

ABSTRACT

ALPI, KRISTINE MARKOVICH. Understanding Learning from Others' Prior Experience in Veterinary Education: A Mixed Method Study of the Impact of Motivational and Environmental Influences. (Under the direction of Dr. Duane Akroyd and Dr. Susan Barcinas).

Health professions education (HPE) must prepare future health professionals for learning from peers who bring diverse prior experience to their professional practice. Health professions students have many opportunities to learn from others with greater expertise, but whether and how students value other students' prior experiences as a source of learning is unknown. The objective of this study is to understand how veterinary students at public universities perceive sharing prior horsemanship experiences as a way to learn from each other in the context of an equine medicine course. Verbal sharing of others' experiences has been observed as a means for nursing students to learn from fellow students, but studies of vicarious learning in HPE have not considered personal factors or educational environment surrounding sharing prior experience as a learning strategy.

This sequential exploratory mixed methods study of veterinary students examines prior horsemanship experience, perceived usefulness of learning from others' prior experience, as well as motivational and environmental factors that may influence sharing or valuing of prior experience. Sharing of horsemanship experiences was studied through qualitative interviews with recent graduates of a public veterinary college. A survey of veterinary students across the U.S. rated the usefulness of scenarios where horsemanship knowledge was shared in classroom and clinical contexts and reported whether they would be willing or likely to share their knowledge in similar contexts. Usefulness and receptivity to sharing were then evaluated in separate multiple regression models comprised of potential predictors such as achievement goal orientation, knowledge sharing self-efficacy, career

interests, horsemanship experience, and having been asked to share by an instructor.

Integrated findings demonstrate how sharing of students' prior experience is viewed and what might constitute optimal educational environments that facilitate peer sharing.

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Understanding Learning from Others' Prior Experience in Veterinary Education: A Mixed
Method Study of the Impact of Motivational and Environmental Influences

by
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A dissertation submitted to the Graduate Faculty of
North Carolina State University
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

Educational Research and Policy Analysis

Raleigh, North Carolina

2018

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DEDICATION

This research is dedicated to my current and past veterinary students who have participated in this research and must remain anonymous. I have learned so much from what they shared. They motivated me to persist and share their wisdom with others. This work would not exist if not for their generous gift of their very precious time and their willingness to share their experiences.

BIOGRAPHY

Kristine Alpi was born in Indianapolis, Indiana where she began riding horses at an early age. After graduation from Sececina Memorial High School, she matriculated at Indiana University-Bloomington and earned a Bachelor of Arts in History of Art (Honors) and Spanish with a minor in Italian in 1995, a Certificate in Business Foundations in 1996, and a Master of Library Science in 1996. In 1998, she completed an Associate Fellowship at the National Library of Medicine, National Institutes of Health in Bethesda, MD.

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ACKNOWLEDGMENTS

My parents, Louie and Marianne, believed I could learn most things happily as a self-directed learner and reader, and drove me to riding lessons and visits to stables that welcomed young visitors. I am the learner I am because of you and my teachers, both human and animal. Thank you, Tricia, Nadeem, Maddie, Mary Pope, Julie, and Karyn, and my equine friends Randy, Atticus, Bob, Princess, Tucker, Bella, and Liberace.

My husband Jeff made this all possible—as a cheerleader, Qualtrics expert, source of funding for incentives, and even as an occasional proofreader. At home, Rocky, our bulldog, and a series of rehabilitating turtles from the Turtle Rescue Team provided companionship during the coursework and this long writing phase.

My doctoral group became a second family for my life at the College of Education--J.J., Jenny, and Sally, it has been an honor to learn with you. J.J. encouraged me to keep on keeping on, and Jenny reviewed my cognitive interview data to provide a balanced perspective. My committee members have been amazing resources—my co-chairs Drs. Akroyd and Barcinas were my first advisors and instructors and remained committed to seeing this through with me! Dr. Gray introduced me to the wide world of motivation and cognitive interviewing, and Dr. Figuers modeled how to bring daily practice as an educator of clinicians to applying my research to helping others learn.

The NCSU Libraries has been an amazingly supportive place to work throughout this journey, and I thank Carolyn Argentati and Susan Nutter for creating the flexibility that allowed me to be a scholar and a librarian and bring my learning back to my work. I owe a great deal to my current and past co-workers in the Veterinary Medicine Library who covered for me to attend classes and asked about my progress.

Several of my colleagues at NC State and in other aspects of my life encouraged me and helped me. Dr. Regina Schoenfeld, a collaborator and friend, provided an amazing sounding board during the proposal phase and in developing my instruments. Dr. Ken Royal also provided feedback on the survey development. Dr. Amy McLean and Becky Blikslager shared their equine expertise in helping me capture horsemanship experience more robustly. Drs. Sherman, Dorman, Kennedy-Stoskopf, and Stoskopf checked in on my progress as we pursued other research projects and helped me balance life and work and scholarship. Our friends Scottie and Phil Pitner, writer and scientist respectively, asked about the writing in a way that was motivating and helped me describe my work to audiences outside of veterinary medicine, equestrians, and health professions educators.

My topic was inspired by discussions with Dr. Dick Mansmann, an equine veterinarian and horseperson, about the value of our veterinary students' prior experiences, and the students from whom I learned about their engagement with horses. I appreciated the encouragement of the classes of 2016, 2017, and 2018 who regularly asked if I were finished with my PhD yet. Thank you to the veterinarians who helped me pilot my interview questions and surveys and gave very candid feedback and cannot be named—you know who you are! My current and past students who have participated in this research must remain anonymous, but this work would not exist if not for their generous gift of their very precious time and their willingness to share their experiences.

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CHAPTER ONE: INTRODUCTION

Health professions education (HPE) is an investment by society, members of professions, and students in preparing future health professionals. Health professions (HP) adult students bring diverse prior experiences and knowledge with health and related domains to learning their chosen professions. A stated goal of HPE is to create self-directed, lifelong learners (AACN/AAMC, 2010; Bleakley, Bligh, & Browne, 2011; NAVMEC, 2011). While self-directed learning has been pursued effectively in select courses or institutions (Murad, Coto-Yglesias, Varkey, Prokop, & Murad, 2010), many contemporary HPE structures and environments promulgate learning directed by others with scant consideration of students' prior experiences. Little has changed in 30 years since Schön (1987) criticized professional education in many settings for consisting primarily of a transfer of information from instructors to students who must learn, receive, store, digest, and apply it as knowledge. The second edition of Gunderman's text *Achieving Excellence in Medical Education* (2011) promotes learner development by reminding readers that medical students bring prior experiences and a desire to shape their own learning as well as a performance-orientation with high expectations for their own achievement. He exhorts medical educators to bring to light and make use of what learners already know, which is something that Kay and Blythe (1984) identified as a role for medical schools working with older students. Unfortunately, he cited no studies that address how to understand or measure what HP learners already know from prior experience or what academic environment or other structures would be needed for learners to feel comfortable sharing what they already know based on their prior experiences. Nor did he provide explicit guidance for HP instructors, most of whom have no training in adult education, on how to consider and leverage the potential of prior learning or experiences of their students in the classroom or the clinic. In

the subsequent five years, the problem or opportunity of leveraging prior experiences seems not to have been studied in HPE.

HPE must prepare future health professionals to reflect and build on their own experiences, to learn from colleagues who bring diverse prior experiences to their professional practice, and to share experiences with others to broaden the team's collective knowledge. Nursing educators have invited sharing of unique student experiences and backgrounds to enhance didactic and clinical teaching and develop cultural competency among their students (Davidson, 2004), but this sharing of student experiences in formal educational settings does not seem to occur frequently in medical education. In nine years of precepting first-year medical students learning evidence-based medicine at a private northeastern medical college, I rarely observed medical students sharing prior knowledge from their experiences as patients, volunteers, or workers. On the rare occasion when a student commented about personal experiences prior to medical school relevant to the case, neither instructors nor fellow students publicly acknowledged or built on the knowledge that had been shared.

Health Professions Students as Adult Learners

HPE presents many formal and informal opportunities to learn from others with different expertise. The relationship among adult learning theory, the structure of educational opportunities, the practice of instructors, and the motivation of students is complex and has mostly been discussed in review articles rather than empirical research. Misch (2002) rejects the adult education theory of andragogy and its associated intrinsic motivation as an explanation for medical student learning motivation, suggesting instead that a variety of factors that range from internal to external, unconscious to conscious, and individual to societal need to be studied to develop a greater understanding of the forces that drive medical students to learn. Parkinson and

St George (2003) view the balance of educational approaches as a progressive cycle from pedagogy to andragogy changing along with student changes in knowledge, goals, experience in context, but this is framed in light of students having experiences during their education rather than experiences had prior to entering HPE. Students recognize an informal curriculum (Newton, Barber, Clardy, Cleveland, & O'Sullivan, 2008) which can negate or support the formal curriculum as well as provide learning opportunities not addressed in classes.

Motivation, goal setting and self-regulation are critical for HP students becoming self-directed learners. Becoming a self-directed learner involves deciding what learning opportunities and material to attend to within the formal education context, as well as how to create learning opportunities elsewhere that are lacking in the curriculum. As adult learners with prior experiences, in the process of learning, exploring the learning context, navigating the classroom environment, or engaging with instructors and fellow students, students decide how to use their previous knowledge in order to have it validated, have it corrected, or share it to potentially help others learn by acting as a role model and “inspirer” for co-students (Karakitsiou et al., 2012).

Self-regulated students actively participate in their own learning process by personally initiating and directing their own efforts to acquire knowledge and skill rather than relying on teachers, parents, or other agents of instruction (Zimmerman, 1989). Part of self-regulation is understanding what one knows, what one would like to know, and figuring out the mechanisms to get to that place where one can gain the knowledge that one seeks, whether that knowledge is pursued publicly in educational settings or privately outside the classroom. Another aspect is considering how motivation might influence the decision of whether to incorporate material into

one's knowledge base for short-term immediate needs such as test performance or commit to a longer-term effort to master the material.

This study addresses the problem that HPE does not appear to measure the extent of, or value deeply understanding, the prior experiences that adult learners bring to their HP education, and the subsequent issue that sharing of students' prior experiences seems to be an underutilized way for HP students to learn from and with others. The study design combines multiple sequential qualitative and quantitative methods to explore how veterinary students at public universities perceive sharing prior horsemanship experiences as a way to learn the broader domain that surrounds practicing medicine on horses. First, exploratory interviews with recently graduated former students who have prior experiences and career motivation elicited thoughts of students on sharing and engaging in learning from others with prior experiences. These findings were analyzed and used to develop novel questions to be combined with standard motivational research instruments for a survey of veterinary students across the U.S. This survey explored the extent of prior experiences and personal and educational environment factors potentially related to sharing prior experience as a learning strategy in veterinary education. Following sections in this chapter introduce specific challenges to recognizing and valuing prior experiences and knowledge, the need for a deeper exploration of verbal sharing of experiences as a component of vicarious learning from others, and motivation for learning from others generally and in the domain of veterinary education, leading to the statement of purpose of the study.

Motivated Students Learn from Prior Knowledge and Experiences of Others

HP students come with a broad range of pre-existing knowledge, skills, beliefs, and attitudes, which influence how they attend, interpret and organize incoming information. Studies of how HP students or instructors view prior experiences are scarce. Feil, Kristian, and Mitchell

(1998) reported from focus groups of older students that recognized a difference in educational priorities between themselves and younger students with older students more interested in “real learning” (p. 99) while younger students focused on test material to achieve good grades and avoided challenging the thought process in classrooms. Another study comparing survey responses from medical students over thirty with responses from younger medical students found that older students more often agreed with the statement that their previous experiences made them better learners (Kick, Adams, & O'Brien-Gonzales, 2000). The survey otherwise focused on the difficulties faced by older students. Prior experience of mature learners was viewed as a challenge by facilitators in an interprofessional education intervention (Anderson & Thorpe, 2008) who suggested a more relevant set of learning resources sensitive to their prior life experience. The prior experience domain for this study is horsemanship, an area in which a significant but unknown proportion of veterinary students come to their formal education with extensive prior knowledge and experiences, occasionally beyond that held by their instructors.

Defining prior knowledge and prior experience.

Dochy and Alexander (1995) describe prior knowledge as the whole of a person's knowledge, including explicit and tacit knowledge, metacognitive and conceptual knowledge. Prior learning and prior experience have been used interchangeably with prior knowledge, but they are also used as more specific entities. A person may have prior knowledge of an issue through reading or watching, without having had prior experience performing that function. Although the study uses primarily the terminology of prior experience with horses, sharing of prior knowledge or prior learning developed through mechanisms other than direct experience would also be relevant to understanding learning from others. Student confidence in and attitudes towards declarative prior knowledge gained through observation or reading may differ

compared to feelings about prior knowledge that is procedural and based on concrete prior experiences. Some types of knowledge are easier to share than others or may require a certain context, e.g. tacit knowledge may be easy to demonstrate in a hands-on environment, but hard to explain. Metacognitive and conceptual knowledge may be so tied up in the individual mindset and worldview that it would take a long time to explain or require a very open or similar audience to be able to be transmitted.

Prior knowledge or learning can have either positive or negative effects on new learning (Broad & Newstrom, 1992). Fyfe and Rittle-Johnson (2016) provided evidence from experiments suggesting that prior knowledge often predicts learning from feedback, but that factors such as motivation and intelligence may be confounders in terms of performance on pre-existing indicators of prior knowledge. This leads to the need to consider motivation as associated with the questions of both leveraging one's own prior experiences and learning from prior experience of others. Knowledge sharing involves knowledge donating, the process of communicating to others what one knows, and knowledge collecting, gathering information from others (Van den Hooff and De Ridder, 2004). The extensive research on knowledge sharing in corporations and organizations reviewed by Wang and Noe (2010) includes organizational context, individual characteristics, and motivational factors as influencers of knowledge sharing. However, their definition of knowledge sharing as provision of task information and know-how to help others with problems or tasks represents a different goal for sharing than what this study hopes to explore.

The choice of mixed methods research is largely due to the need for complementary approaches to gathering information about the extent of prior student experiences. The broad exploration of what is going through the minds of students with the experiences in deciding

which, if any, experiences to share along with factors that affected their decision allows a deeper understanding of their processes. This understanding informed the development of questions to measure in a more standardized way the extent of experiences, the value of sharing experiences, and any relationships between these factors across students with potentially very diverse experiences and perceptions of the value of learning from others. Shaari et al. (2015) suggest that knowledge sharing, especially when it comes to tacit knowledge, needs to be fostered and enabled. Thus, understanding how students perceive instructors and educational environments affecting their sharing decisions is also important.

Learning from the experiences of others (vicarious learning).

Vicarious learning, or learning from the experiences of others, is a mechanism by which people learn from observing, or hearing from others experiencing, a learning situation. Early publications define vicarious learning as learning from observing peer performance, but Bandura (1962) indicates that in learners with highly developed verbal skills, presenting a model's attitudes and response patterns through verbal description can be exceedingly effective in shaping behavior. Vicarious learning encompasses more than observation in terms of how one is exposed to the experience and can go beyond peers in terms of whose experience could provide a useful model. For example, vicarious learning can come from "being able to observe or 'listen in' on experts or peers as they discuss a new topic" (Cox, 1999, p. 432) or "learning from the experience of others through discussion, conflict, challenge, support, and scaffolding from a more competent other" (Roberts, 2010, p. 13).

In discussing the combination of types of learning in which professional students engage, Schön (1987) highlights interactions with coaches and fellow students as separate from a "more diffuse process of 'background learning'" (p. 38) where the groups of students in a practicum are

important to each other in creating a world in which learning by exposure and immersion, referred to as background learning, occurs. While students may not be conscious of this type of learning at the time, Schön suggests that a student may become aware of benefitting from this background learning later, after moving into a different setting. The more explicit vicarious learning experience from coaching is described by Williams, Thakore, and McGee (2016), who found vicarious learning particularly important for individuals who have not yet been able to develop personal mastery to not just directly observe, but to derive information from hearing about another's career experiences as second-hand information and through verbal modeling.

HPE involves a great deal of observational learning from watching both experienced practitioners and student peers. In addition to their instructors and peers, HP students may learn from students in related professions, technical staff, and patients/clients. Vicarious learning from attending to verbal expression of prior experiences by others, especially others who are not instructors, is much less studied than observational learning. The most common verbal vicarious learning opportunity for learning from peers in HPE is discussing case studies or critical incidents (Tarcinale, 1987). Verbal vicarious learning has also been studied in adult education and nursing through discourse, discussion and storytelling among students after experiencing professional practice encounters (Roberts, 2010). Roberts defined it as "learning from a peer's experience," and suggested that students share examples from their own personal experiences in clinical practice so that other students can benefit (2010, p. 13), but she also mentions scaffolding from a more competent other.

The question of whose experience is valued as a knowledge source from which to learn has been asked in non-HP domains. Studies of music masterclasses provide an example of where learners appreciate being told why a technique is beneficial and being able to engage in

discussion with the master, as well as learning by watching performances of others at skill levels similar to and greater than theirs (Long, Hallam, Creech, Gaunt, & Robertson, 2012). Karabenick (1996) found that co-learners and their questions are an important social influence on metacognition. Existing studies on vicarious experience and competence (Crundall & Foddy, 1981) and on near-peer teaching (Bulte, Betts, Garner, & Durning, 2007) suggest that students view instructors and trainees who are more advanced in their education as competent others while viewing their fellow students as peers. With the growth in interprofessional HPE bringing together students and instructors from diverse disciplines, it is important to explore whether students acknowledge experienced technical staff or experts from other disciplines as competent others given the difference in the length and extent of their educational experiences. Hood et al. (2014) studied how prior experiences with interprofessional health learning relate to professional identity, but not how these identities were perceived by students from other disciplines.

Little is known about whether and how willingness and capacity to learn from others changes over the course of HP education and whether attitudes towards learning from others parallel other measures of openness to others. One of the cognitive elements of empathy that has been measured in health professionals is perspective taking, an individual's capacity to understand another person's viewpoint, and spontaneously adopt the point of view of the other person. A study of affective and cognitive empathy in veterinary practitioners used the Davis Interpersonal Reactivity Index which includes a scale on perspective taking (Schoenfeld-Tacher, Shaw, Meyer-Parsons, & Kogan, 2017). There were no significant differences in perspective-taking scores among veterinary practitioners based on years of clinical experience. However, a study using the same instrument with students in the didactic portion of a Doctor of Veterinary Medicine (DVM) program (years 1–3) showed that perspective taking as a component of

empathy scores among students declined between second and third year (Schoenfeld-Tacher, Kogan, Meyer-Parsons, Royal, & Shaw, 2015).

A longitudinal study in medical students of vicarious empathy, defined as emotional response to perceived emotional experiences of others, showed significant decreases in empathy during medical education, especially after the first and third years in men who chose specialties outside of primary care or internal medicine (Newton et al., 2008). Hojat et al. (2009) also found a significant decrease in empathy scores in the third year of medical school, with the pattern of decline similar for men and women and across specialties. The decrease in vicarious empathy is of concern, because empathy has been seen as crucial for successful relationships with patients and fellow practitioners. Patterns of changes in empathy may predict similar changes in openness to attending to and learning from others. The commentary (Crandall & Marion, 2009) accompanying this study emphasized the need to explicitly role model for students what we value as important. In reviewing studies on declining medical student empathy, Colliver, Conlee, Verhulst, and Dorsey (2010) caution that the decreases are small, that the accuracy of self-assessment is poor, that empathy measures are not clear on what they actually measure, and that empathy scores may not equate to patient perceptions. They suggest medical educators focus on leveraging the hidden curriculum to actively model behaviors that show respect and attentiveness to others.

The continuum between implicit learning contexts and overt, explicit teaching was addressed in a study of exemplary behaviors role modeled for medical students in operating rooms (OR) (Curry, Cortland, & Graham, 2011). Much implicit learning of exemplary behavior occurred through informal role-modeling with students reporting interactions as learning moments, regardless of whether OR team members comprehend that they are functioning as role

models. The authors recommend making OR teams aware of the implicit learning context and that “every one of their actions represents a ‘teaching moment’ during which some impressionable person may be ‘learning’” (p. 955).

Motivation: Achievement Goal Orientation as an explanatory factor.

Motivation has been implicated as a factor related to the use of prior knowledge (Fyfe & Rittle-Johnson, 2016). Schön’s (1987) description of student resistance to demands of any opportunities not viewed as having immediate practical utility often holds true today.

Achievement goal orientation (AGO) is the motivation that students have towards the pursuit of learning in a specific course or educational situation. Achievement goals have been studied in many academic and workplace settings (Gillet, Lafrenière, Huyghebaert & Fouquereau, 2015).

The achievement goal constructs highlighted here are mastery and performance, where mastery is a focus on learning, and performance is a focus on doing as well as required or better than others. These constructs have been further broken down into approach and avoidance by Elliot and McGregor (2001). Approach for performance focuses on demonstrating competence relative to others, while approach for mastery is more self-focused on attaining task-based or intrapersonal competence. Avoidance for Performance manifests as wanting to avoid performing worse than others, while Mastery Avoidance is described as avoiding task- or intrapersonal-based incompetence (Gillet et al., 2015).

Achievement goals have been studied in help-seeking, a domain that could be viewed as related to willingness to learn from others. Karabenick (2004) found that perceived class achievement goal structure emphasizing mastery positively predicted college student help-seeking approach patterns even after controlling for students’ personal achievement goal orientations. In first- through fourth-year medical students at a unique program where students

gain medical education in exchange for post-graduation military medicine service, Artino et al. (2012) found that help avoidance positively correlated with Performance Avoidance goal structures and negatively correlated with Mastery goals. They also found that medical students' perceptions of Mastery and Performance Avoidance goal structures varied with their phase of training with first- and third-year students reporting the learning environment was more about understanding and mastery than those in the second year.

Achievement goals have also been studied as explanatory factors for student academic preferences. Pre-medical students preferred courses based on content interest, difficulty and relevance to current interests, teacher knowledge or style, and perceived relevance to future practice (Horowitz, 2009). Harackiewicz, Durik, Barron, Linnenbrink-Garcia, and Tauer (2008) found relationships among initial interest, achievement goals, situational interest, and class performance, and longitudinally, that situational interest, independent of initial interest, predicted subsequent course choices. Achievement goals and these other variables can be incorporated into a model to explain the value perception of sharing experiences in a particular subject in veterinary medicine.

Understanding How Veterinary Medical Education Context Impacts Learning

The North American Veterinary Medical Education Consortium (NAVMEC) emphasizes students developing as lifelong learners as they move from pre-veterinary education, through the veterinary medicine curriculum, and into practice (NAVMEC, 2011). Veterinary medical education in the United States takes place during a four-year post-bachelor professional degree leading to the DVM or VMD (Veterinary Medical Doctor) degree focused on learning from scientific evidence that can be empirically tested. Veterinarians must work in collaborative interprofessional teams that may include veterinary technicians, specialists, pharmacists, and in

the case of equine medicine, ancillary professionals such as trainers and farriers. One of the NAVMEC competencies, Collaboration, requires students to “Recognize and explain the diverse roles, responsibilities, perspectives, and resources of others” (NAVMEC, 2011, p. 58). Two multiple choice exams, the North American Veterinary Licensing Examination (NAVLE®) and a state licensing examination, represent the cumulative assessment of student veterinary knowledge and readiness to practice. These exams address only knowledge, not any of the other competencies that may be more influenced by prior experiences and the ability to share with and learn from others.

Prior experiences and prior knowledge.

Veterinary students bring variable levels of prior experiences and knowledge to their education. Most successful applicants to veterinary programs have completed at least 300 hours of supervised volunteer work or shadowing observations in veterinary clinics or research (Association of American Veterinary Medical Colleges, 2015a). This observation and participation experience being common across students is one type of prior experiences that could be shared, particularly if it was gained in an unusual setting that made it unlikely to be held by other students. Prior knowledge in this study is defined to reflect a deeper level of knowledge in a domain peripheral, but relevant, to veterinary medicine developed by the student prior to or outside of the targeted experience gathering for the DVM admissions process. This more specific prior knowledge would not only be deeper and held by fewer students, but also represent more diversity in when and how the experiences were gained.

The prior knowledge domain is performance animal engagement, specifically horsemanship. Performance animal medicine represents an increasingly important segment of veterinary medical practice. In April 2010, the American Veterinary Medical Association

(AVMA) approved the creation of a new specialty, the American College of Veterinary Sports Medicine and Rehabilitation (ACVSMR, 2015) which promotes expertise in the structural, physiological, medical and surgical needs of athletic animals, specifically horses and dogs, and the restoration of normal form and function after injury or illness. Performance animal medicine has always been a major component of equine medicine practice with clients engaging in competitions from local 4-H shows to Olympics and horse racing events, but now performance animal-owning clients are also common in other segments of veterinary practice.

Career relevance.

Regardless of student experience levels, backgrounds and attitudes towards horses, all AVMA-accredited veterinary programs require their students to work with horses. Prior knowledge in horsemanship would likely be viewed as most valuable to equine and mixed (large and small) animal practice careers. A straightforward example would be veterinary students with high levels of horsemanship experience who had equine medicine as their original career goal and would leverage their prior experience to become leaders in equine medicine (e.g. Tiffany, 2013). However, veterinarians with extensive prior horsemanship experience also choose other areas of practice with less risk and higher financial rewards as evidenced by small animal practitioners who mention a history of experience with horses (e.g. Brincks, 2016).

Career goals of veterinary students may change over the four years of the curriculum as students who intended to focus in a certain area become more intimately aware of the demands of a particular kind of practice (Loomans, van Weeren-Bitterling, van Weeren, & Barneveld, 2008). Amass, Davis, Salisbury, and Weisman (2011) reported that 5.6% of applicants to a public midwestern veterinary school in 2008 listed equine practice as a career objective, and all were female. Yet nationally in 2013, the year after those students would have graduated, only

1.9% of female veterinary students and 2.5% of male veterinary students took positions in equine practice, with an additional 8.0% of women and 12.8% of men pursuing mixed animal practice (Shepherd & Pikel, 2013). Gender differences found in public veterinary students included influences on their career choice and in their academic experiences, gender-role expectations and conflicts, attitudes regarding professional dedication and competence, and need for support services (Andberg, Follett, & Hendel, 1979).

The value students place on learning in a domain may also change as achievement goals and career desires change. Elkins (1984) found differences between various years of the cohort and gender in their survey of feelings of burnout. The culmination of veterinary student academics for those not pursuing additional clinical training is the NAVLE®. Preparation for and performance on the NAVLE® varies with career focus area. Focus areas of interest reported on the NAVLE® are small animal, companion animal (small animal and equine), mixed animal, food animal, and other. On the 2014 NAVLE, companion animal and mixed animal-focused students for whom equine knowledge is career-relevant respectively answered 79% and 70% of equine questions correctly, performing better on equine questions than small animal-focused students who achieved 66% correct (National Board of Veterinary Medical Examiners, 2014). Students who plan to apply for a post-DVM internship or residency must earn high grades across all courses to be competitive. Internships, residencies or advanced education were pursued by 47% of women and 34% of men graduating from DVM programs in 2013 (Shepherd & Pikel, 2013). These students may have a performance goal orientation to score well on equine questions regardless of whether they are interested in equine practice or the information is career-relevant. Veterinary medical education researchers appear not to have considered the intersection of prior

experiences, course-related achievement goals, career motivation, and how they relate to student perceptions of learning from the experiences of others.

Health Professional Learners' Prior Knowledge Is Undervalued

As a non-clinician instructor of medical and veterinary students since 2000 and as a lifelong adult learner, I believe that learners' prior knowledge and experiences are valuable and underutilized in HPE. The process(es) by which HP students learn from sharing of their own or others' prior experiences is not well understood. To explore what transpires in the minds of students with prior experience and other students in classrooms or clinics, an approach that encourages reflection is needed. Prior experience may be leveraged or ignored for a variety of complex and possibly interrelated reasons such as extent of and comfort with prior experience, motivation, perceived value of the domain of the prior experience, or behaviors and perceived attitudes of others in the environment. Asking students known to have extensive, career-relevant prior experiences about their sharing of experiences may provide additional insights into these assumptions and other factors possibly at play.

In order to understand sharing of prior experience, the depth and nature of the prior experience itself needs to be better understood. The selection of horsemanship as the subject for prior experience is in part drawn from my interest in horsemanship expertise. Having worked with horses under the care of veterinarians with diverse horsemanship backgrounds, I value veterinarians' horsemanship knowledge and have had informal conversations with veterinarians who are experienced riders and competitors about how these past experiences influence their practice. Little is known about the prior horsemanship knowledge, experience, or expertise of veterinarians or veterinary students beyond biographies of well-known authors who are both riders/trainers and veterinarians (e.g. Dr. Hilary Clayton, Dr. Gerd Heuschmann). Equine

veterinarians anecdotally suggest that equine “background” is important (Marks, 2003) which leads to the assumption that prior horsemanship experience has value in veterinary education, at least to those interested in equine practice.

In the domain of horsemanship, this study provides insight into how students describe their horsemanship experience and choose to share it with others during veterinary education as well as some information on the prevalence and depth of horsemanship experience in veterinary student at public universities. Beyond increasing awareness of veterinary student horsemanship experience, the study of veterinary student perceived usefulness of learning from others’ prior knowledge and willingness to share one’s own prior knowledge, as well as any relationships to achievement goal orientation and career plans adds to the DVM-level research in motivation and provides background data for future studies. This study helps consider pathway(s) and possible predictors of learning from others’ prior experience.

Purpose Statement

The purpose of the exploratory sequential (qualitative to QUANTITATIVE) mixed method study shown in Figure 1 (p. 19, also Appendix A) is to understand how veterinary students at public universities value prior horsemanship experience sharing by students during formal veterinary education. The qualitative phase explores sharing of prior experiences through interviews with former DVM students from a single public veterinary college who have had distance and time to reflect on horsemanship experience, and any personal and environmental factors they feel relate to their sharing and learning. More than a year away from their academic experience, these veterinarians were assumed to be more comfortable than current students in reflecting on their experience and sharing scenarios involving prior experience. First, their responses were used to consider pathways to using prior experience in veterinary education, and

further to refine a survey instrument and develop scenarios of sharing prior experience for the quantitative phase.

The quantitative phase is designed to understand how horsemanship expertise, personal motivational and environmental factors, and institutional factors may be associated with how current veterinary students at public veterinary colleges perceive usefulness of learning from prior experiences shared by others. Veterinary colleges vary in their focus on large animal medicine. Therefore, the prevalence of horsemanship experience in the veterinary student population and the value placed on sharing knowledge of horsemanship is likely to vary by institution. Expanding from what I learned through deeply questioning a few former students of a single institution to surveying students across all four years at public U.S. veterinary colleges is important to identifying the potential for interventions to facilitate sharing of veterinary student prior experiences and knowledge. Comparing student attitudes towards learning from others across all four years of education along with examining convergence between student views provides insight into how openness to sharing with and learning from experiences of others evolves over the course of the curriculum or with changes in students' goals.

