no. So, I think to please everybody else instead of what I wanted to do, I definitely would have continued the path that wasn't, wasn't mine.

And about her feelings after dropping the Pre-Vet option, Student B stated:

> I felt like a weight has been lifted off my shoulders and you can see that reflected on my grades. I did not see good grades during the time I had the [Pre-Vet] option but after dropping it, I got pretty good grades.

**Figure 14**

*Stages of Aspiration to Become a Veterinarian: Student C*



***Stages of Aspiration to Become a Veterinarian: Student C***

Student C's aspiration to become a veterinarian was stable beginning in elementary school until her senior year in college (Stage: 1. Initial aspiration during elementary school, 2. Starting college, and 3. Two semesters before graduation, prior to moving to an off-campus house from a university dormitory; see Figure 14). Moving from a university dormitory to a house made Student C reflect on her life, which led to her aspiration to become a veterinarian to decrease (Stage 4. Beginning of summer before fall graduation, after moving to an off-campus house from before the study abroad course – Student C' s aspiration started to drop; see Figure 14). Student C stated:

> . . . so before we went on the trip, I guess I still had the mentality that, that being a vet it's all I'm going to do so it's probably 100% and that summer I kind of got more interested in living life, so I moved into a house instead of a dorm for the first time and it kind of gave me, that I like having a regular life vibe so it [my aspiration] kind of went down . . . .

By the time the group of students traveled to Mexico during the trip component of the study abroad course, Student C's aspiration to become a veterinarian had declined some but the experience helped her realize that veterinary school was not the only pathway for her to work with animals (Stage 5. During the study abroad course; see Figure 14). Student C stated:

> The trip itself was really wonderful and I enjoyed how we went and saw vet schools in different countries and how they're structured and how the students like were living but I really enjoyed the community service we did, the community aspect, I enjoyed like the idea that we were improving people's lives

> with something so small as giving their, their donkey [de]wormer and vitamins, you know, I like the idea of improving people's lives, of giving people a chance to make a difference, with just something so small, you know just caring about your community, I love that.

During her last semester of college, and after the study abroad course, Student C's aspiration to become a veterinarian decreased significantly (Stage 6. At college graduation with pre-vet option in the fall of 2019, after the study abroad course; see Figure 14). Student C posited:

> When I graduated in Fall [semester] of [20]19, I didn't know what I wanted, I just wanted to be done with school, I wanted to do something different, spend time living life, you know, so when I graduated it was probably closer to like 35[%] I just didn't want to be in school anymore, I was done, I graduated, I wanted to do something different but now I'm like yeah I'm kind of ready to do something, you know.

Student C graduated from college with the Pre-Vet option, she was working in a job unrelated to veterinary medicine, and she had not applied to veterinary school at the time the interview was conducted, one year after graduation (Stage 7. One year after college graduation with the pre-vet option and working a job unrelated to veterinary medicine as of spring 2021; see Figure 14). Student C stated:

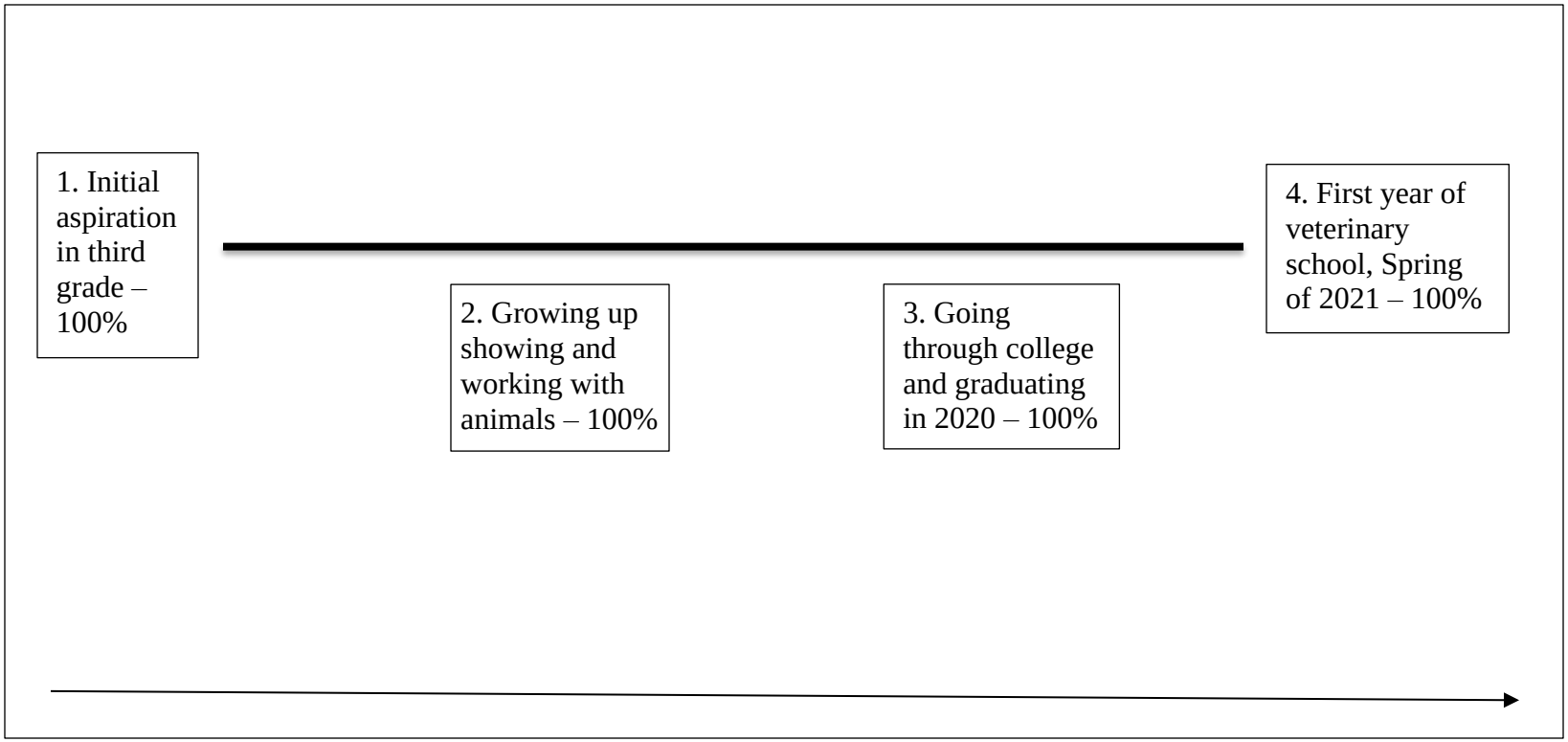
> I 100% plan on working with animals, livestock in some way but I just, I don't know about going to vet school because my personal mental health went down a lot when, in my last half of college, so I don't know if I can, I don't know if it will be all right for me to go to school more.

And Student C added:

> I, I still love vet [medicine], like being a veterinarian I would love that, I love the idea of going to vet school, having those experiences but it's hard so I don't know, it's 50/50 whether I decide rather I want to go back to school or start another career path or do something completely crazy, you know, but I'm just kind of in a spot in my life, where I'm like I don't know who I want to be.

**Figure 15**

*Stages of Aspiration to Become a Veterinarian: Student D*



### *Stages of Aspiration to Become a Veterinarian: Student D*

Student D's aspiration never changed since he decided to become a veterinarian in the third grade (Stage 1. Initial aspiration in third grade; see Figure 15). And the study abroad course helped him confirm his long-term career aspiration. Student D mentioned: "For me the entire trip really kind of helped me confirm that, like I always wanted to be a vet . . . ." He attributed his passion for veterinary medicine to his involvement with animals during his childhood (Stage 2. Growing up showing and working with animals; see Figure 15), but he never had the opportunity to work with a veterinarian before college. Student D said:

> . . . my parents were teachers, so I didn't have that opportunity to work with a veterinarian . . . all those field days and stuff that we got to go on and actually mess with the animals and deal with the people as well and see every aspect of it [during the trip [ portion of the study abroad course] really kind of, helped push me towards that even more.

Student D's aspiration stayed the same throughout college, including before and after the study abroad course (Stage 3. Going through college and graduating in 2020; see Figure 15). When asked if his aspiration had ever changed, he answered:

> I wouldn't say that it really ever changed, that's kind of been my number one thing since before, since third grade I haven't really had any other desire to do anything else. I did look at a couple of other options in case I never got into vet school. Knowing that it was a competitive program I definitely looked into that. I applied to some other programs . . . but everything that I did related back to veterinary medicine, at least a little bit. One thing was chiropractor school and

> that's because I could do certification and become an animal chiropractor so that kind of was the interest, it was the backup plan but I would say vet school was only my number one [career choice] from third grade.

The study abroad course helped Student D affirm his interest in theriogenology. After one year in veterinary school (Stage 4. First year of veterinary school, Spring of 2021; see Figure 15), he was still passionate about veterinary medicine and exploring theriogenology as a potential area of specialization. When asked about his interest in theriogenology after the study abroad course, he answered:

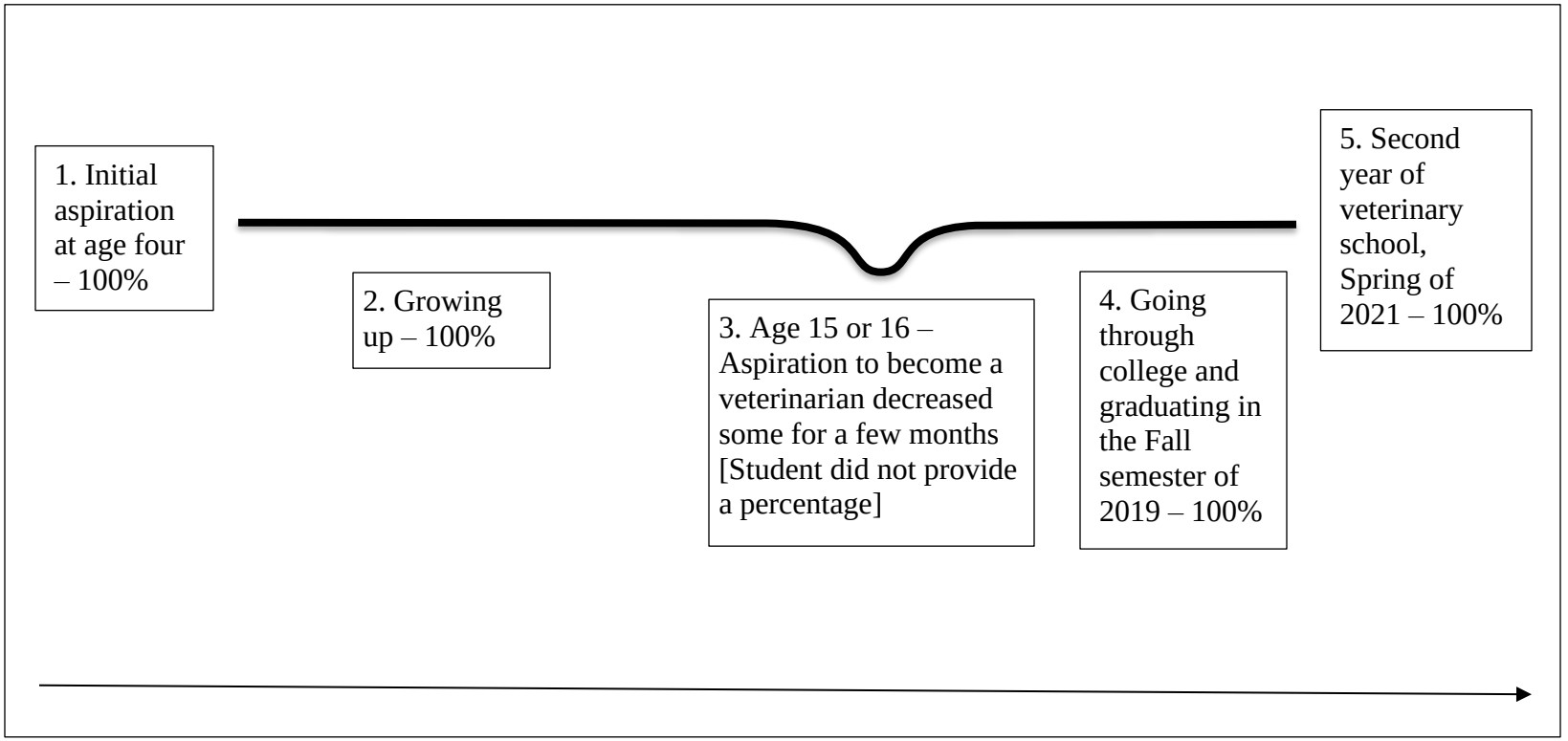
> It's still pretty good, it's still up there, I think it kind of goes up every day because we actually have a therio class and then I got to start working for a vet who does a lot of embryo transfer in cattle and stuff like that . . . .

Student D also emphasized the importance of the study abroad course in helping him further explore his interest in a practice option. He stated:

> . . . it [theriogenology] has kind of always been in the background of my mind but that really, talking to [one of the veterinarians from OSU on the trip] really kind of set that forward and having the connection from the study abroad with her set me to do some research with a couple of doctors here on campus so it just kind of helped me get I little more into it, I guess.

**Figure 16**

*Stages of Aspiration to Become a Veterinarian: Student E*



### *Stages of Aspiration to Become a Veterinarian: Student E*

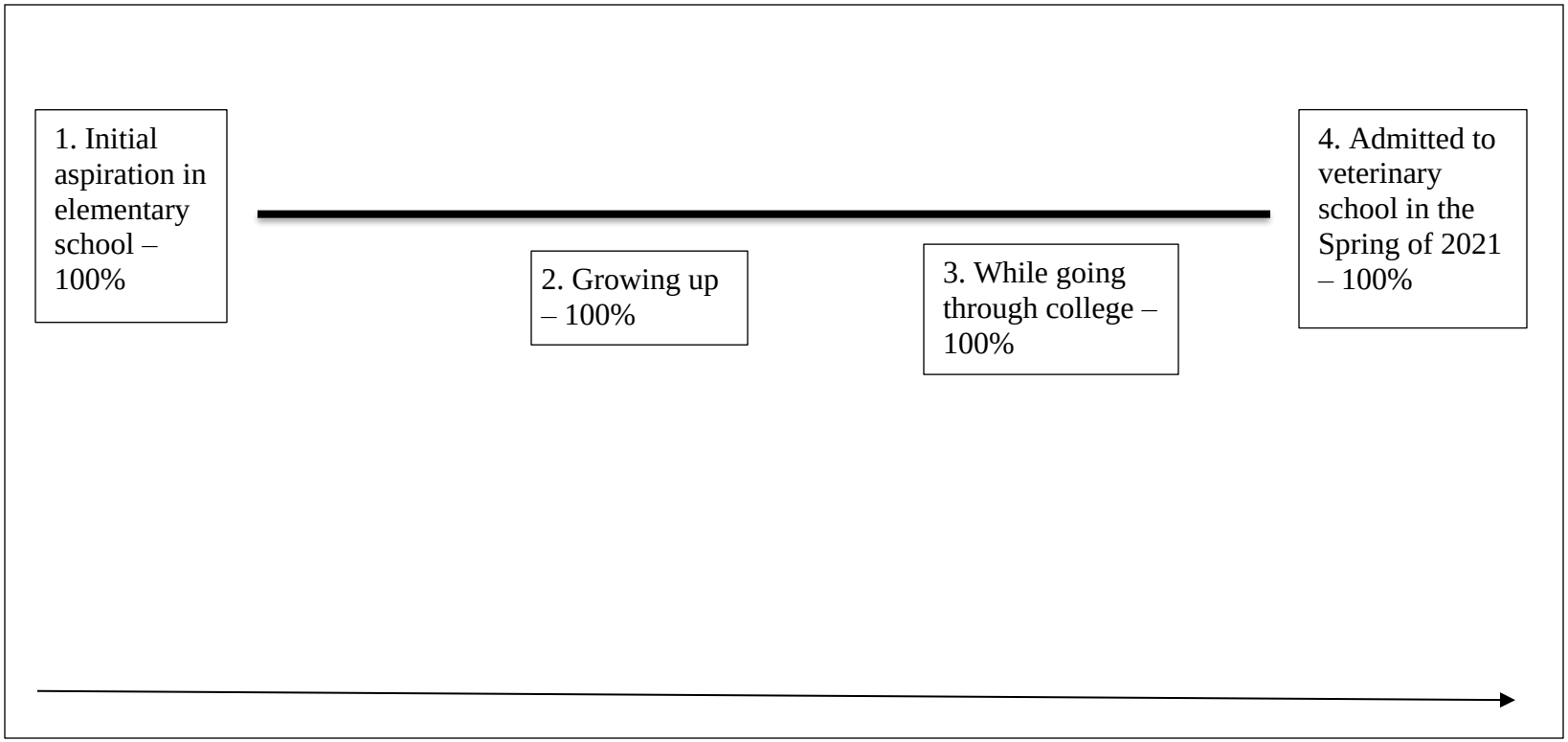
For Student E, her level of aspiration stayed the same while growing up since age four until age 15 or 16 (Stage 1. Initial aspiration at age four, 2. Growing up, and 3. Age 15 or 16 – Aspiration to become a veterinarian decreased some for a few months; see Figure 16). Regarding a short-term decrease in her aspiration to become a veterinarian in high school, Student E posited:

> I'd definitely say from, probably when I realized [that I wanted to become a veterinarian] when I was four until I was high school age, I think it was my freshman or sophomore year so I think I would have been 15 or 16 you know I was 100% sure that I wanted to be a vet. I had a brief decision, or like lapses of, I don't want to say lapse of judgement but I had like another, I was like well I want to be a therapist and then I though, umm I'd probably bring that home with me and I won't really like it as much, and the I was like I don't really like people that much, I need animals so after that realization of probably a few months I was back to 100% so there was only like a small little [time period] where I was unsured.

When asked about the length of time her aspiration to become a veterinarian declined during high school, Student E said: "a few months." After those few months, Student E's level of aspiration went up and remained the same during college and after two years in veterinary school (Stage 4. Going through college and 5. Second year of veterinary school; see Figure 16).

**Figure 17**

*Stages of Aspiration to Become a Veterinarian: Student F*



### *Stages of Aspiration to Become a Veterinarian: Student F*

For Student F, her aspiration to become a veterinarian never changed beginning in elementary school through her admission to veterinary school (Stage: 1. Initial aspiration in elementary school, 2. Growing up, 3. While going through college, 4. Admitted to veterinary school in the Spring of 2021; see Figure 17). Although the study abroad course did not have a significant effect on Student E's confirming her career aspiration, she recognized the value of the study abroad course to help students either affirm or disconfirm their aspirations to become veterinarians. When asked if the study abroad course helped her in this regard, Student E said:

> I think it was really insightful to see veterinary medicine in other country, and then, for me personally it didn't really affirm or like not confirm because I was already so set in it like I've wanted to be a veterinarian since I was really little, and I was like, I'm like one of the few people who've had veterinary experience since I was really, really young in already knew what veterinary medicine entailed so I think it didn't really change my mind, because I already had enough like exposure and experience to be pretty set in it. And then also I know that, like what we did over there was mostly focused towards equine medicine and there's a lot of other options . . . . I enjoyed the equine medicine, not really my area of interest, but if I were someone who hadn't yet figured that out, didn't really have much experience with veterinary medicine, like, I'd still going to say like this is interesting, maybe this isn't what I want to do, but there's still a lot of options for me to explore.

However, she also highlighted the value of the activities during the trip component of the study abroad course to help her disconfirm equine medicine as a potential practice option in veterinary school. She said: ". . . I hated working with horses . . . ."

**Table 26**

*Students' Aspirations and Motivations to Become a Veterinarian Before and After a Study Abroad Course to Mexico in the Summer of 2019*

| Questions/Response Prompts | Students Who dropped the Pre-Vet Option After the Study Abroad Course | | | Students Who continued with the Pre-Vet Option After the Study Abroad Course | | |
|---|---|---|---|---|---|---|
| | **Student A** | **Student B** | **Student C** | **Student D** | **Student E** | **Student F** |
| | | | **Students' Aspirations to Become Veterinarians** | | | |
| **At what age you decided you wanted to become a veterinarian?** | Five or six | I want to say by at least age 10, I was pretty set on being a, becoming a veterinarian. | . . . I was in elementary school . . . | . . . I was a third grader . . . | . . . I was probably four . . . | Elementary [school] |
| **Were there significant experiences or individuals that influenced your decision?** | Shadowing a vet [in middle school] | I was showing goats at this time, I think it was, and my goat had actually broke its leg, and we were, my mom was like, no, no, no, like it's not broken, and I was like no it's broken right here in these many spots like | . . . I had milk goats and one of them, he had [a problem with his] legs and you take it to the vet and you, you know they do some blood tests and they're like hey he has a deficiency and that's why but it's kind of the | . . . my grandpa was steer roper, now his steer roping horse . . . we brought him up to the hospital up here on campus [at OSU] and he [the horse] was up here for a very extended amount of time trying to get that under control and I remember one | . . . I came to preschool dressed up in a little lab coat and like the little plastic kit, doctor kit. And I have always loved animals and knew that I wanted to help make them better, whenever I was younger . . . | I think it was my dad for having work with him for so long because I remember working with him when I was really little going into vet clinics and everything and then the older I got the more I started to do, but I also was |

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| | | whatever, the vet came out and looked at it and he was like yeah she's right, and so then I was like ha-ha I could do this, and so that's kind of where it started. | investigation and puzzle making aspect of it that was really interesting to me as well. You do something, and you get an answer you know. | specific time my grandparents brought me up here with them and we had one of the doctors that is still here, she was the lead clinician on the case and she, whenever we came in she is like: do you want to see all of this? And I was like heck yeah, as a third grader I'd love to . . . | | able to get experience, like in the vet clinics that we worked with, he was like a mobile surgeon self-employed, so we worked a lot for different clinics like that, [I saw] a lot of different sides. |
| | **Students' Knowledge of Admission Requirements to Schools of Veterinary Medicine** | | | | | |
| **GRE scores** | . . . had to be pretty good . . . | I know that it's like up in the one like 155 like 160 range, I think. I think that's where [students I know] were kind of shooting for anyways. | No, I don't have them memorized. | [Student did not provide a response] | In regard to GRE, I didn't have to take it since I did early admin program . . . | It varies depending on the school there's not really a set, you have to get like this score to get in . . . |

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| **GPA** | . . . I knew like also your GPA had to be pretty good . . . | I know it has to be good, and I know it has to be like up in the threes like, up to like 3.5 and higher. | I mean they tell you the numbers, but I don't know, in the threes, somewhere in the threes? | [Student did not provide a response] | 3.5 | . . . there's not like a minimum requirement, there's also averages and typically the out-of-state average is going to be higher than your state average because out-of-state are typically more competitive . . . |
| **Experience hours** | No answer | I don't know the number, but I know that the more you have the better like don't just stop it, like at the requirement, like get as many as you can. | I think something said 185 or something, maybe that was for an internship I don't know. | . . . the average is around 1,000 hours . . . | [Student did not provide a response] | So that also varies by vet school, some of them don't have a minimum requirement and some of them do and they'll also split it between you have to have this many hours for animal experience and then this need |

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| | | | | | | for veterinary experience. That can vary a little bit I think Georgia was around 200 veterinary [hours] maybe 400 total at least, minimum. |
| **Did you learn about this before or during college?** | . . . that was prior to me coming to OSU. | During [college] actually, I didn't even realize that you had to take the GRE until we were in Mexico and [one of the students in the group] . . . was like I just took the GRE and I was like what is that? | . . . at OSU . . . | [Student did not provide a response] | I believe it was [college] orientation, they talked about like our majors that we selected, and they mentioned that the pre-vet option had all the veterinary requirements for Oklahoma State . . . | Before OSU. |
| **What were your major sources to learn about such?** | . . . I learned a little bit about NC State's and Virginia Tech's. | I learned it through like upperclassmen who were going through the process of | It's, that's something you get from the vet school's website, or you know the | [Student did not provide a response] | . . . [college] orientation . . . | Just the different school websites, because it does vary by school . . . |

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| | | becoming a vet like applying and all that and we're talking, like we're talking scores hours all of that. | handout packet you get but it's, you'll go through and you'll have like requirements, it'll be like a tab on their website or you'll go to the VMCAS or the AVMA and it will have requirements for all schools. | | | |
| **Students' Knowledge of Professional Options in Veterinary Medicine** | | | | | | |
| **How many practice options in veterinary medicine are you aware of?** | I'm not totally sure . . . . I'd just say that there's a bunch of different routes. | . . . know that there's like private practices and then there's corporate practice. . . . And then there's large animal, small animal, mixed. | Like everything, so you have your you know you have large animal, small animal, exotic, and then you can specialize in like, like oncology and oh what's it called with bones and | [Student did not provide a response] | I know that there are quite a lot. Earlier I thought that I wanted to be a theriogenologist and then I realized that I would always be on call and I don't really like that. Ideally, if I could get my certification, or | Oh, goodness so there's a lot, so you can do general practice and with general practice, you can usually split into small animal, large animal, mixed animal, it depends on your interest, it |

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| | | stuff like that, or you do like pathogens and it's like everything was human medicine, but animalized. | specialize I would be a pathologist. I really like immunology and pathology a lot so I think that's what I would do but I don't think that I want to do that now so [much]. | depends on your area. You can also choose to specialize and there's a lot of different specialty colleges, you have like theriogenology ophthalmology dermatology radiology. You can do more sort of like the laboratory side of things, with like microbiology, pathology, virology and then you also have other ones that like internal medicine and surgery, you can also split into like small animal large animal, do medicine, exotic animals. |

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| | | | | | | Those are the ones off the top of my head, but like there's a whole list. |
| **Did you learn about this before or during college?** | I learned a little bit in high school . . . | . . . before OSU. | Oh, I learned almost everything while I was at OSU. . . | [Student did not provide a response] | . . I think a lot of learning about different avenues of veterinary work came from veterinary school and not like undergrad . . . | Both. |
| **What were your major sources to learn about this?** | . . . [a] veterinary assistant interactive course . . . | Just growing up, that just. I don't really know where I learned it, it was just like you know, there's a large, large animal, there's small animal. | . . . I learned a lot of the options through volunteering at the vet school and doing research at the vet school because they there you're going to talk to that students or people who are doing their residency and | [Student did not provide a response] | . . . veterinary school . . . | . . . [o]n the AVMA website. |

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| | | | they're like yeah there's all these options and I'm doing this and you're like wow I have options. | | | |
| | **Students' Knowledge of Preparation for the Professional Expectations of Veterinarians** | | | | | |
| **Employment options** | . . . it depends on what you specialize in . . . | They can, well first they have to like do internships and then assistantships and then they can be like they kind of just work their way up the train like basically, a doctor, you know they do like residency and then they have, either can have their own practice, they can do it with someone else. | So, you can have a private practice, you can work at a zoo, you can be a professor, you can work with communities. When we went to Mexico, we worked with community service, I don't know, everything, it's really, you can do a lot with it. And even though you're a veterinarian you don't have to be a | [Student did not provide a response] | PetWell Partners and Southern Veterinary Partners, or like VCA [animal hospital] as well, they had meetings with us to inform us about their programs as well as public health wide, public like, I guess like government . . . . I feel like I'm aware of the options, especially within USDA or anything like that . . . . | So, it depends on your interest your specialty area like large animal your employment options are going to be more kind of like rural, or like Oklahoma where even if you do have some city areas you still have like a wide variety of large animal and then a lot of specialty stuff will be more like city based so where you have larger |

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| | | | veterinarian, you can work with like any job because you have information, you have knowledge. | | | populations of companion animals because also with livestock usually you don't do as much with specialty because you've hit a point where you are okay what's the cost to fix this . . . |
| **Work hours** | . . . sometimes it can range all the way to 60 per week depending on how many surgeries you have . . . | It depends on, it depends on what practice you're in and if you're on call that week so it could be 40, it could be 50 like there's, it depends. | Because you're working with lives it's not a 40-hour work week it's more because you wish it was 40 hours but it's not because you have emergencies or you have your patient struggling and you have a phone call you, you, I | [Student did not provide a response] | [Student did not provide a response] | The norm would probably be like normal full time work and to be like around 40 hours a week, maybe a little bit more, but then, as you specialize like the more you get into specialty and also like self-employment, the more you can control it, |

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| | | | don't know, you're kind of busy. | | | and like kind of cut back a little bit. |
| **Salary** | . . . if you specialize you can like, that's where you start reaching like toward the six figures . . . | I mean starting out like $50,000 and then by the time you made your name like you could be up there in like the $150,000. | So, I feel like people tell students like if you're going to be a vet you're going to make 80 to $100,000 a year but I know it kind of depends on your own lifestyle like if you're living in an affluent area, you can make more money, but if you're living in a rural area, you may do a lot of helping people out, you know payment plans so you make closer to $50,000 you know but you're not | [Student did not provide a response] | . . . something around $90K . . . . Salary was never like that important to me, it's the work that makes me feel good. It's what I need from the job. | Varies very widely, off the top of my head I don't know for sure, like the general practice salaries because if you specialize since you're putting more time into your like education and more money into your education your salary is going to be a lot higher for specialty than for general practice. I've seen some specialties get up to like $300,000 maybe a year, whereas general practice, |

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| | | | going to, I don't think you're going to starve as a veterinarian; they'll do well. | | | especially if you're new you're going to be lower on the salary so really depends on what you are doing what area you're in . . . . Probably like $70K, $80K would be on the low range. |
| **Did you learn about this before or during college?** | . . . I knew all about that stuff coming into OSU. | . . . we had a, actually had a vet come talk to us in capstone the other day [on March 8, 2021] | [Student did not provide a response] | [Student did not provide a response] | It was during my first year of vet school. | [Online] |
| **What were your major sources to learn about this?** | No answer | . . . like I said, we had a vet come into capstone the other day this semester, and she really was like this, this is really what goes on, okay. | I have a lot of friends who graduated from vet school, so I talk to them, I have their information, I know what they're going through, people who are well | . . . I got to talk to a lot of students, a lot of professors and staff that [they] have been through vet school . . . [Student D's sources of any information he learned about veterinary | . . . business club meeting [at the OSU college of veterinary medicine] . . . | Both [online and in-person sources] |