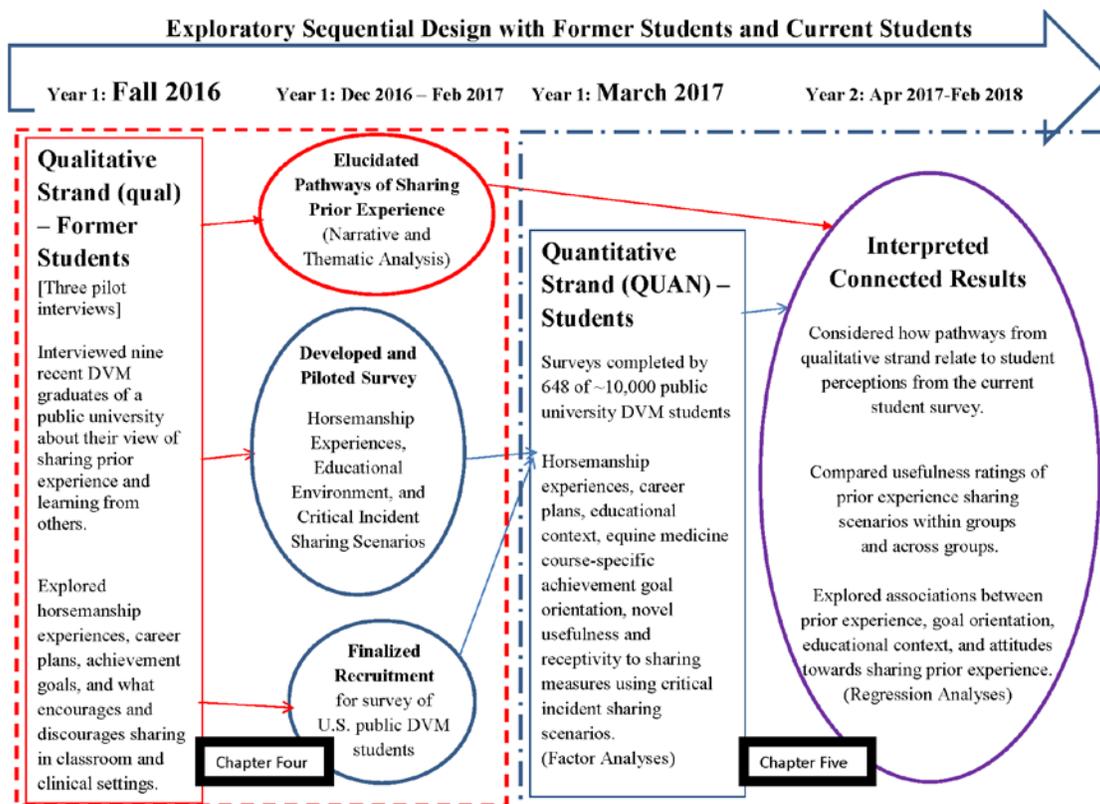


Figure 1. Exploratory Sequential Design with Former Students and Current Students.

Research Questions

Qualitative phase questions.

Research question #1:

A. Former Students:

- 1. How do former public university DVM students perceive sharing their own prior experiences and learning from shared prior experiences of other students in the veterinary education context?*
- 2. What shared prior experiences, if any, did they find relevant to their learning or practice?*

Quantitative phase questions.

Research question #2:

A. Current Students:

- 1. How useful do veterinary students perceive the sharing of prior horsemanship experience of others to be in the context of an equine medicine course and how receptive are they to sharing their own experiences?*
- 2. How do personal, motivational and environmental factors such as career plans, achievement goal orientation, classroom practices, and other factors raised during the qualitative interviews explain students' perception of the usefulness of prior horsemanship experience shared by others and willingness to share their own prior experiences?*

Mixed method interpretation and connection of research results.

In addition to interpreting the results from the research questions in each phase, the final component of this mixed method study considers the results in combination to demonstrate what

can be expressed about the existence and sharing of prior horsemanship experience in veterinary education across all study populations. One combination that may converge to yield relevant insights for formal veterinary education are:

1. *How do current student views on usefulness of sharing prior experience and willingness to share their own experiences relate to the picture of the educational environment created from sharing experiences provided by former students?*

Theoretical Framework

Several theories about knowledge and experience, learning, attention, development and recognition of expertise inform various components of a pathway to learning from others' prior experience through traditional vicarious learning (see Figure 2, p. 24). The student must recognize his or her prior experiences as potentially valuable and situationally relevant, then be able to communicate them to others. In the lecture classroom, there may be predominately verbal sharing opportunities, while in learning laboratories and clinical rotations, students may demonstrate or coach others. Many of the skills held by those with prior knowledge of horsemanship would fall into the tacit dimension of knowledge (Polanyi, 1967) and may not be able to be conveyed verbally. Kolb (1984) and other theories of experiential learning suggest that the learner would need to experience the situation directly rather than just hear about it from someone who did have the experience. However, Hoover and Giambatista (2009) defined vicarious experiential learning as a process that exists when: "a personally responsible participant cognitively, emotionally, and behaviorally processes knowledge, skills and/or attitudes through processes of observation in a learning situation characterized by a high level of active involvement despite the absence of direct, personalized consequences" (p. 36). Myers

(2015) integrates theories of experiential learning and symbolic interactionism to describe vicarious learning as co-constructed, interpersonal learning interactions between individuals.

Salience of the learning situation to the potential learner reflects attention given to models described by Bandura (1962). If the potential learner does not attend to the student sharing the prior experience, the potential learner may not have sufficient exposure to permit a value judgment on the experience itself or the source of the sharing, components necessary for vicarious learning. Ironically, either correct or incorrect prior knowledge that creates a sense of confidence in learners such that they do not feel the need to attend to new knowledge development opportunities (Svinicki, 1993) can result in negative transfer or failure of the potential to learn from others' prior experience.

Theories of expertise development and recognition (Ericsson, 2009) provides a lens into how the extent of experiences can be viewed as expertise, as feelings about expertise may relate to a student's comfort with sharing, as well as considering rating what perception of expertise is sufficient to gain the attention of a peer or be viewed as valuable. The study asks students about their extent of horsemanship experience, understanding that it is unlikely that many respondents have 10,000 hours of horsemanship experience acquired in the dedicated manner typical of experts as defined by Ericsson. Having relevant experiences to share should not require that a student be, or feel like, an expert. However, students may feel as though sharing experiences means they are representing themselves as experts or trying to stand out from other students (Purdue University, 2016).

Figure 2 (p. 24) shows one possible pathway of learning from others where there are several possible points of transmission and reception. My assumptions informing this pathway

are that the student knows how to share, is comfortable with knowledge sharing, and that there are no environmental barriers or cultural norms against sharing.

Significance of the Study

This research is designed to address questions important for current and future practitioners in the profession of veterinary medicine, for instructors and scholars in HPE, and for education theorists. For veterinary medicine students and practitioners, this study provides data on the extent of horsemanship knowledge and experience in veterinary students across four years of veterinary training at public universities. It also provides insight into the application of prior horsemanship experience in veterinary education and practice. Veterinary students and instructors may find awareness of levels of horsemanship expertise in the veterinary profession helpful in setting learning goals in this non-clinical domain. The findings may also provide background data for future studies of horsemanship or other types of prior knowledge in veterinary students.

For HP educators, the explication of pathways of sharing prior knowledge in formal and informal educational contexts may provide opportunities to consider how to leverage adult student prior knowledge in HPE. This gap has been mentioned in several studies of older adult or second career medical students (Kay & Blythe, 1984; Feil et al., 1988; Kick et al., 2000; Anderson et al., 2008). Student responses to the scenarios may highlight whether types of sharing might be welcomed or problematic. Gaining a sense of how students do or do not find examples from others' prior experience or sharing their own experiences useful could help course coordinators consider whether opportunities for sharing prior experiences from fellow students, veterinarian instructors, or non-veterinarian instructors could be created in a course or other learning activity. If the sharing scenarios are viewed as valuable, the next step could be an

This pathway represents one set of possible interactions between three parties in the educational environment: the **Student** with the prior experience, the **Instructor** (shown with dotted line as optional for peer-to-peer sharing), and the potential **Learner**.

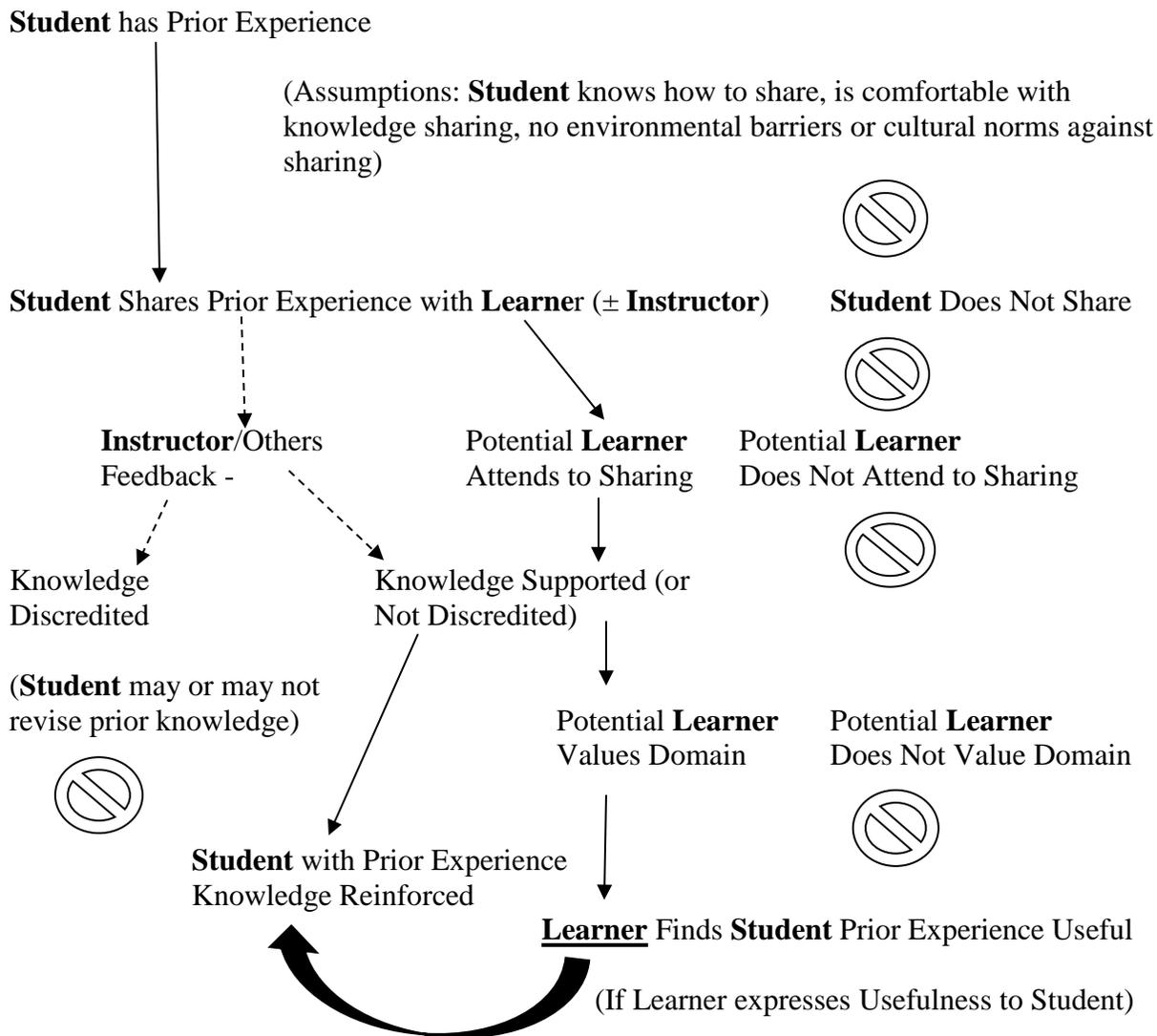


Figure 2. A Possible Pathway to Learning from Fellow Students.

Note. The circular graphic  means that the pathway stops at that point.

intervention study to create a vicarious learning opportunity involving sharing prior experience in a HPE environment.

Finally, and perhaps most importantly for future research, the potential significance of this study for education theory is better understanding and extension of two aspects of vicarious learning theory, first the impetus for and barriers specific to verbal sharing of experiences and second, the concept of peers with prior experience as competent others in an otherwise instructor-dominated learning environment. Through exploring whether students report value in listening to experiences of others who they may or may not view as experts, a better understanding of the role of the potential learner in vicarious learning in adult education can be gained and further assessed in future research.

Summary

Many HP educators lack understanding of how to elicit and leverage the prior experiences of HP students to enhance learning. The sequential exploratory study of sharing prior experience as a step towards vicarious learning in veterinary education in public universities in the United States uses semi-structured interviews of recent graduates of a single university to understand how students view having and sharing prior experience in the area of horsemanship in the veterinary education context. These findings informed a survey to assess U.S. veterinary student attitudes toward sharing prior experience in large animal medicine classroom and clinical education settings. A host of individual and structural factors, both those predicted based on previous literature and those uncovered during the interviews, were explored to further explain the relationships between prior experiences and knowledge, sharing with and learning from others, and motivation in veterinary education. This study begins to address the problem in HPE of not understanding how to measure, value, and leverage the prior experiences

of HP students by providing both deep and broad insight into the prior experiences of veterinary students and informing models that can be used to study personal and academic environment factors that may impact whether sharing can lead to vicarious learning that has value in HPE.

CHAPTER TWO: LITERATURE REVIEW

The literature informing this research comes from the broad domains of HPE, adult education, and educational psychology, as well as narrower areas of study such as veterinary medical education, horsemanship, and motivation. Lifelong learning in the health professions provides the foundation for a brief review of select studies of the formal and informal curriculum in HPE. Prior knowledge and its relationship to feedback, growth of knowledge, learning, knowledge transfer and expertise development are touched on briefly from the adult education and human resource development literature before delving into the few studies in HP where prior knowledge is the educational focus. Receptivity to vicarious learning or learning from observing or attending to others' experiences has a rich history in the educational psychology literature, but few empirical studies in HP education. As the selected example of prior knowledge, horsemanship experience and its measurement are described and then broadened back out to the area of non-clinical knowledge. After exploring prior experiences and vicarious learning in light of HPE learning goals and outcomes, the review addresses potential predictors of student receptivity to learning from prior experience. The primary predictor of interest is student motivation. A brief examination of motivation constructs that have been studied in the health professions then focuses on achievement goal orientation of students and educational environments created by instructors. Career aspirations of veterinary students related to equine medicine flesh out the context for student valuing of others' prior horsemanship experiences.

Health Professions Education Context

The goal of HPE is to create self-directed, lifelong learners. The North American Veterinary Medical Education Consortium (NAVMEC) emphasizes students developing as lifelong learners as they move from pre-veterinary education, through the DVM curriculum, and

into practice (NAVMEC, 2011). While self-directed learning (SDL) has shown some effectiveness (Murad, Coto-Yglesias, Varkey, Prokop, & Murad, 2010), many current HPE structures promulgate learning directed by others. While there are journals full of studies on learning in the formal curriculum, in classrooms, laboratories and in clinical experiences for all HPE disciplines, including veterinary medical education, very few studies address how students see themselves driving their own learning. Two learner roles relevant to vicarious learning and SDL reported from a focus group of Greek medical students are (a) acting as a role model and “inspirer” for co-students, and (b) striving to promote one’s own deep knowledge and understanding (Karakitsiou et al., 2012).

Veterinary education structures and practices.

Veterinary medical education in the United States takes place during a four-year post-bachelor professional degree with external certification in the final year of the program. In many other countries, veterinary education is a five-year program at the bachelor level with the certification examination responsibilities lying with the university. With this diversity in academic training and experience, populations of U.S. and other veterinary students are often sufficiently distinct that they are typically not combined for research on learning issues. Unless stated otherwise, all studies described involved North American student populations in four-year, post-bachelor’s medical or veterinary programs.

Veterinary colleges offer many approaches to helping students learn deeply in areas of interest. Prior to the clinical year(s) of training, these approaches to gaining specialized knowledge and skills are primarily extracurricular, such as employment, mentored research opportunities, and participation in student organizations (Jones, Rush, Elmore, & White, 2014). As of 2015, only two North American veterinary colleges provided structured pathways by

interest area through the formal curriculum. One pathway example is the tracking curriculum, starting in the second year of the DVM curriculum, where students can focus on, or "track," their primary area of interest (Virginia-Maryland College of Veterinary Medicine, 2015a). In other colleges, students may direct their learning by selecting focus areas for certain species and thematic areas (see Table 12, p. 166 for a list of focus areas). They may then be assigned an advisor from that area, and/or have priority for short courses or electives or rotations on related topics. Focus area mentoring, optional courses, and informal learning activities provide avenues to develop expertise in a practice area, but they are inconsistent and insufficiently described across veterinary programs. Depending on an institution's strengths and goals to provide certain types of veterinarians, there may be greater or fewer opportunities for large animal-focused learning.

While focused curricular choice permits students with equine or farm animal interests to engage in additional formal education, it does not permit students focused on other areas to avoid core large animal courses due to their importance in the knowledge base required by the national examination. In some programs, a relatively small proportion of veterinary students have prior experiences with horses or other farm animals and this is considered an issue for student safety (Gronqvist, Rogers, Gee, Bolwell, & Gordon, 2016) as these students work to gain the requisite experience working with these species in spite of their lack of interest or perceived value to future practice.

Veterinary students function earlier as self-directed learners.

One major principle of adult learning is the concept of learners exploring and refining prior knowledge by connecting it to their new learning. As doctoral-level students averaging 26 years of age (American Veterinary Medical Association, 2013a), many veterinary students, even

those of traditional age who have directly matriculated post-bachelor's, represent adult learners with a rich prior knowledge base and experiences. Brockett (2015) advises those who teach adults that the majority of adult learning is self-directed. In an interprofessional health sciences course for first-year undergraduate students, higher scores on the Self-Directed Learning Readiness Scale were associated with age, gender, and previous education, although the effect size for each was small (Slater, Cusick, & Louie, 2017). In medical education, Daily and Landis (2014) suggest that physicians do not begin the transition to SDL until residency which occurs after the completion of the medical school curriculum. In their discussion of how medical students set learning goals, Kindler, Bates, Hui, and Eva (2017) suggest that the way educators treat preclerkship (year 1 and 2) students as a cohesive whole, rather than self-directed individuals, creates a mismatch between assessments and how students monitor their own progress as learners.

Veterinary students, unlike medical students, are considered ready to practice independently upon graduation with their veterinary medical degree. They are not required to complete an internship or residency, although about 40% do (American Veterinary Medical Association, 2013b). Veterinary students must be supported during the veterinary medical curriculum in exercising the skills essential to their success as self-directed adult learners. Blumberg (2005) suggests that veterinary faculty need to overtly model SDL for their students. Through this combination of self-reflection and seeking the perspectives of others, including their students, faculty would reveal their own hidden curriculum and model professional behavior and ethics in their specific domain of learning and practice. In comments from mature students regarding role models and the hidden curriculum, Roder and May (2017) found that clinicians in predominantly referral hospitals where most clinical training occurs were

considered inappropriate role models who did not demonstrate a balanced lifestyle or appropriate career progression for students going into private practice.

Expertise, Prior Knowledge and Experiences, and Feedback

HPE combines professional training towards mastery of core competencies with practical experience guided by instructors primarily at a high level of expertise. Expertise has been defined as mechanisms underlying the superior achievement of an expert, e.g. "one who has acquired special skill in or knowledge of a particular subjects through professional training and practical experience" (underlining mine) (Webster's, 1976). And although it is more than forty years old, this is the definition cited by Ericsson on his faculty website (<https://psy.fsu.edu/faculty/ericssonk/ericsson.exp.perf.html>). While expertise in certain domains resulting from approximately 10,000 hours of deliberate practice (Ericsson, 2009) is easy to recognize and valued by society, less fully developed expertise can also be valuable. The demands of preparing to enter veterinary or medical education would often preclude the time investment to develop expertise in another domain, but there are studies of doctors with multiple expertise domains. For example, Watling, Driessen, van der Vleuten, and Lingard (2014) studied medical students and doctors who had also trained extensively in sports or music. These experts were very self-directed in their learning and creating opportunities for deliberate practice and that carried over as self-regulation strategies in their new domain.

Prior knowledge or learning can have positive or negative effects on new learning (Broad & Newstrom, 1992). In positive transfer, the prior learning assists in acquiring new knowledge or skills. This proactive facilitation of learning is one mechanism through which educators may assume prior experiences are valuable. Negative transfer, also referred to as proactive interference, occurs when prior learning interferes with the acquisition of new knowledge or

skills. Negative transfer can result from incorrect prior knowledge that leads a learner to reject new knowledge that seems incompatible (Svinicki, 1993) but it can also result from correct prior knowledge that creates a sense of confidence in learners such that they do not feel the need to attend to new knowledge development opportunities.

Fyfe and Rittle-Johnson (2016) reviewed the literature on prior knowledge and feedback and provide evidence from experiments suggesting that prior knowledge often predicts learning from feedback, but that factors such as motivation and intelligence may be confounders in terms of performance on pre-existing indicators of prior knowledge. For higher knowledge learners, feedback may be an unnecessarily redundant distraction, wasting cognitive resources and reducing learning. Fyfe and Rittle-Johnson (2016) provide another example of expertise reversal where instructional techniques that are effective for novice children lose their benefits for experienced learners. Learners with more prior knowledge are also more susceptible to ego threat and may revert to old strategies or have reduced self-confidence. In work learning transfer literature, the transfer of training climate can either support or inhibit the application of learning on the job, and these transfer climate constructs include situational cues and consequences such as the nature of feedback (Holton, Bates, Seyler, & Carvalho, 1997).

Horsemanship knowledge and experiences.

Many knowledge domains relevant to veterinary practice could be considered, but the knowledge domain of interest in this study is horsemanship. Horsemanship is skill in, or the art of, riding, managing, or training horses (Webster's New World College Dictionary, 2010). Performance-focused riding includes, but is not limited to, sports including Dressage, Hunters, Jumper, Barrel Racing, Reining/Other Western Performance. Training includes the field of Equitation Science which is a discipline which applies scientific methods to assess objectively

interaction between trainer and horse (McGreevy, McLean, Buckley, McConaghy, & McLean, 2011). Managing includes grooming, farriery, feeding, first aid and bandaging, and stable management. Horsemanship has also been defined in a veterinary context as “best practice in human-horse interactions” (Payne, Boot, Starling, Henshall, McLean, Bennett, & McGreevy, 2015, p. 247), although the authors agree this is distinct from horsemanship in the general equine husbandry context.

Expertise in domains that have competitions may be easier to recognize. Someone who wins national level competitions will likely be considered an expert regardless of the amount or years of experience it took to get there. In some competitions, the comparison of expertise and skill is relative to others, while in other domains there is an explicit scoring system. Many veterinary students have participated in competitions that measure knowledge of horsemanship such as Horse Bowl. In Florida, the 4-H Horse Bowl questions cover: 1) Nutrition & Feeding, 2) Reproduction & Genetics, 3) Conformation/Unsoundnesses/Action, 4) Internal Anatomy/Physiology, 5) History & Evolution, 6) Breeds/ Colors/Markings, 7) Tack & Equipment, 8) Showing & Competitions, 9) Health, and 10) Psychology/Training/Safety. Similar knowledge-based competitions for domains in the health professions exist through Health Occupations Students of America (HOSA), a national student organization recognized by the U.S. Department of Education and the Health Science Education Division of the Association for Career and Technical Education.

Horsemanship experience has been measured in general populations through horse industry surveys of equine activities. The longitudinal American Horse Publications Equine Industry Survey (2010; Stowe, 2015) asks about 25 activities from general lessons to very specific, high-level performance like Steeplechasing. Horsemanship factors measured by the

unpublished “Survey of youth participating in equine activities” include respondents' number of years of horseback riding, frequency of horseback riding, and skill level or riding classification (Saunders-Ferguson, Barnett, Culen, & TenBroeck, 2008). Rossano and Burk (2013) analyzed previously collected questionnaires that asked about years of horse experience as a factor for undergraduate performance in an equine management course. Mean years of experience for the 2007 students was 8.5 ± 7.1 years and the highest years of experience was 11.4 ± 6.7 in the 2009 class. Although they found a significant association with years of horse experience and course performance, the effect (0.3%) was small; the authors suggest this is because the tests and assignments did not require students to draw on previous experience. Two previous studies have investigated the association between either equine experience or level of interest in pursuing an equine-related career with performance in equine management courses and found no significant effect of horse experience (Lawrence, 1987; Pratt-Phillips and Schmitt, 2010). Relying on students to self-report their experience has been considered a limitation in these studies.

Riding expertise of those planning riding instruction is frequently evaluated by questionnaire and then followed up with a skills demonstration for appropriate course placement. The questionnaire used by St. Andrew's University (n.d.), a university with an equine studies degree program, competitive show teams, and recreational riding for students not studying equine science. Self-report elements of the questionnaire include discipline, years of riding instruction, times per week currently riding, horse ownership or leasing, lifetime history of equestrian competition or therapeutic riding volunteer service, and recent history within the past six months, and a checklist of equine management and riding skills to select those things that the respondent would feel comfortable doing on an appropriately trained horse. While no studies correlate equestrian self-reported ability with instructor-assessment, we know from nursing

education that both over- and under-reporting have been associated with characteristics of students reporting their performance (Hadid, 2017).

Studies of equine veterinarians focus on veterinary knowledge or opinions on horse industry issues (e.g. Wiedenheft, Traub-Dargatz, Gillette, O'Keefe, Rao, & Salman, 2013) rather than horsemanship experience. Veterinary students were included in a study of equine-related injury that used an anonymous retrospective questionnaire to gather demographics, qualitative and quantitative data regarding attitudes and experiences of students prior to and during their program of education, and incidence of horse-related injury, reporting and management (Riley, Liddiard, & Thompson, 2015). Demographics included gender, age, educational program and year level, hours of horse exposure in practical equine courses completed on-campus, and length of time spent at equine work experience placements outside of the university campus. Sixty percent (156 of 260) of respondents reported contact with horses prior to beginning their university program. The approximate duration of this experience varied widely (mean 340 ± 811 days). These values did not differ significantly between animal science and veterinary students, or among year levels within programs.

Value of non-clinical knowledge for clinicians

Little is known about horsemanship/performance animal care knowledge, experience, or expertise of veterinarians or veterinary students. Equine veterinarians suggest that equestrian “background” is important in care, but do not provide evidence for this assertion. Veterinary texts anecdotally mention the value of knowledge of experience, and high-level expertise in riding, training, and other aspects of horsemanship (e.g. Marks, 2003) but do not document sources demonstrating this value. Articles about horsemanship and veterinary medicine most often are written to inform veterinarians of what they need to know about horsemanship and

equitation science (Derksen & Clayton, 2007). These authors seem to assume that their audience of equine or mixed practice veterinarians have little prior knowledge of horsemanship or equitation science and that having more knowledge would be valuable to their practice. In terms of the potential value of horsemanship experience to clients, a study of Minnesota horse owners reported on what qualities (experience, knowledge, education, etc.) individuals and organizations involved in horse care should possess before providing information to horse owners (Martinson, Hathaway, Wilson, Gilkerson, Peterson & Del Vecchio, 2006). Scores for these qualities ranged from one for not at all important to four being very important. Referral networks with quick access to specialists ($M = 3.4$), general knowledge about many horse topics ($M = 3.3$), specialized knowledge about a few horse topics ($M = 3.2$) and personally owning a horse ($M = 3.1$) were viewed as more important than having shown/exhibited horses ($M = 2.5$). College training in veterinary medicine ($M = 3.2$) mattered more than college training in equine management ($M = 2.8$).

Veterinary medicine scholars have found non-technical competencies that facilitate client communication increase career success (Lewis & Klausner, 2003; Cake, Rhind, & Baillie, 2013). Communication skills are a competency well-supported by evidence from expert frameworks, stakeholder perceptions, and empirical research (Cake et al., 2016). Sharing the vocabulary of a sport with a client can facilitate communication both in the context of generally establishing rapport or in narrowing in on the performance effects perceived by a patient or client. Shah (2008) addressed the need to foster better communication between dancers and the medical community by describing dance epidemiology and basics of techniques. The goal was not to have doctors practice dance towards developing expertise in ballet, but instead to gain knowledge from the dancers of the environment in which doctors would apply their medical

expertise to problems from the dancers' domain. Veterinary curricula and continuing professional education are increasing focus on communication and other non-technical competencies.

Attending to Vicarious Learning Opportunities

A major component of self-direction or self-regulation for students involves their decisions about how to attend to the multiple stimuli or affordances that are offered in educational situations. Students who respond to classroom environmental cues provided by instructors are attuned to the informal curriculum (McCaslin & Good, 1996) and accumulated experiences begin to shape a student's repertoire of propensities to attend to stimuli. Students recognize this informal curriculum in medicine (Newton et al., 2008) which can negate or support the formal curriculum as well as provide learning opportunities not addressed in classes. The term hidden curriculum to describe this socialization comes from a broader educational context (Jackson, 1968). This informal, or "hidden" curriculum in veterinary medicine has been called out as an area where further research is needed (Whitcomb, 2014). She quotes a powerful statement on the teacher's role in the hidden curriculum in orthopedics: "Every word we speak, every action we perform, every time we choose not to speak or act, every smile, every curse, every sigh, is a lesson in the hidden curriculum" (Gofton & Regehr, 2006, p.21) and recognizes this as often unconscious communication by teachers. Students who seem to miss the observational opportunities presented by instructors or offered by others in the educational environment are not influenced by the observational form of vicarious learning.

In veterinary medicine, students find the hidden curriculum both positive and negative, reinforcing student resolve to behave similarly or differently when faced with similar situations (Roder & May, 2017). Being educated in a referral tertiary care hospital environment where

everyone was viewed as learning did give students confidence on asking for help and getting ideas on where to find information, though as a whole the effect of being in such as specialized environment raised concerns about being ready to practice under real-world constraints. An Australian study of veterinarian clinical role models found they provide intensely personalized learning opportunities for students and that tacit learning in contexts such as extramural and practice-based work placements may influence students more than explicit learning within the formal curriculum, especially when learning is contradictory (Schull, Kyle, Coleman, & Mills, 2012).

In medicine, as well as other disciplines, vicarious or observational learning is a key strategy for learning from others. Observational learning is the term used by Haddon (2014) who studied how music students learn as observers in the masterclass context. She found limited discussion of observation and of the processes involved in implementing observational learning. Learning could be enhanced by “developing perception through facilitated engagement with systematic observation and consideration of processes of transferable learning” (p. 55). This has implication for strategizing to how to extend observational learning in the HP education context. Most HP literature on vicarious learning involves early stage undergraduate nursing students (Roberts, 2010); less common are papers addressing vicarious learning by advanced graduate students or trainees, two of which are described below.

Vicarious learning by observation has been compared with learning by doing in simulations with standardized patients (Stegmann, Pilz, Siebeck, & Fischer, 2012). Instructional support in the form of observation scripts focused learner attention and facilitated both vicarious learning and learning by doing, and medical students achieved greater knowledge of doctor-patient communication scores through vicarious learning. To improve medical students’ ability

to interact with healthcare professionals (HP) on clinical rotations, a program for third-year medical students ($N = 237$) assigned each student to shadow a HP from one of 20 professions for a mandatory two-hour period, one week prior to clerkship (Shafran, Richardson, & Bonta, 2014). After shadowing, students participated in a small-group reflective discussion moderated by a physician. Post-experience surveys reported that the majority (92%) of the 207 respondents found the experience to be a valuable, and 75% felt better equipped to communicate with HPs. Qualitative feedback revealed students wanted additional similar opportunities to learn about HPs. These results were similar to the two published programs for first-year students shadowing nurses; results suggest that these exposures should occur early and late during training. Beyond these studies, few provide details on how the awareness of learning evolved. It remains to be addressed whether the full gamut of knowledge is useful to students or whether value is assigned only to communications conveyed by those viewed to have substantial expertise.

Feedback on observed performance is critical to facilitating learning by both the student performing and the students observing. One of the few papers studying medical students compared the elements of response to feedback in medical students, residents, or other doctors trained extensively in sports or music (Watling et al, 2014). They conducted semi-structured interviews to distinguish the elements of the response to feedback that are determined by the individual learner from those determined by the learning culture, and then understand how these elements interact in order to make recommendations for improving feedback in medical education. From the constructivist grounded theory approach, individual traits that the authors categorized as motivation and orientation towards feedback remained stable across the medical, sports, and musical learning contexts. One of the ways the learning culture influenced feedback was by directing teachers' and learners' attention toward certain dimensions of performance.

Characteristics of the feedback, including specificity, credibility, and actionability were valued. The specificity of the vicarious learning example is controlled by the source of the example, credibility is both a characteristic of the source and a decision made by the learner, ultimately whether an example is actionable lies entirely with the learner.

Valuing and openness to learning from prior experience of others.

Interviews of fourth-year medical students investigated the relative influence of the explicit curriculum, implicit curriculum (beyond direct control of curriculum), and extracurriculum (clubs or volunteering) on learning on each of ten curricular objectives (Balmer, Hall, Fink, & Richards, 2013). Students perceived that learning took place mostly in the implicit curriculum, often through watching or interacting with peers, for these six of the ten objectives: (1) Be Aware/Committed–Health Systems, (2) Communicate, (3) Generate Hypotheses, (4) Support Team, (5) Teach, and (6) Understand Patients Deeply. Students reported variable amount of learning from peers about the objectives Teach and Support Team. By documenting the influence of the implicit and extracurricula on students' learning, Balmer et al. (2013) inspires attending to the openness of “other-than-explicit” curricula (p. 1139).

In comparing the learning culture of music and medicine, Watling, Driessen, van der Vleuten, Vanstone, and Lingard (2013) found that medicine valued learning by doing more than learning by lesson, and that while medical learners aimed for competence, music students aimed instead for ever-better performance. Medical learners viewed self-assessment as a skill they could develop, whereas music students recognized that external feedback would always be required. Valuing external feedback is somewhat parallel to openness to learning from others, though the question of learning from peers as compared to learning from those with greater expertise or different domain experience remains salient.

Kinnison (2014) presented a veterinary social network analysis on interprofessional working, learning, and education. She reported that stereotypical views of other professionals are a barrier to working and learning interprofessionally in veterinary medicine in the United Kingdom. Between veterinarians and veterinary technicians, stereotypical views are exacerbated by separate training at most institutions, lack of understanding others' perceptions, and lack of appreciation of others' knowledge and skills. Her preliminary network analysis focused on the question "Who influences your working habits, for example through observation of their work?" and she recommends veterinary interprofessional education (IPE). Comments on perspective surveys from dental and pharmacy students after an IPE case discussion indicated that the case discussions, teamwork and getting to know the other professional students were most useful in their learning, but they also wished to learn more about each other both personally and professionally (Wilhelm, Poirier, Otsuka, & Wagner, 2014).

Outside of medical education, valuing of vicarious learning was assessed via undergraduate and graduate music students' responses to a questionnaire exploring the value and purpose of master classes (Long et al., 2012). Students with prior experience of performing in master classes were more likely to learn by listening to their peers. Significantly more female than male students listened to master classes and used peer-learning strategies while listening. The sample was the same proportion of males and females at both undergraduate and postgraduate levels of study; the findings imply that, compared with females, males are less inclined to engage in master classes as members of the audience listening to others perform. There were no significant differences between postgraduates and undergraduates, except that "Hearing the playing of others and their interpretations" (p. 693) was ranked for importance more frequently by postgraduates with moderate levels of experience in master classes. The

authors suggest that skill acquisition involved in learning by listening to peers may develop alongside greater levels of experience in both performing and listening in master classes.

Critical incidents as a way to share prior experience.

Examples from real practice are persuasive to students (Rademacher, Simpson, & Marcadante, 2010). Critical incident technique (Flanagan, 1954) has been used to capture experiences for future learning by others. Flanagan (1954) developed the critical incident technique as a set of procedures for collecting direct observations of human behavior in such a way as to facilitate solving practical problems. His procedure involved obtaining first-hand reports, or reports from objective records, of satisfactory and unsatisfactory execution of tasks as described by a cooperating individual (Spencer-Oatey, 2013). These tasks were memorable because they were defined as extreme behavior, either outstandingly effective or ineffective with respect to attaining the general aims of the activity. More broadly, Brookfield (1990) describes critical incidents as situations or events that are vividly remembered and hold special significance for the learner. Understanding these experiences of learners may help instructors better support learners in reflecting towards growth, problem solving or thinking critically (Brookfield, 1990).

Critical incidents are commonly used for teaching in health professions education and in practice (Lily Lin, 2012; Branch, Jr., 2005; Rademacher et al., 2010). Four potential ways of using critical incidents in educational practice described by Rosenal (1995) include fostering learners' self-reflection, informing educators of the reality and impact of experiences, conducting learning needs assessments, and acquiring exemplars useful in teaching. In the context of practicing nurses, Rosenal (1995) asserts that critical incidents in the student's voice tend to be received as credible by peer learners.

Preskill (1997) used critical incidents to model evaluation practice in the teaching of evaluation. Students could submit critical incident forms anonymously or could identify themselves. Then at the beginning of class, students were asked to read the typed-up critical incident summaries which may or may not have been their own. Depersonalization may have made it safer to share examples where students contributed to the outcome of the situation. To evaluate the use of the critical incident technique, students were asked to indicate the ways in which they thought the critical incidents affected their experience with the course, what they learned about evaluation from completing the critical incident questions, what they learned about themselves, and whether the instructor should continue having students complete the critical incident forms in other courses. One of six themes in the analysis of the responses was “Increased Appreciation for Individual Differences.” Preskill found critical incidents seemed to have a significant effect on students’ awareness of the multiple perspectives that exist within any group of people with frequent comments that they were surprised at how diverse their peers’ perspectives were on any given topic or issue. Over 90% of the students responded that the critical incident evaluations should continue, with dissenters remarking that it took up time better spent on content and that some used critical incidents as an opportunity to whine.

George (1989) described learning by example using student observations of critical incidents as a participatory learning strategy with hospitality management students to enhance their human resources management skills. The critical incident report form used by George was similar to instructions provided by Benner (1984) to gather clinical critical incidents from nurses. Of most relevance to the question of sharing experiences is his discussion of the effect of “untrained eyes” (p. 60). His students directly observed situations from which to record critical incidents and he warns that their early critical incident reports may be too generalized and not

contain enough detail to provide a useful learning experience. He highlights that students are better able to report incidents of ineffective behaviors which end badly since they are memorable, and that exposure to careful systematic observations may be required to increase student awareness of recognizing and reporting effective behaviors. George offers that a benefit of using critical incident technique is movement towards the goal of increasing students' empathy and their interpersonal-communications ability in the workplace, but this benefit was not measured.

Clouder (2005) begins her paper on caring as a threshold concept with a vignette from a student's first experience of clinical practice that she refers to as a 'critical incident.' She comments that the way he recalls his distress in telling the story powerfully reveals the emotional nature of this interaction. She also reports on action research where students are encouraged to share 'critical incidents' with their peers with the intention of developing skills in critical reflection. Developing clinical scenarios for patient or family case simulation is extremely common in HP education, but the methodological literature on creating scenarios primarily addresses developing future scenarios for scenario planning (Thomas, Lee, & Wilson, 2014) or creativity and engagement (Lloyd, Vanderhout, Lloyd, & Atkins, 2010).

In veterinary education, interactive clinical cases were developed to encourage veterinary undergraduates to adopt independent and deep approaches to their study (Allenspach, Bell, & Whittlestone, 2008). The realistic nature of the cases, the way they stimulated students' interest, and the need to apply existing knowledge gained in lectures were cited as three of the five characteristics that students most liked. However, there are fewer examples of scenarios featuring veterinarians or veterinary students as the objects of the scenario. Typically, these types of scenarios are seen in ethics education or surveys about professionalism. Waheed,

Mengal, Shah, and Sheikh (2011) provided ten brief professionalism scenario questions to faculty and students. The students agreed that the scenarios indicated what an institution values in its students and contributed to personal reflection of what will be expected of them in the medical profession.

Factors That Affect Professional Student Sharing of Prior Experiences

Learning from others requires an openness on the part of the potential learner and sharing of knowledge or experiences by others that can add to learning. Students who are open to learning from others cannot learn from others if the students with experiences do not share their experiences with their peers. Sharing opinions or experiences can be encouraged or discouraged by multiple personal and environmental factors such as varying levels of interpersonal competence, experience engaging in peer learning activities, or actions of the instructor. Both veterinary faculty and students in England ranked technical competence above interpersonal competence as the aspect most important to the veterinary profession (Roder, Whittlestone, & May, 2012). In focus groups with medical students about peer assessment, challenges to participation included students' personal struggles with reporting peer behaviors, characteristics of a peer assessment system, and the environment in which the system would operate (Arnold, Shue, Kritt, Ginsburg, & Stern, 2005). Only a few studies such as Fogelberg and Farnsworth (2009) compare responses between veterinary faculty and student populations. They found faculty and student responses to a survey were fairly similar on questions of ethics that required development of sensitivity to other people's concerns.

There are spoken and unspoken rules on how to share insider knowledge. In her dissertation on how nursing students finesse incivility, Thomas (2013) discusses the positive role of co-learners as "purveyors of vicarious experience" (Eraut, 1994, p.13) and emphasizes how

students learn from each other and view each other as valuable resources. The Purdue University School of Veterinary Medicine's Insider's Guide summarizes how to share your knowledge with others:

Don't be a know-it-all. Everyone comes from different knowledge backgrounds. If you know something, share, but don't talk it up like you are an expert. All that will get you is a lot of funny stares and no friends. And, no matter how much you know, you will find out quickly that you really don't know anything. (Purdue University, 2016, p. 29)

Student perspectives can be elicited by veterinary educators (Whitcomb, 2014) in a way that both encourages self-reflection and increases the likelihood of sharing being viewed as a positive professional behavior.

Measures of university student or adult willingness to participate in various aspects of learning from and communicating to others can be adapted to assess receptivity towards sharing in HPE. Receptivity towards teaching and learning has been studied for peer teaching and learning in older adults. Chou and Brown (2002) asked participants to rate willingness and likelihood for both learning about safe medication use from trained older adults and teaching other older adults. Willingness to teach and learn was rated on 5-point scales ranging from one representing "Extremely Unwilling" to five "Extremely Willing." Likelihood also ranged from one representing "Extremely Unlikely" to five "Extremely Likely." The receptivity score for peer teaching was derived by summing the two item scores for willingness and likelihood to peer teach, as was the score for learning. Willingness to communicate has been measured as state variable using a thermometer-shaped figure with a scale of 1 to 10 in a study of male and female university students which also considered anxiety and perceived communication competence as factors in communication (MacIntyre, Babin, & Clement, 1999). Knowledge-sharing self-efficacy, defined as confidence in one's ability to provide knowledge that is valuable to others, measured with three questions and using a 7-point Likert-type scale from one (*strongly disagree*)

to seven (*strongly agree*). (Lin, Hung, & Chen, 2009) has been used and adapted in knowledge sharing research in virtual communities (Chang, Hsu, & Lee, 2015).

Facilitative and inhibitory environments.

Healthcare or educational settings that highlight power differentials or engender competition can inhibit dialogue. Medical student unwillingness to speak up in hospitals has been studied. Over half (56%) of fourth-year students responding about their third-year clerkships in internal medicine or surgery reported that they would not speak up when witnessing a possible adverse event (Bowman, Neeman, & Sehgal, 2013). Prior studies of third-year medical student narratives see steep authority gradients from students in low positions of power as hindrances to open communication (Gaufberg, Batalden, Sands, & Bell, 2010). Earlier in education, competitive classrooms have been shown to decrease seventh grade students' self-efficacy on a writing performance task (Chan & Lam, 2008) which corresponds with recommendations to minimize comparative evaluation in modeling.

Findings from a focus group of students after an undergraduate women's health issues course where storytelling served as one of the primary teaching and learning tools revealed three themes: personalizing learning, participatory learning, and group trust/safe environment (Davidson, 2004). A safe environment seemed to play a critical role in student sharing. Enhancements to learning came both to the students who shared a great deal during the course as well as those who did not engage in active storytelling. Conklin (2013) reviewed the literature on student experience in teaching environments broadly and recommended that educators work to create autonomy-supportive classrooms. Instructional behaviors discussed as autonomy-supportive from a study by Reeve and Jang (2006) included several relevant to vicarious

learning: (a) listening, (b) giving the student opportunities to talk, (c) being responsive to questions and comments, and (d) acknowledging the student's perspective and experiences.

Andersen (2016) argues that teaching interventions can enhance the reflective capacities of nursing students who reflect on critical incidents or everyday practice events to learn from experiences during clinical practicums. After clinical practice, students describe their experiences to each other and to the instructor. Clinical instructors report difficulty in promoting introspection and engaging students meaningfully in discussions. Variations in responsiveness have been studied extensively; three of the overarching reasons are anxiety and fatigue, student apprehension and anxiety, and stress, but the fourth aspect relates very much to motivation for achievement. Students are focused on the concepts of performance and the evaluative role of instructors creates a sense of risk for students.

Motivation in learners.

Motivation can affect what learners perceive and therefore facilitate, impede or otherwise focus observations and responses (Bandura, 1962). Further, overt participation may increase motivation and heighten attention to stimuli (McBrearty, 1961). Bandura also raises the question of the relationship between empathy and imitation, and the idea that in learning situations, instructors create conditions which enhance and channel a learner's observing responses. Both individual motivation constructs applicable to learners and the creating of a motivational context by instructors are relevant.

Goal orientations as intrinsic motivators have been studied in light of two distinctive types of knowledge-sharing behaviors in employees, knowledge collecting and knowledge donating (Kim & Lee, 2013). Of particular interest here is knowledge donating, the motivation of individuals to pass on their own intellectual capital to others (Van den Hooff and De Ridder,

2004). Kim and Lee (2013) measured knowledge donating in hospitality employees using a four-item scale adapted from Van den Hooff and Hendrix which they found reliable (Cronbach's $\alpha = .87$). Performance goal orientation correlated negatively with knowledge donating, whereas there were positive relationships between learning goal orientation for both knowledge collecting and knowledge donating. Although a useful instrument about sharing information generally, all four questions relate to recent information or activities and are not easily adapted to sharing prior experiences in an academic context.

HP students are traditionally viewed as highly motivated due to the very competitive nature and academic demands of the admissions process. Veterinary students are no exception. A study of Finnish veterinary students' motivation cautions educators not to take veterinary students' high motivation for granted due to the multi-faceted nature of motivation for individuals and the structural factor that programs do not provide students sufficient time and flexibility to support "interest-based studying" or find course content meaningful (Mikkonen & Ruohoniemi, 2011). Most motivation literature involving medical students relies on self-determination theory (Williams & Deci, 1996) or uses the Academic Motivation Scale which is based on that theory (Sobral, 2004). Research addressed changes in motivation and self-regulated learning over the move from the classroom to the clinics (White, 2007) and how pass/fail grading can be used by instructors to encourage intrinsic motivation (White & Fantone, 2010). Findings on motivation for career choices in medicine (Williams, Saizow, Ross, & Deci, 1997) are less applicable, as veterinary primary practice involves both medicine and surgery and most do not specialize. Payakachat et al. (2013) reported on facilitators and barriers to academic help-seeking behaviors in student pharmacists that may inform the assessment of academic self-efficacy and instructional approaches in other student populations.

One of the few motivation studies of veterinary students included a new instrument to measure veterinary student motivation designed in Belgium for undergraduate-level veterinary students (Vandeweerd, Dugdale, & Romainville, 2014). It addresses primarily motivation for veterinary medicine as a career, and not motivation within focus areas of veterinary medicine. Question items were obtained from semi-structured interviews with students and from a review of the relevant literature. For factors enhancing motivation, there were several items from interviews and the literature about instructors and involvement in subjects focused on the ultimate goal of becoming a practitioner, but there was nothing about fellow students. For factors reducing motivation, there were clear connections with achievement goals such as “fear not to succeed” from interviews, and “Low perceptions of relevance” from the literature. In surveys of veterinary students using the short version of the Approaches and Study Skills Inventory for Students, being motivated by assessment was correlated with a surface learning approach (Chigerwe, Ilkiw, & Boudreaux, 2011). Surface learning was further described as focused on the rote learning of facts related to the syllabus by students who do not see value in the material. Ryan et al. (2004) found that veterinary students’ feeling that their prior knowledge is inadequate was among the factors positively associated with surface learning in physiology and biochemistry.

Motivation for veterinary student engagement in extracurricular activities was studied by Jones, Rush, Elmore, and White (2014) who described the level of extracurricular involvement, determined the association between extracurricular activity involvement and academic performance, and determined the motivation for extracurricular involvement. Students enrolled in curricular years one through three at Kansas State and Texas A&M Universities responded ($n = 665$). Students for whom the primary reason for participation was networking or social

enhancement had lower overall GPA than students for whom the primary reason was gaining new knowledge and skills (3.28 or 3.02 vs. 3.41; $p < .05$).

Student achievement goal orientation.

Achievement goal orientation (AGO) is the motivational approach or purpose that an individual has to the pursuit of learning in a specific situation. Individuals motivated by mastery focus on growing their competence by acquiring knowledge and skills, while those motivated by performance focus more on displaying their competence relative to others. Motivation theorists (Elliot & McGregor, 2001) added an approach-avoidance dimension to the idea of mastery and performance goals. Approach represents a desire to increase and demonstrate growing skills and has a positive valence. Avoidance emphasizes avoiding mistakes, failures, or diminution of existing skills and may be coupled with a desire not to be perceived as less able to handle activities than peers (Brophy, 2005). This idea of whether sharing prior experience is seen by students as adding to an individual's display of competence or is something to be avoided as it may lead to having that prior knowledge corrected or seen to be diminished in value is relevant to this research.

Several achievement goal frameworks have been used to study university students, with little of the work focusing on graduate or professional students. In relating graduate students' achievement goals to students' disposition to critical thinking, Dehghani, Mirdoraghi, and Pakmehr (2011) used Midgley et al.'s Goal Orientations Questionnaire which included three subscales—Mastery, Performance Approach and Performance Avoid goal orientations. Artino et al. (2012) used three goal structure subscales—Mastery, Performance Approach, and Performance Avoid—from the Patterns of Adaptive Learning Scales in his survey of medical students. The focus in this literature review is the use of the 2x2 AGO framework where the

goals are mastery or performance by approach or avoidance and are measured with the Achievement Goal Questionnaire-Revised (AGQ-R) (Elliot & Murayama, 2008). Achievement goal theory research has operationalized Performance Approach goals inconsistently, emphasizing the competence demonstration element in some cases and the peer comparison element in others (Senko & Dawson, 2017). A meta-analysis by Hulleman et al. (2010) discovered that students' academic achievement was negatively predicted by Performance Approach goals that focus on appearing talented, but positively predicted by Performance Approach goals that focus on outperforming peers, while Senko and Dawson (2017) explored when and why the two types of Performance Approach goals are most likely to diverge versus converge. Strunk (2014) performed a factor analysis of the AGQ-R in two populations of undergraduate students and did not find different factors for Performance Approach versus Performance Avoidance, just an overall performance factor. However, he also tested an alternative three-factor model with Mastery Approach, Performance Approach, and Performance Avoidance, because of the theoretical debate over the Mastery Avoidance construct. In this model, which was a good fit to the data except for a large chi-square to degrees of freedom ratio, those three subscales maintained their original structure and the controversial Mastery Avoidance subscale was removed.

AGO has been studied in a few relevant college and HP student populations. A study in first- and second-year pharmacy students used a 16-item version of the Achievement Goal Questionnaire and found that pharmacy students were mastery- and performance-oriented learners with males and second-year students scoring higher on work-avoidance (Gavaza, Muthart, & Khan, 2014). The AGQ-R has also been studied in UK pharmacy students (Hall, Hanna, Hanna, & Hall, 2015) where the highest mean score (rescaled from seven points to five

points) was found for Mastery Approach orientation ($M = 3.83$), followed by Performance Avoidance ($M = 3.76$), then Mastery Avoidance and Performance Approach. Investigating relationships between goal orientations and resiliency in undergraduate agricultural students, Splan, Brooks, Porr, and Broyles (2011) found females scored almost one point higher on a seven-point scale for Mastery Approach than males, and that freshman rated themselves slightly higher in Mastery Approach and Mastery Avoidance than more advanced students. These gender and time in program trends might predict AGO variation in public university veterinary students as many of those students earned agricultural or animal science undergraduate degrees.

The AGO framework has been used with graduate students in the life, physical and behavioral sciences by Deemer, Carter, and Lobrano (2010) as the basis for developing an Achievement Goals for Research Scale. Factor analysis of the Achievement Goals for Research Scale led to a 6-factor model which included subscales for (1) absolute task mastery goals; (2) incremental task mastery goals; (3) Mastery Avoidance goals; (4) Performance Approach goals; (5) Performance Avoidance goals; and (6) self-demonstration of competence goals. That Mastery Avoidance was included provides some evidence of the validity of this component of AGO which has been less studied and is more contradictory (Baranik, Stanley, Bynum, & Lance, 2010; Senko & Freund, 2015). There is also some variation on AGQ-R response strategies with studies using a 7-point Likert-type scale from one (*not at all true of me*) to seven (*very true of me*) (Abercrombie, Parkes, and McCarty, 2015; Hall et al, 2015) or 1-7 agreement (Splan et al., 2011) rather than one (*strongly disagree*) to five (*strongly agree*) as used by Elliot and Murayama (2008).

Classroom structures and practices.

Meece, Anderman, and Anderman (2006) used an achievement goal framework to examine the influence learning environments have on students' academic motivation and achievement. They found evidence that elementary and secondary students show the most positive motivation and learning patterns when settings emphasize mastery, understanding, and improving skills and knowledge. Although classroom goal structures and associated instructor practices have not been assessed by veterinary students, there have been studies of veterinary student perceptions of their learning environments with more general instruments. In 2013, researchers at the Virginia-Maryland College of Veterinary Medicine surveyed all four years of veterinary students using the Dundee Ready Education Environment Measure, a 50-item questionnaire with subscales on students' perceptions of learning, students' perceptions of course organizers (faculty), students' academic self-perceptions, students' perceptions of atmosphere, and students' social self-perceptions (Pelzer, Hodgson, & Werre, 2014). A few of the individual items from this measure with mean scores in parentheses relate to how instructors' classroom teaching is perceived, for example, "I am encouraged to participate in lectures" ($M = 2.8$), "I feel comfortable in lectures socially" ($M = 2.8$), "The atmosphere motivates me as a learner" ($M = 2.4$), and "I feel able to ask the questions I want" ($M = 2.8$) and negative valence questions on a scale where 4 equals strongly disagree: "The faculty are authoritarian" ($M = 2.3$), "The teaching is too faculty centered" ($M = 2.4$), and "The faculty ridicule the students" ($M = 2.8$). However, all of these scored higher than the threshold mean score of ≤ 2.0 indicating that none of these negative statements were items of concern to veterinary students who participated. The authors noted that the veterinary students overall score of 129 out of 200 was higher than the median scores from 57 published studies of medical, dental, chiropractic, and nursing students. With

only one study of veterinary students, it is not clear whether veterinary students across the nation would more positively assess learning environments on similar standard measures compared to other HP students. The institution where this study took place has a significant equine focus including an Equine Track (Virginia-Maryland College of Veterinary Medicine, 2015b) and therefore likely represents a significant number of equine-focused students.

Career interest.

In 2015, only 6% of private practice veterinarians in the United States were equine-focused and another 6% practiced mixed animal medicine which includes caring for horses (American Veterinary Medical Association, 2015). In a public university first-year DVM course about career options, Kedrowicz, Fish, and Hammond (2015) found through their Veterinary Careers Survey that equine private practice had the second highest percentage of students (42%) expressing 'no interest at all.' Regardless of student interests, veterinary medicine curricula cover large animal anatomy, medicine, and surgery, so students must take courses with substantial equine content even if they do not intend to provide care for horses after graduation. Therefore, learning from students' horsemanship experiences and understanding any associations among student horsemanship knowledge, achievement goal orientation, and career interests, as well as instructor practices and attitudes can be studied across U.S. veterinary colleges.

Summary

Veterinary students are exposed to many opportunities for learning from others with diverse experiences. Limited information is available about prior experiences of veterinary students. In horsemanship, the domain of interest for this research, several studies measured horse-related experience in a number of populations. The potential for learning vicariously from the observed experiences of others has been studied outside HPE in professional domains and

settings such as the music master class. Research on vicarious learning from verbal sharing of past experiences is limited, but several studies demonstrate HP student openness to learning from others. In healthcare and adult education, critical incident technique is a common methodology used to capture and share the experiences of others for learning. One study found veterinary faculty and student responses to a survey were fairly similar on questions of ethics that required development of sensitivity to other people's concerns (Fogelberg & Farnsworth, 2009).

This review introduced the scarce literature on environmental, motivational, and demographic factors that may relate to how graduate-level professional students learn from others' experiences. The literature around motivation was delimited by the focus on college or graduate-level health professional students. In summary, this research assessing the usefulness of learning from critical incident scenarios involving prior knowledge and examining motivational constructs as possible predictors of openness to sharing with and learning from the shared experiences of others seems to be novel in the veterinary and medical education literature.

CHAPTER THREE: METHODOLOGY

The research design of the sequential exploratory study draws on two definitions of mixed method inquiry to develop a better understanding of sharing or valuing of prior horsemanship experience for learning in veterinary medicine. After these definitions and an introduction to methodological challenges and approaches in the veterinary education context, I present the methods for the initial qualitative phase. This includes cognitive interviewing to learn more about how the achievement goal orientation measure (AGQ-R) was understood by recent veterinary graduates. Supporting the qualitative study design are discussions of thematic analysis of interviews in HPE. As the qualitative phase findings inform the development of the prior experience sharing scenarios, I introduce literature on critical incident technique and scenario development. The quantitative phase builds on the qualitative phase with new questions in combination with standard measures in motivation and self-efficacy. A few examples of multiple regression analyses provide background on the models developed to study the research questions in the quantitative phase. To develop awareness of limitations, I reviewed studies addressing challenges of surveying veterinary students and practicing veterinarians. The methods to combine and integrate the findings from both phases remained flexible and were further developed as the results became available for analysis.

Research Design

The mixed methods study reflects Jennifer Greene's definition of mixed method inquiry as involving more than one methodological tradition, way of knowing, and technique for gathering, analyzing and representing a human phenomenon for the purpose of better understanding (Johnson, Onwuegbuzie, & Turner, 2007). The mixed method interpretation and connection of results from the research questions draws on Hallie Preskill's explanation of mixed

methods as using data collection methods that collect both quantitative and qualitative data to strengthen each other. “Mixed methods research acknowledges that all methods have inherent biases and weaknesses; that using a mixed method approach increases the likelihood that the sum of the data collected will be richer, more meaningful, and ultimately more useful in answering the research questions” (Johnson, Onguebuzie, & Turner, 2007, p. 121).

Theoretical Framework

The best-known theoretical framework underpinning vicarious learning research is Albert Bandura’s social cognitive theory (1986) which addresses how a learner uses cognitive processes to consolidate personal, behavioral, and environmental influences from potential models. The underlying process and interpersonal dynamics that guide a vicarious learning interaction have been further explicated in a working paper by Myers (2015) describing a “coactive vicarious learning theory.” Myers integrates theories of experiential learning and symbolic interactionism in accounting for vicarious learning as co-constructed, interpersonal learning interactions between individuals at work. Relevant to this study, Myers argues that vicarious learning that involves the mutual processing of another’s experience, built around discourse and analysis, could lead both to linear growth in individuals’ knowledge and growth in their individual and relational capacity for future learning. These elements from Bandura and Myers inform my understanding of the possible pathways of learning from sharing prior experiences with others (see Figure 2, p. 24) and guides the analysis of the stories shared by the participants in this research. Specifically, I hoped to understand how sharing knowledge with fellow students impacted those who shared the knowledge in terms of how they saw themselves as coaches or improving their sense of their ability to teach others, and whether experiencing positively received sharing influenced their desires to share or be a role model in future interactions.

Study Design

The one-year exploratory sequential (qualitative to QUANTITATIVE) mixed method design shown in Appendix A is a two-phase design that started in August 2016. The initial qualitative phase explored sharing of prior experiences through interviews with former DVM students from a single southeastern public veterinary college who have had time to reflect on horsemanship experience, and any personal and environmental factors they feel relate to their sharing and learning. Their responses informed my consideration of pathways to using prior experience in veterinary education, and further, led to the refinement of a survey instrument and development of prior experience sharing scenarios for the quantitative phase. The robustness of the prior learning and vicarious learning tools for the quantitative phase depends on the findings from the qualitative research.

The quantitative second phase in Spring 2017 extended the study to veterinary students at public U.S. veterinary colleges nationwide. The quantitative phase is designed to understand how current public university veterinary students' horsemanship expertise, personal motivational, institutional and environmental factors may be associated with perceived usefulness of sharing prior experiences and learning from experiences shared by others. The mixed methods analytical plan compared qualitative findings from former students with survey results from current students to understand pathways and predictive factors for perceptions of sharing and learning from others' horsemanship experience at all stages of veterinary education.

The qualitative phase of the research (Protocol #6623) was originally designated exempt by the North Carolina State University (NCSU) Institutional Review Board (IRB) on January 5, 2016 before the start of pilot interviewing. Changes were made to the interviewing protocol and recruitment plan after the pilot interviews. These were approved by the IRB on August 26, 2016.

See Appendix B for the IRB-approved consent form for former student interviews. The results of the interviews that led to changes to the quantitative phase measures are discussed in Chapter Four. Prior to the quantitative phase, all instruments and procedures were submitted to the NCSU IRB for review and the quantitative phase (Protocol #11715) was designated exempt on January 26, 2017. Appendix I outlines all IRB activities related to this research.

Context.

The context of all phases of the research is the university-based, formal education of veterinary medical doctors at public universities in the United States. The four-year curriculum leading to the DVM/VMD involves learning about multiple species. Regardless of student career interest, all students must complete core courses that include large and small animal medicine. In some programs, training in clinical settings starts in the first year, while others wait until the final year to offer educational experiences that are primarily clinical in nature. The number of participants in each population that were recruited for the two stages of the sequential design are described below.

Qualitative Phase

The first phase, semi-structured interviews with former students from a single public institution, was designed to elicit the experience of having prior horsemanship knowledge and deciding whether and how to share it with others in the formal veterinary education context. The questions shown in Appendix C were designed to elicit former students' reflection on barriers and supports to sharing prior experience with others, as well as any prior experiences representing critical incidents where horsemanship or other knowledge of value was shared or not shared. These elicitations inform the design of the quantitative instrument to include factors

that interview participants report as relevant in addition to those already identified in the literature such as career interest.

The interview protocol was reviewed by the dissertation committee co-chair (Dr. Barcinas) and then pilot tested with three veterinary residents (post-DVM trainees), one non-equine without horsemanship experience, one equine-focused with horsemanship experience, and one non-equine with horsemanship experience to ensure clarity of questions and instructions, and estimate the time required for the interview process to refine the recruitment messaging. One avenue of questioning that felt redundant to the first pilot participant was removed to reduce the time required to about an hour. The first two interviews were done in person and the third was done using Skype online conferencing. The final protocol used for the interviews appears as Appendix C.

Participant selection and criteria.

A purposeful sample of recent former students providing equine health services was chosen for this qualitative interview phase, along with a few recent former students from the same program years not providing equine services as negative case comparisons. Recent is defined as up to five years from graduation; respondents should have been close enough to their DVM training experience to recall any salient experiences in the courses relevant to their career area. Recent graduates are the focus of these interviews rather than current students. Being more than a year away from their academic experience, they are likely to have had time to reflect on their educational experiences and what has been valuable in practice, also they have enough distance to feel comfortable being candid about recalling instructor practices, their own feelings, and sharing scenarios involving prior experience.

NCSU College of Veterinary Medicine (CVM) DVM graduates within the past five years who had practiced equine medicine or surgery and were currently based in North Carolina (NC) were eligible for recruitment for the qualitative stage. In 2015, 209 equine veterinarians were listed in the NC Veterinary Medical Association database (www.ciclt.net/sn/peo2/p_find.aspx?ClientCode=ncvma). I compared those names with the list of graduates of the NC State CVM from 2011-2015. Twenty-one of the 209 practitioners listed were recent graduates. Within the NC-based recent graduates, I based the selection on maximum variation sampling (Seidman, 2013) to involve male and female students, equine-only and mixed practice, and different parts of the state. Of the 12,395 students enrolled in DVM programs in 2015, approximately 20.4% are male (AAVMC, 2015b). As gender is known to be a predictor of attitude to vicarious learning in master classes (Long et al., 2012), it was important to recruit an equivalent proportion of males for the qualitative interview components to listen for any gender-based differences.

The ability to reach saturation from the interviews depends on complexity of the meaning structures offered by the interview participants. Defining saturation as the generation of an intersubjective meaning structure (Bjerrum Nielsen, 1995) around what former veterinary students experienced in their formal education. I anticipated that five to ten participants representing those assumed to have equine experience would be required to achieve saturation. I also sought negative case comparisons assumed not to have equine experience through contacting a few graduates practicing small animal medicine. I identified 16 recent graduates (2012-2015), 13 in large animal and three outside of large animal for recruitment, consisting of 13 women and three men. I sent initial emails in September 2016 with at least one email follow up in November and mailed follow up cards in December. I recruited and interviewed seven

females and two males (22%). As scheduling in-person interviews ($n = 1$) was challenging; most were phone ($n = 7$) or Skype ($n = 1$).

Data collection.

Description of protections.