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| | | | established veterinarians like if you volunteer at their clinic they're always willing to talk about life, they're always willing to talk about what you should expect. | medicine before and during college.] | | |
| **Influence of the Study Abroad Course on Students' Professional Aspirations and Other Student Observations** | | | | | | |
| **How did the study abroad course help you affirm your aspiration?** | . . . when I was on the trip, I was still trying to figure out if I wanted to do large animal or small animal. Wherever I wanted my focus to be, and so that was another large reason that I went on the trip. And after experiencing working with equids and | [Student did not provide a response] | It gave me a more positive view of veterinarians, well, I mean I love veterinarians as humans, but it really showed me like being a veterinarian is more than a clinic, it's community, it's life, I really think it gave me a | . . . [Theriogenology] it was kind of always being in the background of my mind but that really, talking to Dr. Baldrighi really kind of set that forward and having the connection from the study abroad with her set me to do some research with a couple of doctors | . . . I'd say the field days would definitely help you with that because that's kind of grossly what a day would [be] like you seeing patients and just working through them . . . | I think the field days were really good like experience wise you actually got some hands on experience because, like in the US veterinary medicine is a little bit more regulated and so, like if you're not actually a veterinary student you |

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| | everything, I think I was still wanting to be a vet so I can definitely say that but I think after going on the trip I didn't want to work with large animals. | much more positive view of career paths with veterinary medicine. | here on campus so just kind of helped me get I little more into it, I guess. | can't do as much hands on, so I think those field days, because we were in Mexico and we were there with like Mexican veterinarians, we were able to do a lot more than we could have done with like horses in the U.S. And then having some of that more hands on experience, especially in a very, very different setting was helpful because you never know like if you go into veterinary medicine, like you don't know where you're going to end up, what kind |

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| | | | | | | of area you're going to be working in. |
| **How did the study abroad course help you disconfirm your aspiration?** | . . . in the negative light it was more of a like these animals are very large, and more than one time I thought I could have gone [sic] like kicked or something or stomped on. A little nerve racking there. | . . . I did a castration in the middle of Mexico, in the middle of Veracruz, Mexico, I still have no idea where we were at, there's a language barrier, you know it was so cool, one of the most coolest experiences I'll ever experienced in my life, I think, and I stood up from it, and I was like huh, that was cool but I don't want to do this for the rest of my life, and so I, we literally | . . . going to Mexico and coming back it reminded me that there's more to life than school and I can have a career and also travel and be part of the world. | . . . [Exotic animal practice,] that's kind of always been my idea, I haven't really affirmed that yet . . . . My main thing right now is that I want to do theriogenology like Dr. Baldrighi because I still have a passion for food animal practice, that is what I have always been involved in so I have a passion for that but I also have a passion for conservation, and then with therio that kind of gives me an option to pursue both fields, I mean because we | . . . I'd say so just because like it was cool and I had fun doing it [watching the veterinarian from OSU palpating a cow to diagnose pregnancy with the ultrasound], whether or not I necessarily can enjoy an activity like that. I don't think it would have influenced my decision still. | . . . I hated working with horses . . . |

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| | | landed, I think on a Thursday, I don't know whatever day we got back, the next day I was in [my advisor's] office switching my major, switching my option to production. | | will always going to be breeding and reproducing animals on both sides of it so that's my main thing is therio right now. | | |
| **Why should students enroll in this study abroad course?** | Two definite reasons: one, it's great to experience a culture that is so relatively close, and I mean geographically. That it's only like an 8, a 6-hour flight I believe down there to Mexico City in total from Oklahoma City to Dallas or whatever and then to | I think going on this this study abroad for one is going to give you a chance to get out of your comfort zone. Uhm, you're in a totally different place meaning totally new people and probably working on animals that you don't | So, before I went on study abroad I've never traveled abroad and it's a safe environment with fun people that you know that you'll always be friends with afterwards, for you to just feel free to just be yourself and learn something about | Well, first I'd sell our advisers that went with us because you guys were awesome. I still think that that made a big part of our trip, was you, and, you guys did behind the scenes . . . you guys did an amazing job with coordinating everything. I'd just promote like the amount of hands on | I'd say that every student needs to study abroad and get out of their comfort zone, I really like not knowing anybody going into it, I got to make new friends and I got to learn new things regarding veterinary medicine and Mexico's culture and the food was really fun, and I | So, I think since it is focused towards pre-veterinary students, it is really important to have a bit of the context of this is what we know what veterinary medicine looks like in the U.S. like we live in the U.S., when we do our hours of experience like |

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| | Mexico. Um, getting that different cultural experience I think is really important because you don't see much of that, especially if you go to Cancun or if you go to any of the touristic spots. So, I really, I would encourage students to go for that sake if, even if they aren't pre-vet. And then, focusing more on the Vet side, it will definitely help them decide what they want to do, whether or not if you still want to be a vet, if it's | normally see, even though we were working on cattle like we're working on breeds that I didn't even know we're breeds. And so, you're out of your comfort zone but also you're able to fully see what life as a veterinarian is going to be like the ups, the downs, how hot it is, all the people you're going to have to encounter, rather that's you know people coming into your clinic and having the enough money to do whatever they need to or | something you love. So we went with, not every student there was a pre-vet option but everyone there loved agriculture and they loved the idea of veterinary medicine so everyone on the trip I think I'm friends with on social media so even afterwards, even during this pandemic I keep, I get to keep like in contact with them and I get to love them and their lives and their achievements. Also, I was kind of an older student compared to | experience that we got, that was an incredible experience to get in to go out to those fields every day, that's not something even that we would ever get here, that's not something that I know of anyone going out into one field one day and saying hey we're going to be here this day and seeing that many people show up. So, that was awesome, we got to see some really cool cases that were brought up and then, I would also say the friendships that you make because that was a big deal . . . like we still all stay in touch, we | mean going to the beach was really cool too so those were bonuses but going for the purpose of learning more about what being a veterinarian is definitely the reason that kids should go on this. | we do it in the U.S. but it's still really important to know what it looks like in other count[ries] because you also like you might grow up, get older, have experience in veterinary medicine and say okay, I want to move somewhere that doesn't have as much veterinary medicine, you need to know how to kind of transfer from a very, very developed country to a non-very developed area because also you are going to have areas in |

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| | small animal or large animal because getting that hands on experience with horses that may not be as tamed or as well brought up as in some of the areas in America. Working with those horses I think will help them a lot because it's not always going to be this horse is so well brought up, some of them might be a little more iffy. And, so working with the horses where the majority of them weren't, at least in some American aspects they didn't seem | someone on the other end of things that's just like please help this dog okay. You're able to see both sides of things and you're really like, take it for what it's supposed to be used for, go in with an open mind of hey, like, is this where I want to go? Is this the route that I need to take? | the other ones, so I was more thinking of what like who am I going to be here in a couple months so I really got to just kind of spread my wings and just kind of relax and see hey, this is a beautiful country, look how different it is from day one to day 10 because we traveled south. And, I don't know, it just kind of gives you the opportunity to see the whole world, with people you love. | saw all our Snapchat[s] that we kind of comment back and forth throughout the year so I'd definitely say friendships, that was a big one. And just kind of getting to see a different aspect of veterinary medicine because between Mexico and the United States it's a very drastic change, it's nowhere similar I'd say and I think that's really cool to see how they practice, I still remember getting to go into one of their practices, I think that was Puebla [at UPAEP[a] farm] that we went to one of their | the U.S. as well that aren't as developed, smaller towns, so I think that aspect of it is really important that kind of multicultural aspect, what does this look like in another country because also you'll have even if you never go outside the country you'll still have veterinarians from other countries coming in and having that context of how does better medicine work and some of these other countries will help you relate to these |

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| | like well kept. That was definitely a great experience there, and helped me decide, okay if I want to work on large animal or small animal. And then just in general like if someone is trying to decide if they still want to be a Vet or not, I'd still definitely suggest for them to go for that same reason if not, especially if there's more hands on learning included in it. I think that will help them decide it as well and may | practices and that was really cool to see how they just kind of practice differently than we do, and just getting different perspectives on it. | veterinarians as well. |

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| | be not just equids but working with the dogs there as well or some of the cats if possible . . . | | | | | |
| **If you could summarize the study abroad course in one word or one statement, what would that be?** | I guess it would be incredible, like if it's one word incredible, like a statement, I truly don't think I can quantify how great of an experience it was, um, because I think I will not ever experience something like that again, even if I do go back to Mexico and if I go back to Mexico City or wherever I don't think I will be able to help the people that we did help | For me, I would say eye-opening like, if I had to do it in one word, eye-opening. If I had to do a statement, that study abroad is literally what gave me the opportunity to open my eyes and kind of branch out to figure out where else I can help and be as successful in the agriculture industry, not just in vet medicine. | I want to say something about like losing fear. I've always been afraid of going to other places because it's not something I'm familiar with but since I went on the study abroad, I lost my inhibition of just getting out of my comfort zone, I, whatever how old, I am now 23 years old, I'm so willing to go to other places, so I definitely lost | . . . I'd probably just say that it's a great place to make friendships and within an industry that you would like to pursue as well as have great experiences and opportunities. | I'd say that it gave me hope that I knew my days were, my days of school were like closing in and it, I knew like kind of . . . I'd say that it is inspirational and reminds you that school is not going to be forever. | . . . Very heavily equine focused. But even if horses aren't your area of interest, like part of veterinary, with the experience hours that they want, [it would also be beneficial to get experience with horses because] they [schools of veterinary school] don't want you to focus on one animal. They want you to have like a broader range of experience |

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| | those few days with the equids or even get the, when we went to the Ag businesses, get those insider looks around the factories and things like that. Yeah, I truly think it's a one time or once in a lifetime experience. | | my inhibition. I don't know. How [can] I make that a sentence? [I] lost my inhibition to go outside of the country [and] for trying new things. | | | so even if you're not interested in horses it's still really good to have that experience, it'll make you [a] more competitive applicant. |
| **Is there anything your college could have done to better prepare you as a pre-vet student to better affirm or disconfirm your aspiration to become a veterinarian?** | I don't think so because if it wasn't for [the college administrator] like talking to me my first week being there, like, I would have never know about ambassadors probably for another year or two, and then I | I don't really think so, uhm, if anything I could have, like, I don't, I don't really think so because I was still taking animal science classes like there was, I think there's only one class that I took that like I didn't | . . . I feel like there's like sort of a disconnect with the vet school like if I wanted to go talk to someone at the vet school, who would I [have] talked to, where's their office, how do I get there, I don't | So, at this first year I feel that we were pretty prepared for just about everything except for maybe histology, like there's always one or two classes. Where I was more prepared in all of our therio stuff that we had during our PHYS [Physiology] II, | . . . I think that my only thing is like I wish, I myself would have taken another class like virology or something another class that would have built upon, like I would have been able to build upon my knowledge as | I think I did struggle with the fact that I am in the biochemistry molecular biology degree which is much more heavily like pre medical instead of pre veterinary so my advisors, advisor for that, for my major |

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| | would not have learned about MANRRS or anything like that as well, and so it is also that. I call it the grace of God to get to meet her and talk to her and get to meet you and talk to you as well and get really plugged into the SSLs [Student Success Leaders] my sophomore year as early as I could. Also, I don't think anything different could have been done, so, after that, it just took time for me to develop leadership roles in the clubs. | need now that I've switched my option so I was taking the same classes I would have been taking, I was hanging around with the same people I would have been hanging around, I was in FIT [Freshman in Transition program] so like, they were all you know Ag majors, and so I really don't think so, I think that, it just like, I think that's what it was going to have to take for me to ah, let it go. | know. . . . if I really felt aspired to go talk to someone and just get information, I feel like I didn't, couldn't go over there. | and as well our genetics helped me a lot in PHYS I. I remember that a lot, it kind of played a big factor in that and that was because I went Animal Science with major whereas some people have a better histology experience because their major were more biomedical and they had a little bit of experience with different subjects and so I think it just varies back and forth, you are never going to have like a perfect medium. . . . Like this semester we started Virobic Immunology which other | opposed to go in cold . . . | didn't really have a whole lot of information about veterinary medicine my, my mentors, my department head does have a little bit more experience, but again it's like mostly like medical pre-medical health for dental but I did have my minor advisor . . . which was on the animal science thing so he works with pre-veterinary students a lot more, so I did still have someone I could go to about pre-veterinary . . . |

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| | | | | students in different majors I think Biochemistry I think they have to take immunology maybe Biochemistry majors to grad, and I didn't have to take that so I never did and I kind of look back and I think I kind of wish I would it taken that and a few others but I think it just comes down to what you do within your major and everybody is prepared for a little different subject. | | |
| **Is there anything else you would like to add about the value of this study abroad course for students?** | . . . I suggest honestly everyone to do it, if not do "that" study abroad do "a" | Um so, there's going to be, you are going to have a lot of fun on this trip, you're going to | So, the study abroad course was just a very positive affirming trip for me, | Just having that hands-on experience, I think was a big turning point for a lot of people | I'd say if you are on the fence about it [aspiration to become a veterinarian or | I think like it's really good to have that experience that exposure but take it with a |

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| | study abroad because I remember when I came in like, I'm sure you remember our conversation with me being like oh no, I'm not going to do a study abroad and then, yeah. | make memories that you will hold on to forever, you're going to make friends but make sure you're going into it like I said, with an open mind and not just there to have fun, not just being will be like oh I went on a study abroad, we did this, go into it, be serious about it but also like, have fun. | nothing about it made me think oh I don't like veterinary medicine, but it did show me different career paths I can do with agriculture with animals because during our trip we didn't just go to veterinary type facilities, we went to research and husbandry facilities and we also went to a couple of you know, went to the vanilla farm and like a citrus place but it just kind of, it shows you all your options and | because I know a few people that came back actually not wanting to do it anymore, after that which is, I mean that was kind of those things that's what that experience was about, it was for us to kind of define, how that defining moment of whether or not we were wanting to do this. | not] go ahead and do it because one day you might regret not going. | grain of salt because the your veterinary experience in the U.S. isn't going to be the same and just because you like if you do, for some reason end up going on the trip and you're like oh my gosh I don't want to work with horses . . . that doesn't mean you won't find something else in veterinary medicine. |