Consent forms from the interviews are maintained separately from the transcripts and other materials. The audio files are stored on a password-protected local drive on a personal computer in my home office and backed up to a password-protected portable hard drive as well as stored in the secure NCSU Google cloud hosting. The audio files will be deleted after the dissertation is made available. While all interview data was anonymized during transcription and checked for identifiability through member checking, there is a risk that the critical incidents may be recognizable to others to whom the story had previously been disclosed in other contexts.

Instruments: semi-structured interview protocols.

A semi-structured interview of 45-60 minutes with a set of broad, open-ended questions was used for recent graduates (Appendix C). All interviews were audiorecorded with explicit permission on consent forms (Appendix B) and transcribed verbatim with the exception of replacing names with roles. During the interview, participants responded to several questions about a hypothetical written scenario (Appendix C, part 4). After completing the questions, they were asked whether the scenario resonated as an example of sharing similar to something they might have heard shared in the past as a quick check of cognitive validity of the scenario as a tool to represent sharing of prior experience (Karabenick et al., 2007). In addition to using the hypothetical written scenario, critical incident technique (Flanagan, 1954) was used to elicit positive or negative events from their own prior experience or incidents that were shared with them which could become the basis of additional scenarios. Cognitive interviewing was

employed specifically to assess the comprehension of the AGQ-R motivational instrument. This was particularly important for checking the recent graduates' responses and reasoning for the items on the Mastery Avoidance subscale of the AGQ-R. Strunk (2014) observed anecdotally that students report difficulty with responding to the Mastery Avoidance items on the AGQ-R which could indicate some problem with the wording of the items. He raises the possibilities that this either causes the items to fail to adequately measure the latent construct of Mastery Avoidance goals or this could stem from a larger issue with the theoretical construct; i.e., the latent factor of Mastery Avoidance goals may not exist as it is currently conceptualized.

Extent of prior knowledge and prior experience.

Prior knowledge from two perspectives was discussed early in the interview. The first asked participants to describe prior experiences with any aspect of horsemanship or performance animal care as a volunteer or employee, as well as prior experience as an owner, trainer, or rider with a competition animal being treated clinically. The second was stating their prior knowledge of horsemanship, how it evolved over time, and what it means to them in their practice. There are challenges in measuring prior knowledge and prior experience. The interview invited broad discussion of horsemanship, but I did not ask about specific skills. The example in the scenario was the skill of applying support bandages. Bandaging with the correct, even amount of tightness so that bandage fulfills its function, but does not cause cording from improper pressure, requires practice, experience and attention to details (Harris, 1997). A self-reported prior knowledge question would be, "Do you know how to apply support bandages?" A self-reported prior experience question might be "How many times have you (correctly) applied support bandages?" A more empirical question about prior knowledge would ask about the steps of bandaging that would be known by someone with bandaging experience—"Tell me how you bandage and check

for tightness, etc.” The most realistic way to test that the prior experience created relevant prior knowledge would be to have the person demonstrate correct support bandaging technique. For the interview, after the general discussion of their prior horsemanship experience, they were asked to rate agreement with learning something from the presented critical incident scenario where the impact of a failure to bandage correctly was shared. Lastly in the horsemanship experience questionnaire, there was a question about comfort in applying support bandages.

Application of prior knowledge or experiences.

After the participant answered questions about the usefulness of the sample scenario about bandaging, they were also asked about whether they would consider hearing about it from a classmate a waste of time, and about their willingness and likelihood of sharing a similar experience. Lastly, questions about their application of prior horsemanship experience were asked in a way that was open to hearing about examples where it interfered as well as positive examples. When participants asked what is meant by prior knowledge or experience, I used the example of how tightly you were comfortable bandaging legs when you were working with horses prior to your veterinary education as compared with the tightness that you are willing and able to employ when applying immobilization bandages as a veterinarian. Here is the example language for eliciting additional critical incidents:

Please describe a situation in your practice where your knowledge or experience in riding/training/horsemanship affected how you handled a case.

[NB: choice of wording riding/training/horsemanship will try to mirror what interviewee used earlier to describe his or her experience Optional prompt for “handled a case”: How you diagnosed or treated a case or communicated prognosis of future performance to a client.]

A few additional questions about horsemanship knowledge and expertise were asked to help assess whether the participant found horsemanship expertise valuable for reasons other than

handling cases. Although the meanings offered by early interviewees among the recent graduates could have been shared for discussion with later interviewees at the end of their interviews to attempt to gain a more complete picture of interrelationships and possible convergence among experiences of former students, that turned out not to be necessary.

Demographics such as age, gender, etc. were completed in writing independently at the end of the interview. Participants were offered the opportunity to participate in member checking to see if I effectively documented our conversations and sufficiently de-identified critical incidents. They were not asked to review the analyses across participants.

Procedures.

Each candidate who agreed to participate took part in an interview of around 60 minutes. Mean interview time was 66.2 minutes with a standard deviation (SD) of 14.8, range 51-74 minutes. No incentives were provided other than a box of donuts taken to the in-person interview. All participants received their transcripts in June 2017 and were specifically asked to review quotes designated as possibly for presentation in the narrative or thematic analysis and to confirm their comfort with their unique identifiers. Eleven of the 12 (92%) responded to the request for member checking and three of the participants minimally edited some responses, mostly to correct grammatical errors. Others commented on their use of grammar but did not edit their transcripts.

Data analysis

Procedures.

As a qualitative researcher, I focused on critical events, incidents and factors from the perspectives of participants in their own words and took an inductive approach to data analysis (Butterfield, Borgen, Amundson, & Maglio, 2005). I considered multiple ways of interpreting

the interview texts within frames of reference, attempted to make sense of the initial categories that emerged from the data, and the specificity or generality of the categories as they applied to the examples that the participants shared, understanding that my interpretation and sense making of these findings is grounded in my own experiences (Denzin & Lincoln, 2011). To understand the process by which participants in veterinary education decide whether and how to share their prior horsemanship experience, I analyzed the interview data in two ways after transcribing and multiple re-readings of the interviews. Both types of analysis of the interviews were ongoing so that meaning structures from the first interviewees could inform discussion with the following interviewees within the framework of the interview protocol.

First, I considered narratives about sharing with within individual interview transcripts to capture participant views of sharing. After all interviews were completed, individual narratives were compared to each other and to the model pathway proposed in Chapter One (see Figure 2, p. 24) as well as the co-active vicarious learning model (Myers, 2015) to assess commonalities and differences shared by participants. These findings address the primary qualitative research question of how former students view sharing their own prior horsemanship experience in veterinary education contexts and what personal, motivational and environmental factors may have impacted knowledge exchange. Examples of learning from others' prior experiences shared were extracted for consideration as the basis of the critical incident scenarios to be developed. For the most part, these were either too detailed to be included or publicly known to other participants. However, one on wound healing was used as the basis of one of the incidents developed for the survey research.

The second analysis was thematic, with the goal of identifying themes that can be used to develop additional questions for the quantitative phase of the study. I applied basic interpretive

and constant comparative methods to the qualitative semi-structured interviews of former students. I re-read the transcripts before analysis using basic interpretive methods (Merriam, 2002) of data reduction to code for and capture themes of barriers and encouragements to sharing experiences. I open coded line by line to see what arose in addition to or contrary to the themes anticipated by the interview questions. As I coded, I compared applied codes and re-coded again using the constant comparative method (Glaser, 1965 as described by Bernard & Ryan, 2010). Words of participants were retained as the labels for the coding variables and themes where possible. Thematic analysis was based on the open coding and research questions and I selected quotes that represent themes.

Themes about sharing or valuing of prior knowledge, learning goals, and elements of vicarious learning interactions (Bandura, 1986; Myers 2015) were explored through open coding and application of the constant comparative method. While similar to the constructivist grounded theory approach used in an interview study of doctors and medical students (Watling et al., 2014) where they read and examined the incidents, experiences and perspectives their participants described, I did not pursue a pure grounded theory approach since several possible themes had already been identified in prior literature. Anticipated themes based on Horowitz (2009) include content interest, difficulty and relevance to current interests, teacher knowledge or style, and perceived relevance to future practice. Harackiewicz, Durik, Barron, Linnenbrink-Garcia, and Tauer (2008) found relationships among initial interest, achievement goals, situational interest, and class performance, and longitudinally, that situational interest, independent of initial interest, predicted subsequent course choices. The interrelationship between themes such as interest and value, achievement goals and class performance were also considered due to these studied associations in quantitative research. Encouraging discussion of

value and expectancy through open-ended questions may have produced data that convergences or diverges from what has been seen in studies of undergraduate students, as professional students may differ.

Reliability and validity.

I coded the transcribed entire interviews twice by hand and then once from clean files in Nivo until I no longer found additional topics to code. Complete transcripts with selected quotes bolded and enlarged were shared with each individual participant for member checking. After the dissertation is accepted, I will share aggregated data with participants who expressed interest in the findings. For content validation, the questions on horsemanship experience derived from the interviews were submitted for review to two horsemanship experts and the entire survey was submitted to two experts on survey design in medical and veterinary education (Appendix F).

Subjectivity.

The life experiences that I bring to this research project fall into two areas. First, I have been a non-veterinarian instructor of veterinary students since 2008, and a non-physician instructor of medical students from 2000-2008. As an adult learner and an instructor, I believe that adult learners' prior knowledge is valuable and underutilized in HPE. The subject matter is drawn primarily from my interest in horsemanship expertise. I consider myself a horseperson of long, but shallow experience, since I have ridden at least weekly since 1981 but do not own a horse. I competed in Hunter Seat, Jumping, Combined Training and Dressage, and have ridden Western. I attend competitions of many horse sports and training seminars from schooling level to Olympic and World Equestrian Games competitions. Having worked with horses under the care of veterinarians with diverse horsemanship backgrounds, I value veterinarians' horsemanship knowledge and have had informal conversations with veterinarians who are

experienced riders and competitors about how these past experiences influence their practice. My experience being more on the English riding side as a competitor and observer likely led to my asking more in-depth questions about student experience with those disciplines.

My familiarity with the language of horses may have led to some preemptive closure on discussions since I was already familiar with the topics and did not ask participants for further explanation as might have been required by a researcher less familiar with the topic. My embeddedness in the local context may have created a similar effect with explanations of instructor behavior or attitudes as I was familiar with the instructors and most of the private practice veterinarians interviewees mentioned as positive and negative exemplars, and therefore they may not have felt the need to elucidate their points or would not have wanted to disparage instructors who were my professional colleagues at the time of the interviews.

Positionality and ethical considerations.

Specific to the research participants and the research setting, I have taught veterinary students at a highly-ranked veterinary program in large public university in the southeastern United States since 2008. I am not a veterinarian and that makes me more of an outsider. As a non-owner, my horsemanship knowledge as a rider may or may not be viewed as valuable but it does make it easier to connect with students who also have riding experience. Students often share their riding experiences during their introductions at orientation, especially if they plan to work with horses as part of their veterinary careers, and I tend to follow up with those students to let them know about available equine resources. Most equine-focused veterinary students are white, middle-class, mostly female students with a background similar to my own. I actively participated with equine-focused students through the Student Chapter of the American Association of Equine Practitioners (AAEP) activities such as Horseman's Youth Day and lunch

meetings, where I have frequently overheard students sharing their horse-related experiences. Since commencing this study, I have also been a student member of the AAEP and attended the 2015 annual convention where I spoke with former students and other practitioners about my desire to pursue this research.

Due to my teaching and librarian service roles, I have relationships with all DVM students at my university and this impacted my selection of the population for the qualitative component of this study. I chose to recruit former students rather than current students to reduce the possibility that participants would feel coerced to participate or unwilling to disclose classroom factors related to their current instructors. While the recent graduates recruited for the qualitative study were all former students of mine, they have more of a distance and see me only at the annual North Carolina Veterinary Conference. Therefore, I presume they were comfortable in refusing participation. Through these relationships and engagement with them during their DVM degree, I had some awareness of the equine background of several but not all of the former students that I chose to recruit for the qualitative phase. The qualitative study was approved by the NC State University Institutional Review Board (Appendix I).

The critical incidents were intended to be modifications of memorable incidents shared by interview participants. In the situation that the incidents shared by the interviewees were too particular to avoid recognition by participants who may have heard these stories shared by their classmates, alternate scenarios were developed based on characteristics shared by participants. The process of identifying and redacting or further developing these incidents is covered in the Chapter Four analysis of interview data and generation of the instrument for the quantitative phase of the research.

Quantitative Phase

Participant selection and criteria.

In 2015, there were 28 accredited schools of veterinary medicine in the United States of which 23 are based at public universities. Students from these 23 public institutions (Table 1) were recruited as study participants. These schools are ranked by the U.S. News & World Report (USNWR) and have a quality score published as part of the ranking process which in 2015 was an average rating on a scale from 1 (marginal) to 5 (outstanding), based on a survey of academics at peer institutions. The annual enrollment of veterinary schools was stable in 2015 with limited numbers of dropouts, leading to the assumption that in the public universities there are approximately 10,300 veterinary students across four years that could potentially participate. Of the 12,395 students enrolled in public and private DVM programs in 2015, approximately 20% are male and 15% are historically underrepresented students (AAVMC, 2015b). Although race has not been identified as a predictor, it was a goal to recruit at least a similar proportion of male and non-white students to explore the potential for demographic differences in valuing of vicarious learning. Across the 23 public veterinary programs, there are 2,592 seats available in the class of 2019 (Association of American Veterinary Medical Colleges, 2015a) which means that across all four years of the program approximately 10,300 DVM students are enrolled in public universities. I intended that all these students would receive the email invitation to participate in the survey through the student chapter recruitment strategy.

Ethical considerations.

Although the horsemanship expertise of many of the students at NCSU College of Veterinary Medicine is known to me and I currently teach courses involving the first- and second-year students at NCSU, I did not use my insider access to recruit students at NCSU. In

Table 1

Estimated Public Veterinary Students for Recruitment by Veterinary Medical Program in Order of 2015 USNWR Score

University	USNWR 2015 Score	Class of 2019	Total (SPYx4)
University of California—Davis	4.5	138	552
Colorado State University	3.9	135	540
North Carolina State University	3.9	100	400
Ohio State University	3.7	180	720
University of Wisconsin—Madison	3.7	87	348
Texas A&M University—College Station	3.6	132	528
University of Minnesota—Twin Cities	3.4	102	408
University of Georgia	3.3	114	456
Michigan State University	3.2	113	452
Iowa State University	3.1	149	596
Auburn University	3.0	120	480
Kansas State University	3.0	110	440
Purdue University—West Lafayette	3.0	84	336
University of Florida	3.0	112	448
Washington State University	3.0	133	532
University of Illinois—Urbana-Champaign	2.8	130	520
Virginia Tech - University of Maryland	2.8	120	480
Louisiana State University—Baton Rouge	2.7	89	356
University of Tennessee—Knoxville	2.7	85	340
University of Missouri	2.6	120	480
Oklahoma State University	2.5	82	328
Mississippi State University	2.4	85	340
Oregon State University	2.1	72	288

Note. USNWR = U.S. News and World Report; SPY = students per year (estimated). Class of 2019 are students matriculated into veterinary medicine degree in Fall 2015. Total estimated is 10,368 students.

the same manner as the other universities, I reached out to the leaders of the Student Chapter of the American Veterinary Medical Association (SCAVMA) to recruit participants at NCSU for the current student study. In terms of ethics of individual participants, while I am aware that students may exaggerate their knowledge, expertise or credentials, there is no incentive for them to do so. I did not test the truth of their self-reported experiences nor check the data they reported.

Data collection.

The single time point for surveying all DVM students was March 2017 before final exams for spring courses and after the NAVLE® examination. Although spring is the time of year when students feel more emotional exhaustion (Chigerwe et al, 2014), it is a time when all students should have experienced at least one course involving large animals and it is after the NAVLE® exam for the fourth-year students has been completed.

Survey response rates and strategies for veterinary students.

The challenges of recruiting veterinary student populations without administrative support from their universities who are concerned about survey fatigue have been extensively discussed in the veterinary education literature. Veterinary student response rates to published surveys a decade ago varied from 76.5% for in-class surveys to 43.5% for an online survey (Reisbig, Hafen, White, & Rush, 2007) and continues to drop. In-class surveying is infeasible because veterinary school administration is highly unlikely to permit use of limited classroom time for external research based on communication with the Associate Dean of Academic Affairs at my own institution. There is no comparable class for fourth-year students in which they could be reached. Previous surveys garnering more than 40% response rates suggest these survey characteristics: include questions that can be checked off and require minimal writing, take no

more than 30 minutes to complete, and have reminders at two weeks for online surveys. One example of surveying students about past experiences, was an online 2016 survey with veterinary medical students in all four years of the curriculum across six veterinary colleges. It explored Adverse Childhood Experiences (ACE), a very personal type of prior experience and garnered a 39% response rate (Strand et al., 2017) and they found similar to other population-based studies that 61% (677) of students reported having at least one ACE suggesting that veterinary student recall of significant life experiences is similar to recall by other populations.

Reisbig et al. (2007) suggest that explaining the importance of the research when asking for participation is very important in reaching these students, many of whom have performed their own research. All DVM students were recruited to participate online through emails sent to student leadership at each of the public veterinary programs. Each veterinary college has a Student Chapter of the American Veterinary Medical Association (<https://www.avma.org/About/SAVMA/WhatIsSAVMA/Pages/SAVMA-Directory.aspx>). I reached out to each of those chapter presidents to ask their leadership for assistance with study recruitment, specifically requesting that they forward the email invitation to participants to their DVM classmates to increase the likelihood of response by non-equine focused students. To preserve anonymity but encourage survey participation, all students who visited the survey site had the opportunity to follow a separate link to provide information for a drawing for one of three \$100 Amazon gift cards. This contact information was collected and stored in a separate Qualtrics survey database from the one used to collect the survey responses.

Instruments.

The instrument questions and prior experience sharing critical incident scenarios depended to some extent on the findings of the qualitative phase interviews. Three scenarios

were planned for the survey instrument contingent on how interviewees responded to the sample scenario (Appendix C, part 4), whether they were able to recall or offer additional potential scenarios as part of their personal narratives of sharing, and whether three scenarios could be completed in the amount of time that pre-tests indicated would be acceptable. The scenario conditions and examples described below are an example of what I planned to offer depending on what elements are identified by interviewees as being important to sharing. In the case that no scenarios were offered by interviewees, I planned to create three scenarios to cover the possibility of different responses by educational context and positive or negative valence.

The validated scales representing motivational constructs in this study had been subjected to cognitive interviewing with the qualitative participants to see whether they were understood and responded to as intended by their developers. Additional novel survey questions were to be developed or existing validated measures adapted to capture elements identified by participants in the qualitative phase that are not captured elsewhere. The final decision about item inclusion in the survey was made after analyzing the results of the cognitive interviewing, the feedback from content validity experts, and the pilot testing assessing participant burden.

Critical incident scenario development and conditions.

Three scenarios were developed and presented to cover the possibility of different responses by educational context and positive or negative valence. Watling et al.'s (2014) findings suggest that positive feedback is better responded to by doctors. Having scenarios with different valences addresses the question of whether the value students assign to experiences shared by others varies by whether those experiences were positive or negative. Offering scenarios in classroom and clinical education environments addresses whether value varies from classroom to clinical settings.

Scenario 1: In equine medicine **classroom**, sharing **negative** experience

Scenario 2: In equine medicine **classroom**, sharing **positive** experience

Scenario 3: In equine **clinical rotation setting**, sharing **positive** experience

The critical incident scenarios may or may not be actual reports of direct observations depending on the responses of the interviewees in the qualitative phase. The scenarios were presented as having been directly observed by the student sharing the information in the educational context as described above and silent about the response of the instructor.

Survey development.

The survey included original questions and scenarios developed as a result of the qualitative work, standard motivation instruments described below, demographics, closed-ended questions about horsemanship experiences, career plans, barriers and encouragements, and wrapped up with an open-ended question to elicit other information students may wish to share. The design of the anonymous survey was like that used by Long et al. (2012) in the music master class environment, but also depended on the findings from the qualitative phase of the research. Assumptions that were questioned in the survey included knowing how to share and being comfortable with knowledge sharing, both through the KSSE, as well as whether faculty elicited their prior experience through a novel question. Although I intended to question participants about whether there are environmental barriers or cultural norms in veterinary education against sharing prior experience, in the interviews what constituted a barrier or norm seemed to be very specific to instructors, course structures, course timing and class and individual personalities in a way that developing survey questions for these seemed premature. The validated scales, novel questions, prior horsemanship experience measures, the critical incident prior experience sharing scenarios, and demographics were combined into a web-based survey in Qualtrics (Appendix H).

Students' achievement goals for an equine medicine course were measured by the AGQ-R (Elliot & Murayama, 2008) which is based on a 2x2 achievement goal structure of Mastery and Performance with Approach and Avoidance. Although Elliot has further expanded the structure to a 2x3 structure of task, self and other approach and avoidance (2011), much of the comparable literature in HPE is based around the 2x2 structure. This 2x2 approach seems to fit with the research question of how deeply one wishes to learn equine medicine, which is why I chose to use the mastery and performance constructs from this 2008 conceptualization. AGQ-R consists of twelve items representing the four factor areas to which students respond on a scale from one (*strongly disagree*) to five (*strongly agree*), and the items were averaged to form the Mastery Approach, Performance Approach, Mastery Avoidance, and Performance Avoidance indexes which produced internal consistencies using Cronbach's α of .84, .88, .92, and .94, respectively when used in an undergraduate psychology course. Although the correlations between some pairs of goal subscales were rather high (Mastery Approach and Mastery Avoidance, $r = .51$; Mastery Avoidance and Performance Avoidance, $r = .46$; Performance Approach and Performance Avoidance, $r = .68$), Elliot and Murayama (2008) show that the goals within these pairings are not equivalent. As these measures had not previously been published in veterinary education, pre-testing and cognitive interviewing protocols (Karabenick et al., 2007; Koskey, Karabenick, Woolley, Bonney, & Dever, 2010) were employed in the qualitative phase to check how the instrument was understood and whether responses reflected the intended constructs. Of specific concern was participant understanding of the Mastery Avoidance items (Baranik et al., 2010).

The dependent variables for the quantitative phase research question are the scores on the constructs on which the students rate the prior experience sharing scenarios (Table 2, p. 79). To

Table 2

Dependent Variables Initially Defined for Quantitative Phase

Variable Name	How Measured	Source	Psychometrics
Perceived usefulness of shared information (USEFULNESS)	Likert Scale 1-5*	Novel	N/A
Waste of educational time (TIME CONCERN) (reverse-coded)	Likert Scale 1-5*	Novel	N/A
Learned something (LEARNING)	Likert Scale 1-5*	Novel	N/A
Willingness to share something similar (WILLINGNESS)	Likert Scale 1-5*	Adapted from Chou & Brown, 2002	None
Likelihood of sharing (LIKELIHOOD)	Likert Scale 1-5*	Adapted from Chou & Brown, 2002	None
Willingness to communicate (WILLINGNESS_EXTENT)	State variable using a line from 0-10	MacIntyre et al., 1999	None
Index Measures Created from Combining Individual Variables			
Usefulness Index (Combination of Usefulness and Time Concern scores)	10 point maximum*	Novel	None
Receptivity to Sharing Index (combination of Willingness and Likelihood scores)	10 point maximum*	Adapted from RECEPTIVITY (Chou & Brown, 2002)	None

Note. After the pilot study, the individual items marked with * were transitioned to 6-point Likert-type scales. Therefore, maximum score is 12 for each Index.

address the research questions drawn from earlier literature in other students, I was interested in whether students find information shared by other students to be useful or a waste of time, whether they learned from what was shared and whether they themselves, would be willing or likely to share in a similar situation. The literature on receptivity towards participating in an activity or on communicating used two types of measurement approaches, one was agreement on a Likert-type scale (Chou & Brown, 2002) and the other was a numerical score on a thermometer from 0-10 (MacIntyre et al., 1999). As there was limited data on which functioned better, I chose to look at both methods and planned to assess their concordance.

The independent variables for the student study (Table 3, p. 81) are years in veterinary education, gender, age, extent of prior horsemanship experience, the mean scores from 1-5 on each of the AGQ-R subscales towards the equine medicine course, student focus area/career goal, overall GPA, and grade in equine course. Equine career plans could be dichotomous with yes for those indicating equine or mixed animal and no for those responding for other categories or unsure, or categorically divided into levels. I decided not to ask for race as the numbers are too small to use due to the low percentage of non-white students and the low number of equine-focused students in U.S. public veterinary colleges. The horsemanship questions produced many possible variables to represent horsemanship experience. Three considered were (a) a self-assigned numerical score on a 100-point expertise visual analogue scale (Crichton, 2001) that can be used as a continuous variable, (b) a horse ownership dichotomous variable, and (c) length of horse experience in years, a ratio variable.

Table 3

Independent Variables Initially Defined for Quantitative Phase

Variable Name	How Measured	Psychometrics
Horsemanship Experience in Years (Maximum reported for any category)	Continuous	Novel
Horse Ownership (past or current)	Dichotomous	N/A
Horsemanship Experience Thermometer	Continuous (0-100 point scale)	Novel
Equine Career Interest Equine-only focus area = High; Focus area involving some equine, e.g. large animal, mixed, or companion animal with equine = Medium; Focus area not involving equine = None	Categorical	N/A
Internship/Residency Planned Y/N	Dichotomous	N/A
Achievement goal orientation (AGQ-R) on equine medicine course Mastery Approach ($\alpha = .84$), Mastery Avoidance ($\alpha = .92$) Performance Approach ($\alpha = .88$), Performance Avoidance ($\alpha = .94$)	Continuous (Mean score on each subscale)	Cronbach's alpha (Elliot & Murayama, 2008)
Knowledge-sharing self-efficacy (KSSE) 3 items adapted from Lin, Hung, & Chen, 2009	Likert-type* 1 (<i>strongly disagree</i>) to 7 (<i>strongly agree</i>)	Composite reliability, $\alpha = .91$
Gender (Female/Not Female)	Dichotomous	N/A
Years in veterinary education (1-5)	Ordinal	N/A
Age (18-26, 27-30, 31+) [Traditional (18-26) or Non-traditional (27+)]	Interval Dichotomous	N/A N/A
GPA Overall - Letter grades or other options.	Categorical	N/A
Grade in Equine Course	Categorical	N/A
Veterinary college quality (USNWR Score) from 1 (<i>marginal</i>) to 5 (<i>outstanding</i>); binned into quartiles, 4 being highest and 1 being lowest)	Interval	Not available.

Note. * These were transitioned to 6-point Likert-type scales for consistency in the survey.

*Procedures.**Reliability and validity.*

Content validation efforts began with member checking the questions and scenarios derived from the qualitative interviews with the interviewees. The questions on horsemanship expertise were reviewed and improved through suggestions from two non-veterinarian horsemanship experts (Appendix F). After refinement based on feedback from subject matter experts and review by two educational faculty members in the NCSU CVM, the survey was piloted tested by five veterinary residents (post-DVM trainees) with horsemanship experience representing diverse equine disciplines and different veterinary degree-granting institutions to ensure clarity of questions and instructions, effectiveness and reliability of the Web interface in Qualtrics, and accuracy of data captured.

Likert-type scales for responses on the valuing of the scenarios, and the presence of a scenario for each setting and valence facilitate comparisons. Open-ended questions provided the opportunity to understand the rankings assigned to the scenarios, but no participant provided these types of explanations. All data was checked for missing values and in most cases, the responses with missing values were dropped from the analyses of those questions. The number of respondents is listed for each of the questions since the data available per question varied slightly.

Description of protections.

The quantitative study was approved as exempt by the North Carolina State University Institutional Review Board Administration (Protocol #11715) on January 26, 2017. The study data collection was anonymous at the student level and confidential at the university level. The Health Insurance Portability and Accountability Act Privacy Rule considers Internet Protocol

(IP) addresses to be direct identifiers (U.S. DHHS, 2010). To preserve participant privacy, I set the option in Qualtrics to mask the IP address from the online surveys before I downloaded the data for analysis. The online survey used a separate, specific Qualtrics panel with embedded data for each school to allow me to distinguish between response rates at each school, regional coverage, and use the score assigned to the school from the U.S. News and World Report in 2015 as an independent variable. However, data are not presented by individual institution. The characteristics being captured by the survey in terms of prior experience might be sufficiently unique that if presented individually a student or instructor could be identified; therefore, prior experience is presented in the aggregate or generalized up from specifics supplied by the respondents. Responses to open-ended questions were redacted to remove identifying information, and extremely unique examples in the Other content areas were not listed. The use of slider bar design for numeric scoring the 0-100 and 0-10 scoring in Qualtrics was prohibited by the NCSU Administration as not disability-accessible and those item responses were changed to direct numerical entry.

The approved survey and recruitment messages appear as Appendix H. On February 18, 2017, the original request to disseminate the survey was emailed to each SCAVMA President. Eight presidents responded that they distributed the survey. Others did not respond but data began to appear from their institutions. One president responded that her university prohibited survey distribution to students unless cleared through the university process. That university was removed from the follow-up process. The two-week reminders were emailed March 12-13, 2017. The final reminder was emailed March 25 indicating that the survey would close on March 31. On April 2, the contact information for the 69% who entered the Amazon gift card drawing was downloaded and three random numbers were generated to identify the three students to receive

the gift cards. All the students responded to the message about preferred gift card distribution mechanism and received their emailed gift cards on April 4, 2017. As several surveys were still listed in process on April 2, the survey collection in Qualtrics was closed April 9, 2017.

Data analysis.

Procedures.

The student quantitative data from the closed-ended survey questions, the Likert-scale responses to the prior experience sharing scenarios, and the scores from the AGQ-R are first presented descriptively before being used as variables in an explanatory model (Figure 3, p. 86) to address the first research question for the quantitative phase about usefulness. All questions with continuous variables (willingness score, years of horsemanship experience, horsemanship experience score) and Likert-type scale responses were graphed to examine the distribution of responses. As participants responded to the same questions about each of three scenarios, there are repeated ratings or measures to be taken into consideration in the analysis (Gray, 2014). I used repeated measures ANOVA to test within-subjects for the dependent variable of interest, Usefulness Index score, using the scenario valence (classroom-negative, classroom positive, clinical rotation-positive) as the within-subjects factor. I performed correlations of the dependent variable scores for each of the scenarios, and for the Usefulness score across all three scenarios.

Multiple linear regression analyses are statistical techniques that may be applied to questions where a dependent, quantitative variable is studied in relationship to or as a function of any independent variables or factors of interest. Variables are combined in a model (Figure 3, p. 86) which is mathematically represented by an equation showing the values of the relationship between the independent variable components and the dependent variable, taking also into consideration relationships between independent variables (Cohen, Cohen, West, and Aiken,

2003). While Long et al. (2012) conducted one-way ANOVAs to investigate whether male and female students differed on the extent of prior experiences with vicarious learning and their positive or negative perceptions of vicarious learning, the number of variables under consideration and the possibility of interactions leads me to regression analyses to address the research questions about how personal, motivational and environmental factors explain students' perceptions of usefulness of prior horsemanship experience shared by others (Model 1) and willingness to share their own prior experiences (Model 2).

Gender, age category, and career goal were dummy coded (Alkharusi, 2012). For gender, female was dummy coded as 1 and male was coded as 0. For age, traditional age students were coded as 1 and those 27 or older were coded as 0 (not-traditional age) For equine career interest, I planned to code dichotomously any student working with horses as equine career interest and those not working with horses as no career interest. However, in the qualitative interviews the mixed animal-focus students seemed distinct from the completely equine-focused students, so I also coded the species focus area question as to whether they were focused on horses solely or whether horses would be some part of their practice—Equine Career-High (equine only focus), Equine Career-Medium (mixed animal, large animal, companion animal), and Equine Career-No (small animal only, food animal only, wildlife, etc.). I treated years in veterinary education as an interval variable. For the internship/residency goal, I recoded the variable so that no/unsure were 0 and yes/already applied were 1. For horsemanship experience, I used three variables, horse ownership dummy coded (zero for no history of horse ownership and one for history of horse ownership), the self-reported horsemanship experience score, and the maximum years of experience reported on any category of horse experience or participation.

Figure 3 below shows the model for Usefulness and Figure 4 shows the model for Receptivity to Sharing.

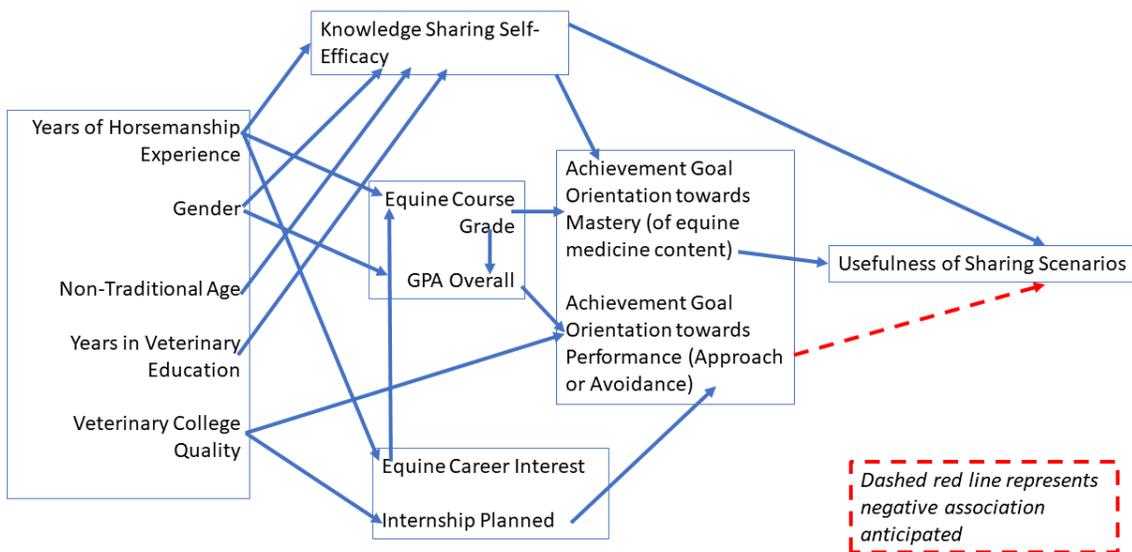


Figure 3. Model 1: Proposed Predictors of Usefulness.

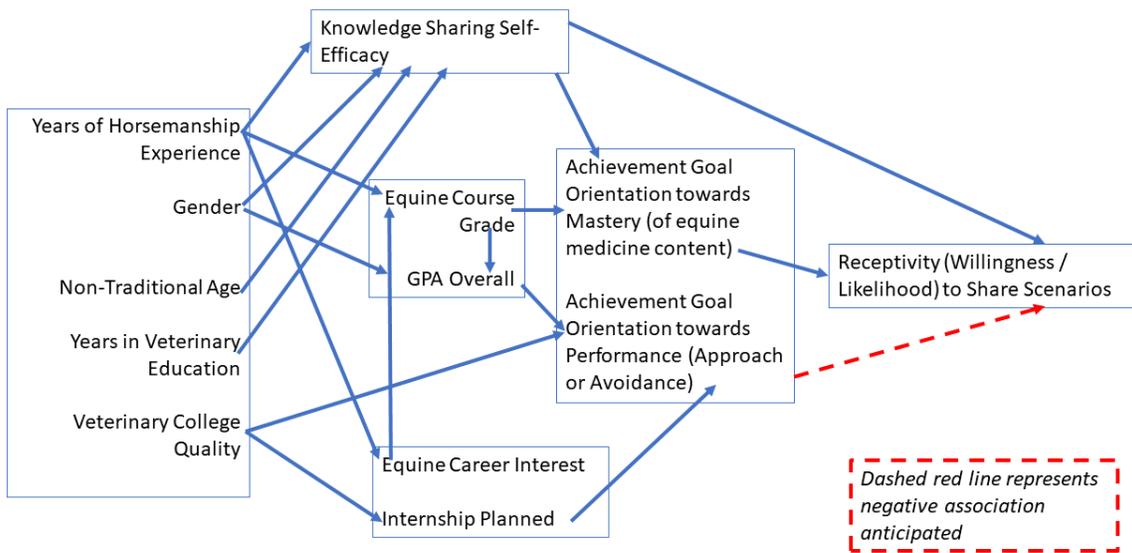


Figure 4. Model 2: Proposed Predictors of Receptivity to Sharing.

The relationship between the dependent variable and the independent variables could have been curvilinear rather than rectilinear, and so all data were plotted and visually inspected before choosing the appropriate analysis technique. This included cases of potential moderating variables, for example, sharing of experiences could have been very valuable for those with low experience and high career interest, but not at all valuable for students with low experience and low career interest or for those with high experience and high career interest if they feel that they would already know everything.

Beyond the quantitative research questions with vicarious learning represented by the Usefulness Index or the Receptivity to Sharing Index as the dependent variables, I am interested in the correlations and possible moderating or mediating interactions between independent variables such as the AGQ-R scores, KSSE scores, and additional factors to be analyzed as part of the multiple regression analysis. These individual and contextual factors such as plans to apply for internship/residency, area of veterinary career interest, novel items from the interviews, and USNWR scores as a measure of organizational quality were considered through correlation analysis and most were considered in the final models.

Reliability and validity.

The survey development has been described in the section on data collection. Test-retest reliability was not pursued. Where there are multiple questions that represent a construct, e.g. the three questions that comprise the Knowledge Sharing Self-Efficacy Scale, correlation data is provided and used to justify whether further analysis was warranted. As this is the first publication of the KSSE and the AGQ-R in a veterinary population, exploratory factor analysis (Fabrigar & Wegener, 2012) was performed on these standard measures. Since the items for the Usefulness Index are novel, and those for the Receptivity to Sharing Index are being used with

new scenarios in a new context, factor analysis and the reliability measure Cronbach's alpha are provided for those items using data from all students who answered those questions. The multiple regression analysis incorporates several of the fourteen quality checklist elements provided by Kelley and Maxwell (2010) including describing each of the variables in detail to convey how the model should be interpreted, justifying variable selection and sample sizes, and addressing assumptions underlying the analysis and resulting inferences.

The data shared by respondents who commented in open-ended questions was considered as part of the discussion of those questions and used to provide exemplars of the other types of activities they represented. However, the general comments provided by some survey participants were not analyzed thematically as they were not elicited to address any of the research questions nor were they sufficiently robust to warrant qualitative analysis (LaDonna, Taylor, & Lingard, 2017).

Possible interactions between predictors.

Several of the predictor variables in Models 1 and 2 such as horsemanship experience and equine career interest are likely to interact with other variables such as achievement goal orientation (AGO) towards mastery in an equine medicine course. Figure 5 (p. 89) presents a simplified view of possible relationships between predictors being studied within the student population which could be analyzed by techniques shown by Garcia, Schmitt, Branscombe, and Ellemers (2009) or an additional model with AGO as the dependent variable.

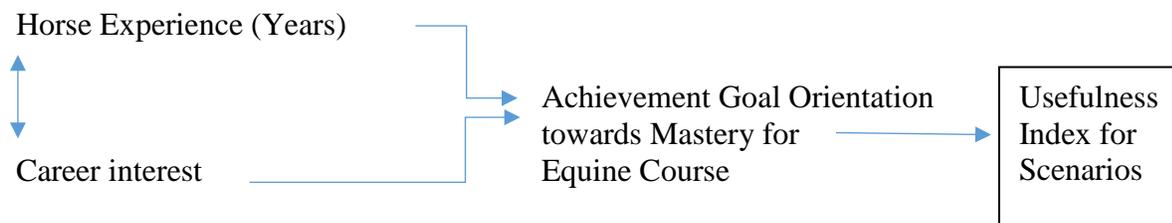


Figure 5. Possible Interactions among Predictors.

Analysis of Convergence and Divergence Across Students

The exploratory nature of the research and the diversity of program requirements and curricula demands capturing the broadest variety of student goals, interests, and attributions. All these factors were considered in seeking explanatory and predictor variables. Combining standard measures and open inquiry provided an opportunity to understand learning experiences valued by recent veterinary graduates as well as what motivates them now versus when they were students, and how they defined achievement.

To address the research question of how experiences and values that current veterinary students have with vicarious learning relate to those reported by recent graduates, those responses were compared. Thematic analysis on barriers and supports to students sharing experiences were compared, along with numerical data from survey questions. This synthesis of the data strengthens the findings by providing a richer base of data on agreements and on discrepancies to be explored further.

Data displays feature within-group themes and exemplar quotes and data tables from the survey responses. The scenarios are presented with associated responses. Data across years of DVM study provide a sense of differences over the length of the curriculum. For all questions,

the survey findings were considered in light of themes from the qualitative work and relevant exemplar quotes provided.

Limitations

Reisbig et al. (2007) expressed concern that surveys of veterinary students rarely reach his stated minimum adequate response rate of 50%. While a low response rate makes it difficult to generalize about veterinary students as a population from the results, we still learn a great deal from the responding participants. The results still provide valuable preliminary data on the segment of this population that was sufficiently introspective to participate in this type of survey research. Recruiting sufficient students at all levels for both stages represents a challenge, and those willing to participate in interviews may be more open to learning from others or more comfortable speaking out thereby under-representing the students who are more reluctant to share.

Eliciting stories of prior health learning that were or were not shared, or having students recall examples of vicarious learning, were challenging in the interview process. Having prepared exemplars was one strategy to prompt student recall. Since the scenarios designed for the quantitative phase of this study are novel and based on my personal experiences and those experiences shared by former students in the qualitative phase, it was possible they did not accurately represent situations experienced by other students. However, the scenarios were pre-tested with a subgroup of recent graduates to see if they sufficiently represented any sharing they may have experienced. Finally, without observations of classroom practice, I did not confirm students' reports of the classroom as encouraging or discouraging sharing of personal experiences.

Summary

This sequential exploratory mixed methods study of former and current veterinary students examines perceived usefulness of learning from others' prior experience and motivational and environmental factors that may influence learning in the veterinary education context. Horsemanship is the area of prior experience relevant to veterinary medicine measured through multiple experience measures. Students' perception of the usefulness of learning from experiences of others and receptivity to sharing their experiences are documented through student ratings of scenarios where horsemanship knowledge is shared by students in classroom and clinical contexts. Usefulness and Receptivity to Sharing Index scores are evaluated in two separate multiple regression models comprised of potential individual predictors such as achievement goal orientation, career interests, and extent of prior horsemanship experience, as well as academic environment factors such as presence or absence of perceived barriers or supports. Quantitative and qualitative comparison of findings suggest how the types of students who participated in this research might respond to an educational environment that facilitates the sharing of students' prior experience.

CHAPTER FOUR: RESULTS OF QUALITATIVE EXPLORATORY PHASE

This mixed method study consists of two phases, a qualitative exploratory phase and a quantitative phase. The results of the qualitative exploratory phase reported in this chapter comprise several components: pilot testing of the interview protocol with recent graduates including cognitive interviewing of the established achievement goal orientation measure (AGQ-R); qualitative interviews with recent graduates which also included cognitive interviewing of the AGQ-R and quantitative data collection for demographics and performance animal experience; and an external expert assessment of how recent graduates numerically scored their horsemanship expertise. The relationships between these diverse data sources are discussed. The results end with an explanation of how the findings from this phase were used to further develop the survey instrument for the quantitative phase involving currently-enrolled veterinary students.

Research Questions: Qualitative Phase

The two research questions for this phase were:

- 1) How do former public university DVM students perceive sharing their own prior experiences and learning from shared prior experiences of other students in the veterinary education context?*
- 2) What shared prior experiences, if any, did they find relevant to their learning or practice?*

Pilot Testing of the Interview Protocol

To refine the IRB-approved interview protocol (Appendix C) and narrow the time estimate for participants, I engaged three veterinarians pursuing advanced training in pilot testing in August 2016. The first [P1] was not large animal-focused and had graduated from a midwestern public veterinary college several years prior, the second [P2] was a graduate of the university being studied, was known to have extensive horsemanship experience, and was

practicing in a field involving performance animals, and the third [P3] had horsemanship experience and was a graduate of the program, but was not practicing in an area involving performance animals. One difference between the pilot population and the recent graduates being recruited for the qualitative phase was that all three pilot veterinarians had pursued or were pursuing an academic residency or advanced post-DVM degree.

Pilot testing included going through the entire interview protocol, sample scenario, and cognitive interviewing of the AGQ-R. The first interview was in-person, did not include the horsemanship questionnaire, and lasted 78 minutes. After that interview, the following changes were made to refine and shorten the protocol.

1. In part 2, Experiences, eliminate the section "Being a veterinary client" since this was covered in general prior experiences.
2. Reworded question prior to the scenario about "listening in" as a way of learning when not observing the activity as this had to be re-explained verbally.
3. Reworded question post scenario about similar experience as they focused on the clinical experience of wrapping too tight rather than the sharing of "at my barn" type experiences.
4. Revised wording to introduce cognitive interviewing section.
5. Changed AGQ-R item order to put all the Mastery Avoidance scale items earlier in case of survey fatigue. All now in first six, separated by one item from the other scales.
6. Dropped the question about overcommitting to extracurricular activity and the question of previous response to similar surveys because they were unrelated to research questions.

The revised version in-person pilot interview lasted 63 minutes [P2], and the pilot Skype interview [P3] lasted 53 minutes. As these two veterinarians had horsemanship experience, they

completed the horsemanship experience part of the demographic questionnaire independently after the interview.

Interviewee responses generally reinforced my expectations based on the literature. Respondents had shared their expertise with classmates and instructors in several veterinary education-specific contexts beyond the classroom and the clinic. Although participants reported challenges in recalling specifics of large animal medicine classroom environments, all recalled salient events and experiences which they or other students had shared that they felt were unusually interesting. Many of these were highly identifiable or not equine-specific, and therefore could not be used for the critical incident scenario development. Participants indicated that willingness or likelihood of sharing was much more an individual, personal characteristic rather than a result of the classroom environment. However, they also indicated they would have shared had instructors asked them to do so. P1 felt that veterinary education had changed a great deal since she earned the DVM and she had graduated from a different institution in an earlier time frame than the other pilot participants. Therefore, I did not analyze her experiences thematically with those provided by other participants. P2 and P3 met the qualitative main study inclusion criteria, so I included their responses in the thematic analysis of all interview participants.

Pilot cognitive interviewing.

Cognitive interviewing of the AGQ-R generated three types of data—text explanation of item interpretation, a numeric score for each item, and text justification for the chosen score. Item interpretation should have been similar across participants. The participants' own words about how they understood each of the AGQ-R items is presented in Table 4. As the AGQ-R is set in a particular course context, the equine medicine course, each of the interviewees referred

to the equine medicine context in responding (e.g. comparing equine course ratings with ratings in other courses of more or less interest). The AGQ-R literature led me to anticipate comprehension issues with the Mastery Avoidance items. Concerned about my potential bias towards over-recognition of problems with these items, I invited a doctoral student unfamiliar with the AGQ-R to independently analyze the transcripts for comprehension issues and we agreed on the comprehension issues listed in Table 4. Participants also compared items within subscales (e.g. #12 compared to #11, both Performance Avoidance items) and across subscales #2 (Mastery Avoidance) compared to #1 (Mastery Approach). Two of the three rephrased items to parallel wording used for items in another subscale, e.g. changing wording for #2 (Mastery Avoidance) to trying to learn as much as one possibly can which might be seen more as Mastery Approach language.

Table 4

Pilot Participants' Understanding of AGQ-R Items (N = 3)

AGQ-R Construct and Item Language	Comprehension Issues	Rephrasing, Comparisons (Cf.), and Other Observations	Understanding of Item in their own Words
Mastery- Approach 1. My aim is to completely master the material presented in this class.	P1-P3: None	P1-P3: None	<p>P1: How motivated you were to learn all information...probably not just whether you wanted to internalize all the information given but that you also wanted to be able to apply it later on when you got to clinics.</p> <p>P2: Expectations of wanting to understand the material or learn the material...even more as than learning it for the exam or understanding for out in practice.</p> <p>P3: It is asking how type A I am...how dialed in I am, and if I'm planning on squeezing everything possible out of it.</p>
Mastery-Avoidance 2. My aim is to avoid learning less than I possibly could.	<p>P1: That's an interesting wording ...it's hard when they're negatives.</p> <p>P2: This may just be a statement I have trouble understanding. Is that what that one means? It's the wording, it's</p>	<p>P1: Rephrase "I would want to learn as much as I possibly could."</p> <p>P2: Rephrase "Trying to still learn as much as you can?"</p>	<p>P1: To find out if your goal is just to get by with the minimum of what you could possibly do and still succeed.</p> <p>P2: Not making the effort to learn as much as possible.</p> <p>P3: I feel like it's asking the same thing almost because it's just asking it in the negative way.</p>

Table 4 (continued)

	<p>confusing. P3: Oh my God, this is complicated. It's one of those negative questions.</p>	P3: Cf. to #1	
<p>Performance- Approach 3. I am striving to do well compared to other students.</p>	P1-P3: None	P1-P3: None	<p>P1: How motivated you are compared to your other students. Whether you're competitive. How much you are actually trying to do well in school.</p> <p>P2: Trying to academically achieve similar to the other students and be academically successful.</p> <p>P3: Getting at competitive nature of people in a course and kind of the nature of a person who's going to go for an individual success versus a team effort.</p>
<p>Mastery- Avoidance 4. My goal is to avoid learning less than it is possible to learn.</p>	<p>P1: Oh no, it's another "avoid less" P2: It's confusing. P3: Again, it's like this question is asking things backwards, avoiding...not learning much...</p>	<p>P1: Rephrase "so your goal would be be to learn more than the minimum it's possible to learn." P2: Cf. with #2. Rephrase P3: Cf. with #2. Rephrase.</p>	<p>P1: If you're a person who's just trying to do the minimum to get by or whether you're actually in it to get the most out of the class or to understand things to do better later on. P2: Of trying to do as well as possible P3: So, it's kind of a way of saying again that you're trying to learn as much as you can in a class and not be apathetic in your learning.</p>

Table 4 (continued)

<p>Performance-Avoidance 5. My goal is to avoid performing poorly compared to others</p>	<p>P1: Another negatively worded question or statement. P2-P3: None</p>	<p>P1-P3: None</p>	<p>P1: To find out whether your goal is just to do a little bit better than everybody else or if you're striving to do the best that you can. Or maybe just related to self-esteem.</p> <p>P2: That mindset of not wanting to do worse than others in vet school.</p> <p>P3: Getting at the fact like is this person afraid that they're going to be the worst and they're just trying to not stand out as being the worst person in the class. They just want to blend in.</p>
<p>Mastery-Avoidance 6. I am striving to avoid an incomplete understanding of the course material.</p>	<p>P1-P2: None P3: ...using the word "incomplete" so I start thinking about completeness of understanding which is...</p>	<p>P1-P2: None P3: Rephrase</p>	<p>P1: Targeting again the people that are just there to learn enough, to memorize enough to get through the class or to get through questions during clinics, versus maybe the people that are going to end up actually being equine vets and will have to practice, and want to learn that stuff to apply to their own careers.</p> <p>P2: How much you did want to understand the material.</p> <p>P3: It's basically asking if someone's trying to understand the topics in that course and doing what they need to do to understand it.</p>

Table 4 (continued)

<p>Mastery- Approach 7. My goal is to learn as much as possible.</p>	P1-P3: None	<p>P1, P3: None P2: Cf. with #6 (antithesis)</p>	<p>P1: Whether you're there to learn or just memorize the facts. P2: I guess it makes me think of what some of the other questions have hinted about, but to learn as much material, to kind of master the exams, to understand, just beyond that understanding the material. P3: Getting at the heart of the dedication of trying to master the knowledge and take away as much as possible.</p>
<p>Performance- Approach 8. My aim is to perform well relative to other students.</p>	P1-P3: None	<p>P1: Cf. with #3 "more like in-class related." P2: Cf. unspecified P3: None</p>	<p>P1: Seems like it would be more clinically relevant, performing well. P2: Kind of like the others, performing well even amongst the equine students. P3: It's comparing yourself to other students. It's that competitive nature again, this question about looking good in comparison to other students.</p>
<p>Mastery- Approach 9. I am striving to understand the content of this course as thoroughly as possible.</p>	P1-P3: None	<p>P1: None P2: Cf. unspecified P3: Reiterates context of course material.</p>	<p>P1: Trying to memorize all the facts to get through a test versus those that are trying to understand what's being taught to them so that they can apply it later on. P2: It's kind of the same, to understand the content.</p>

Table 4 (continued)

<p>Performance- Approach 10. My goal is to perform better than the other students.</p>	<p>P1-P3: None</p>	<p>P1: None P2: Wording comes off a bit more, I don't want to say arrogant, but... P3: Cf. unspecified.</p>	<p>P3: Kind of understanding the material and mastering it so you can use it later on and understanding it as thoroughly as possible. Carrying that connotation of almost that type A personality coming through again, obsessively going through material.</p> <p>P1: More if you wanted to do better just to be better than the other people, or just trying to be better because you want to learn everything better than they did.</p> <p>P2: Make the highest exam grade in the class, when it says perform better.</p> <p>P3: That's an even more blatant way of putting you're going to be comparing yourself to other people and not being part of a team.</p>
<p>Performance- Avoidance 11. I am striving to avoid performing worse than others.</p>	<p>P1-P2: None P3: It's so weird. I really want to know what you're getting at with some of these questions.</p>	<p>P1: None P2: Cf. unspecified. P3: Cf. unspecified.</p>	<p>P1: Why you're there, and how competitive you are, and whether you're more concerned about comparing yourself to others versus whether you're concerned about how well you're actually learning the subject.</p> <p>P2: It's the same, but it's opposite, but definitely even though you may not want to be the best, you definitely don't want to be the worst.</p> <p>P3: It's again the opposite, the avoidance of poor performance which I feel like just carries that negative connotation. It's again a person avoiding trying to stand out and doing poorly compared to others.</p>

Table 4 (continued)

Performance-Avoidance 12. My aim is to avoid doing worse than other students.	P1-P3: None.	P1: None P2-P3: Cf. with #11.	<p>P1: Why you're trying to do how well you do in your class.</p> <p>P2: There's really nothing different, in hindsight, it's hard to say the idea of it versus doing it, but the idea of it is not to do worse.</p> <p>P3: Doing worse and performing worse. Those two carry pretty much the same meaning for me. What you do in a class is your performance in a class, so again the question is a comparison of the individual to how everyone else is doing in the class.</p>
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The second type of data was quantitative. Participants scored each item from one (*strongly disagree*) to five (*strongly agree*) and these responses were aggregated into the four constructs as shown in Table 5. Scores should vary among participants according to characteristics such as interest in the course, plans to use the material in the future, the need or desire for high grades or instructor recognition. For the two with equine experience, Table 5 includes their years of equine experience and their self-reported horsemanship experience score on the scale of zero (*no experience*) to 100 (*nationally expert*).

Table 5

Pilot Participants' AGQ-R Subscale Scores

Participants' Experience ($N = 3$)	Mastery Approach	Mastery Avoidance	Performance Approach	Performance Avoidance
No Equine Experience; No Equine Career [P1]	4.3	4.7	3.7	3.7
Equine Experience (22 years, self-reported horsemanship score: 50); Equine Career [P2]	5.0	4.0	4.3	4.7
Equine Experience; (15 years, self-reported horsemanship score: 31) No Equine Career [P3]	5.0	5.0	4.0	3.0

Participants with equine experience strongly agreed ($M = 5.0$) that they were motivated to master equine course material, but their Mastery Approach scores were only 0.7 of a point higher than the participant with no equine experience or career interest. This suggests that content mastery may be broadly important for veterinarians. Mastery Avoidance scores were problematic, as participants had difficulty understanding the items and often reframed them to Mastery Approach wording. Participants rated Mastery Approach higher as a motivating goal than both Performance Approach and Avoidance. Within participants there was little distinction between Performance Approach and Avoidance scores, but the subtleties can be appreciated from the interview comments.

The final element was participants' describing why they scored the item the way that they did, and how their experience, career interests, and approach to learning played into their responses. Explanations were often similar within items for the same construct, e.g. a similar

statement was made for all Performance Avoidance items, and participants occasionally referred to a previous response. Responses for each construct are grouped and presented thematically with representative quotes.

Mastery Approach

Getting the Most out of Everything

Trying to master everything regardless of topic was described as a trait by the two respondents interested in horses. All focused on lifelong learning, and two of three described themselves as type-A personalities. “Being the typical type-A person, I always wanted to do as best as I could in classes, but on the other hand with this being something not in my primary area of interest, it wouldn’t be the highest priority for me.” [P1] “I would like to master everything in the class. Even if that doesn’t happen, that’s still going to be my aim just to get the most out of everything and take the most I can with me.” [P3] “That’s my goal in life and it applies to every class that I’m in, including equine medicine.” [P3] “Probably a lot of people in vet school would strongly agree with [My goal is to learn as much as possible] considering that we’re committing to learning for an entire lifetime.” [P1]

Applying Equine Medicine in the Future

Each distinguished how equine medicine relates to their future work or goals. “To completely be the best equine clinician is not big on my list of goals” [P1] “As an equine student, I was very interested in learning all the aspects of the equine medicine class as much as I could to take that out as I branched out in vet school and beyond.” [P2] “Equine medicine is kind of the basis of a lot of what we do...you have to have an understanding of that to have any of the other specialties.” [P2] “For me, for equine medicine, that would be a 5, just because it applied so much to REDACTED medicine.” [P3]

Mastery Avoidance

While the explanations provided are relevant to understanding respondent motivation, participants often rephrased Mastery Avoidance items to mimic Mastery Approach items. Therefore, I did not categorize them as themes around avoidance. Students commented on what depth of knowledge they felt they could achieve: “Definitely I want to avoid learning less than it is possible to learn, although I question the statement of it being my goal, I don’t go in with it being my goal to avoid learning less than possible.” [P1] “I was never someone who was trying to memorize it or learn as much as absolutely possible, but I tried to learn as much as I could.” [P2] “I don’t want [my understanding] to be incomplete, but some of the intricacies definitely...more details are something I would not be concerned about not understanding.” [P3]

As with Mastery Approach, they emphasized the future utility of the information similar to the “Applying Equine Medicine in the Future” theme: “I would want to learn as much as I possible could, especially in relation to vet school, and vet school classes, it’s like your one opportunity to gets lots of information from the people who know most in their field.” [P1] “Not understanding horse material is something that I would avoid at all costs because I would want to know the information and understand it so that I could apply it in clinics.” [P3] “This course was something I was very interested in understanding the medicine behind it, since I was hopefully going to be taking it out into my actual vet school practice.” [P2]

Performance Approach

Standing Out by Doing Your Best

Veterinary students, especially those who want to do internships/residencies, can be competitive and want to stand out. “I definitely do want to do well compared to others...but, doing the best I can do is the most important thing.” [P1] “When I was trying to get into an

internship and trying to remain competitive, academic performance was definitely important. So, doing well from that standpoint, I guess it was more of a personal thing because you're not really competing with the other students, it's kind of more like dressage, you're always trying to do the best you can for yourself. But it is definitely a competitive environment when it comes to that in vet school about class rank and grades." [P2] "Amongst the equine students, I was definitely in a small group compared to the big group, but I wanted to perform well." [P2] "I am always going to have a competitive drive for myself, but it's more of a personal drive. I do want to play on the team, but I also want to do extremely well." [P3] "I am really striving to do very well and that by default forces me to want to perform better than other students because I want to stand out and do better and learn..." [P3]

Remaining a Team Player

Although the academic environment encourages comparisons, the two pilot interviewees who were recent graduates keenly felt the importance of being viewed as a team player. "Obviously I'm trying to push myself to do the best I can, and probably is going to be hopefully doing well compared to some others, but I'm not going to sacrifice being a team player for it." [P3] "I was just trying to do the best I could...I had classmates I felt like their goal was to be number one no matter what." [P2]

Performance Avoidance

Comparing Happens, But It Does Not Motivate

While no participant wanted to perform poorly, avoiding that was not viewed as motivating or a goal. They shifted their responses to doing their best, recognizing the expertise of their fellow students, and dealing with the academic environment that promulgates comparisons. "That's not my primary reason, but in general everybody wants to not perform

worse than everybody else.” [P1] “I understand that there are people who are going to do better than me.” [P1] “Obviously I don’t want to be worse than others, but I feel on the other hand the connotation to this question is not something I believe...” [P3] “That by default is a goal, no one wants to be worse than other students, but that’s just not how my mind presents the material. I fall more on the side of wanting to perform better than as opposed to avoiding doing worse than others.” [P3] “Even though it is a personal stance of trying to do as best as you can, you still get presented with averages and ranges of the class so there is definitely a goal to not be, at least, below average or within certain ranges.” [P2]

Summary of the pilot interview findings.

The pilot interviews functioned as rich sources of information on prior experience to inform the investigator for the formal interview phase. Cognitive interviewing provided insight into both participant understanding of the AGQ-R items and goal orientation towards an equine medicine course. Although the three pilot respondents struggled with comprehending the Mastery Avoidance items, these items were retained for the full qualitative phase to see if comprehension difficulties also occurred with the larger study population. Pilot responses to the sharing scenario in terms of Usefulness of the shared material and participant Receptivity to Sharing are included in the scenario scoring across all participants later in this chapter.

Qualitative Interview Phase with Recent Graduates

The revised protocol and consent forms for “Learning from Others’ Prior Experience in Veterinary Education: A Mixed Methods Study of Motivational and Environmental Influence (Phase 1: Qualitative),” IRB#: 6623 were approved by the NCSU IRB on August 26, 2016. The two research questions to be addressed in this phase were 1) *How do former public university DVM students perceive sharing their own prior experiences and learning from shared prior*

experiences of other students in the veterinary education context? and 2) *What shared prior experiences, if any, did they find relevant to their learning or practice?* These questions were addressed through narrative and thematic analysis of the interviews, as well as participant scores on the measures of Usefulness and Receptivity to Sharing that followed the sample scenario.

Participants.

Recruitment of participants began on September 21, 2016 with direct emails to thirteen veterinarians who graduated between 2012 and 2016 and were involved in some way with large animal or equine practice since graduation. Seven students responded and completed interviews, although two of these turned out to have minimal involvement with large animals prior to graduation and were considered negative case comparisons. Letters with the study information were mailed to the six non-respondents on December 3, 2016 and one responded to the follow up and was interviewed. An additional round of email recruitment for negative case comparisons to three students (one male and two female) from the same class years was sent December 4, 2016. One female student responded and was interviewed on December 23, 2016. Participant quotes are identified with a bracket around letters of their chosen pseudonym, e.g. [H] for Horses. Identifiers for the participants with limited equine experience are prefaced with [N-], e.g. [N-G].

The population interviewed included seven veterinarians who provided at least some equine veterinary care (five female and two male) and two female veterinarians primarily practicing small animal medicine. They averaged 2.4 years since graduation (range 1-4) and three of those providing equine care had completed a one-year post-DVM internship. All but one was age 35 or under which I classified as having been a traditional age student.

Evolution of the interview protocol.

Over the course of interviewing, two questions were added to the protocol. After the first interview, I added an open question at the end for participants to share anything they thought I should know that I had not already asked. As a probing question in the section about sharing experiences with faculty, I added a specific question about sharing with the student's faculty advisor after this was brought up both in an early interview, and our October 2016 CVM faculty meeting that advisor practices differed greatly.

Narratives of experience.

For privacy reasons, it is not possible to provide participant's individual narratives of how they came to their personal experience. There are few equine-focused graduates and often a single element of their personal histories, which are often known to their classmates or instructors, would uniquely identify them. Personal histories are aggregated in the thematic analysis and the performance animal experience quantitative measures. Recent graduates' recalled experiences in the classroom were sufficiently similar, so I synthesized their stories into a collective classroom experience narrative. Occasional differences are provided as alternative explanations to the collective narrative. Hands-on and clinical experience narratives were constructed separately for those with and without horse experience.

Classroom sharing narratives.

This narrative combines similar participant descriptions of what student participation and instructor elicitation looked like in the mandatory equine medicine course and other courses (see Appendix C, Classroom Environment section). The original intent was to provide separate narratives for horse-experienced and non-horse experienced participants, but the classroom narratives were so similar that they were pooled. The difference between the experienced and

non-experienced populations was in how they discussed the hands-on laboratories that accompanied the equine lecture course, so that is addressed separately after the combined narrative. Differences within the experienced group are explained as alternatives below. Narrative wording directly from participants is italicized. Analytic and summary comments are in regular text with explanations bracketed.

Classroom participation by interest area.