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| | | | how you can have a variety of options within veterinary medicine. | | | |
| **Other thoughts?** | . . . if OSU could like pull all of the pre-vet options kids together and may be have them take a seminar class their freshman year and talk more in depth about that because like, yeah, my freshman [year], my first semester here at OSU I remember I had two freshman seminar classes one was just general Ag. The other one was Ag Business specific but | I think that if you are thinking about going like pre-vet having that option, no matter if you're in Ferguson, or if you're in, whatever college . . . a requirement of work hours while in your undergrad should also be in there, just because there's a lot of kids that come in and have no work experience or like, this is what I do, I'm smart enough to this, I'm | [Student did not provide a response] | . . . I still look back and there's a couple of professors that were kind of revamping their curriculum based of what they have heard students coming off vet school being like I wish I would [have] had more histology. I know one professor, she actually gave us, I think we had one lab over histology science and stuff so basic information so that was really cool that she has started to incorporate that just based off of students she has | I'd argue [learn about practice options during] undergrad because maybe someone isn't interested in like private practice work and I feel like that's kind of the face of vet med, since that's one of the biggest avenues that people choose to take but if they find out that they could do like regulatory work or like other options whit it, I think that [those other practice options] might like, spark their interest, and they | I think that [it] would be helpful [to have more professors with a veterinary background in the department of Biochemistry and Molecular Biology] because it's one of the reasons that I chose my major because I didn't want to do animal science because the vast majority of students applying to vet school are animal science majors, if you want to stand |

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| | they both were the same practically because in general [Ag orientation] they teach you how to write a resume and stuff like that, Ag Business they will do the same exact thing so it does intrigue me a little bit about what was, animal science's eight week seminar class like, what was food sciences, what was plant and soil, like if they really dive more into those majors and if so like, I think the reason kids come in with a pre-vet option is to eventually | going to do this, hit vet school still with very limited hours and they're like oh, this is not what I want. So, I think it'd be a very good like not a lot of hours but be like hey like you know kind of like community service hours, but it may be work hours. | heard because her course it's made for more vet student oriented. And then like I kind of wish, my last semester that I had in undergrad was [not] COVID, that was the first semester of COVID, everything was kind of weird, we didn't get to have all of our labs . . . . I don't feel like I got as much out of it as would have if I would have been in class but there was nothing that anybody could do . . . . | might want to look into it more. So, I think having all of that beforehand [learning about practice options before veterinary school] is helpful. | out and be more competitive, you need a different major so I minor in that because it still had a lot of like veterinary requirements, like some of my classes that I had to take were animal science because pre-reqs for vet school but if you do try and take that approach, and you do a major that's not the one that most people do you get into an area where people don't, like your advisors don't know as much about vet school . . . |

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| | pursue vet school so may be group them together rather than just grouping them by major. |

*Note.* [a]Universidad Popular Autónoma del Estado de Puebla

A summary of the study's findings is presented in chapter V. This synopsis presents the results by research phase. Research phase one helped in fully answering research questions one and two, and to partially address research question three. Phases two and three contributed to further answering research question three. In accord, the study's findings were summarized in chapter V by the respective research phases (see Figure 10).

# CHAPTER V

## SUMMARY OF THE STUDY, CONCLUSIONS & IMPLICATIONS, AND RECOMMENDATIONS

In case study, an entry vignette at the beginning of its written report is complemented with the case's assertions to aid in offering a closing vignette (Creswell & Creswell, 2018). This case study's entry vignette was contextualized by what Sprecher (2004) foresaw:

> Veterinary medicine is at a crossroads: the future of the profession will be determined by those who join it and by those who select who will join it. Veterinary schools are the gatekeepers of the profession, and the entire veterinary profession is responsible for ensuring that the image it presents to those who will join it matches the social needs that it must serve. (p. 199)

Chapter V is divided into four sections, a summary of the study, conclusions and implications, recommendations for future research and practice, and the case's study assertions and closing vignette. The study's purpose, research questions, problem statement, and significance of the study were included in the first section.

## Statement of the Problem

Although studies have been conducted to understand the influence of study abroad courses on undergraduate students' career aspirations (Arghode et al., 2020; Jon et al., 2018; Kronholz & Osborn, 2016; Mohajeri Norris et al., 2009; Paige et al., 2009), limited research exists regarding the impact of study abroad courses on the affirmation of pre-vet students' career aspirations to become veterinarians (Cake et al., 2019). With so much at stake for pre-vet students, schools of veterinary medicine, and the veterinary profession, examining a learning experience that may help students make better-informed choices as well as improve their related career outcomes warranted rigorous investigation. The need to fill this gap in the literature motivated the researcher to pursue this line of inquiry.

## Purpose of the Study

Overall, this mixed methods case study sought to explore, understand, and interpret the impact of a study abroad course on pre-vet students' aspirations to become veterinarians. In addition, the study strove to describe pre-vet students' views on the influence of local culture and the overall practice of veterinary medicine in Mexico. The investigation identified specific factors associated with the study abroad course that appeared to help students either affirm or disconfirm their career aspirations to become veterinarians.

Rule and John (2015) concluded:

> Case study is a widely prevalent approach within educational research but has been criticized for its lack of theoretical depth and rigor. . . . [However, i]n the recursive practice of research, case study can involve a dialogic relation between

> theory and research, and case study might engage with theory in different ways at different stages of the study. (p. 7)

The pre-vet students who participated in the study abroad course *AG 3803: International Study Tour in Agricultural Sciences and Natural Resources: Mexico* (see Appendix A) during the summer of 2019 were the subjects of this investigation's case and source of its data.

## Research Questions

Three research questions guided this study:

1. What were the perceptions of students who participated in the study abroad course *AG 3803: International Study Tour in Agricultural Sciences and Natural Resources: Mexico* regarding the practice of veterinary medicine in Mexico?
2. What were the AG 3803 students' perceptions regarding the influence of culture on the practice of veterinary medicine in Mexico?
3. How did the study abroad course *AG 3803: International Study Tour in Agricultural Sciences and Natural Resources: Mexico* impact students' decisions to affirm or disconfirm their career aspirations to become veterinarians?

## Significance of the Study

Understanding the overall impact of the study abroad course *AG 3803: International Study Tour in Agricultural Sciences and Natural Resources: Mexico* on participants' career aspirations has the potential to assist undergraduate, pre-vet students in either affirming or disconfirming their career aspirations to become veterinarians. Moreover, because this study also explored the students' perceptions regarding the practice of veterinary medicine in Mexico, a culture different from their own, how that

experience impacted their career aspirations may be understood better. This is of special interest to undergraduate students, as well as their academic advisors and institutions, because all would benefit from learning experiences that assist students in affirming their career aspirations before enrolling in schools of veterinary medicine, assuming they achieve admission. In their study of first-year veterinary students, Fish and Griffith (2014) reported that most changed their interests in practice options after taking a required course on veterinary careers; they attributed the students' course experiences as one factor that caused them to reconsider choice of practice.

## Summary of the Study

### Summary of the Study's Introduction

Veterinary Medicine has grown considerably since its conception as a profession in the United States; it continues to be a demanding occupation, and a very competitive process to those aspiring to become a veterinarian (AVMA, 2020, Bierer, 1955, Peters, 2007, Smithcors, 1963). Applicants invest significant time and effort to fulfill a range of admission requirements to schools of veterinary medicine in the United States (AAVMC, 2014, 2019, 2020b, 2020c; Burzette et al., 2017; CoVM, 2020; Jackson & Dawson-Saunders, 1987; Kogan et al., 2009; McRae, 2010; The GRE Test, 2020). Academic course-taking and related performance is among the more rigorous requirements because most AAVMC member institutions require a minimum letter grade on course prerequisites if applying to their programs (AAVMC, 2020b). Aspiring veterinarians may take such courses more than once to meet the minimum grade requirement but, remarkably, these course prerequisites may not significantly influence students' performance in schools of veterinary medicine (Burzette et al., 2017; Kogan et al., 2009).

Overall, the average GPA and GRE test scores results for applicants to schools of veterinary medicine in the United States are higher than the U.S. average for college graduates and GRE test takers (AAVMC, 2019; Educational Testing Service, 2019; see Table 1).

Applicants to schools of veterinary medicine in the Unites States apply to an average of five institutions and one in every two applicants may expect to be admitted to a school of veterinary medicine (AAVMC, 2020a; AAVMC & Dabdub, 2020). They usually take a pre-veterinary curriculum concentration before applying, but because this is not an application requirement, applicants may come from a variety of academic backgrounds (AAVMC, 2020a; AAVMC & Dabdub, 2020). Many pre-vet students enroll in college with an intention to apply to a school of veterinary medicine, but a significant number will not gain admission (AAVMC, 2019, 2020; IRIM, 2018; OSU CoVM, 2020).

Ample and broad veterinary practice experiences are an important component in a competitive application to schools of veterinary medicine in the United States, but opportunities to attain such may be difficult for many students to find (AAVMC, 2014). And existing opportunities are mostly related to companion animal practice and limited options exist outside of that area (Amass et al., 2011; Hashizume, et al., 2015; Kane et al., 2013; Lenarduzzi et al., 2009; Sprecher, 2004). Moreover, type of veterinary practice experience may dictate the focus areas veterinary students select in schools of veterinary medicine and the practice options they pursue after graduation (Amass et al., 2011). About one-half of all positions held by veterinarians in the United States are in companion animal practice (AVMA, 2020). Furthermore, a surplus of veterinarians is projected in urban and suburban areas, especially for companion animals, but a shortage

is expected for rural practice, which often involves treating large animals (IHSH & CHWS, 2013; National Research Council, 2013).

It is also important for aspiring veterinarians to understand the professional expectations of a Doctor of Veterinary Medicine. Increasing rates of practice-related stress, depression, and suicide have been reported for veterinarians and at levels substantially higher than the U.S. population overall (Brody et al., 2018; National Institute of Mental Health, 2019; Nett et al., 2015; Norris et al., 2017). Veterinarians may be at increased risk of dying by suicide compared to the general U.S. population, especially female clinical practitioners working on companion animals, which is the majority of all practitioners and projected to increase (AAVMC, 2019; AVMA, 2020; IHSH & CHWS, 2013; National Institute of Mental Health, 2019; Stone et al., 2018; Tomasi et al., 2019). Several factors have been associated with stress, depression, and suicide rates of veterinarians but student debt is likely one of the main causes (Platt et al., 2012, Strand et al., 2005; Tomasi et al., 2019). And tuition costs at schools of veterinary medicine are projected to increase; therefore, veterinarians will likely need to retire at an older age to offset their educational expenses (Chan, 2019; IHSH & CHWS, 2013; Lau, 2018; National Research Council, 2013).

Pre-vet students in the United States would likely benefit from opportunities to explore, as early as possible during their collegiate experience, whether veterinary medicine is an appropriate career fit for them. Short-term study abroad courses may be a valuable exploratory opportunity. Studies have reported several academic and career benefits due to students studying abroad. Study abroad courses could help pre-vet students not only understand better the different practice options in veterinary medicine

but also affirm their career aspirations to become veterinarians (Geyer et al., 2017; Jon et al., 2018; Mohajeri Norris et al., 2009; Paige et al., 2009). These opportunities should support the motivational interests of students to pursue careers in veterinary medicine (Cake et al., 2019; Tomlin et al., 2010). Individuals' personal and situational interests (Krapp et al., 1992) and their P-E Fit (Edwards et al., 1998; Rauthmann, 2021) are of special relevance when interpreting personal motivations. Novelty, opportunities to explore, and cognitive or physical challenges as characteristics of situational interest usually lead to positive perceptions presaging the final psychological state of the person and an actualized personal interest; in the case of this study, the impact of a study abroad course in helping students affirm or disconfirm their aspirations to become a veterinarian.

**Summary of the Study's Methodology**

This study complied with OSU IRB's guidelines required for research involving human subjects. Permission for the investigation was granted on January 21, 2021 and the study's IRB number was designated IRB-21-23 (see Appendix B). Tracy (2010)'s *eight big-tent criteria* were followed for achieving excellent quality in the study's qualitative components. Measures of objectivity, as well as internal and external validity, were considered for the quantitative phase of the investigation (Creswell & Creswell, 2018; Creswell & Plano Clark, 2011; Gertler et al., 2016). A reflexivity statement was offered by the researcher about his potential personal biases in regard to conducting and reporting on this investigation (Shaw, 2010), as well as bracketing procedures to mitigate the potential effects of such (Tufford & Newman, 2012).

A case study, mixed methods [CS-MM] approach (Guetterman & Fetters, 2018) was used as the research design for this investigation. The case study consisted of an

intrinsic single case (Guetterman & Fetters, 2018; Stake, 1995) with priority given to the qualitative phases of the embedded, mixed methods design (Creswell & Plano Clark, 2011). The study's research procedures included journal writing, phenomenological methods, photovoice, retrospective evaluation, and timeline interview to triangulate an understanding of the phenomenon and support its interpretation.

Twenty-five undergraduate students from OSU who participated in the study abroad course *AG 3803: International Study Tour in Agricultural Sciences and Natural Resources: Mexico* (see Appendix A) during the summer of 2019 were the subjects of this investigation. The students traveled to Mexico from June 16 to June 25, 2019. The study abroad course had a higher participation of students who are usually underrepresented in such courses at colleges and universities in the United States, e.g., minority and Freshman students (see Table 4). Fifty-two percent of participants in the study abroad course were minority students compared to a 29.5% participation rate at OSU and 29.8% in the United States overall (OSU, 2021a). Also, 36.0% of participants in the course were Freshman students compared to a 1.3% participation rate at OSU and 4.0% for the nation (OSU, 2021a). Moreover, 20.0% were first generation college students compared to a 9.0% participation rate for the United States overall (National Survey of Student Engagement, 2020). Studying abroad has been demonstrated to have a positive relationship with higher retention rates of college students (Barclay Hamir, 2011).

The study's research design was operationalized through three research phases, i.e., qualitative, quantitative, and qualitative (see Figure 10). The results from each phase informed analysis of the subsequent phase. Each research phase helped in answering the

research questions. For the first research phase, photovoice (Delgado, 2015; Wang & Burris, 1997) and phenomenological methods (Creswell & Poth, 2018; Groenewald, 2004; Guba, 1981; Moustakas, 1994) were used as research procedures to operationalize data collection and analysis (see Figure 10). Two course assignments consisting of students' photo journals and written journals served as the sources of data for this phase. Textual content analysis was used to identify codes and frequencies in the data that led to the emergence of significant statements and themes. Photovoice narratives and journal essences were derived from the study's first research phase.

The second research phase consisted of a retrospective, then-post evaluation procedure (Howard et al., 1979). After returning from Mexico, students responded to an online survey questionnaire with three components: academic motivation, curriculum evaluation, and activities evaluation (see Appendix C). The academic motivation data were used to support answering the study's research questions. In addition to descriptive statistics, a Wilcoxon Signed-Ranks Test was conducted to examine the statistical significance of this data (see Tables 23, 24, & 25). The students' responses to the evaluation regarding how the course helped them to either affirm or disconfirm their career aspirations for veterinary medicine were aggregated from the phase's quantitative data analysis.

Regarding the third research phase of the study, follow up interviews were conducted with a purposeful sample of six students to better understand the impact of the study abroad course on their career aspirations to become veterinarians. Timeline interviews were conducted with the students representing two different perspectives, three of them narrated the value of the study abroad course to help them affirm their

interests in veterinary medicine, and three for which the study abroad course aided them in realizing that veterinary medicine was not the career path they wanted to pursue. Visual timelines showcasing students' career aspirations were drawn from the interview data. Related information derived from the students' interviews was used to contextualize stages or changes in their levels of aspiration toward veterinary medicine over time.