Participants offered one of two distinct views on student participation by interest area—some felt there was a large difference in participation because students were not interested in horses (1), and others felt there was still quite a bit of participation regardless of interest (2). They also introduced the idea that participation was a function of the class cohort. A class cohort is the group of 80-100 veterinary students who start and almost always finish the DVM program together, e.g. the Class of 2015. Class cohorts are often self-labeled or described by faculty and staff as having distinct personalities such as being easy-going or demanding.

1. *There wasn't much student participation because the majority of the class is small animal. You know there's not as many questions asked as there are in your small animal courses. Pretty sure that most of the people who were equine-related participated more. The other students were a little bit less....I'm not sure if they were lost by the concept or just didn't care as much. I don't feel like participation was very good because we only had I think 11 or 12 students in the whole class [of 80] that were even interested in horses either being solely equine or mixed-animal focused. I remember times that those students who weren't interested were a little disrespectful in class, honestly, to some of the instructors, so it was not good.*

2. *I remember the general feeling from my class being "oh it's about horses this doesn't matter to us" you know with the exception of about 20 who were really excited to finally discuss*

horses. But participation-wise, I feel like my classmates asked quite a few questions. There were a good many people who would ask questions a lot who were not horse people which I liked because I felt like they felt comfortable even in a classroom with a lot of horse people. It was a good balance of questions and discussion coming from horse people and non-horse people. With any class, there's certain number of students that you know are willing to speak up and talk in class, so that class was no different than any other class where the professor made a point, then one of them raised their hand and asked for more clarification.

Collective classroom experience in equine medicine.

This experience was very similar across participants and the collective narrative follows: That course was very much a didactic, listen kind of lecture. Definitely questions were allowed, but it was a lecture. There wasn't a whole lot of audience participation, just the typical question sort of thing as you're going along the way. I feel like we never had anyone raise their hand and ask any questions like "hey this happened to my horse, is this the same thing you are talking about" and kind of discuss. I just remember people asking for clarification about a statement that the professor had either on the screen or had made verbally. I don't remember instructors asking for student prior experiences or stories in this class. Some instructors would ask had anyone heard of this before, but there's so much material they have to cover in such a short amount of time. Those came out more in small animal versus large animal, I don't know why.

Interaction was always positive, questions gave them a way to break up their lecture a little bit because lectures can be a little monotonous. Whenever anybody asked questions, they were always willing to step out and answer those questions and I kind of feel like the professors liked it a lot because it gave them a way to maybe give a little bit more detail that they wouldn't have added otherwise. There were some stories shared, like questions that were asked about

where students had an experience and it would relate to the topic, and they would relate their message or their story in the form of a question for the instructor. I don't think I shared anything. Some classmates would volunteer their prior experience stories very readily. Some of us are not as outspoken as others.

Reception depends on if the student poses a question, more so than a "we did it this way..." or if it adds anything to the conversation. I can definitely think of people who are adding to it, or asking the question since we've seen all kinds of stuff coming into this with all kinds of experiences and you're wondering if what you learned at this other vet was acceptable. There's always that one person who's done it all and seen it all and wants to tell you it all. Unfortunately, it gets a negative connotation sometimes, and we probably should value the question, but I think it's just one of the emotions that you go through in a very fast-paced curriculum.

Instructors tended to respond well. They let them answer or give their piece of advice or their experience, or whatnot, and then go on from there, make a comment, go on, but the instructor didn't shut the people down or anything like that. The instructors listened to the story like you would a case and then, because they were mostly stories in the form of questions, they would take pieces of information from the story and answer the question as you would for any other case. Here is an example:

We were talking about the anatomy of the equine foot and a case was brought up about a horse at someone's boarding barn where the horse stepped on a nail just like how it was treated and you know, what happened with that particular horse. The instructor was good about going through that whole treatment and diagnostic protocol for that, just to reinforce like what she was leading up and making sure the whole class was following

what was happening with the conversation. And everybody seemed interested in the topic.

My sense was that it was beneficial, I think a lot of students would agree with that. If it's on topic then most people are receptive to it if it's an interesting addition. People would either choose to kind of not pay 100% attention to it or if they were really interested in it, they were receptive to it. Sometimes it was negative, sometimes it was positive, depending on the student. There were certain students that would ask really good questions and you know they wouldn't ask questions all the time, and whenever they would ask a question it was something like I was thinking that too, so you know that was a good question.

Then there are the few select students that have questions all the time and some students would think they were more a waste of time than anything, just because they were stopping the teacher from doing what they needed to do. But at the same time, I felt like they were adding to the experience rather than taking away. Sometimes people are like "that person is a know-it-all about the subject," but it might depend on how often they're interjecting their own personal experience. There have been times that people would ask a couple of questions based on that and keep interrupting based on that and sometimes other students are kind of like can we just move on. Even for those students, there were a few times when their specific case would be beneficial and cause the teacher to go into further detail.

Class cohort effects were mentioned, with it not being observed in one cohort versus being problematic in others. 1) *I didn't hear too much rumbling about questions asked in the class. I heard other classes rumble about how particular classmates would ask questions just to appear intelligent and then would take up time and they were frustrated with that, but I don't remember anybody in our class doing things like that and not enough to annoy me or anybody*

else around me. 2) You know you always have maybe that one student that always asks questions and maybe some students in the class are like maybe you ask too many questions and you could tell that when they raised their hand and the professor called on them, they would be like, uh, not another question. There were a couple students that did it frequently and I think the consensus was that a lot of classmates were annoyed by it because it was leading off-track from what we were discussing. I appreciated all the questions, but some of the other classmates pretty much any time they asked a question, whether it was a good question or not a good question, were like of like “ugh, why are they talking again.” You see that more with the repeat folks where it’s in their personality to share a lot. They ruined their chances so much that when they raised their hands, their classmates slouch down in their seats, sigh, or even roll their eyes.

Instructor behaviors.

Only one participant recalled instructors in the equine course asking if students had an example from prior experience to share. However, several recalled inquiries about familiarity with a procedure or condition in equine or small animal courses. Most recalled that instructors in discussion-based courses (e.g. Behavior, Ethics) asked for personal experiences. A few mentioned small group breakouts (Evidence-Based Practice and selectives) as a place where prior experience was shared. Most students reported only positive instructor reaction to student sharing, but one interviewee [SH] had two different observations based on timing and repetition.

- 1. The problem was we hadn’t quite gotten there yet with ancillary therapies, and so that was kind of brushed off. The student was acknowledged, that’s definitely an option and we’ll get to that, but it wasn’t the appropriate time was the problem with that. It wasn’t so much that is was out of sorts or put down, it was just premature.*

2. *With repetition, I think the instructors also get sick of people who share a lot when it's not supportive of what they're teaching, or when it's more like they're telling you what they know and not adding to the class or trying to help anybody else by saying it. So much that you could make the comment that it was almost dismissive, we've got to get on with this lecture, it's not leading us to a learning opportunity here.*

That participant also shared an observation in which the instructor asked a question to elicit prior experience that he then discounted: "I can think of Dr. X asking us if we had ever seen a [DISEASE REDACTED], and what we did. And I remember one student particularly mentioning the use of [DRUG REDACTED] and Dr. X is very much against the use of [drug] and so that just sticks out in my head, as one example of he posed the question and that anyone seeing this...how was it handled, and I think he was probing at that as a chance to say no." [SH] Based on this information, I modified the pathway in Figure 2 (p. 24) to add the instructor as the instigator of the sharing and further downstream possibilities of how learning happens through discredited prior knowledge (see Figure 6, p. 116). The participant referred to this example as demonstrating the "*ivory tower mentality*" where "something like [drug] is used by a lot of people maybe without some research, but still yet used, and it's absolutely kind of shunned, or just flat out no, never, ever...and really, we weren't presented with a good reason, research-based why that should never be used." [SH]. Another example I classified as the ivory tower mentality was described by a different student in another part of the interview: "I would have liked to discuss other ways to have done things, but it was kind of one of those things where you kind of felt like you probably shouldn't...because they had their way and knew stuff." [N-PR] A third interviewee's example was less ivory tower mentality and more not wanting to conflict with the teaching styles of others: "I did hold back in those situations because I didn't want to confuse

things that were being taught by the professors. A lot of times the way things are taught at school and the way they happen in real life aren't the same and I would say there definitely were more times in school that I did hold back and not share my experiences because I didn't want to confuse things if I didn't teach them exactly the way the textbook was going to teach." [H]

Hands-on experiential learning prior to clinics.

Interviewees discussed the hands-on components supplemental to the lecture course as well as the Teaching Animal Unit (TAU) and wet labs (hands-on learning opportunities by the instructors or the clubs), specifically to the question "Where else did you observe sharing outside of the classroom and the clinics?" Here is how one experienced student described the engagement in the TAU: "There aren't enough professors or assistants or whatever to go around for every student and so I liked to be placed in a group of the students who were the non-horse people, because I felt like I had a lot of experience that I could share with them...at one of the basic labs we had on haltering the horse and leading a horse, learning about their behavior and all, I was able to help with that, in explaining that to my group, versus them having to wait for somebody to come around to help them...I was not the only one by any means who had the horse experience, but they learned those of us who did and those who did not, they would come to us and want to be in our group because they knew they would get that real-life experience, stories and stuff from us." [H]

Experienced with horses.

I would say overall everybody was pretty open to learning. Of course, there were those select few who were like I've never touched a horse before and I don't care if I ever do and then of course there were some that oh I'm touching a horse now but I'll never touch one again. But I would say the majority were very open to learning and participating in class discussions and

This revised pathway shows interactions among three parties in the educational environment: the Student with the prior experience, the Instructor, and the potential Learner. Dotted line elements may or may not occur. Additions are in red. The bolded left-hand path represents an example shared by one of the interviewees.

Instructor Asks about Prior Experience

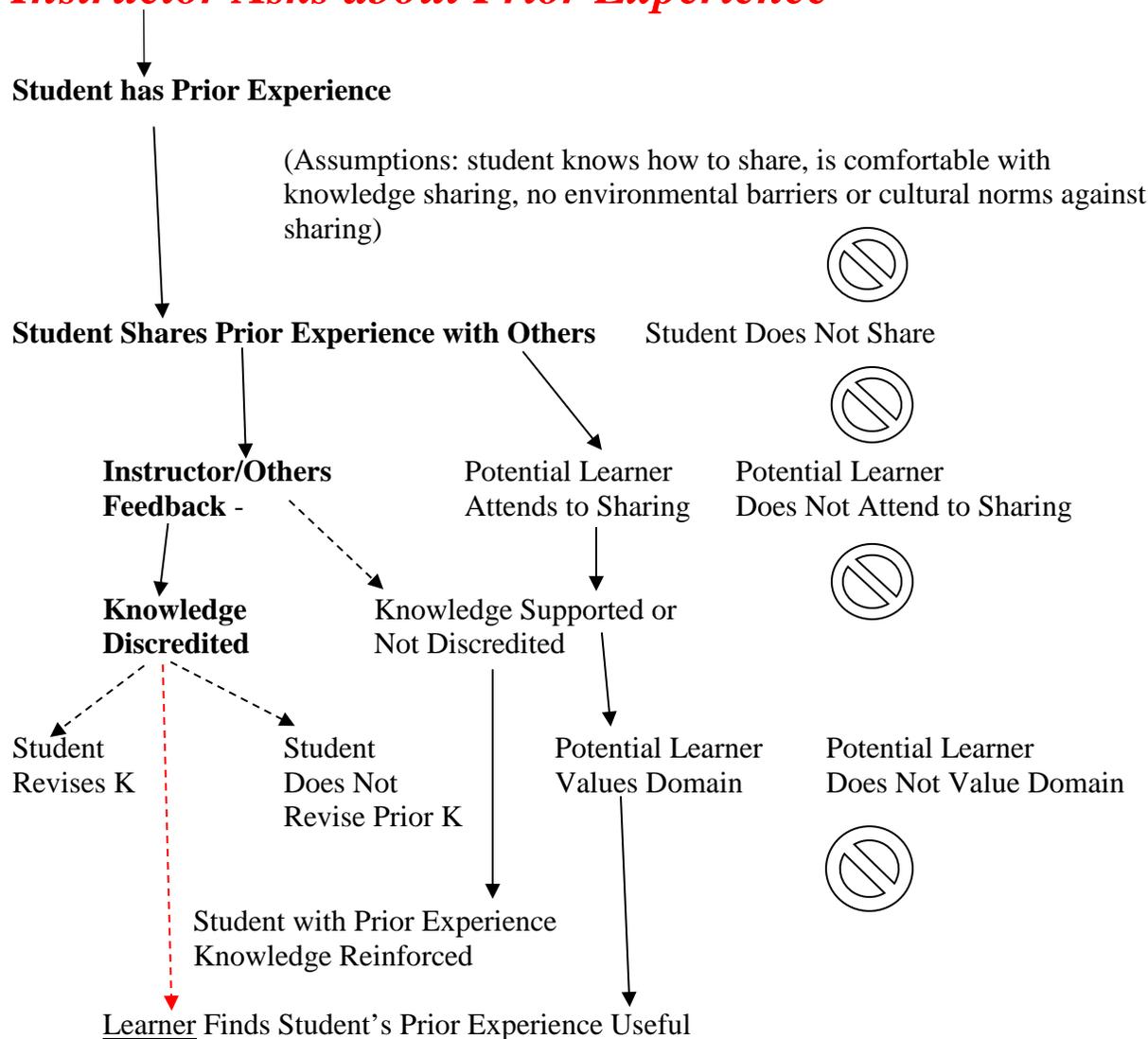


Figure 6. Revised Pathway Illustrating an Example of Elicited Experience.

asking questions and participating in the labs. Some of the hands-on, physical exam labs where we are working with animals, that is where people are sharing their handling experiences and how they would have done certain things. Many of those were welcomed and totally supported. It's not 100%, it's the context of what it is.

A lot of my classmates came into vet school being terrified of horses and I think they left feeling at least somewhat more comfortable around them to where if there was an emergency situation that a friend had a horse that they needed someone to see and there was nobody else around that they could at least manage the situation.

Not experienced with horses.

The "horse girls" were the ones with experience and if any of them brought stuff up in class I probably just kind of listened to it and didn't think a whole lot about it, because I didn't envision doing any horse work after school, but that was in the classroom. Like I said, I got a whole lot more out of the lab part of the class and the TAU. I don't remember any instructors asking prior experience questions in those classes except TAU when we were actually with the animals and they were asking us those types of questions. I learned more from them and classmates being like well this was my horse, this is how you hold a horse, and this is how you walk a horse, that kind of thing, so more the hands-on animal stuff. Classmates with horse experience were always very helpful with like if anybody wasn't comfortable holding a horse, they would be like "this is a good way to hold a horse and you know, this is a way to approach a horse and be comfortable around a horse" and kind of give some of their personal handling experience that most people in vet school do not have.

Clinical year large animal rotation narrative.

This narrative combines interviewees' descriptions of student participation and instructor elicitation in equine or large animal rotations (aka blocks) pursued during their fourth-year clinical training (see Appendix C, Clinic Environment section). Many equine-focused students did multiple equine rotations. Rotations reported on are equine medicine and equine emergency which are in-hospital, and equine primary care and ruminant medicine which are ambulatory care meaning that students traveled with the instructor(s) to other farms. Rotation experiences varied by the number of students on the rotation and the caseload. The number of students on a rotation increased over time as the class sizes in the veterinary college increased from 80 to 100 and with the addition of island students who were required to take a large animal rotation. Island students [aka offshores] are fourth-year students from the Caribbean veterinary colleges—Ross, St. George, St. Matthews—who do clinical rotations at U.S. veterinary colleges. Island students rotate on equine service, and generally the equine medicine, emergency or surgery blocks at a participating university with few large animal-focused students may have more island students than their own students in a block. Small animal-focused students did not have to do a large animal rotation, although at least one of the non-equine participants interviewed did so.

Caseload also impacted participation as some reported a very low caseload and therefore more time in rounds, while others reported so many cases that there was no time to discuss anything outside of the cases. On equine emergency: *That rotation ended up being so busy I feel like mine didn't flow the way most of them do. We didn't have the time to sit and really discuss things outside of just the cases that we had coming in because we had so many cases.* There was also crossover between rotations: *We were both on call a lot, but we both really participated in our maximum to learn all that we could during that rotation, and if there were any days that*

there was downtime, if the farm animal rotation had anything interesting going on, we would go over and observe or participate while waiting for equine emergencies.

Horse-experienced collective clinical year rotation narrative.

When you have other large-animal oriented students on the block, it seems to go a whole lot better. I think that's because everyone has a good background and foundation and is capable of doing all of the things that we're supposed to be able to do and you can help each other out. You're kind of bonded in the fact that you all have equine experience, and are comfortable, you know accustomed to working with the owners, and I think the technician staff and the doctors, as well, everybody kind of knew that and so their job was a little bit easier, not having to watch where we were standing or not going, and dictate every move because we weren't a liability quite as much.

During orientation when you started on any of the large animal rotations, you introduce yourself and you're asked what your level of horsemanship is or what your background and what your experience level was or if you are comfortable around horses, things like that so the clinicians and the technicians know how to assist you with anything. I think the instructors would do that, as I do now when students come to see me, so that they can get an idea of how much they can trust you and how well you know the animals and your skill level. This happened on the horse and food animal side, more than anything I think to gauge on a safety level, but also to figure out what basic skills needed to be taught. They might ask if we have experience with the flexion test, if we've done the flexion test before, which I guess isn't as much prior horse experience as prior veterinary experience prior to vet school. This is different from the small animal rotations which do not ask about your previous experience. But really on all of them, you felt that the professors want to know your background and your experience.

Participation was certainly more so than a lecture setting. Instructors had a good idea of who they were talking to, you didn't have a majority of the class who didn't give squat about a horse, so I think it was much more engaging. They definitely cared about what you'd done, where you'd been, and calling on those experiences. Most people participated fairly well. Some of the students that were small animal, like some of the island students, probably participated a little bit less because they either didn't have the background or... The clinical setting for sure, was much more receptive of that. The instructors have more opportunity to engage, because they have time. They're not constricted to a fifty-minute time slot, so they want to hear what you have to say about what you've seen and how it applies to your case. But I feel like it's much more receptive again, in a clinical setting like that, because honestly, that's when it really matters, is how I looked at it. They might pay more attention to what student gets assigned to a particular case, particularly those with aggressive or difficult to handle horses. I had really good interactions with all the faculty and the interns that we worked with. I feel like they were helpful, but they were also...they also pushed me to look up some things to really know everything I could about something before coming to rounds.

Every week we had rounds, group rounds with the other services, and that is when we would have all the students who were on equine rotations come together and the participation in that was great. We each had to pick a case to discuss during rounds, to present to other services. Everyone had to talk about their own patients, but I think sometimes the equine students, that were more interested in the cases would elaborate a little bit more, like ask questions about the other people's cases, and sometimes, and it depends on the student too, because sometimes you would get students who were totally small animal who were just really good at what they do and they will be interested in whatever we are doing. I might have asked

questions about the other students' cases on the other services. Rounds were very directed towards the cases so we didn't talk a whole lot about everything during that.

For the most part, it would come up during discussions on rounds and sharing experiences usually led to a question of why did this happen or what might be going on with a patient, or situation. And they never shot down those questions or comments. A very specific example of sharing handling experience outside of rounds: Trying to get horses into the trailer we would have people try to help or share other experiences they had with getting horses into the trailer and we've definitely had horses reluctant to leave the vet school. In general, anyone's receptive of any different type of suggestion at that point.

The learning at that point was getting these ideas and getting a base of experience so that we might not have witnessed something but to say this happened one time and here's what happened with this horse or cow. That was a point when I was sharing some of my experiences and hey, I remember I had a horse that did this and can we treat this one the same way. Definitely my experiences were considered, and my horse experience, I believe, was appreciated because we were so busy. When students shared, instructors were mostly positive, they'll say "that's a great example, or well, this sounds a little bit different" or maybe "possibly" or they weren't bothered by it. I think that the professors try to elicit more student participation in general during fourth-year rotations rather than lectures because I think the lecturers...it would be good if we had more student participation, probably, but a lot of times in lecture-type classes it's a lot more of a lecture and less student participation.

Students appeared to be fine with those experiences too and have positive reactions to people sharing. The sharing patterns seen in the classroom arose on clinics to a lesser extent. Fellow students were mostly also positive. I like to hear other people's experiences so that I can

learn from them as well. Most people, I thought, enjoyed hearing stories too. I can think of learning from other people on blocks when you are having to do things. It's a different dynamic. There are times, again, it seems to be the personalities of people who do this all the time, that all they do is tell you about what they've done, and that's probably the exception. There were a few times when students wanted to share their experiences just to build themselves up and to brag. The other students would not respond as positively in those situations because they had a hard time taking them seriously because you knew they were just trying to impress the professors. But that again was only a couple of times that that happened, for the most part it was pretty positive interactions among the students sharing. Sometimes if students are bored or if they don't want to be listening to rounds and they want rounds to go faster, if they're not as interested, they'll sometimes, they may "why are you talking more, we want this to be over with...." But usually not, most people are pretty receptive.

Whether or not sharing went well was more of a learning aptitude issue in one participant's view: *The student I was with for soft tissue surgery wanted to do small animal and so she wasn't as interested in experience equine-wise, but we ended up working really well together because she took any advice I gave her on safe ways of moving around horses and then we worked together on a lot of stuff and shared well. That can be an individual person thing too, but both of those ended up, the other emergency rotation student I was on with, she was interested in doing some large animal work and so she was pretty involved.*

Instructor behaviors.

Instructor behaviors were generally viewed positively, both for faculty and interns/residents (post-DVM clinicians who were completing 1-3-year specialty training programs who have significant instructional interactions with students). However, one negative

example of a resident was recalled: *I would say that in my [REDACTED] rotation specifically, one of the residents was not very welcoming to student ideas and sharing of their experiences, but that was very unusual because all of my other rotations had not been that way at all. But definitely on that rotation, but that was not one of the professors, it was one of the residents and it made it a little awkward and I wasn't the only one who felt that way on that rotation. It made me a little nervous to share past experiences because this person didn't really seem to want to hear about what you had to say or what you thought. It was basically we'll do it the way I do it or we won't do it at all kind of thing.* Another reason a student with extensive experience chose not to share was because she did not want to constrain her learning opportunities: "I would try to lay low sometimes because I didn't want them to feel like I was being a know-it-all, like I already know how to do that so you don't need to teach me that and so I just wanted to go in open-minded and open to learn new things, and I think sometimes that helps you to not let on in some situations so that you could just get the most out of the learning opportunities." [H]

Non-horse-experienced collective clinical year narrative.

Two students did primary care rotations in either equine or ruminant while the other did large animal medicine.

That one was very hands-on, we didn't have an intern or resident, it was just a bunch of fourth-year students and a professor, so we got to do everything. For the most part, it was all hands-on experience and talking about the case while learning as we went. There was a thing on the first day where we went around and talked about who had experience so that we could all benefit from each other and the person that had the most experience wasn't operating the head gate all the time. We do go through and discuss what type of experience we have with cattle and goat-wise, and what we wanted to know more about to get skills to be efficient running cattle

through and work them as quickly as possible while being safe. We would all load up on one of the 15 passenger vans and on the way there we may talk about what we are going to do and that might have prompted some stories from what people had seen in the past, and that was probably instructor-driven so not voluntarily like they just offered up something.

We had probably one or two people who had horses of their own and I learned quite a bit from them again on handling, holding, just being around a horse, being on a horse farm, kind of some techniques of teeth floating from people who had done it more than I had, and so that one was really good. I kind of knew before the rotation just from being in school with them for four years and knowing they had horses or cattle or goats and then you know kind of being like oh, you know when I'm with my horse you know saying things like that. I think professors can tell, well especially the equine ones, they can tell pretty quickly who's been around horses and who has not. I don't think I can think of one time in entire vet school that anybody was ever like "hey, who in here has a dog or cat, or who here is from a farm, or who here has horses" I think you pick up on that as you have discussions and conversations and you know, we go through school then and the professors see us go through school too.

I guess instructors took student sharing as a learning experience. I never saw any of the instructors, you know, scoff at it or think it was a bad idea. I can remember a few cases where students would share information and it led to a more detailed discussion with a larger portion of the group than just one-on-one. I would say very receptive and it definitely kind of helps again in those small groups so conversation keeps flowing and discussion going and really, I think it brings a lot of value to kind of learning, just seeing what other people have done and their specific experiences cause like otherwise you're just learning from a book, and there's only so much you can get from a book.

Most of the time, the students were willing to listen, just depending on the rotation. I mean I think for the most part we were in the mode to listen to the previous case circumstance to be beneficial to them. The smaller the group and the more focused it was on the specific subject, the better things are received. So, me on the preventive care equine block, there's a reason I'm taking it and I want to get a little bit of horse experience just in case I do horse work so I was much more receptive to stuff in that block than I would have been in the equine classroom when I was like, hmm, I don't think I'll ever do equine work. So, I would say the smaller the group, the more receptive everybody would be to other students sharing experiences.

For the non-horse experienced who took the equine medicine rotation, her experience was unique: *Equine medicine was my first large animal rotation and it was pretty early on when I had it, so I told them "hey, I don't really have much experience, so horses freak me out sometimes..." and they helped me a little bit more with that since I had this nervous behavior around horses. On that rotation, I had one classmate who was really big into horses, so I looked to her for guidance on how to do different things, and give me some more general information. If I had a case, and I was having a bit of a struggle with it, she would definitely step up and help me because she was helping everybody because she just really loved horses so any case that we had, she was involved in all of them and that helped me with my confidence. The other student that was on the rotation had experience with horses, but they were a little bit like me, not as confident with horses, and the experienced classmate was our person to look up to and that helped us out and when we would have rounds in the morning, she would always ask questions and contribute to the discussion which was really good, because that helped me understand my case a little bit more as well.*

We had to present our own cases. I wasn't big into stepping out and like putting myself out there in the open, but occasionally I would step up and ask a question on their case to learn more information because every case was different, so maybe their case would help me out later if I had another horse come in with the same condition. So, it was mostly talk about my case and occasionally ask a question about their cases too.

She [the experienced student] would use her prior experience to discuss the case or she would help us with our case, because she was like "oh yeah, I've seen a horse like this before and maybe you kind of want to think about this," so she freely gave her prior experience which maybe that's why the professors didn't ask so often because she was just freely giving it, which was great. They liked it a lot because they could tell that more or non-experienced classmates really appreciated the information. You could tell that the professors got even more engaged with those students because of their experience, so it was positive in that sense. I never heard the professors talking behind the students that they didn't like it. I feel that all of them enjoyed all the experiences from the experienced classmates. You know they appreciated their stories and everything they told them.

It was more of my classmates, I was having more open with them about my hesitation around horses and they would help me out, not as much as the professors because I wasn't as free with that information as I was with them. And one of my classmates, he was excellent with horses, that's what he wanted to do, so he was always in the barn because he always had equine rotations so if I needed something then I knew I could go to him, and if my horse was misbehaving, he would give me some tips on how to handle the horse.

Interview thematic analysis.

This analysis includes the nine participants for the qualitative study and the two pilot participants who met the qualitative study inclusion criteria. Basic interpretive analysis of the interviews involved multiple serial readings of the transcripts with tagging and labelling during which a spreadsheet of 85 tags were identified as an initial working codebook. The transcripts were then brought into NVivo (version 11) and parallel coded for each of the tags to see how the content associated with the tags was presented and interrelated. Through this process, a set of eighteen themes were refined with descriptions and then grouped into three overarching themes (Table 6). Four areas of the interview are purposefully excluded from this thematic analysis— (a) classroom and (b) clinical experiences already covered in the narrative analysis, (c) cognitive interviews on achievement goal orientation which appear later in this chapter, and (d) definitions of horsemanship provided by the participants. In consultation with my co-chair, I have set aside the horsemanship definitions and did not analyze them as part of this study.

The thematic analysis coalesced into three connected themes which each had 5-7 subthemes. The first examines veterinary student/veterinarian experience with performance animals looking at what it means to be a person who has horse experience at various levels and how that evolves from pre-veterinary life to clinical practice. The second theme focuses on sharing one's experience with horses in a variety of settings, what motivates that sharing and how it is perceived. This theme provides examples beyond what was covered in the narrative analyses of the classroom and clinical settings. The final theme addresses how those with and without horse experience learn more during and after their veterinary training.

Table 6

Thematic Analysis: Themes and Subthemes

Theme 1: Examining prior experience with performance animals

- Being horse people
- Backyard versus high-performance horses
- Knowing the lingo
- Pretending to know
- Clients care about horsemanship experience
- Understanding performance expectations matters

Theme 2: Sharing one's horse experience during veterinary education

- Expectations from being equine-career focused
- Attitudes toward questioning and sharing
- Deciding to share
- Holding back from sharing
- Sharing tacit knowledge in hands-on labs
- Starting on clinical rotations
- Trying to be safe working with large animals

Theme 3: Leveraging horse experience to learn during and beyond veterinary education

- Prior experience facilitates advanced content acquisition
 - Learning outside of required classes
 - Content learned through conversations
 - Vicarious learning on clinical rotations
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Examining prior experience with performance animals.

Interviewees spoke of their early experiences with horses or showing ruminants, such as being a child in 4-H, living on a farm, or showing a dairy cow in an animal science course. As ruminant showing experience was limited, and no one reported having working or show dogs, the focus on performance animals represents primarily horses.

Being horse people.

Identity as a horse person was common for those with horse experience regardless of whether they planned to work in equine medicine. Respondents who did not plan equine careers also labeled others as “horse people” or “horse girls.”

I feel like for whatever good or bad connotation that might carry, I think there is a certain understanding that comes from having been in the horse world and how important a horse is to someone. In communicating with a client, it’s kind of that ability to understand where that client is with their horse and kind of what their goals are for that horse. [P3]

You’re kind of like bonded in the fact that you all have equine experience [SH]

Things I kind of draw from are things I’ve learned from other people that I consider horse people that you know, either own a horse or grew up around horses and you know, showed them and have a whole lot more experience than I do. [N-W]

Backyard versus high-performance horses.

Interviewees almost all made the distinction between having or working with “backyard” horses compared to high-performance horses. Experiences ranged from occasionally petting “pasture ornaments” that were rarely handled to managing a barn full of performance horses in a specific discipline. Horse people also spoke of discipline or breed-specific tribes.

Several of my classmates who had shown in bigger shows, high-dollar horses and big time traveling around the country-type things and showing...those classmates who were showing at higher levels and more competitive and all also experienced more injuries, lamenesses in their horses. I know there were several times they would share about injuries they had dealt with, working with their veterinarian, getting their horse through and we would share those things with each other as the horse people, but also with the rest of our classmates too. [H]

And then some people use their backyard horses for trail riding and pleasure riding so kind of understanding general knowledge of riding a horse and how to care for them and things to look for like simple things on should I call the vet, do I not need to call the vet, so kind of more like husbandry, simple care, and I see that more as a pet, like I see my dog and cat as a pet, I see those horses as a pet. Whereas the true performance horses, I see them in a different light. [N-W]

Knowing the lingo.

Part of being identified as a horse person was knowing the terminology. There were distinct levels of discipline-specific language among horse-focused students.

It helps to understand the language of the discipline. It also gives you a little bit more credibility with the clients, if you understand what they are, the different terms that they're using. [S]

Being able to talk to them and understand the lingo, if you will, of the horse world helps tremendously. Even just somebody calling in and asking for something sometimes they use terms that the average person's never heard of if you're not a horse person, so it has definitely come into play with that. [H]

Pretending to know.

Veterinarians with varying levels of experience hide that they do not recognize all of the terms that their fellow students or their clients are using.

I don't let them [other students] know that I don't know because pride is a problem in humans [C]

I go to the big barns and they use terms that I'm not familiar with sometimes...I agree with it, I go along with it in the barn, but after that I go look up and see exactly what they were talking about. [N-G]

Clients care about horsemanship experience.

Clients commonly ask the veterinarian treating their horse whether they ride or own horses; this experience was shared by veterinarians who viewed themselves as horse people and those who did not. All the horse-experienced respondents still working in equine practice had been complemented by clients on their horse handling skills.

I did have someone say, who asked if I rode, and I mentioned that I had done [SPORT REDACTED]. They said they liked that I had ridden...that some of the other vets they didn't think rode and they weren't as comfortable with those that didn't ride. [S]

Every time I have a client when I'm working with their horses, they are asking me, "how many horses do you have..." um, like none. They always kind of look at me funny..." [N-G]

Clients for the most part want to know your experiences and the more you have, the more they'll draw from your experiences because you can provide firsthand experience that other people can't. [N-W]

Understanding performance expectations matters.

From pre-purchase examinations to end-of-career decision making, respondents reported that eliciting and understanding performance expectations is critical for discussing prognosis.

On a lot of the pre-purchase exams or lameness exams, having that experience of different people's expectations, and then when you see potentially certain conditions that can be managed in a particular discipline or legally in a discipline, that definitely comes a part, so there's some injuries that knowing what they do can potentially be very workable or potentially career ending. [P2]

We weren't doing high level of you know, showing and all, but...definitely it is helpful to know that your veterinarian understands the different levels of performance. [H]

Sharing one's horse experience during veterinary education.

This second category focuses on sharing one's experience with horses in a variety of settings, what motivates that sharing and how it is perceived. It provides examples beyond what was covered in the narrative analyses of the classroom and clinical settings.

Expectations from being equine-career focused.

The interest in sharing or attending to shared information was perceived by respondents to be associated with either career intent or being, or not being, a “horse person.” However, two of the respondents who did not value equine information during veterinary school ended up in large animal or mixed animal practices where they occasionally treat horses.

Equine medicine is notoriously a difficult class in veterinary school and quite frankly there is a subset of people who are interested in becoming equine practitioners and then there is a larger group of people who want to do small animal and do not carry horse experience and do not plan on treating horses. So their interest in topics, especially like equine lameness is minimal. [P3]

Probably would depend on the class and if you’re really interested in the subject or not. If you were really interested in the subject and someone brought something up, you know, I’m sure those group of people were very receptive and if you were in the class and you were not super focused on that specific subject and someone brought something up you might think it’s more like okay whatever kind of thing. Not, I can’t think of anytime where people were like didn’t want someone bringing something up at all, but you know people would either choose to kind of not pay 100% attention to it or if they were really interested in it, they were receptive to it. [N-W]

I guess we did learn a bit of that in anatomy, but people who weren’t horse people probably didn’t pay attention to it. Or if they did, they forgot it. [S]

You would get students who were totally small animal, small animal type students who were just really good at what they do and they will be interested in whatever we are doing. [S]

Attitude towards questioning and sharing.

Respondents were less willing to share in classroom-type settings than in hands-on or small group settings. Sharing via asking questions with a case component was more acceptable regardless of group size. These concepts are explored more in the subthemes of deciding to share or holding back.

That was one of my favorite parts about vet school was being able to share my experiences to help my classmates. [H]

I personally just said I never shared stories because I was just very shy and timid. I didn't mind if other people did. [P2]

I like to listen to people more than share, because that's just a personal thing. [SH]

People asking questions, it seems like it was about 50-50 horse people and not-horse people. [M]

It's always good to get those first-hand responses even if it's not your first-hand experiences to then take as you move forward. Sometimes they can be very powerful. [P2]

Deciding to share.

The information shared depended on the setting with most sharing stories that taught a lesson or sharing in social connection settings. Negative or horror stories were more salient for a few of the responders.

I always felt like the most productive type of sharing experiences...brought in a personal of when it is done wrong, what it can do and the outcome, and lead to how to do it correctly. I always felt like those were very appropriate personal shares and experiences and almost drove why it's so important home. At least with me, and hopefully with the other students. [P2]

I'm sure I have, definitely I would have in passing, you think about some of the great horses that you were around, or that taught you a good life lesson, definitely would share those. [SH]

Holding back from sharing.

Fear of being perceived as a "know-it-all" and time constraints were primary reasons for holding back, especially when they had seen how other students were viewed who shared too much. A few mentioned the ivory tower mentality already discussed in the narrative analysis, and one person pretended not to know so as not miss out on seeing other ways of doing things. Emotional aspects such as euthanasia of beloved animals also held people back.

I think it was looked down upon, or just the general feeling from many in the classroom was just this is a know-it-all who was not really posing a question but just sharing everything that they've done, kind of that sort of thing. And it had a negative connotation to it. [SH]

I would try to lay low sometimes because I didn't want them to feel like I was being a know-it-all, like I already know how to do that so you don't need to teach me that and so I just wanted to go in open-minded and open to learn new things, and I think sometimes that helps you to not let on in some situations so that you could just get the most out of the learning opportunities. [H]

Sharing tacit knowledge in hands-on labs.

Respondents found it easier and even enjoyable to share their experience with classmates through hands-on demonstration in small group "laboratory" settings with the teaching animals or "wet labs" such as bandaging on leg models.

During third year we had an equine-specific TAU...that's where I shared most of my experiences. Equine TAU, because I was often paired up, my group a lot of times was with people who didn't have a lot of horse experience and so we were like this is how to pick up the horse's leg. You know you need to run your hand down their leg and lean into them and this is how you pick up the foot, how you use the hoof testers, so I think that because that was hands-on, that's where people were more likely to share their previous experiences as opposed to lecture. [S]

I wanted extra practice with it and to see if other people had other ideas, but I had bandaged a lot of horse legs over the years, so I paired up with a classmate who had not and we worked together and we both learned some new things and I was able to teach her and we got a lot accomplished. We felt like we both really learned a lot because we were able to work together, and I had some prior experience of doing things like that. [H]

Starting on clinical rotations.

Instructors asking about students' prior experience with horses at the beginning of clinical rotations was commonly experienced by interviewees that took a large animal rotation.

At the beginning of both equine rotations, the faculty members in charge would ask about our horse experience to gauge our level of comfort in handling horses, being around them, and our level of comfort with different procedures... on the food animal side also just asked us our experience, asked us specifically what was our experience working with

beef cattle or sheep or goats. More than anything, I think, to gauge on a safety level, but also to just figure out what basic skills needed to be taught. [M]

I don't think they ask specific things about what your experience was, but at least at the beginning they want to know who has experience working with horses, if anyone's afraid of horses, things like that. [S]

They kind of asked us you know how comfortable were we with horses and I freely told them that I wasn't.... [N-PR]

Trying to be safe working with large animals.

Respondents connected asking about experience at the beginning of the rotation with the theme of safety. Working with more dangerous and unpredictable horses was expanded content learned during veterinary school. They mentioned risk and safety also in practice, especially in advising clients how to handle their horses safely during veterinary visits and in hiring technicians with horse handling experience.

[the mare] was very aggressive. So that would allow them [the instructors] to have the confidence in me to be able to treat that mare because she was awful...So that made them more comfortable when working with me working with the horse because I would have to do treatments [O]

The horses I was around growing up were all very safe, they were...had good manners, they were used for REDACTED, 4-H, so it was once I got into vet school and started being around some other, more excitable horses that I started learning some of the techniques to handle more aggressive or horses that are maybe a little more unpredictable. But I feel like the foundation was built with the ones I grew up with. [M]

Working with horses there are a lot of risks that you take, no matter how experienced you are so I think if personnel can come in having that experience, it makes the whole environment a lot safer [H]

Leveraging horsemanship experience to learn during and beyond veterinary education.

The final category addresses how those with and without horse experience learn more during and after their veterinary training.

Prior experience facilitates advanced content acquisition.

This became more apparent in hands-on laboratories where respondents recalled helping coach less experienced classmates, as well as on clinics where they were often assigned more challenging cases once instructors learned of their familiarity.

That has been huge for me because I can focus more on the things that I didn't know, the difficult medical cases and things like that and I don't have to worry about the basic skills because I have that prior. [H]

By the time I graduated vet school I felt very comfortable about being around horses, it was not an issue. Cause when I went out into practice, I didn't have to...I already had that checked off. [O]

I know a lot of people say they have a lot more experience telling if a horse is lame even before vet school, and I was always pretty bad at it beforehand. And so I wanted to get better at it, I feel like lameness is one of those that takes such a long time to really get an eye for it, as if you've already got that jump on it before vet school, it's good. [S]

Learning outside of required classes.

Clubs, wet labs, trips, rounds, conferences, and externships provided unique learning opportunities for students with diverse levels of experience. The horse handling week-long selective course was mentioned by four respondents with intermediate-level experience as one of the most useful items on advancing their horsemanship. Conversations among students and with more advanced peers or instructors in these environments also led to learning.

In the long run, I felt that it [horse handling selective] was a better use of my time because we talked a lot about lameness and arthroscopy in clinics...and we didn't talk about horsemanship, and so I thought that was really good. And it sort of boosted my confidence too because I'm not a very confident person sometimes in my own abilities, and so I thought that was helpful going into it. [S]

On my externship when I was mixing with different students from different vet schools, they would tell stories and I would absolutely learn from them about how they handled it in their...at their vet schools and/or just what they had seen in the different experiences and the different rotation, individual cases that were similar to the ones that we were seeing, but it turned out a little bit differently, how was it treated compared to how we

were treating it now. I mean those were a lot of fun because you got to hear how people do it differently. [C]

A lot of those club organizations would do rounds with the senior students so they would be talking about a case that was in the large animal hospital and discussing what they had done to it, so definitely I would overhear conversations from other classmates and learn information from them. [N-PR]

We would all load up on one of the 15 passenger vans and on the way there, we may talk about what we are going to do and that might have prompted some stories from what people had seen in the past, and that was probably instructor-driven so not voluntarily like they just offered up something. [N-G]

Content learned through conversations.

Some content learned outside of class from fellow students were details never covered in courses. Other times, the stories told by colleagues reinforced or put a new perspective on topics already covered in class.

Little tidbits about different pieces of tack... didn't know what polo wraps were until they talked about it and what they were for, and so I learned all those little pieces of information like that from their stories. [C]

I did learn about the different injuries, lamenesses and all. I had heard of them before but never personally experienced them, so I was definitely able to learn from them in that, then in learning from them the politics of the horse world. [H]

Helped reinforce some of the stuff I had learned in school, because sometimes when you learn information from a professor, or a book, it doesn't kind of click until you see it in practice, or you hear a story, like a real-life story. A lot of times we would learn about things with horses, like ligament issues or orthopedic issues, and then once a classmate shared their story, you were like "oh, yes, that's what they were talking about in class" so it kind of reiterated or helped solidify some of the information I learned in school. [N-PR]

Learning on clinical rotations.

Weekly rounds were the primary venue for sharing experiences and learning from others' cases. Much was learned from house officers and veterinary technicians, particularly vicarious

learning through observing house officers discuss cases with clients. However, learning and sharing was not always instructor-led:

I didn't feel like it was more asked about 'Let's talk about your experience...' It was more learning about the experience at hand. And then sometimes the students would ask questions about their past experience, but it wasn't always instructor led. [P2]

I would say being there, being present, when the clinician or the house officer would be talking with your block mates about their cases. Often times, I could be sitting and doing my paperwork but I would go when a classmate was working on one of their patients just so I could listen and observe and learn something. So, yeah, I think there were multiple times when that was the case and that's always a great way to learn. When you're not the one that has to be in charge, you can just sit back and listen. [H]

Lifelong learning modalities and motivations.

Post-DVM internships, conversations with classmates, continuing education, and self-directed search and reading were strategies employed by graduates at all levels of experience.

Unless you were able to take orthopedics and get to see a lot or talk with someone and gain more knowledge, potentially on an externship, it may have been a self-based learning after. That's why a lot of people wanted to do internships when they got out to make sure they had a broader understanding. [P2]

Just educating myself on, reading books and magazines of that sort, to just learn what a client's talking about...some of the lingo they use I still don't understand. So yeah there have been just on my own time, learning so that I can better communicate with the client and things. [H]

Perceptions of usefulness and receptivity to sharing from scenario.

After the interview questions, interviewees ($N = 12$) were presented with a single classroom-based, negative valence scenario which they read and scored from 1-5 on a Likert-type scale with one (*strongly disagree*) and five (*strongly agree*) (Table 7). These items were intended to address the research question about perception of sharing their own experiences in a similar veterinary education context in the following areas: (a) whether they felt others sharing their experiences was useful or a waste of time, (b) whether they learned from others, and their

(c) willingness to share and (d) likelihood of sharing. I was trying to understand whether these were separate constructs. Using the twelve interviewee scenario responses, there were no significant correlations between seeing sharing as useful and any of the other items (not a waste of time, learning, likelihood or willingness). Not being a waste of time (reverse coded) was highly positively correlated with willingness to share on both the Likert-type scale ($r = .72, p = .008$) and the numerical scale ($r = .80, p = .002$). Not being a waste of time also trended towards correlation with likelihood of sharing ($r = .55, p = .06$). Learning from the scenario was not significantly associated with any of the other items.

Checking different approaches to measuring similar constructs, responses to the variable WILINGNESS on the 5-point Likert scale and WILLINGNESS_EXTENT on a 10-point numerical scale were highly positively correlated ($r = .91, p < .0001$). Correlations are weaker but still statistically significant between WILLINGNESS and LIKELIHOOD ($r = .83, p = .0008$) and WILLINGNESS_EXTENT and LIKELIHOOD ($r = .72, p = .0077$), suggesting that likelihood of sharing is highly positively associated with willingness.

When item scores were aggregated into Usefulness Index and Receptivity to Sharing Index and those Indices compared with a paired t test, the 2.17 difference in means (95% CI, 1.02 – 3.31) is statistically significant ($t = 4.1682, df = 11, p = .0016$). This demonstrates that the judgment of usefulness of sharing by others is not the same as receptivity to sharing one's own experiences. This is further borne out by their partial correlation value of $r = .49$ which is not statistically significant ($p = .1048$). The difference was also mentioned in the themes "Attitude towards questioning and sharing" and "Deciding to share" (see p. 133).

Table 7

Scenario Responses from Pilot and Recent Graduate Interview Participants, N = 12

Item	Mean Score \pm SD 1 (<i>strongly disagree</i>) to 5 (<i>strongly agree</i>)
This student's story of prior experience seems useful. (USEFULNESS)	4.42 \pm 0.51
If this story was shared in my course, I would have considered it a waste of time. (TIME CONCERN) [reverse coded score shown]	4.25 \pm 0.62
I learned something from the student's story. (LEARNING)	3.83 \pm 0.39
I would be willing to share a story from my own experience in this setting. (WILLINGNESS)	3.42 \pm 1.16
I would be likely to share a story from my own experience in this setting. (LIKELIHOOD)	3.08 \pm 1.00
[NB: The next item was a numerical rating from 0 not at all to 10 extremely willing.]	
How willing would you be to share a story from your own experience in a similar setting? Rate your willingness as a single number from 0 not at all willing, to 10 extremely willing. (WILLINGNESS_EXTENT)	6.54 \pm 2.64 Range 2-10
[NB: Aggregated scores for Usefulness and Receptivity to Sharing were generated by adding the scores below for a Maximum score of 10, 5 from each measure.]	
Usefulness Index Combination of USEFULNESS and TIME CONCERN scores.	8.67 \pm 0.98 Range 7-10
Receptivity to Sharing Index Combination of WILLINGNESS and LIKELIHOOD scores.	6.50 \pm 2.07 Range 4-10

Cognitive interviewing of AGQ-R.

The final component of the interview was cognitive interviewing to understand how former students interpreted the AGQ-R and responded about their motivation for their equine medicine lecture course. First, the participants' commented about what they did or did not understand the AGQ-R items to mean (Table 8). To avoid bias towards recognition of problems with Mastery Avoidance items, the same doctoral student who reviewed the pilot interviews also independently analyzed these for comprehension issues. Mean cognitive interview time was 13.9 minutes (SD 3.2), range 9.5 – 21. Technical difficulties during the 21-minute outlier required asking the participant to repeat responses.

Table 8

Qualitative Phase Participant Understanding of AGQ-R Items (N = 9)

AGQ-R Construct and Item Language	Comprehension/ Rephrasing	Understanding of Item in Their Own Words
<p>Mastery- Approach</p> <p>1. My aim is to completely master the material presented in this class.</p>	<p>None</p>	<ul style="list-style-type: none"> - How proficient you are; Able to understand the material and apply it for a particular case [N-G] - Determine work ethic [C] - Knowledge of the material [H] - Not memorizing for test [S] - Does mastering the material matter to you? [SH] -Is it something I think I need to know every single detail for what I will be doing after graduation. [N-W] - Going to understand as much as I can to ace the exam or regurgitate it [O] - To be able to regurgitate, not just regurgitate, completely understand all the material, come away knowing everything presented. [M]
<p>Mastery-Avoidance</p> <p>2. My aim is to avoid learning less than I possibly could.</p>	<p>Don't understand what they are asking [C]. Rephrase.</p>	<ul style="list-style-type: none"> - Trying to do as little as possible to get through [N-G] - Not be distracted by things that would cause missing out on knowledge [H] - Trying to learn as much as I can/ enough to be proficient [S, SH, N-PR] - Want to learn more and don't want to be one to not learn [O] - Do better than failing the class, learn what you can without pushing super hard to learn it all [N-W] - Want to avoid learning this material in general [M]

Table 8 (continued)

Performance-Approach 3. I am striving to do well compared to other students.	None.	<p>Trying to do better than or as well as other students/comparing myself to others [multiple]</p> <ul style="list-style-type: none"> -Wanting to stand out compared to others [S] - Trying to do the best you can, or you don't care what everyone else does, do your own thing [C] - If I were equine, I would want to do better than everybody else, someone only doing small animal [N-W]. - If overall, they aren't doing well, then I want to do better than them [M]
Mastery-Avoidance 4. My goal is to avoid learning less than it is possible to learn.	Rephrased to Mastery Approach-type wording by four participants	<ul style="list-style-type: none"> - Learning the most that I can/as much as possible [multiple] - Avoid learning makes me think learning is a negative thing, avoid doing work [C] - I want to figure out some way to learn more. If you feel like you are not learning as much as you should, you want to figure that out [N-W] - Avoid missing out on opportunities to learn those things [H]
Performance-Avoidance 5. My goal is to avoid performing poorly compared to others.	None.	<ul style="list-style-type: none"> - Avoid not doing as well as other classmates, falling below statistics/standards of others [multiple] - Trying to figure out my competitiveness, how much I care about what other people think or what other people are doing [C] - Concerned about how you are within the class instead of your own goals [N-W]

Table 8 (continued)

<p>Mastery-Avoidance 6. I am striving to avoid an incomplete understanding of the course material.</p>	<p>Rephrase – trying to get a complete understanding.</p>	<ul style="list-style-type: none"> - Make sure I understand it completely [multiple] - Trying to understand to the best of my ability [O] - Not just pieces for test [H] - Avoid not understanding the material, don't want to come out not knowing more than you did when you went in the class [N-PR]
<p>Mastery-Approach 7. My goal is to learn as much as possible.</p>	<p>None.</p>	<ul style="list-style-type: none"> - Obtain as much information as possible [multiple] - As much as the brain can hold [M] - Be there, participate, learn [O] - I'm here to learn, teach me. [C] - Really focused on that course, want to work hard [N-W]
<p>Performance-Approach 8. My aim is to perform well relative to other students.</p>	<p>None.</p>	<ul style="list-style-type: none"> - Compare to other students to be better or at least as good as [multiple] - Want to be one of the top students in the course [N-W] - If they're understanding the material, then you feel like you should be able to understand the material too [N-PR]
<p>Mastery-Approach 9. I am striving to understand the content of this course as thoroughly as possible.</p>	<p>None.</p>	<ul style="list-style-type: none"> - Means you want to understand every detail/being able to comprehend all the material in as much detail as possible [multiple] - How hard am I going to work, put in extra effort to look up things and ask questions [C] - You're working to understand it, but having a hard time understanding everything [N-W]

Table 8 (continued)

Performance-Approach 10. My goal is to perform better than the other students.	None.	<ul style="list-style-type: none"> - Competitiveness/trying to do better than everybody/get a 4.0 or be the best student possible [multiple] - How is my self-esteem, regard for others [C] - Only working hard than is takes to be better than the student that you're comparing yourself too. [O]
Performance-Avoidance 11. I am striving to avoid performing worse than others.	None.	<ul style="list-style-type: none"> - Avoid being at the bottom of the class/doing worse than everybody/trying not to look bad/getting the lowest grade [multiple] - Focus on testing situations [N-G] - How do I think of my capability [C] - Comparing to potentially subpar performance of others/don't want to be worse than someone who's not getting it [N-PR]
Performance-Avoidance 12. My aim is to avoid doing worse than other students.	Cf. with #11 – don't see much of a difference.	<ul style="list-style-type: none"> - Don't want to be worst/at bottom of class [multiple] - Doing worse encompasses whole outlook on the class vs. performance looking at testing [H] - Don't want to be last, doesn't address wanting to be first [S] - If you see a lower level of how you're doing in the class, you might want to pick it up a little bit [N-PR]

Aggregate analysis of item meaning.

These themes represent what participants thought the items were trying to gauge and are aggregated from the comments appearing in Table 8.

Mastery Approach

While participants generally agreed these items were about figuring out how hard you are going to work and what you will retain, they gave conflicting responses about the meaning of mastery related to being able to regurgitate content to ace the exam. Three equine-focused students offered different interpretations—one said mastery is not about memorizing for the test, another stated the point of mastery is to ace the exam or regurgitate content as needed, and the third started with the regurgitate idea and then moved away from that to knowing everything presented, not just for regurgitating.

Mastery Avoidance

Interpretation for these items ranged greatly from trying to avoid learning to trying to learn as much as one can. Like the Mastery Approach theme, they consider it to be trying to measure effort, such as trying to do as little as possible to get through, or learning enough not to fail the class. Most rephrased these items as a Mastery Approach items. The only item fairly consistently interpreted was “striving to avoid an incomplete understanding of the course material” which seven indicated was trying to get a complete understanding. Only two participants understood the idea about avoiding learning less to be concerned for opportunity costs and worrying about missing out on learning opportunities.

Performance Approach

Interpretation of these items was generally consistent, e.g. trying to do better than or as well as other students or comparing oneself to others. A few mentioned wanting to stand out compared to others or be one of the top students in the course. An interesting single viewpoint on this was comparing your own capability of understanding the material: “If they’re understanding the material, then you feel like you should be able to understand the material too”

[N-PR]. A few indicated it meant more personal consideration of one's self-esteem and regard for others, also what it means to only work as hard as your comparator.

Performance Avoidance

All were interpreted as avoiding being at the bottom of the class or doing worse than everybody with a focus on figuring out competitiveness. For example, how much I care about what other people think or what other people are doing, mostly in testing situations, rather than focusing on your own goals. A few focused on what you can learn from comparing yourself with others in terms of your own efforts, how do I think of my capability, what are the risks of comparing to potentially subpar performance of others such as someone who's not getting it. "If you see a lower level of how you're doing in the class, you might want to pick it up a little bit."

[N-PR]

AGQ-R scores.

Participants scored each item from one (*strongly disagree*) to five (*strongly agree*) and these responses were aggregated into the mean scores for each of the four constructs as shown in Table 9. As responses were anticipated to vary according to characteristics such as interest in the course, plans to use the material in the future, or the need or desire to achieve high grades or instructor recognition, the AGQ-R scores are divided into those that went directly into equine careers, those that pursued internships prior to large animal practice, and those that did not plan equine careers or residencies in any discipline. Internship plans are separate because participants indicated that internship plans somewhat drive the need for high grade acquisition and class ranking comparisons.

Table 9

Qualitative Phase Participants' AGQ-R Subscale Scores, Mean \pm SD

Participant Career Plans	Mastery Approach	Mastery Avoidance	Performance Approach	Performance Avoidance
Equine Career Planned without internship ($n = 4$)	4.83 \pm 0.19	4.58 \pm 0.50	2.08 \pm 1.42	2.75 \pm 1.00
Equine Career with internship/residency ($n = 2$)	4.67 \pm 0.47	3.17 \pm 0.24	3.17 \pm 1.18	2.50 \pm 2.12
Neither Equine Career nor Residency Planned ($n = 3$)	3.44 \pm 0.51	3.78 \pm 0.69	3.00 \pm 1.53	3.67 \pm 0.88
Overall Average ($N = 9$)	4.33 \pm 0.75	4.00 \pm 0.76	2.63 \pm 1.34	3.00 \pm 1.18

Participants with equine experience who were planning equine careers strongly agreed that they were motivated to master equine course material similarly to pilot interviewees with equine experience. Their motivation was over a point higher ($M = 4.83$) than average Mastery Approach scores reported by non-equine students ($M = 3.44$) ($p = .004$). Mastery Avoidance item scores from pilot participants do not follow this pattern, but participants clearly struggled to interpret those items. Overall, participants rated Mastery Approach higher than Performance Approach as a motivating factor. In non-equine and equine non-internship participants, Performance Avoidance was more motivating than Performance Approach, although these

distinctions are not large or statistically significant. Distinctions between individuals can be appreciated from the interview comments that follow.

The final piece of the cognitive interviewing was participant descriptions of why they scored the item the way that they did, and what factors they mentioned about their experience, career interests, and approach to learning played into their responses. Explanations were often very similar within the items for the same construct, e.g. a similar statement was made for all the Performance Avoidance items, and participants occasionally referred to a previous response. The results are presented thematically within each construct with representative quotes from the three types of participants. The themes appearing for these recent graduates differed from those seen in the pilot interviews who were further removed from their DVM education.

Mastery Approach

Getting the Most out of Everything (aka is Mastery possible?)

Mastery was perceived to be at a very high, perhaps unobtainable level, for even the most dedicated students. From three of the most experienced respondents, “Completely master’s a strong word. Don’t think I can completely master anything, but give it my damndest.” [SH]. “It would be difficult to master equine medicine without prior knowledge, and so it is a goal, but you have to be reasonable.” [H] “That’s kind of an ideal aim....I’d love to master all of the material in all of my classes, but I also realize that’s pretty much impossible because you have so many classes as a vet student...to be able to completely master the material, I’d have to totally focus on just that and nothing else.”[M]

Applying Equine Medicine in the Future

Levels of understanding seemed to associate with the interests in equine practice. For non-equine students, trying to make it through and learn the very basics, get through the course,

and pass was challenging enough. For example, “At that point I was going to be strictly small animal, so I needed to understand the material, but not completely.” [N-G] When discussing whether it was their goal to learn as much as possible, several equine-focused graduates compared their score to scores they would have given courses like epidemiology or lab animal medicine which were not in their areas of interest. The focus was on learning as much as they could so that they could be good equine clinicians and apply the knowledge in practice. Equine-focused students reiterated taking a realistic view of not learning all the details, but making sure of major content areas and knowing where to get more detail and look up techniques later in private practice. Non-equine students emphasized that missing details as not critical since they would not need that knowledge in the future.

Mastery Avoidance

Students struggled to understand the items about avoiding learning and generally disagreed with them unless they had reframed them to Mastery Approach-type items.

Depth of Knowledge by Practice Intent

As there was a lot to learn before you go out into practice, they wanted to learn as much as they possibly could. Even the non-equine students wanted to have some knowledge of horses in case they changed their minds about working on horses or were presented with a situation where they had to work on a horse. Equine medicine was a very hard course for interviewees who did not have a lot of horse experience and were not excited about learning about horses. One student indicated that if you felt like you were not learning as much as you should, you want to try to figure that out—what is holding you back from learning [N-W].

Performance Approach

Doing Your Best.

Interviewees reported wanting to do well in their courses, but for the most part the emphasis was on doing the best they could, and increasing their knowledge base and future practice skills, not on comparing themselves to others. One reason to avoid comparisons was that some students knew a lot, and some did not know much, for example, a non-equine student said there were a lot of people big into horses in her class and there was no way she could have performed better than them. Another said that comparing yourself to other students was not healthy and that first year of veterinary school can be rough due to competition and you can waste time looking at others instead of focusing on yourself. One positive reason given for comparison was seeing that if other people could perform well, you could perform well also if you applied yourself.

Three notable exceptions were evident. The first was competitive, but also a “people pleaser”—she would rather be the best, but also wanted others to do well. The second was trying to stand out to be recognized by the faculty and get good recommendations for internships since equine medicine is a third-year course. She also described herself as kind of competitive with grades and liking to be in the top part of her class. The other comparison that was mentioned primarily in responding to the item of performing well relative to other students was doing at least as well as others and not wanting to be last, which is more of a performance-avoidance response.

Performance Avoidance

No one wants to be the worst.

Not wanting to be at the bottom or the worst was mentioned by most of the students although it was not their primary goal. No one wanted to perform poorly, even if they did not want to compare themselves to others, e.g. “you don’t want to be the person that’s not understanding the information at all.” [N-PR] Three of the more experienced said they did not pay attention to class rank or compare themselves to others; one recognized that it is not useful to compare yourself to others because they may have more equine experience [H]. Both equine and non-equine students distinguished between wanting to do their best while not worrying about being the best. Most did not want to judge others or use them as a reference point. Reasons for comparing oneself to others were: being kind of competitive, having a fear of failure, and wanting to make a good impression on instructors for recommendations. One male and one female respondent wanted to be at the front of the pack or better than the majority of students. Others knew they did not need to have top grades since they did not plan an internship or were solely focused on learning material that they would be putting into practice.

Summary of cognitive interviewing findings.

The cognitive interviewing provided some insight into how recent graduates viewed their prior equine knowledge in relation to motivation towards equine medicine. There was a lot of cross-over in how participants responded to items in various subscales. They frequently explained their lack of Performance Avoidance or Mastery Avoidance goals with a shift towards Mastery Approach goals. About a third of the students viewed themselves as more competitive and their spoken comments reflected positive responses to Performance Approach goals, even though they seemed to almost self-censor that attitude in their responses.

Demographics and horsemanship experience.

After finishing the interviewing protocol, participants completed the demographics and horsemanship experience questionnaire on their own. After the investigator reviewed the open-ended responses and the content of the first five interviews, additional responses were added to the questionnaire for partial leasing of horses and for involvement in breeding operations. An additional open-ended question was added to elicit other types of horsemanship experiences.

The horsemanship questionnaire was completed by the nine qualitative phase participants and two of the pilot participants. Four currently owned horses, and two had owned horses in the past. All eleven participants felt comfortable grooming/bathing horses, but only the nine with horse experience were comfortable with lunging, loading, and bandaging. Only two were comfortable trimming hooves, and one of those was not a person with extensive horse experience. Over half the respondents ($n = 6, 56\%$) had participated in schooling shows, closely followed by 4-H participation ($n = 5, 45\%$) and volunteering at a therapeutic riding center ($n = 4, 36\%$). The most common riding type was Western ($n = 6, 56\%$) followed by Hunter Seat ($n = 5, 45\%$). For those recruited from post-DVM large animal veterinary practice, experience with horses personally ranged from no experience outside of veterinary school to a maximum of 22 years. Those recruited as not having worked primarily in equine/large animal had less than a year personal experience outside of time spent working with horses in veterinary school. All were asked to assign a numerical value to their horsemanship expertise using the question below:

Please consider your horsemanship experience and give a number to represent it using a scale from 0-100 where 0 represents having no experience with horses and 100 would be nationally competitive/expert in your equestrian discipline. Provide the number for when you were at your highest skill level with horses.

External expert assessment of horsemanship expertise scoring.

The numerical horsemanship expertise scores discriminated between the recent graduates known to be experienced ($M = 54$) and those who recruited on the assumption that they were not experienced ($M = 18$). However, participant self-ratings varied substantially from what I would have expected given their descriptions of their horsemanship experience and their responses to the experience demographic questions. To assess whether my observation was unique or whether other horse people would similarly perceive their expertise, I recruited two equine industry experts (Appendix F) to assign a score to each participant based on his or her responses to the horsemanship demographics questions (see Appendix E).

Self-assessments varied by 26 points on average ($SD 15.1$) from the scores assigned by the reviewers with eight of the recent graduates underrating their expertise by 5 to 49 points. For nine of the eleven participants that completed the horsemanship questionnaire, the assessments by the experts were within 15 points of each other with a mean difference of 13.8 ($SD 11.5$). The difference between reviewer A's assessments and the recent graduates' self-assessments ($M = 21.3$, $SD 16.8$) was not significantly different from how reviewer B's assessments compared to those by the recent graduates ($M = 27.6$, $SD 18.8$), t test for two dependent means, $t = 1.45$, $p = 0.18$. Overrating experience was less common. Two of the three that overrated their expertise were the recent graduates with limited horse experience, and the range of point variance was smaller (13-25 points).

Research Questions: Overall Analysis of Findings

How do former public university DVM students perceive sharing their own prior experiences and learning from shared prior experiences of other students in the veterinary education context?