An interpretation of findings was offered for each of the three research phases. And in accord with the recommended format for presenting a case's findings (Creswell & Creswell, 2018), a closing vignette was derived from the research process and assertions were presented to provide explanatory context and interpretation.

## Summary of the Study's Findings

### *Summary of Findings Associated with Research Phase One: Qualitative*

Most of students' written journals featured a mix of their observations on culture and veterinary medicine, and five focused exclusively on culture (see Table 5). At least 180 words, e.g., qualitative codes, were used with a frequency of more than 10 times in the aggregated text of students' written journals, with the top 50 words ranging from 233 to 28 occurrences (see Table 6). These top 50 words culminated in 33 clusters according to their contextual relevance and occurrence in the aggregated text of the students' written journals (see Table 7 ).

Regarding photo journals, one-third of the photographs and related written descriptions submitted by the students were associated with veterinary medicine, one-fourth to culture, and almost one-tenth were classified as other related topics. More than 100 words were used with a frequency of more than 10 times in the aggregated text of students' written descriptions of their photographs, with the top 50 words ranging from

118 to 15 occurrences. These top 50 words culminated in 29 clusters according to their contextual relevance and occurrence in the aggregated text of students' written descriptions of their photographs.

A total of 668 significant statements emerged from the aggregated text of the students' assignments, from which 340 corresponded to their written journals and 328 to photo journals (see Tables 11, 14, 17, & 20). Sixty-two themes were derived from these significant statements; 32 associated with students' written journals and 30 with their photo journals. Ten themes came from students' assignments as related to research question one: 1) Access to Care, 2) Animal Condition, 3) Animal Productivity, 4) Climate Influence, 5) Comparison with the United States, 6) Humane Treatment, 7) Mexican Schooling, 8) Range of Veterinary Procedures, 9) Socioeconomic Influence, and 10) Work Settings for Veterinary Practice (see Tables 11, 12, & 13). Eight themes emerged from students' assignments as related to research question two: 1) Animal Caretakers, 2) Animals for Work, 3) Animal Functionality, 4) Context-based Welfare Practice, 5) Give-back to the Community Tradition, 6) Naming Animals, 7) Presence of Animals, and 8) Traditional Practices (see Tables 14, 15, & 16). And six themes came from students' assignments as related to research question three: 1) Broadening of Career Perspectives, 2) Hands-on Learning Experiences, 3) Learning of Medical Judgement, 4) Learning on a Range of Veterinary Procedures, 5) Recommended Unique Learning Opportunity, and 6) Unique Learning Opportunities (see Tables 17, 18, & 19). In addition, 13 other themes related to culture were gleaned from the students' written journals and written descriptions of their photographs (see Tables 20, 21, & 22). One representative significant statement, one photograph with its written description, and a

range of supporting words, e.g., qualitative codes, helped contextualize each of these themes. Findings from this research phase answered research questions one and two, and partially addressed question three.

***Summary of Findings Associated with Research Phase Two: Quantitative***

Descriptive and inferential statistics were reported based on the analysis of participants' responses to the academic motivation component of the course evaluation (see Appendix C). Data from the evaluation was non-normally distributed according to its levels of skewness and kurtosis. Mean differences were found between the students' retrospective pre-course responses and their post-course answers (see Tables 23 & 24). Results of Wilcoxon Signed-Ranks Tests showed that the post-test means were statistically significantly higher ($p < .05$) than the pre-test means for three of the evaluation questions: EQ5. Before the trip and now that you are back, how certain were/are you about your focus in veterinary medicine (small, large, exotic animals, wildlife)? [$Z = 85.500$, $p < .003$]; EQ7. Comparing what you learned on the trip and what you knew before, how knowledgeable did/do you feel about the veterinary profession? ($Z = 78.000$, $p < .001$); and EQ8. Before the trip and now that you've returned, how motivated were/are you to get good grades in college? ($Z = 15.000$, $p < .025$) [see Table 25]. These findings augmented more fully answering research question three.

***Summary of Findings Associated with Research Phase Three: Qualitative***

Stages or changes in the students' levels of aspiration were examined and depicted based on the follow up timeline interviews with six participants in the study abroad course. Three students had dropped the pre-vet option after the study abroad course, and the other three represented those who remained in the option. Pertinent

quotes and significant patterns of information identified in the students' interview transcriptions were used to describe significant stages and critical events impacting their career aspirations. Overall, the students' aspirations to become a veterinarian began during their childhoods and remained stable until their time in college. For students who dropped the pre-vet option, the study abroad course was not the main reason for exiting the option, but it played a meaningful role in their decisions (see Figures 11, 12, & 13). These students' levels of aspiration had already declined by the time of travel to Mexico, and they had experienced a drop in interest due to different reasons, e.g., the students realized they were pursuing the pre-vet option because of social pressures. They also highlighted the academic rigor and their related performance as an important consideration for deciding to drop the pre-vet option, e.g., not doing well in a chemistry course. On the other hand, for the three students who continued with the pre-vet option, their aspirations had remained very stable beginning in childhood and during their collegiate experience (see Figures 14, 15, & 16). These students were better informed about information related to their aspirations, e.g., application requirements for schools of veterinary medicine, practice options within veterinary medicine, and professional expectations of a Doctor of Veterinary Medicine. The study abroad course helped them to better affirm their aspirations to become a veterinarian, especially the choice of practice option on which they intended to focus.

## Conclusions and Implications

### Conclusions and Implications Related to Research Question One

Students were able to compare and contrast the practice of veterinary medicine between Mexico and the United States, as well as contextualize the differences and

similarities (Jon et al., 2018; Kronholz & Osborn, 2016). They highlighted that access to veterinary care, as well as animal condition and productivity, were highly dependent on socioeconomic and agroclimatology conditions in Mexico. These contextual factors impacted the quantity, quality, and overall access to veterinary care, and affected the work settings of veterinarians and the veterinary procedures they performed (Arghode et al., 2020). Access to veterinary care in rural communities is not only restricted by what people can afford but also by the availability of services. Many times, the only care animals receive in rural communities are the free clinics such as the one offered during the study abroad course in which the students participated. Overall, the study abroad course helped students realize that veterinary medicine in Mexico is not as structured as in the United States (Jon et al., 2018; Kronholz & Osborn, 2016).

In some areas, such as the community the students visited in Puebla, animals may have been underweight and exhibited injuries, including significant scars and cuts. Student 18 described this: "The village was living in extreme poverty, and many of their animals reflected their economic status. We saw some very serious and [likely] fatal injuries." In other areas, e.g., the community visited near Veracruz, animals were in better physical condition and used for different purposes. The geographical and socio-cultural context in which students experienced the study abroad course allowed them to observe a range of veterinary procedures (AAVMC, 2019; Chan, 2019; Lau, 2018; National Research Council, 2013) and to express appreciation for the work of veterinarians in Mexico (Cake et al., 2019; Paige et al., 2009; Tomlin et al., 2010). Students also contrasted the education system of Mexico with the United States. This was reflected by Student 5's comment: "The students here [at UNAM in Mexico] come to the

vet school out of high school, instead of obtaining their undergrad like we do here in the US."

This ability to conceptualize veterinary medicine in Mexico as a highly context-specific practice demonstrated the importance of providing pre-vet students with learning opportunities such the study abroad course (Abrams, 1979). Students not only discerned the uniqueness of veterinary medicine in Mexico, but they also distinguished some of its universal components and benefited from those experiences (Arghode et al., 2020; Geyer et al., 2017). In this regard, Student 2 asserted: "Veterinary [practice] is different down under the U.S. but the language is something each veterinarin [sic] can understand, and that is the constant care for the welfare of each animal that enters their clinic." Their ability to navigate the differences and similarities while staying focused on learning is of special relevance considering this was the first international travel experience for most of the students (see Table 4). By contrast, they could have been experiencing significant, or even debilitating, culture shock (Mumford, 1998; Oberg, 1960). Aligning with the study's human capital conceptual framework (Becker, 1962, 1994; Mincer 1958; Schultz, 1961; Smith, 1776) and with its theoretical underpinnings, IBMT (Hidi & Anderson, 1992; Krapp et al., 1992) and P-E Fit theories (Edwards et al., 1998; Rauthmann, 2021), students' interactions with the situational factors of the course augmented them forming views on the practice of veterinary medicine in Mexico.

**Conclusions and Implications Related to Research Question Two**

Based on findings derived from the written journals and photo journals, the students portrayed that the roles of animals in Mexico, especially their purpose and functions, are significantly different in comparison to the United States, and the practice

of veterinary medicine, care, and welfare of these animals is informed by cultural traditions (Jon et al., 2018; Kronholz & Osborn, 2016). Most animals in rural communities in Mexico are used for work rather than leisure or companion purposes, e.g., horses, donkeys, and dogs. Their value as a *work tool* is a priority over their welfare. Student 2's statement highlighted this contrasting perception of animal welfare between the two nations and cultures: "The problem in Mexico is that the welfare of the animal is often tossed out the window due to the need to work." Traditional practices, such as not practicing castration, often not naming animals, and women and children being the primary caretakers of animals, were very evident in Mexico, as the students observed and commented.

Another important cultural component of veterinary medicine in Mexico identified by students was the tradition of giving back to the community (Kronholz & Osborn, 2016; Paige et al., 2009). Veterinarians and veterinary students offer free services to rural communities in Mexico. This was reflected in Student 24's journal entry:

> One of my favorite parts of this trip was getting to experience and see firsthand the importance placed on giving back to one's community. The fact that it is not only encouraged and supported but that it is expected is huge. In the United States I feel that we often get caught up in doing what is best for us and completing things on our list or in school so we can go on and be successful and forget to give back to those around us . . . .

This comment may have signaled Student 24 experiencing a form culture shock (Mumford, 1998; Oberg, 1960), i.e., contradictory cultural norms, but in the context of veterinary medicine (Cake et al., 2019; Paige et al., 2009; Tomlin et al., 2010). The

overall influence of culture on the practice of veterinary medicine in Mexico was also clearly reflected by Student 16, who wrote:

> It was quite hard to put aside my ideas of what a healthy animal should look like based on my experiences in the U.S. and realize that while skinny and scarred, these animals can work day in and day out in difficult terrain.

Students reflected on their own culture while learning about the influence of culture on the practice of veterinary medicine in Mexico. They made an effort to contrast the ways culture influences the practice of veterinary medicine in their nation and in Mexico (Jon et al., 2018; Kronholz & Osborn, 2016). The role animals play in Mexico was new to the students and differed from their previous normative understanding and worldviews (Mumford, 1998; Oberg, 1960). Students saw the treatment of animals from a different cultural perspective or lens but still attached the meaning of medical care and attention to animal health. Some realized that their interests in animals was more about the role animals play in culture and society than the clinical aspects of veterinary medicine. This realization reinforced the value of the study abroad course to help students expand their perceptions of veterinary medicine from a mostly exclusive clinical view to a more holistic, societally rooted and culturally influenced profession. The students saw veterinary medicine from a broader and more realistic perspective (AAVMC, 2019; Chan, 2019; Lau, 2018; National Research Council, 2013), and perhaps beyond an *often-glamourous* view of it (Lau, 2018). These implications also highlighted a connection between the study's findings and its theoretical framework (Krapp et al., 1992; Rauthmann, 2021). The individual-environment interaction affected the way students

perceived the influence of culture on the practice of veterinary medicine in Mexico, as well as stimulating them to reflect on the profession as practiced in the United States.

**Conclusions and Implications Related to Research Question Three**

The study abroad course not only helped students confirm whether veterinary medicine was a good career fit for them, they did that in relation to their application requirements to schools of veterinary medicine, their consideration of practice options within veterinary medicine, and their understanding of the professional expectations of a Doctor of Veterinary Medicine. Regarding admission requirements, broad and sufficient veterinary practice experience is one of the requirements students have the most challenges fulfilling (Amass et al., 2011; Hashizume et al., 2015; Kane et al., 2013; Lenarduzzi et al., 2009; Sprecher, 2004). The study abroad course to Mexico provided students with valuable hands-on practice experiences, as described by Student 11: “I have worked in a shelter before and I did more hands-on training in Mexico than I have ever done in America.” Moreover, the course motivated students to do better in school, as supported by the statistically significant difference ($p < .05$) between post-test means and pre-test means ($Z = 15.000$, $p < .025$) for course evaluation question eight — Before the trip and now that you’ve returned, how motivated were/are you to get good grades in college? This was an important finding considering many students will likely benefit from being more motivated academically (London, 1983), because a large number repeat courses to attain the required grade by schools of veterinary medicine, or to earn higher grades (Burzette et al., 2017; Holladay et al., 2020; Kogan et al., 2009). Student E voiced this concern:

> I was concerned a few semesters [about having to repeat a class], the first that I remember was Spring of my Freshman year. I took, it was CHEM 1515. I thought I wasn't going to pass that class, but I ended up doing just fine but I remember worrying myself sick about it like, I was actually sick . . . .

Regarding practice options, Student 18 explained the benefit of the study abroad course on students' exposure to different areas: "Needless to say, [after watching the veterinarians work with the elephants] I walked away seriously considering becoming an elephant specialist." This statement contextualized what Kronholz and Osborn (2016) highlighted about the value of study abroad courses in helping students develop a positive view of career options. Also, the post-test means were statistically significantly higher ($p < .05$) than the pre-test means ($Z = 85.500$, $p < .003$) for course evaluation question five — Before the trip and now that you are back, how certain were/are you about your focus in veterinary medicine (small, large, exotic animals; wildlife)? This may also attest to the value of the study abroad course in helping students to consider the broad range of practice options within veterinary medicine. Moreover, considering that practice experiences of pre-vet students usually presage their choice of practice options in veterinary medicine (Amass et al., 2011; Daly & Erickson, 2012; Ilgen et al., 2003; Lenarduzzi et al., 2009), exposing them to different opportunities may help address the imbalance that exists between demand and availability of veterinary practitioners within different options in the United States (IHSH & CHWS, 2013; National Research Council, 2013). And according to the study's timeline interviews (see Figures 12, 13, 14, 15, 16, & 17), the students who had enrolled in veterinary school were still looking to learn more about practice options in the veterinary profession (see Table 26).

Concerning professional expectations, students were familiar with employment options, work hours, and expected salaries. However, school debt was a concern, and the overall stress the veterinary profession entails (Bartram & Baldwin, 2010; Chan, 2019; Lau, 2018; National Research Council, 2013; Nett et al., 2015; Platt et al., 2012; Strand et al., 2005; Tomasi et al., 2019). Student C's statement reflected this concern:

> I 100% plan on working with animals, livestock in some way but I just, I don't know about going to vet school because my personal mental health went down a lot when, in my last half of college, so I don't know if I can, I don't know if it will be all right for me to go to school more.

Participating in the study abroad course informed students' career aspirations and decisions on whether to remain in or exit the pre-vet option, and those keeping it viewed the study abroad experience as a way to explore potential practice options. According to IBMT, students' personal interests in becoming veterinarians were influenced by the situational interest represented and manifested by their participation in the study abroad course, which led to an actualized and, for some students, heightened level of personal interest supporting their career aspirations (Krapp et al., 1992). Overall, the students' course participation and related situational experiences influenced and, in some instances, reinforced their career motivations and aspirations as postulated by IBMT, and P-E Fit theories (Edwards et al., 1998; Hidi & Anderson, 1992; Krapp et al., 1992; Rauthmann, 2021; Renninger et al., 1992; Shen et al., 2003) [see Figures 1, 5, & 6].

## Contributions to Theory

In his in-depth examination of the literature on the relationship between theory and research, Camp (2001) asserted that "[t]he basic purpose of theory is to understand

realty. [And that t]he basic purpose of research is produce theory" (p. 23). He defined theory as "a set of interrelated constructs, definitions, and propositions that present a rational view of phenomena by explaining or predicting relationships among those elements" (Camp, 2001, p. 11). And he also highlighted

> that theories could be grouped into three types based on the degree of the theory's generality or specificity. Grand theories are used to explain major categories of phenomena and are more common in the natural sciences. Middle-range theories fall somewhere between the working hypotheses of everyday life and grand theories. Substantive theories offer explanations in a restricted setting and are limited in scope, often being expressed as propositions or hypotheses. (Creswell, 1994, as cited in Camp, 2001, p. 7)

Camp (2001) further added:

> Applied research based on theoretical assumptions falling well short of grand theory can have important implications for practice in our field and can be perfectly legitimate. Indeed, given the scientific immaturity of educational research in general and career and technical education in particular, substantive theory may well form the theoretical frameworks of much of our research for some time to come. (p. 23)

This study's findings attested the important influence of the interaction between an individual's and his or her environment, i.e., students' participation in the study abroad course assisted them in affirming their career aspirations by either remaining in or exiting the pre-vet option. Such may contribute to the advancement of existing theory, i.e., P-E Fit and IBMT, regarding individual-environment interaction, and its impact on

career choice (Edwards et al., 1998; Hidi & Anderson, 1992; Krapp et al., 1992; Rauthmann, 2021; Renninger et al., 1992; Shen et al., 2003). And support for HCT was found, most due to students acknowledging gaining career-related skills through their course experiences and the relationship of that to their professional aspirations, which may impact their wellbeing (Becker, 1962, 1994; Mincer 1958; Schultz, 1961; Smith, 1776). Furthermore, and as proposed by Camp (2001), that even though this study's theoretical positioning was restricted to aspirants' career choices and persistence, and to its unique setting and scope, findings may support the postulate that *study abroad courses tailored to pre-vet students will impact their career aspirations of becoming a veterinarian by helping them decide to either remain in or exit the pre-vet option during their undergraduate collegiate experience*.

## Recommendations for Practice

The following recommendations for practice emerged from this study:

If replicated at OSU, or similar institutions, the study abroad course should:

- Include an after-trip activity component for students to further reflect on their learning.
- Include similar and perhaps more hands-on learning activities during the travel component of the course, especially field days where students join local veterinary students and veterinarians in helping different communities which may expand the range of HIEPs students are exposed to through the course (Kuh, 2008).
- Require students to submit only one assignment that contains a written and photo component, instead of two separate assignments. The focus of the

assignment should specify the need to document and interpret aspects of veterinary medicine *and* culture to achieve the course objectives.

OSU and similar educational institutions should:

- Continue supporting their pre-vet clubs to ensure that students are provided with information related to veterinary medicine as a career path. The clubs' advisors should be very knowledgeable about and interested in guiding and mentoring the student members.
- Establish partnerships with institutions and organizations such as veterinary clinics and hospitals to secure broad and sufficient practice opportunities for students with an interest in veterinary medicine, regardless of their study options. The students most disadvantaged or challenged regarding practice opportunities should be prioritized for such experiences.
- Evaluate alternative advising options for pre-vet students. The advising of pre-vet students should include monitoring their fulfillment of admission requirements to schools of veterinary medicine, developing their understanding of practice options within veterinary medicine, and evaluating their preparedness for the profession while matriculating as undergraduates.
- Facilitate more interactions between faculty members advising pre-vet students from departments offering the pre-vet option, including outside the college which may be the primary unit for such. For example, Student F's advisor from the Department of Biochemistry and Molecular Biology

was not very familiar with the pre-vet option in the Department of Animal and Food Sciences at OSU, especially the recommended courses. This interaction should focus on activities related to admission requirements to schools of veterinary medicine, practice options within veterinary medicine, and professional expectations of a Doctor of Veterinary Medicine. The information also should be made available to students and their advisors online.

- Form an advisory committee to determine and implement better ways to serve pre-vet students.
- Keep records of pre-vet students who drop or add the pre-vet option during their undergraduate studies, of graduation rates of pre-vet students, of those who apply to schools of veterinary medicine and get admitted or not, and of those students who become a Doctor of Veterinary Medicine. A more comprehensive understanding of the career preparation pathways of pre-vet students may help institutions of higher education better serve them, as well as strengthen their connections with former students.
- Offer a pre-vet orientation course for students and have them take it as soon as possible during their first year of study. Considering that students not only drop the pre-vet option, but also join it over time, mainly during their first year of enrollment, the orientation course should be open to all interested students.
- Partner with colleges of veterinary medicine to offer the study abroad course to veterinary students. Having both pre-vet and veterinary medicine

students participating in and interacting during the study abroad course would likely benefit both groups, e.g., by enhancing select HIEPs (Kuh, 2008). Modifications could be made to further accommodate the veterinary students' learning needs and interests in ways complementary to the study abroad course.

- Provide prospective and current students with more information about the various majors offering the pre-vet option, as well as the benefits associated with each. An online catalog including all pre-vet courses from the respective departments could be created.

Student advisors at OSU and other similar institutions should:

- Encourage students with an interest in veterinary medicine, regardless of their study option, to participate in the study abroad course, especially Freshmen students, first-generation college students, and minority or other historically marginalized students.
- Urge students with an interest in veterinary medicine, regardless of their study option, to join their respective pre-vet clubs and to be active participants, as also recommended by the AAVMC (2020c).

In addition, the pre-vet club at OSU and similar institutions should continue providing programmatic information to its members. Such could include, admission requirements to schools of veterinary medicine and related deadlines, practice options within veterinary medicine and potential opportunities to gain these experiences, and professional expectations of a Doctor of Veterinary Medicine, as highlighted by this study's findings.

## Recommendations for Additional Research

Six recommendations for future research were derived from this study:

- An academic component of the then-post retrospective course evaluation that includes more detailed aspects related to admission requirements to schools of veterinary medicine, understanding of practice options within veterinary medicine, and professional preparedness for the profession would help to further understand the value of the study abroad course and the role it could play in assisting pre-vet students to affirm their career choices.
- Comparative studies of students enrolled in schools of veterinary medicine and those who dropped the option would help to further understand changes in their career aspirations to become veterinarians.
- Conducting research about other experiences that influence pre-vet students to either confirm or disconfirm their career aspirations during their undergraduate years of study may help to better advise them, e.g., participation in student organization activities, attendance at veterinary medicine-related seminars, lectures, programs, and similar events.
- Conducting research on the readiness of new, incoming pre-vet undergraduates to pursue veterinary medicine, or at the time students join a pre-vet option, may help institutions of higher education to better serve and prepare these students.
- Exploring pre-vet students' stages of career aspirations using quantitative research methods may help expand on this study's findings regarding students' reasons for confirming or disconfirming their aspirations to become

veterinarians. This research could include students from different classification levels, i.e., Freshman, Sophomore, Junior, and Senior.

- Studies should be conducted to examine pre-vet students' perceptions of veterinary medicine and its appropriateness as their career aspiration after they complete practice option learning experiences.

## Case Study's Assertions

Assertion related to research question one: The students perceived that the practice of and education for veterinary medicine in Mexico, including animal conditions and productivity as well as access to animal care, were more dependent on socioeconomic and agroclimatology conditions in comparison to the United States. This was reflected in the working conditions of veterinarians and the range of veterinary procedures they observed in Mexico during the study abroad course.

Assertion related to research question two: An analysis of students' artifacts and interviews revealed that they perceived the Mexican culture is strongly entangled with the practice of veterinary medicine in Mexico as compared to the United States. Such was reflected in the way animals were used and the care they received.

Assertion related to research question three: Through this unique travel and study opportunity, students perceived broadening their career perspectives while learning medical judgement and select veterinary procedures through hands-on experiences during the study abroad course. This impacted the students' decisions to affirm or disconfirm their practice options and aspirations to become veterinarians.

## Case Study's Closing Vignette

The study abroad course *AG 3803: International Study Tour in Agricultural Sciences and Natural Resources: Mexico* in the summer of 2019 helped the student participants affirm or, in some cases, disconfirm their practice options and aspirations to become veterinarians by actively engaging in culturally and contextually specific practices of veterinary medicine. In many instances, these experiences challenged their preconceived notions of the veterinary profession. From a phenomenological perspective, this encapsulates the course's *essence* (Moustakas, 1994).

The study abroad course to Mexico may have better prepared those who will join the profession of veterinary medicine and inspired or confirmed an important reality for others who opted to discontinue their pursuit of veterinary medicine as a career choice. Some may argue that the larger the pool of pre-vet students, the more likely it is they will more appropriately self-select themselves regarding the veterinary medicine pathway as a career aspiration, i.e., a variation of *the hunger games*. I would argue that the better informed pre-vet students are about the profession of veterinary medicine, as early as possible during their undergraduate studies, the more prepared they will be to apply to schools of veterinary medicine, get admitted to such, choose the right practice option, and navigate their professional careers in less stressful ways.

Regarding application requirements to schools of veterinary medicine, this study confirmed the findings from previous research about pre-vet students' challenges to fulfill course prerequisites and GPA requirements, attaining competitive standardized test scores, and obtaining broad and sufficient veterinary practice experiences (AAVMC, 2019, 2020a, 2020b; AAVMA & Dabdub, 2020; Amass et al., 2011; Burzette et al.,

2017; Daly & Erickson, 2012; Educational Testing Service, 2019; Hashizume et al., 2015; IHSH & CHWS, 2013; Ilgen et al., 2003; IRIM, 2014, 2015, 2016, 2017, 2018, 2019; Jackson & Dawson-Saunders, 1987; Kane et al., 2013; Kogan et al., 2009; Lenarduzzi et al., 2009; McRae, 2010; National Research Council, 2013; OSU CoVM, 2020; Sprecher, 2004).

As for sufficient understanding of practice options within veterinary medicine, this study attested to the limited knowledge of many pre-vet students about their choices (Amass et al., 2011; AVMA, 2019, 2020; Bain & Salois, 2019; Daly & Erickson, 2012; IHSH & CHWS, 2013; Ilgen et al., 2003; Lenarduzzi et al., 2009; Sprecher, 2004). And regarding the pre-vet students' awareness of professional expectations, many had a rather limited or superficial knowledge of what the practice of veterinary medicine entailed and how that could affect their personal satisfaction in the future (AVMA, 2017; Brody et al., 2018; Chan, 2019; IHSH & CHWS, 2013; Lau, 2018; National Research Council, 2013; Nett et al., 2015; Norris et al., 2017; Platt et al., 2012, Stone et al., 2018; Strand et al., 2005; Tomasi et al., 2019). Although this study's findings should not be generalized beyond the intrinsic case analysis, some transferability may exist to similar settings (Creswell, 2018), and, based on this study's findings, some practical advice to pre-vet students could be: *If you ever feel your aspiration to be a veterinarian declines during college, that may be a sign to consider alternative careers. So, seek advice from your family, your institution's faculty and staff members, and other mentors you may have.*

As described by Sprecher (2004), "*[v]eterinary medicine is at a crossroads* [emphasis added]" (p. 199). As such, nothing is more important than the individuals who

seek to enter the profession, their preparation for such, their performance as veterinarians, as well as their long-term personal satisfaction and wellbeing.

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# APPENDICES

## APPENDIX A: Course Syllabus

**AG 3803 International Study Tour in Agricultural Sciences and Natural Resources:**

**International Pre-Veterinary Experience in Mexico**
**Summer 2019 (Travel Dates: June 16-25, 2019)**

# Course Syllabus

**Course description:**
This course consists of multiple experiences through readings, meetings, site visits, travel, multidisciplinary discussions, and critical written, verbal, and multimedia reflections on veterinary education in Mexico. Also, students will have the opportunity to experience rural ambulatory veterinary medicine in a developing country, as well as the use of equids in agriculture and daily lives of rural Mexicans and human-animal interactions that are an integral part of rural Mexican life. Overall, this course is an exploration into the contemporary education, culture, agriculture, veterinary medicine, and animal welfare of a culturally and historically rich neighbor of the United States.

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**Course objectives:**

At the conclusion of the course, students will have:

1. Developed familiarity with history, culture and current issues relating to Mexico.
2. Experienced and explored the unique relationship between rural Mexican communities and animals they own.
3. Enriched understanding of the One Health concept.
4. Hands-on experience of field veterinary medicine in two rural communities in Mexico, a university-owned ranch, and in a private operation.
5. Developed lasting relationships with Mexican veterinary students and veterinarians by working side-by-side in ambulatory clinics.
6. Developed skills in cross-cultural/international communication with persons from a different culture.
7. Developed writing and self-reflection skills through daily journaling during the trip.
8. Experienced orally presenting their individual focus topics to others on the trip and after conclusion of the trip.

**General course policies:**

**"Late work" is accepted only at the instructor's discretion with the appropriate reduction in grade.**

Students are expected to attend all the course meetings and activities prior, during, and after the trip. Absences will be excused at the instructor's discretion with the appropriate documentation and reduction in grade.

All written assignments should be typed, double spaced, using one-inch margins (top, bottom, left, and right) and Times New Roman 12-point font. In-text citations and their reference information should be written using APA style (6th edition). You can consult the following online resource: http://citationmachine.net/index2.php?reqstyleid=2&mode=form&reqsrcid=APAJournalArticle.

All written assignments should be supported by at least 2 citations (references). These citations should have been derived from appropriate scholarly sources. Examples of scholarly sources include but are not limited to the CIA's The World Factbook website, and The Economist magazine. DO NOT rely on Wikipedia or other online sources that may lack appropriate forms of professional review and assurance.

Safety is paramount to the success of learning outcomes. Students are required to follow the course policy regarding safety. These rules include:

- Students are required to follow instructions from the instructors, professional guests, and local authorities;

- Students will not leave the group while visiting the tour locations;
- Students will not leave the tour hotels in the evenings without consent of the instructors;
- Students will **not** participate in local demonstrations or other political activities while in Mexico. This rule is not to take away your right to free speech but to avoid safety risks.

NOTE: Failure to comply with these requirements will result in a failing grade for the course and the student will be sent back to the United States IMMEDIATELY at the student's expense!!!

**Description of course assignments:**

1. **Signed syllabus:** Every student is required to return a signed paper copy of the syllabus as an agreement with the course requirements and grading.
2. **Pre-trip assessment survey:** This assessment will be used to capture students' experiences in relation to the veterinary profession and ensure they get the most out of the trip. A link will be emailed to you for the survey. Please also email a selfie to jose.uscanga@okstate.edu as part of this assignment.
3. **Group presentation:** Students will be assigned groups at the first pre-trip meeting, they will research about a topic assigned by the instructors and present to the class at a later meeting. The presentation topic will be related to culture or the veterinary profession in the context of Mexico. Students are required to submit two pages of written work about their topic.
4. **Pre-trip meetings:** These meetings are designed to prepare students on trip details and expectations.
5. **Photo journal:** Students are required to submit at least 10 mobile-phone quality photos with an analytical description of what each photo reflects in the context of culture and the veterinary profession of Mexico. The photos should be part of the document with analytical description. You are encouraged to compare and contrast between the culture and the veterinary profession of Mexico and the United States while taking or choosing the photo, and writing the analytical description.
6. **Previous-day group briefings:** Students will be assigned groups for the trip activities. Groups are required to orally report the next day on what was learned about culture, the veterinary profession, or any other related topic during the previous day activities. The briefings will be conducted every morning during days 2-10 of the trip. Taking notes during the debriefs is encouraged to complement the Personal Interest Topic Trip Journal.
7. **Personal Interest Topic Trip Journal:** Students are required to choose a topic of their interest related to culture, the veterinary profession, or other related topic previous to the trip, collect information during the trip, and submit a 5-page journal after the trip. The topic name should be submitted to the advisors at the third pre-trip meeting.

8. **Post-trip meeting:** This meeting is designed to evaluate, reflect, and get students perspectives on the course. It is very important for the instructors to get students feedback on the course because it will benefit future participants.

**Grading:**
Grades for the course will be based on the active involvement during the course activities, including the pre and post meetings and a 10-day study trip. Instructions and grading rubrics will be provided for assignments as needed.

| # | Assignment | Points | Due Date | Submission Form |
|---|---|---|---|---|
| 1 | Signed syllabus | 15 | 02/13/2019 | In person |
| 2 | Pre-trip assessment survey | 20 | 02/13/2019 | In person |
| 3 | Group presentation (including written report) | 110 | 03/13/2019 | Canvas |
| 4 | Pre-trip meetings attendance (70 points each) | 210 | | In person |
| 5 | Previous-day group briefings attendance (25 points each) | 225 | 06/17-25/2019 | Continuous |
| 6 | Photo journal | 210 | 07/03/2019 | Canvas* |
| 7 | Personal Interest Topic Trip Journal | 210 | 07/03/2019 | Canvas* |
| 8 | Post-trip meeting attendance | TBD | TBD | In person |
| | Total Points | 1000 | | |

*The submission site will open on the last day of the trip for students who prefer to submit their assignments earlier than the due date.

| # | Extra credit opportunity | Points | Due Date | Submission Form |
|---|---|---|---|---|
| 1 | Completing level in Spanish language app (based on current knowledge; 25 point per level, up to 4 levels) | 100 points | 06/17/2019 | In person |

| Grading Scale | |
|---|---|
| Points | Letter Grade |
| 900-1000 | A |
| 800-899 | B |
| 700-799 | C |
| 600-699 | D |
| <600 | F |

## Itinerary:

**Pre-Trip Meetings**

**Pre-Trip Meeting 1 (Wednesday, February 13, 2019) 216/218 NRC**

| Time | Activity | Notes |
|---|---|---|
| 6:30 p.m. | Sign attendance list | |
| 6:35-7:10 p.m. | Peer-Introduction activity | |
| 7:10-7:30 p.m. | Review of syllabus, pre-trip assessment survey, trip itinerary, overall logistics, and Q/A about the course. | |
| 7:30-8:00 p.m. | Assignment of groups, presentation topics, and research of topic. | |
| 8:00 p.m. | Group dismissal | |

**Pre-Trip Meeting 2 (Wednesday, March 13, 2019) 216/218 NRC**

| Time | Activity | Notes |
|---|---|---|
| 6:30 p.m. | Sign attendance list | |
| 6:30- 6:40 p.m. | Reminders and Q/A about the course. | |
| 6:40-7:55 p.m. | Group Presentations (All groups) | |
| 8:00 p.m. | Group dismissal | |

**Pre-Trip Meeting 3 (Wednesday, April 19, 2019) 216/218 NRC**

| Time | Activity | Notes |
|---|---|---|
| 6:30 p.m. | Sign attendance list | |
| 6:35-7:30 p.m. | Review of trip itinerary, overall logistics, and Q/A about the course. | |
| 8:00 p.m. | Group dismissal | |

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**During-Trip Activities**

**Day 1 (Sunday, June 16, 2019)** **Mexico City (Arrival)**
**Staying at Mexico City Hotel** **Theme of the day: Culture of Mexico City**
**Dress code: Casual. Rain jacket and comfortable shoes recommended (T*: 50°-80°)**

| Time | Activity | Notes |
|---|---|---|
| ** | Meet at McDonald's on Terminal 1, Mexico City Airport | **According to flight arrivals |
| ** | Depart to and check-in at Mexico City Hotel | |
| 3:00 p.m. | Depart to Downtown Mexico City. Meet at Hotel Lobby | |
| 4:00 p.m. | Tour of Downtown Mexico City | |
| 6:00 p.m. | Dinner (included) | |
| 8:00 p.m. | Return to Mexico City Hotel | |

*Expected temperature (Fahrenheit)

**Day 2 (Monday, June 17, 2019)** **Mexico City- Puebla**
**Staying at Puebla Hotel** **Theme of the day: Veterinary Education in Mexico**
**Dress code: Casual. Rain jacket, comfortable shoes, OSU orange recommended (50°-80°)**

| Time | Activity | Notes |
|---|---|---|
| 7:00 a.m. | Breakfast (Included)- Mexico City Hotel | |
| 7:30 a.m. | Previous-day group briefing- Hotel Lobby | |
| 8:00 a.m. | Check-out from Mexico City Hotel | Load luggage to bus |
| 8:30 a.m. | Depart to UNAM Campus | |
| 9:00 a.m. | UNAM Welcome and presentation of potential future opportunities for OSU students | |
| 10:00 a.m. | Tour of UNAM Vet School Facilities and Hospitals | |
| 12:00 p.m. | Tour of UNAM Campus | |
| 1:00 p.m. | Lunch (Included) | |
| 4:00 p.m. | Depart to Puebla | |
| 7:00 p.m. | Check-in at Puebla Hotel | |
| * | Dinner on your own | *According to student's preferences |

**Day 3 (Tuesday, June 18, 2019)** **Puebla**

**Staying at Puebla Hotel** **Theme of the day: Hands-on Veterinary Activities**

**Dress code: Casual. Steel-toe boots required; jeans, long sleeves, and cap (50°-80°)**

| Time | Activity | Notes |
|---|---|---|
| 7:00 a.m. | Breakfast (Included)- Puebla Hotel | |
| 7:30 a.m. | Previous-day group briefing- Hotel Lobby | |
| 8:00 a.m. | Depart to UPAEP Vet School Ranch | |
| 9:00 a.m. | Hands-on activities at UPAEP Vet School Ranch* | |
| 12:00 p.m. | Lunch (Included) – Box Lunch by Puebla Hotel | |
| ** | Tour of Downtown Cholula, Puebla | **Time permitting |
| *** | Dinner on your own | ***According to student's preferences |

*Participation in hands-on veterinary activities will depend on the availability and condition of the animals.

**Day 4 (Wednesday, June 19, 2019)** **Puebla**

**Staying at Puebla Hotel/ Theme of the day: Veterinary Profession and Education in Mexico**

**Dress code: Casual. Rain jacket and comfortable shoes recommended (50°-80°)**

| Time | Activity | Notes |
|---|---|---|
| 7:00 a.m. | Breakfast (Included)- Puebla Hotel | |
| 7:30 a.m. | Previous-day group briefing- Hotel Lobby | |
| 8:00 a.m. | Depart to Africam Safari Park | |
| 9:00 a.m. | Presentation of veterinary program and tour of Africam Safari Park | |
| 12:00 p.m. | Lunch (Included) – Box Lunch by Puebla Hotel | |
| 2:00 p.m. | Return to Puebla | |
| 3:00 p.m. | UPAEP Welcome- Taco bar and cultural activities- Main campus | |
| 5:00 p.m. | Tour of UPAEP Vet Hospital and presentation of potential future opportunities for OSU students | |
| * | Dinner on your own | *According to student's preference |

**Day 5 (Thursday, June 20, 2019)** **Puebla**

**Staying at Puebla Hotel** **Theme of the day: Hands-on Veterinary Activities**

**Dress code: Casual. Steel-toe boots required; jeans, long sleeves, and cap (50°-80°)**

| Time | Activity | Notes |
|---|---|---|
| 7:00 a.m. | Breakfast (Included)- Puebla Hotel | |
| 7:30 a.m. | Previous-day group briefing- Hotel Lobby | |
| 8:00 a.m. | Depart to community in Puebla | |
| 10:00 a.m. | Hands-on activities with equids* | |
| 12:00 p.m. | Lunch (Included) – Box Lunch by Puebla Hotel | |
| 4:00 p.m. | Return to Puebla Hotel | Load luggage to bus |
| ** | Dinner on your own | **According to student's preferences |

*Participation in hands-on veterinary activities will depend on the availability and condition of the animals.

**Day 6 (Friday, June 21, 2019)** **Puebla- Veracruz**

**Staying at Veracruz Hotel** **Theme of the day: Veterinary Outreach in Mexico**

**Dress code: Casual. OSU orange and Rain jacket recommended (50°-90°)**

| Time | Activity | Notes |
|---|---|---|
| 6:00 a.m. | Check-out from Puebla Hotel | |
| 6:30 a.m. | Depart to UNAM Research Center in Veracruz | |
| 7:00 a.m. | Breakfast (Included)- Box Breakfast by Puebla Hotel | |
| * | Previous-day group briefing | *Submit answers in paper |
| 11:00 a.m. | Visit citrus processing plant | |
| 12:00 p.m. | Lunch (Included)- At Dia del Ganadero (Rancher's Day) Activity | |
| 5:00 p.m. | Depart to Veracruz Hotel | |
| 6:00 p.m. | Check-in at Veracruz Hotel | |
| * | Open afternoon | |
| 7:00 p.m. | Dinner (included)- Veracruz Hotel | |

**Day 7 (Saturday, June 22, 2019)** **Veracruz**

**Staying at Veracruz Hotel** **Theme of the day: Hands-on Veterinary Activities**

**Dress code: Casual. Steel-toe boots required; jeans, long sleeves, and cap (70°-90°)**

| Time | Activity | Notes |
|---|---|---|
| 7:00 a.m. | Breakfast (Included)- Veracruz Hotel | |
| 7:30 a.m. | Previous-day group briefing- Hotel Lobby | |
| 8:00 a.m. | Depart to community for hands-on activities* | |
| 10:00 a.m. | Hands-on activities with equids at community working in collaboration with UNAM | |
| 12:00 p.m. | Lunch (Included)- Box Lunch by Veracruz Hotel | |
| 4:00 p.m. | Return to Veracruz Hotel | |
| ** | Open afternoon | **Time permitting |
| 7:00 p.m. | Dinner (included)- Veracruz Hotel | |

*Participation in hands-on veterinary activities will depend on the availability and condition of the animals.

**Day 8 (Sunday, June 23, 2019)** **Veracruz**

**Staying at Veracruz Hotel** **Theme of the day: Hands-on Veterinary Activities**

**Dress code: Casual. Steel-toe boots required; jeans, long sleeves, and cap (70°-90°)**

| Time | Activity | Notes |
|---|---|---|
| 7:00 a.m. | Breakfast (Included)- Veracruz Hotel | |
| 7:30 a.m. | Previous-day group briefing- Hotel Lobby | |
| 8:00 a.m. | Depart to Ranch for hands-on activities* | |
| 10:00 a.m. | Hands-on activities at Veracruz Ranch | |
| 12:00 p.m. | Lunch (included) - Box Lunch by Veracruz hotel | |
| 4:00 p.m. | Return to Veracruz Hotel | |
| ** | Open afternoon | **Time permitting |
| 7:00 p.m. | Dinner (included)- Veracruz Hotel | |

*Participation in hands-on veterinary activities will depend on the availability and condition of the animals.

**Day 9 (Monday, June 24, 2019)** **Veracruz- Mexico City**
**Staying at Mexico City Hotel** **Theme of the day: Landscapes of Mexico**
**Dress code: Casual. Rain jacket and comfortable shoes recommended (50°-90°)**

| Time | Activity | Notes |
|---|---|---|
| 7:00 a.m. | Check-out from Veracruz Hotel | |
| 7:30 a.m. | Depart to Mexico City | |
| 8:00 a.m. | Breakfast (Included)- Box Breakfast by Veracruz hotel | |
| * | Previous-day group briefing | *Submit answers in paper |
| 9:00 a.m. | Visit to vanilla and citrus research center | |
| 12:00 p.m. | Lunch (Included)- On the way to Mexico City | |
| 5:00 p.m. | Visit to Mexican Handcrafts Market* | |
| 7:00 p.m. | Check-in at Mexico City Hotel | |
| 8:00 p.m. | Dinner* (Included)- Mexico City Hotel | **A maximum of $250 Mexican Pesos on A-la-carte menu is included as part of the dinner. Any difference will be covered by the student. |

**Day 10 (Tuesday, June 25, 2019)** **Mexico City (Departure)**
**Dress code: Casual. Travel attire recommended (50°-80°)**

| Time | Activity | Notes |
|---|---|---|
| 8:00 a.m. | Farewell Breakfast and overall trip group briefing (Included)- Mexico City Hotel | |
| TBD | Depart from Mexico City Hotel to Mexico City Airport- For those with a late flight (Uber on your own) | |

**Post-Trip Meeting**
**Post-Trip Meeting (TBD)** **TBD**

| Time | Activity | Notes |
|---|---|---|
| TBD | Sign attendance list | |
| TBD | Most-significant trip photo Presentation | |
| TBD | Course Evaluation | |
| TBD | Group dismissal | |

APPENDIX B: Institutional Review Board

## Oklahoma State University Institutional Review Board

| | |
|---|---|
| Date: | 01/21/2021 |
| Application Number: | IRB-21-23 |
| Proposal Title: | Using a Study Abroad Course to Help Pre-Vet Students Affirm their Aspirations to Become Veterinarians: A Mixed Methods Case Study |
| Principal Investigator: | Jose Uscanga-Aguirre |
| Co-Investigator(s): | |
| Faculty Adviser: | CRAIG EDWARDS |
| Project Coordinator: | |
| Research Assistant(s): | |
| Processed as: | Exempt |
| Exempt Category: | |

**Status Recommended by Reviewer(s): Approved**

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The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in 45CFR46.

**This study meets criteria in the Revised Common Rule, as well as, one or more of the circumstances for which continuing review is not required. As Principal Investigator of this research, you will be required to submit a status report to the IRB triennially.**

The final versions of any recruitment, consent and assent documents bearing the IRB approval stamp are available for download from IRBManager. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be approved by the IRB. Protocol modifications requiring approval may include changes to the title, PI, adviser, other research personnel, funding status or sponsor, subject population composition or size, recruitment, inclusion/exclusion criteria, research site, research procedures and consent/assent process or forms.
2. Submit a request for continuation if the study extends beyond the approval period. This continuation must receive IRB review and approval before the research can continue.
3. Report any unanticipated and/or adverse events to the IRB Office promptly.
4. Notify the IRB office when your research project is complete or when you are no longer affiliated with Oklahoma State University.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact the IRB Office at 405-744-3377 or irb@okstate.edu.

Sincerely,
Oklahoma State University IRB

# CONSENT FORM

Research study: Using a Study Abroad Course to Help Pre-Vet Students Affirm their Aspirations to Become Veterinarians: A Mixed Methods Case Study

## Background Information

You are invited to participate in a research study about the value of study abroad on undergraduate college students' aspirations to become veterinarians. We ask that you read this form and ask any questions you may have before agreeing to be in the study. Your participation in this research is voluntary. There is no penalty for refusal to participate, and you are free to withdraw your consent and participation in this project at any time. You can skip any questions that make you uncomfortable and can stop the interview at any time.

This study is being conducted by Jose Uscanga-Aguirre, doctoral candidate, under the direction of Dr. M. Craig Edwards of the Department of Agricultural Education, Communications, and Leadership at Oklahoma State University.

## Procedures

If you agree to be in this study, we would ask you to do the following:

1. Please reply to the email message from which you received this form and include the statement at the end of this document.
2. Set up an interview date with the researcher for the spring semester of 2021.
3. The interview will be conducted through Zoom and recoded for research purposes.
4. The information provided during your interview will be analyzed and reported in the researcher's doctoral dissertation.

Participation in the study involves the following time commitment: one virtual interview session of 45 to 60 minutes.

## Compensation

You will receive no payment or any kind of compensation for participating in this study.

## Risks

There are no known risks associated with your participation in this study beyond with you may encounter in everyday life.

## Confidentiality

The information that you give in the study will be handled confidentially. Your information will be assigned a random number when reporting the data. The list connecting your name to this code will be kept in a password protected computer in the researcher's locked office. When the study is completed and the data have been analyzed, this list will be destroyed. Your name will not be used in any report derived from the study.

## Contacts and Questions

The Institutional Review Board (IRB) for the protection of human research participants at Oklahoma State University has reviewed and approved this study. If you have questions about the research study itself, please contact the Principal Investigator at (405) 744-5395 or jose.uscanga@okstate.edu. If you have questions about your rights as a research volunteer or would simply like to speak with someone other than the research team about concerns regarding this study, please contact the IRB at (405) 744-3377 or irb@okstate.edu. All reports or correspondence will be kept confidential.

The research team works to ensure confidentiality to the degree permitted by technology. It is possible, although unlikely, that unauthorized individuals could gain access to your responses because you are responding online. However, your participation in this online survey involves risks similar to a person's everyday use of the internet. If you have concerns, you should consult the survey provider privacy policy at https://zoom.us/privacy

## Statement of Consent

Please reply to the email from which you received this consent form. Please copy and paste the following statement to your reply:

**I have read the information in the consent form for the research study "Using a Study Abroad Course to Help Pre-Vet Students Affirm their Aspirations to Become Veterinarians: A Mixed Methods Case Study." I consent to be interviewed by Jose Uscanga-Aguirre during the spring semester of 2021 and my interview be recoded for research purposes. My reply to the email message from which I received this consent form can be used as proof of my consent.**

Approved: 01/21/2021
Protocol #: IRB-21-23

**Follow Up Interview Protocol**

When did you decide to become a veterinarian?

Was there a significant experience or individual that influenced your decision?

What is/was your main motivation for choosing veterinary medicine as your career goal?

Did the study abroad course to Mexico help you to affirm or disconfirm your aspiration to become a veterinarian?

How did the course help you to affirm your aspiration to become a veterinarian?

How did the course help you to disconfirm your aspiration to become a veterinarian or decided to not?

If you could summarize the study abroad course to Mexico in one statement what would that be?

Is there are particular or specific point you would share with other students considering enrolling for the study abroad course?

APPENDIX C: Course Evaluation Instrument

**AG 3803 International Study Tour in Agricultural Sciences and Natural Resources:**
**Mexico (Pre-Vet Study Abroad in Mexico)**
**Summer 2019 (Travel Dates: June 16-25, 2019)**
**Course Evaluation**

**Pre-Vet Study Abroad in Mexico (AG3803)- Academic Motivation Evaluation**

1. What was your student classification in college during the 2018-2019 academic year?
   - Freshman
   - Sophomore
   - Junior
   - Senior
   - Other

2. What is your gender?
   - Male
   - Female
   - Prefer not to say

3. Before the trip and now that you've returned, how motivated were/are you to become a veterinarian?
   - Before the trip
     - Very Motivated
     - Somewhat Motivated
     - Neither Motivated nor Unmotivated
     - Somewhat Unmotivated
     - Very Unmotivated
   - After the trip
     - Very Motivated
     - Somewhat Motivated
     - Neither Motivated nor Unmotivated
     - Somewhat Unmotivated
     - Very Unmotivated

4. Before the trip and now that you are back, how likely were/are you to drop the pre-veterinarian option?
   - Before the trip
     - Very likely
     - Somewhat likely
     - Neither likely nor unlikely
     - Somewhat unlikely
     - Very unlikely
   - After the trip
     - Very likely

- Somewhat likely
- Neither likely nor unlikely
- Somewhat unlikely
- Very unlikely

5. Before the trip and now that you are back, how certain were/are you about your focus in veterinary medicine (small, large, exotic animals; wildlife)?
   - Before the trip
     - Very certain
     - Somewhat certain
     - Neither certain nor uncertain
     - Somewhat uncertain
     - Very uncertain
   - After the trip
     - Very certain
     - Somewhat certain
     - Neither certain nor uncertain
     - Somewhat uncertain
     - Very uncertain

6. Before going on this trip and now that you have returned, how certain were/are you that you would attend veterinary school?
   - Before the trip
     - Very certain
     - Somewhat certain
     - Neither certain nor uncertain
     - Somewhat uncertain
     - Very uncertain
   - After the trip
     - Very certain
     - Somewhat certain
     - Neither certain nor uncertain
     - Somewhat uncertain
     - Very uncertain

7. Comparing what you learned on the trip and what you knew before, how knowledgeable did/do you feel about the veterinary profession?
   - Before the trip
     - Very knowledgeable
     - Somewhat knowledgeable
     - Neither knowledgeable nor clueless
     - Somewhat clueless
     - Very clueless
   - After the trip

- Very knowledgeable
- Somewhat knowledgeable
- Neither knowledgeable nor clueless
- Somewhat clueless
- Very clueless

8. Before the trip and now that you've returned, how motivated were/are you to get good grades in college?
   - Before the trip
     - Very Motivated
     - Somewhat Motivated
     - Neither Motivated nor Unmotivated
     - Somewhat Unmotivated
     - Very Unmotivated
   - After the trip
     - Very Motivated
     - Somewhat Motivated
     - Neither Motivated nor Unmotivated
     - Somewhat Unmotivated
     - Very Unmotivated

**Pre-Vet Study Abroad in Mexico (AG3803)- Curriculum Evaluation**

1. How much did you learn from each of the trip leaders?

| | Nothing | A little | Neutral | Something | A great deal |
|---|---|---|---|---|---|
| [Name] | | | | | |
| [Name] | | | | | |
| [Name] | | | | | |
| [Name] | | | | | |
| [Name] | | | | | |
| [Name] | | | | | |

2. What did you think of the trip leaders?

9. To what extent were you able to achieve the learning objectives listed on the course syllabus?

| | Negative impact | Somewhat negative impact | No impact | Somewhat positive impact | Positive impact |
|---|---|---|---|---|---|
| Developed familiarity with history, culture and current issues relating to Mexico | | | | | |
| Experienced and explored the unique relationship between rural Mexican communities and animals they own | | | | | |
| Enriched understanding of the One Health concept | | | | | |
| Hands-on experience of field veterinary medicine in two rural communities in Mexico, a university-owned ranch, and in a private operation | | | | | |
| Developed lasting relationships with Mexican veterinary students and veterinarians by working side-by-side in ambulatory clinics. | | | | | |
| Developed skills in cross-cultural/international communication with persons from a different culture. | | | | | |
| Developed writing and self-reflection skills through daily journaling during the trip. | | | | | |
| Experienced orally presenting your individual focus topics to others on the trip and after conclusion of the trip. | | | | | |

3. Do you have any insights to share about your learning on the trip?

4. To what extent did the course assignments contribute to your learning?

| | Not at all | Not enough | Neutral | Somewhat | A great deal |
|---|---|---|---|---|---|
| Signed syllabus | | | | | |
| Pre-trip assessment survey | | | | | |
| Group presentation | | | | | |
| Pre-trip meetings | | | | | |
| Photo journal | | | | | |
| Previous-day group briefings | | | | | |
| Personal Interest Topic Trip Journal | | | | | |
| Extra credit opportunity (language app) | | | | | |

5. If you used it, what did you think of the language app?

6. Do you have any comments about the course assignments?

7. How could your learning from the trip have been enhanced?

8. What was your student classification in college during the 2018-2019 academic year?
   - Freshman
   - Sophomore
   - Junior
   - Senior
   - Other

9. What is your gender?
   - Male
   - Female
   - Prefer not to say

**Pre-Vet Study Abroad in Mexico (AG3803)- Activity Evaluation**

1. What impact did the following cultural trip activities have on your learning from the course?

| | Negative impact | Somewhat negative impact | No impact | Somewhat positive impact | Positive impact |
|---|---|---|---|---|---|
| Dinner at traditional Mexican restaurant | | | | | |
| Tour of UNAM campus | | | | | |
| Visit to the Cholula pyramid in Puebla | | | | | |
| Africam Safari park tour | | | | | |
| Demonstration of "Ku the Eagle", the UPAEP | | | | | |
| University mascot | | | | | |
| UPAEP Welcome- Taco bar and cultural activities | | | | | |
| Visit to Mexican handcrafts market | | | | | |
| Group meals | | | | | |
| Meals on your own | | | | | |
| Open afternoons | | | | | |

2. Please rank the following academic trip activities in their order of impact on your learning, with the most impactful coming first.
   - Demonstration of Elephant management and care program at Africam Safari park
   - Demonstration of pregnancy diagnosis with Zebu cattle under embryo transfer breeding system at Veracruz ranch
   - Hands-on activities with equids at Puebla community
   - Hands-on activities with equids at Veracruz community
   - Tour of facilities and labs, UNAM research center in Veracruz
   - Tour of the facilities, demonstration of animal handling and pregnancy diagnosis in cattle under artificial insemination breeding system at UPAEP vet school ranch
   - Tour of UNAM Vet School facilities and hospitals
   - Turtle liberation to the sea
   - Visit to citrus processing plant in Veracruz
   - Visit to vanilla research center in Veracruz

3. Please share an "Aha!" moment (moment of realization) you had during the trip.

4. What did you think of our time in Mexico City?

5. How did you find our time in Puebla?

6. What are your thoughts on your time in Veracruz?

7. What did you think of your working group?

8. How would you evaluate the following logistical aspects of the trip component of the course?
    - Transportation
        - Horrible
        - Needed improvement
        - Neutral
        - Good
        - Excellent
    - Lodging
        - Horrible
        - Needed improvement
        - Neutral
        - Good
        - Excellent
    - Food
        - Horrible
        - Needed improvement
        - Neutral
        - Good
        - Excellent
9. Do you have any recommendations for changes in/additions to the trip itinerary?

10. Do you have any suggestions for this study abroad course?

11. What was your student classification in college during the 2018-2019 academic year?
    - Freshman
    - Sophomore
    - Junior
    - Senior
    - Other

1. What is your gender?
    - Male
    - Female
    - Prefer not to say

APPENDIX D: Study Abroad Course Flyer

# Pre-Vet in México

## June 16-26, 2019

- Specially designed for **Pre-Veterinary students** or those with an interest in animal agriculture.
- Network and work with faculty and veterinary students from the only **AVMA accredited university** in Latin America.
- Get field animal experience on different animal species.
- Hands-on veterinary **medicine and surgery experience** side-by-side with Mexican veterinarians and veterinary students.
- Learn about animal industry and **human-animal interaction** in Mexico.
- Learn more about animal welfare, wild life preservation, citrus, banana cultivation, etc.
- Tour archaeological sites, learn about French migration to Mexico, and **enjoy a beautiful beach**!

Estimated Cost: *

- Course Program Fee= **$1,000** (includes lodging, in-country transportation, and most meals)
- Airfare= ~$500 (vary according to reservation date)
- Course Tuition= $897
- Personal Expenses= ~$200 (suggested)

*All costs are estimated and subject to change

APPENDIX E: Study Abroad Course Recruitment Email

**Uscanga Aguirre, Jose**

**Subject:** FW: REMINDER: Pre-Vet Study Abroad in Mexico. Info Session on 11/29/18
**Attachments:** Pre-Vet in Mexico 2019 Flyer.jpg

**From:** Uscanga-Aguirre, Jose
**Sent:** Sunday, November 25, 2018 8:28 PM
**Subject:** REMINDER: Pre-Vet Study Abroad in Mexico. Info Session on 11/29/18

# Are you interested in getting Pre-Vet field experience?

Come to the information session about the Pre-Vet study abroad program to Mexico during June 16-26, 2019.

Date: Thursday, November 29th, 2019
Where: 123 Animal Science Building
Time: 7:00 p.m.

We will present a day-to-day schedule of activities

# Ready to apply?

Apply here
https://abroadprograms.okstate.edu/index.cfm?FuseAction=Programs.ViewProgram&Program_ID=10871

LIMITED SPACE!

**José Uscanga**
*CASNR Multicultural Programs*
College of Agricultural Sciences and Natural Resources
Oklahoma State University

136 Agricultural Hall | Stillwater, Oklahoma 74078
Jose.uscanga@okstate.edu | 405.744.5395

***Expanding*** Minds, ***Inspiring*** Purpose

VITA

José Manuel Uscanga Aguirre

Candidate for the Degree of

Doctor of Philosophy

Dissertation: IMPACT OF A STUDY ABROAD COURSE ON HELPING PRE-VET STUDENTS AFFIRM THEIR CAREER ASPIRATIONS TO BECOME VETERINARIANS: A MIXED METHODS CASE STUDY

Major Field: Agricultural Education

Biographical:

Education:

Completed the requirements for the Doctor of Philosophy in Agricultural Education at Oklahoma State University, Stillwater, Oklahoma in July, 2021.

Completed the requirements for the Master of Science in Agribusiness at Universidad Popular Autónoma del Estado de Puebla, Puebla, Mexico in 2012.

Completed the requirements for the Master of Agriculture in International Agriculture at Oklahoma State University, Stillwater, Oklahoma in 2012.

Completed the requirements for the Bachelor of Science in Agricultural Engineering at Universidad Autónoma Chapingo, Mexico State, Mexico in 2005.

Experience:

Director of Multicultural Programs in the Ferguson College of Agriculture at Oklahoma State University, Stillwater, OK, USA.

Graduate Teaching and Research Associate at Oklahoma State University, Stillwater, OK, USA.

Agricultural Consultant in Mexico and USA.