Recent graduates recognized the value of their experience: “I had so much experience going into vet school and I knew it helped me tremendously and I was able to help my classmates as well.” [H] Sharing their prior experiences with other students was extremely common in hands-on situations like working with handling horses in the TAU and working in wet labs on things like bandaging. Students with horse experience actively assigned themselves to work with groups of students with less experience that could benefit from their expertise on safe horse handling. Sometimes it was hard to distinguish between sharing horsemanship prior experience and sharing veterinary prior experience for students who had both extensive horse and veterinary work experience. Clinical conference presentations by fourth-year students provided a formal venue to educate classmates about procedures or disciplines they did not learn about in the curriculum. “One of my favorite parts about vet school was being able to share my experiences to help my classmates.” [H]

Verbal sharing was less common in the lecture classroom with very few former students being able to recall an example of sharing in a lecture context. Sharing in the form of asking questions based on past horsemanship or past veterinary experience was viewed as more acceptable than just sharing stories outright. They also suggested that whether stories were welcomed depended on the sharing behaviors of the person telling the story and whether there were time concerns for covering content in the course. Some instructors welcomed questions and sharing experiences more than others in their classrooms. A few students commented that instructors do not want to discuss ways things are done in real-world practice.

Content and venues impact attending to learning opportunities. Negative experiences stand out in their minds more than positive ones. Most like hearing stories when time permits and think that others do also. Some of the equine-focused students talked about their horses all

the time which people tuned out, but others reported drawing on things they learned from “horse people.” On road trips to farm visits, very practical experiences were shared, sometimes elicited by instructors and sometime just arising naturally. These field-based environments were reported as most optimal for vicarious learning through sharing.

What shared prior experiences, if any, did they find relevant to their learning or practice?

Learning from others who share their horsemanship experience was presented differently from the students with extensive horsemanship experience than by the students lacking equine experience. For the students with horse experience, what they learned from others who were active competitors or horse owners were more performance-specific about types of competitions, intricacies of equipment, and performance-related injuries. For those with less experience, it was mostly safe horse handling for basic husbandry and medical procedures. Faculty on clinical rotations would also elicit sharing of prior large animal experience for both safety assessment and to assign more difficult cases to the students with the most experience. Students at all levels of experience reported learning on clinics from students who had more or different experience than they did. This learning consisted of a) hands-on learning from asking for assistance from students known to have more clinical experience with horses, and b) learning more in rounds because students with more experience would ask more questions about other students' cases whereas students with less experience would generally not engage on cases that were not their own.

On the classroom-based scenario which was negative valence, on average, interview participants were between neutral and agree ($M = 3.8$, $SD = 0.4$) on learning something from what the sample student shared. There was insufficient data to assess whether this average score represents average feelings from populations or patterns of high and low amounts of learning

associated with previous experience. This distinction was pursued in the quantitative phase where more data were available.

Quantitative Survey Instrument Refinement

The findings from the exploratory qualitative phase influenced the planning for the quantitative phase in several ways. The first is in refinement of the survey instrument. New questions were developed, critical incident scenarios were refined, additional scenarios developed, and standard measures were reinforced or adapted.

New questions.

The interview questions for recent graduates focused on instructor practices around student sharing in the classroom and clinical settings. Responses indicated that students and instructors engaged in other contexts as well, and it was often in those contexts that prior experiences surfaced especially as the experiences related to career aspirations or how the students wished to be identified as part of a focus area grouping. A matrix question was developed (see Appendix H, p. 282) that listed many of the contexts for a first encounter with an instructor (orientation, advising, wet labs, etc.) and asked about whether an instructor had asked the student about prior performance animal experiences in those contexts.

Critical incident scenario creation and refinement.

The scenario created for the interview which placed the respondent within a classroom setting with a negative valence of bandaging practices was validated by the interviewees. One of the participants said “It’s actually dead on.... Yeah, I, definitely....that’s kind of crazy that’s what your example is. Yeah, I experienced that...”[SH] Although several mentioned that the setting was representative, a few who reported very little classroom sharing mentioned this was

the type of thing more likely to be shared in hands-on settings rather than classrooms, or that in a classroom students may phrase it as a question not just share a story.

For the second scenario planned to be classroom-based with a positive valence, no participant provided a critical incident that could serve as a positive classroom example. Therefore, I created by this scenario from an example that had been shared in a continuing education workshop for equine-focused veterinary students and practitioners. Since several interviewees mentioned openness to and interest in questions asked by fellow students and almost no times where experience was just shared, it included the student in the scenario using the experience as the basis of a question rather than just sharing.

The final scenario for a clinical setting with a positive valence was drawn from a critical incident shared in the interviews about applying topical medications to reduce scarring, but significantly modified to reduce the risk of recognition from others who might have been told about the case. These elements of context, student approach and valence are similar to the strategy used by Hill and Murphy (2016) to create interchangeable scenario elements to ask veterinarians and shelter employees to gauge likelihood of adoption success. The vignettes were shortened for the survey to make them either for diverse audiences to process (Raymond, Ling, & Grabovsky, 2017). Final versions appear in Appendix H.

Modification of the AGQ-R.

I remained interested in the potential relationship between the achievement goal orientation as measured by the AGQ-R and Usefulness and Receptivity to Sharing. Due to the conflicting interpretations of the Mastery Avoidance items shown in the pilot and qualitative phase analysis, I did not include the three-item Mastery Avoidance subscale on the questionnaire for the survey of U.S. veterinary students. The other three subscales, Mastery Approach,

Performance Approach, and Performance Avoidance were included on the survey. Strunk (2014) suggests that factor analysis of the original four scale AGQ-R supports a three-factor model which provides another reason to subject the results of the current student survey to its own factor analysis.

Pilot testing of quantitative phase survey.

The revised survey was reviewed by two veterinary education experts in the NCSU CVM (Appendix F) and several modifications were made to reduce the cognitive demands. All Likert-type responses that were not part of a previously validated instrument were standardized to a six-point scale with no neutral middle point. In the horsemanship and demographics questions, responses for those with no experience were added.

The revised survey was pilot tested in Qualtrics with five equine-focused interns and residents, some of whom trained outside the United States. Their completion of the survey revealed that the horsemanship component of the questionnaire was American-centered in terms of associations and types of competitions, so I added “or international equivalent” to several of those entries. Time to completion of the 51-question survey varied from 8 to 55 minutes inclusive of interruptions, so I used the average of 30 minutes as the time estimate in the consent instructions.

Summary of the Qualitative Exploratory Phase

This qualitative phase resulted in two outcomes. On their own, the narrative and thematic analyses provide insight into the relationship between prior experience and learning in veterinary education across diverse levels of experience and career goals. The interviews also raised issues and questions for consideration in the quantitative phase by the community of currently enrolled veterinary students. The connection between the qualitative phase findings with recent graduates

and the survey results with current veterinary students from across the U.S. are explored at the end of Chapter Five.

CHAPTER FIVE: RESULTS OF QUANTITATIVE PHASE & SYNTHESIS

This mixed method study consists of two phases, a qualitative exploratory phase reported in the previous chapter and a quantitative phase reported in this chapter along with the synthesis and interpretation of the connections among findings. The results of the quantitative survey of currently enrolled veterinary students across the nation consists of several components: demographics, horsemanship experiences, the AGQ-R, and novel measures of usefulness and receptivity to sharing prior experiences in a variety of settings. These variables were studied in models of potential explanatory relationships using multiple regression analysis. Limitations to the quantitative findings are explored. The chapter ends with an interpretation of the connections among the findings from this chapter and the previous chapter.

Quantitative Phase –Survey of Currently Enrolled Veterinary Students

The quantitative phase consists of a survey of students enrolled in veterinary medicine doctoral programs at public universities in the United States in Spring 2017. Public university students were chosen to have a sample similar to the former students who had participated in the qualitative phase of the research, so as to avoid introducing additional potential variation due to differences in the recruitment and acceptance patterns of private veterinary institutions.

Participants.

After IRB exemption (see Appendix I), I contacted the SCAVMA president at 23 public institutions of veterinary medicine (Table 1, p. 73). Of those 23, 14 institutions (60.8%) had at least one respondent which indicated that the survey was distributed. Participating schools represented three of the four AAVMC regions: Midwest ($n = 3$), South ($n = 9$), and West ($n = 2$). There are no public veterinary institutions in the Northeast Region. School distribution included at least one respondent from a school in each quartile of the U.S. News and World

Report scores; top quartile ($n = 3$), 51-75th percentile ($n = 1$), 25-50th percentile ($n = 4$) and lowest quartile ($n = 6$). There was higher representation of respondents from schools in the South and schools in the lowest score quartile. Students at 51-75th percentile scoring schools in the Midwest Region are not well represented.

Based on the number of schools where the survey was distributed, the estimated population of students in public universities reached was 5,624 of the 10,300 available. Response rates by institution ranged widely from a single student at one school to 39.5% (158/400) at the author's institution. A significant portion of the survey questions was completed by 843 of the students reached, about 8.1% of the eligible population of 10,300. However, the usable response rate of 11.5% reflects the 648 students who responded to all the questions related to variables in the regression models out of the 5,624 who received the survey. These 648 students comprise the sample on which the subsequent analyses are based.

Demographics.

All analyses were performed in Stata 12.1 (College Station, TX) or Excel (Microsoft Office 365, Version 1710). Participant characteristics reported by the sample included years of veterinary education (Table 10), internship/residency plans, as well as gender, age, in-state residency, and Pre-Veterinary Association Membership (combined in Table 11).

Table 10

Years in Veterinary Education, N = 648

Year in Program (Years)	Number	Percentage
First year (1)	210	32.4
Second year (2)	176	27.2
Third year (3)	128	19.8
Fourth year (4)	130	20.1
Other* (5)	4	0.6

Note. * DVM/PhD (2), DVM/MPH (1), Graduate student (1).

Years in veterinary education were treated as interval data with those in Other from combined degrees counted as five years. Rates of participation in the survey decreased with length of time in the curriculum from a high of 32.4% in first-year students to about 20% for third- and fourth-year students. Z-tests comparing two proportions shows the 5% difference between first and second year participation to be statistically significant ($p = 0.0114$) as is the 7% difference between second and third year ($p = 0.0025$) while there is no difference between third- and fourth-year participation.

The population was fairly equivalent in terms of those who had decided not to pursue an internship or residency ($n = 245, 37.8\%$), those who were unsure ($n = 215, 33.2\%$) and those who planned to pursue ($n = 188, 29.0\%$). Of those intending internship or residency, 41 (6.3%) had already applied and 147 (22.7%) planned to apply. Most (77.9%) appeared to have directly entered from undergraduate with another 14.8% having a few years in-between.

Table 11

Gender, Age, Residency, and Pre-Veterinary Association Membership, N = 648

Demographic Characteristic	Number	Percentage
Female	563	86.9
Male	84	13.0
Other Gender	1	0.2
Age 18-26 [traditional age]	505	77.9
Age 27-30	96	14.8
Age 31-older	47	7.3
In-State Resident	407	62.8
American Pre-Veterinary Medical Association member	134	20.7

General academic achievement for the population was captured at two levels: the current performance within the veterinary medical program (overall GPA at time of survey) and the anticipated performance on the NAVLE reflecting their view of where they stand compared to veterinary students in North America. Students almost equally earned A's ($n = 261, 40.3\%$) as B's ($n = 286, 44.1\%$) with very few students reporting C's ($n = 52, 8.0\%$) and none lower than C. Other grading systems ($n = 28, 4.3\%$), not recalling grades ($n = 9, 1.4\%$) or other issues such as being between A and B ($n = 12, 1.9\%$) were much less common. NAVLE expectations in terms of percentile performance seemed less clear for respondents with a third of the students having no particular expectation ($n = 213, 33.1\%$). The distribution of 17.1% ($n = 110$)

expecting to be in the top 25%, and 34.5% expecting to be in the next quartile ($n = 222$) adds up to about 51%. The remaining 15.4% ($n = 99$) expected to pass but not be in the top 50%.

Because the AGQ-R and the scenarios were specific to equine medicine, the survey asked what grade students anticipated earning in their equine medicine lecture course. The equine grades were similarly proportioned to the overall GPA, with slightly more students anticipating an A ($n = 286$, 44.1%) than a B ($n = 283$, 43.7%) and even fewer students reporting C ($n = 36$, 5.6%). Pass/satisfactory ($n = 25$, 3.9%) and Other (mostly had not taken the course and would not anticipate a grade) ($n = 18$, 2.8%) comprised the remaining respondents.

The question about focus area or area of primary interest in which the student intends to seek employment after graduation was intended to generate the data for the question about equine career plans for the multiple regression models and to assess how the survey population compared to the national distribution of career interest captured from fourth-year students taking the NAVLE (Table 12). Students often change focus area over years one through three making this data less stable than the NAVLE data which is reported by students in their final year close to pursuing their intended careers. Respondents to the survey were significantly less likely to be small animal only (32.7%) compared to the national average of 52.9%, $p < .001$). Proportions of companion animal inclusive of equine and food animal/large animal were similar. The proportion of other categories was significantly larger (26.3%) than the NAVLE participants (10.8%, $p < .001$).

Table 12

Focus Area/Primary Interest Compared with National NAVLE Data, N = 648

Focus area or area of primary interest	Number	Percentage	NAVLE Percentage (N = 1,902)
Small animal only	212	32.7	52.9
Mixed animal (all species)	150	23.2	21.4
Equine only	42	6.5	Counted in Companion animal, 7.0
Companion animal (both small animal and equine)	23	3.6	
Large animal only	27	4.2	Counted in Food animal only, 7.8
Food animal only	24	3.7	
Wildlife/zoological/exotics	61	9.4	Counted in Other, 10.8
Specialty – non-species specific	43	6.7	
Research	16	2.5	
Other... (e.g. lab animal medicine, public health)	50	7.7	

Horsemanship and other prior experience.

The survey captured several types of horse experiences: activities students feel comfortable doing with horses (Table 13), horse ownership, years spent working with horses in non-veterinary capacities (Table 14), years in horse-related activities (Table 15), and primary horse activities (Table 16). A few activities represent skills practiced during veterinary education; therefore fourth-year students should be comfortable with these towards the end of

clinical rotations. For example, all fourth years who take large animal rotations should be able to load into a trailer and bandage legs. Rates reported by fourth years ($N = 130$) of comfort with bandaging (47.7%, $p = .0458$) and loading/unloading in a trailer (52.3%, ns) are a bit higher than the overall average.

Table 13

Equine Activities Students Feel Comfortable Doing, N = 648

Activity	Number	Percentage
Grooming or bathing	534	82.4
Tacking a horse in a familiar discipline's equipment	346	53.4
Lunging	278	42.9
Loading/Unloading a horse in a trailer	322	49.7
Bandaging for support or for shipping	248	38.3
Trimming hooves	118	18.2

Two questions asked about history of horse ownership or leasing. The first was a standalone question ($N = 648$) where current horse ownership or full leasing was reported by 109 students (16.8%), with an additional 85 (13.1%) having owned or leased in the past, and the majority of respondents ($n = 454$, 70.1%) never having owned or full leased a horse. These numbers are not exactly comparable to the rates for the question about years of ownership and

leasing as part of a variety of horse-related experiences (Table 14) since the categories of owning and leasing were separate. The mean time for each type of horse experience above was calculated using only the time data for those who reported those horse experiences. It does not include zeros for those 184 respondents who reported no horse experience. Mean years of experience working with horses across students who reported any horse experience was 7.0 ± 7.1 . Including students with no experience in calculating the mean years of experience drops it to 5.4 ± 6.9 years.

Many types of equine professional experience were listed. In the veterinary realm, students reported veterinary assisting from highly experienced to shadowing, as well as one each for quarantine work, and acupuncture. Non-veterinary experience included hippotherapy/therapeutic riding, stable/foaling manager or attendants, professional riders/trainers/working students, trail ride leaders and camp instructors, collegiate team athletes, farrier assistant, braider, saddle fitter, and riding during military deployment or other work. Although some students mentioned therapeutic riding and collegiate sport participation here, these are addressed by questions about specific types of equestrian participation (Table 15), primary equestrian activity (Table 16) and organized activity/competition history (Table 17).

Table 14

Length of Horse Experiences, N = 648

Experience	Number	Percentage	Mean time in years \pm SD	Maximum years
Had riding instruction	403	62.2	5.1 \pm 5.8	25
Worked as a groom or stable employee with direct horse or performance animal contact	200	30.9	3.8 \pm 3.6	20
Owned a horse	176	27.2	10.8 \pm 6.0	27
Part leased a horse	75	11.6	2.2 \pm 2.0	10
Worked as a performance animal trainer or riding instructor	67	10.3	4.6 \pm 3.5	16
Bred horses or other performance animals or worked on a breeding operation	64	9.9	3.6 \pm 4.5	20
Full leased a horse	56	8.6	2.2 \pm 2.0	10
Worked in a tack store or other equine industry position (non-veterinary)	27	4.2	3.0 \pm 2.2	9
Worked as other equestrian professional	54	8.3	3.0 \pm 4.0	20
None of these experiences	184	28.4	N/A	N/A

Table 15

Experience in Specific Equestrian Disciplines/Activities, N Varies by Activity

Activity (Respondents)	Current Number (Percentage)	No Longer Number (Percentage)	Never Number (Percentage)	Mean Time Years \pm SD	Maximum Years
Recreational Trail Riding, any style (641)	163 (25.4)	269 (42.0)	209 (32.6)	6.2 \pm 6.6	30
Hunter Seat including Jumpers (640)	33 (5.2)	123 (19.2)	484 (78.6)	6.2 \pm 5.1	20
Natural Horsemanship (636)	31 (4.9)	39 (6.1)	566 (89.0)	5.9 \pm 4.9	20
Dressage (637)	29 (4.6)	63 (9.9)	545 (85.6)	5.9 \pm 4.7	20
Western Performance other than Recreational Trail Riding (639)	22 (3.4)	91 (14.2)	526 (82.3)	5.0 \pm 4.8	18
Eventing (637)	16 (2.5)	36 (5.7)	585 (91.8)	5.2 \pm 3.9	15
Showmanship/Halter (636)	10 (1.6)	59 (9.3)	567 (89.2)	4.4 \pm 4.5	18
Therapeutic Horsemanship (641)	9 (1.4)	70 (11.0)	556 (87.6)	2.4 \pm 2.2	12
Endurance (636)	8 (1.3)	13 (2.0)	615 (96.7)	1.9 \pm 2.1	10
Saddleseat (637)	4 (0.6)	32 (5.0)	601 (94.4)	3.9 \pm 4.0	20
Driving (634)	1 (0.2)	24 (3.8)	609 (96.1)	2.5 \pm 3.8	20
Vaulting (635)	1 (0.2)	8 (1.3)	626 (98.6)	3.2 \pm 3.5	13
Other (304)	13 (4.3)	20 (6.6)	271 (89.1)	4.2 \pm 6.2	28

Other equestrian disciplines written in were racing, occasional trail rides or pony rides or lessons or horse camp, ranch work/rodeo/reined cowhorse, pleasure riding, gaming, foxhunting, polo, trekking for work, rescue, and pet horse ownership.

Table 16

Primary Equestrian Activity in Order of Participation, N = 384

Activity	Number	Percentage
Recreational Trail Riding	200	52.1
Hunter Seat (includes Jumpers)	57	14.8
Western Performance (not recreational trail riding)	27	7.0
Other (not listed)	25	6.5
Dressage	20	5.2
Eventing	15	3.9
Multiple Areas	15	3.9
Therapeutic Horsemanship	7	1.8
Natural Horsemanship	6	1.6
Saddleseat	5	1.3
Showmanship/Halter	2	0.5
Driving	2	0.5
Endurance	2	0.5
Vaulting	1	0.3

Table 17

History of Participation in Organized Activity/Competition, N = 305

Type of Organized Activity	Number	Percentage
4-H or international equivalent	127	33.1
Volunteer at a therapeutic riding center	125	32.6
Local or schooling shows	122	31.8
State fair livestock showing or equivalent	82	21.4
Intercollegiate Horse Show Association or other College Equestrian Organization	59	15.4
USEF recognized competitions	47	12.2
AQHA or other breed association recognized competitions	39	10.2
Pony Club or international equivalent	27	7.0
USDF recognized competitions	20	5.2
Interscholastic Equestrian Association or other High School Equestrian Organization	18	4.7
USEA recognized competitions	17	4.4
FEI recognized competitions	13	3.4
NRHA recognized competitions	6	1.6

Note. Participants could choose multiple responses. USEF = United States Equestrian Federation, AQHA = American Quarter Horse Association, USDF = United States Dressage Foundation, USEA = United States Eventing Association, FEI = Fédération Equestre Internationale (International Federation for Equestrian Sports), NRHA = National Reining Horse Association

Over 40% of the respondents have participated in Recreational Trail Riding which could be English or Western, and a quarter of the 641 respondents continued to do so during veterinary education. Primary activity (Table 16) roughly parallels Table 15 in order of highest current participation. About 4% of respondents consider themselves equally active in multiple areas. Participating in a discipline may not include competition and so there was a separate question about participating in organized equestrian activities (Table 17). None of the acronyms were spelled out as the assumption was they would be recognized by those participating in those activities.

Self-reported horsemanship experience scores reported by participants ($N = 643$) ran the gamut from zero representing no experience with horses to 100 which was described as nationally competitive/expert in your equestrian discipline when at your highest skill level with horses. The mean score was 30.0 with an SD of 27.7. These scores were not normally distributed, but there was not a bimodal distribution.

The open-ended question about other performance animal-related experience not already asked about yielded many types of experience which I have grouped into four categories. The most common was livestock showing or judging (dairy or beef cattle, goats, sheep, pigs, chickens, rabbits) (25 mentions), with a few breeding or owning livestock, and one professional rodeo competitor. Working dog training and showing experiences reported included obedience, agility, rally, herding, frisbee, dock diving, hunting and field trials, as well as specialized examples of seeing eye dogs or other service/therapy work, bomb-smelling dogs, or Schutzhund and guard dog training. Specific horse experiences were less commonly offered, probably due to the extent of survey questions already asked about horse experiences. They included racehorse work, family horse business or ownership, attending or volunteering at major events and rodeos,

occasional trail rides, clinics or horse camp, horse management staff at the university, equine research, horse judging, swimming horses, and owning other pet equids. Many of the responses could be categorized as veterinary-related work experience, but these limited responses do not reflect the prevalence of experience in these domains as survey participants were asked not to consider their veterinary experience. The responses are similar to what was reported by the recent graduates in their interviews such as licensed veterinary technologist or drug testing technician, husbandry work at large animal hospital, Foal Team with Society for Theriogenology club, a range of shadowing hours with horses, and work with other species such as laboratory animals.

A few quotes from these responses provide insight into what these experiences offer regardless of the age at which the experience was gained. “I went to horseback riding camp in the summer during middle school. Not enough to learn anything useful, but enough to be comfortable around horses and learn their body language.” Another participant explained it in terms of future work: “I was able to dabble in showing livestock and horse halter classes through a club that I was active in during undergrad. It was a great experience and I would be interested in working with clients who own show/performance animals in the future.”

Interactions with instructors.

To understand whether being asked about prior experience was common, the survey asked students whether instructors had asked about their prior experience in any of these educational settings or to indicate that the setting was not applicable to their experience. Respondents did not seem to use the not applicable field as intended, so the data in Table 18 reflect the proportion that recalled having been asked about experience in that context with the baseline number including some students who may not yet have had that experience.

Prior experience is clearly important to instructors, particularly in clinical rotations. Eighty percent of fourth-year students recall being asked about their experience at the beginning of clinical rotations where there are both smaller numbers of students and the potential need to better understand student experience for safety and case assignment. Over half of students reported being asked at the beginning of a lecture class about their prior experience. Additionally, over 40% recalled being asked in smaller group settings such as breakouts, wet labs and club meetings which was where we assumed experience sharing discussions would take place based on the qualitative study findings. The lower rate for orientation may reflect the question's specific focus on being asked by an instructor rather than being asked in general by anyone which would be a more common situation at orientation. Disappointingly, only 20% recalled advisors asking for their prior experiences with performance animals in their first meeting. However, rates of advising inquiries varies by focus area with food animal (42%), large animal only (37%) and equine only (31%) being asked more often than mixed animal (21%) or small animal only (16%). Students also reported being asked about their prior experience in interviews, voluntary treatment teams, summer programs, hands-on animal handling labs, and conferences, guest lectures, short courses, club events, and individual interactions with non-faculty.

Table 18

Student Recollection of Instructors Asking about Experiences, N = 648

Did a faculty member or instructor ask about your prior experience with horses or performance animals (show livestock, working dogs, etc.) in any of the following settings?	Number	Percentage
Orientation	232	35.8
Lecture Class, at the beginning	342	52.8
Lecture Class, after the first class	267	41.2
Small Group Breakouts	278	42.9
Wet Lab	277	42.7
Club Meeting	325	50.2
First Meeting with Advisor	129	19.9
Other Educational Activity, please specify:	20	3.1
For Clinical Rotations, limiting denominator to fourth-year students, $n = 130$		
Clinical Rotation, at the beginning		
Note: 38 additional students from years one to three reported being asked when starting rotations.	108	83.1
Clinical Rotation, after the first session		
Note: 28 additional students from years one to three reported being asked after the start of rotations.	65	50.0

Knowledge Sharing Self-Efficacy.

To understand whether students felt they (a) had experiences to share with other veterinary students and the (b) confidence and (c) ability to do so generally, I asked the three Knowledge Sharing Self-Efficacy (KSSE) questions using the Likert-type scale from one (*strongly disagree*) to six (*strongly agree*). No context was specified. The proportion responding in each aspect of the scale is shown in Table 19. About 90% of students at least somewhat agreed that they had knowledge that they were confident in and able to share verbally. Responses were very similar across questions with a mean score of 4.6 on all three items [95% CI 4.5-4.7 for Items 1 and 2, 95% CI 4.5-4.6 for Item 3]. Relatedness of the questions was also shown in the statistically significant (all $p < .0001$) correlation coefficients among questions; having expertise was slightly more correlated with confidence in ability ($r = .82$) than confidence in responding ($r = .73$). This confidence in responding had the same correlation with confidence in ability ($r = .73$). These context-neutral KSSE scores will be compared with the scores for Receptivity to Sharing from the context-specific scenarios that follow.

Exploratory factor analysis of KSSE.

As the KSSE had not been previously used with this population, an exploratory factor analysis was conducted using the data available from survey respondents who answered all three KSSE questions, regardless of whether they completed the rest of the survey ($N = 765$). The three items were examined using a principal factors analysis which was unrotated since it retained a single factor with loadings as seen in Table 20. Interitem

Table 19

Student Agreement with Knowledge Sharing Self-Efficacy Items, N = 648

Item	Strongly disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree
I feel confident in my ability to provide knowledge that other veterinary students may consider valuable. (#1)	0.5%	1.7%	6.9%	33.5%	43.1%	14.4%
I have the expertise, experiences, or insights needed to provide knowledge that may be valuable for other veterinary students. (#2)	0.3%	1.4%	7.6%	34.7%	41.5%	14.5%
I feel confident in responding or adding comments to information shared by other veterinary students. (#3)	0.5%	2.3%	6.2%	34.9%	42.9%	13.3%

correlation for the three items was .75. Each item produced a factor loading greater than the minimum of .40, and each loaded on the single factor. Cronbach's coefficient alpha (α) was calculated to assess the reliability of the underlying construct for the retained factor. Reliability coefficient measures ranging from 0.70 to 0.95 are considered acceptable (Tavakol & Dennick, 2011). Mean Cronbach's alpha was 0.8995. Communality, calculated as 1 minus the uniqueness (percent of variance that is not explained by the common factor), ranged from 63 – 76%. This suggests that all three item variables are fairly well explained by the single factor of knowledge-sharing self-efficacy.

Table 20.

KSSE Items, Corresponding Factor Loadings, and Uniqueness, N = 765

KSSE Item	Factor 1 $\alpha = 0.8995$	Uniqueness
#1 Confident in Ability	0.87	0.24
#2 Have Expertise	0.87	0.24
#3 Confident in Responding	0.80	0.37

The exploratory factor analysis and score similarities support these items representing a single construct. Therefore, I use the combined mean KSSE score as a single variable in the regression models that follow.

Achievement Goal Orientation measured with the AGQ-R.

Achievement goal orientation in the context of an equine medicine course was measured in survey participants using three of the four subscales of the AGQ-R: Mastery Approach, Performance Approach and Performance Avoidance. As the AGQ-R had not been studied in this context with a veterinary student population and there was disagreement in the literature about the constructs, I performed an exploratory factor analysis on participant responses to this measure

Factor analysis of three subscales of AGQ-R.

The exploratory factor analysis used the data available from survey respondents who answered all AGQ-R questions, regardless of whether they completed the rest of the survey ($N = 670$). I expected to find three factors based on the structure of the measure, but also planned to

use the proportion of variance to support the appropriate number of factors to be retained. The minimum proportion of variance for this study was set at 10% and ideally cumulative variance for the retained factors will approach 100%. Principal factors analysis (rotated oblique promax) of these nine items generated 30 parameters and retained four factors. Only the first three factors explained more than 10% of the variance (63%, 62%, and 32%)—the fourth was 7%. Interitem correlation was .36. Table 21 shows each variable produced a factor loading greater than or equal to the minimum of .40 on only one of the first three factors. Mastery Approach is represented by Factor 3 with scores from 0.60 to 0.79, Performance Approach loadings on Factor 1 range from 0.56 to 0.86, and Performance Avoidance appears on Factor 2 with loadings from 0.64 to 0.88. Uniqueness for the Performance items (20 – 38%) was somewhat low suggesting that all six Performance item variables are somewhat explained by these factors, while the uniqueness for the Mastery Approach items was higher, ranging from 40-53%. Mean reliability with Cronbach's alpha was 0.83.

These three factors (Mastery Approach, Performance Approach and Performance Avoidance) are examined as separate predictors in the multiple regression analysis. In terms of the participant scores on the three subscales, there were not large differences in mean scores as this population had very similar Performance scores and slightly higher Mastery Approach scores. (Table 22).

Table 21.

AGQ-R Items (Construct), Corresponding Factor Loadings, and Uniqueness, N = 670

Item (Construct)	Factor 1 Performance Approach	Factor 2 Performance Avoidance	Factor 3 Mastery Approach	Uniqueness
My aim is to completely master the material presented in this class. (Mastery Approach)	0.15	0.00	0.60	0.53
My goal is to learn as much as possible. (Mastery Approach)	-0.04	0.04	0.72	0.50
I am striving to understand the content of this course as thoroughly as possible. (Mastery Approach)	-0.05	-0.02	0.79	0.40
I am striving to do well compared to other students. (Performance Approach)	0.86	-0.01	0.03	0.25
My aim is to perform well relative to other students. (Performance Approach)	0.83	0.08	-0.00	0.22
My goal is to perform better than the other students. (Performance Approach)	0.56	0.25	-0.06	0.36
My goal is to avoid performing poorly compared to others. (Performance Avoidance)	0.20	0.64	-0.00	0.38
I am striving to avoid performing worse than others. (Performance Avoidance)	-0.01	0.88	0.01	0.25
My aim is to avoid doing worse than other students. (Performance Avoidance)	0.02	0.88	0.00	0.20

Table 22

AGQ-R Item and Subscale Scores, N = 648

AGQ-R Items Clustered by Subscale	Mean score \pm SD
Mastery Approach (overall subscale)	4.2 \pm 0.7
My aim is to completely master the material presented in this class.	3.8 \pm 1.1
My goal is to learn as much as possible.	4.6 \pm 0.7
I am striving to understand the content of this course as thoroughly as possible.	4.4 \pm 0.8
Performance Approach (overall subscale)	3.5 \pm 1.0
I am striving to do well compared to other students.	3.8 \pm 1.1
My aim is to perform well relative to other students.	3.7 \pm 1.1
My goal is to perform better than the other students.	3.1 \pm 1.2
Performance Avoidance (overall subscale)	3.8 \pm 1.0
My goal is to avoid performing poorly compared to others.	3.9 \pm 1.0
I am striving to avoid performing worse than others.	3.8 \pm 1.1
My aim is to avoid doing worse than other students.	3.7 \pm 1.1

Theoretically the AGQ-R scale scores for mastery and performance should correlate with the course grade for the course that provided the context, in this case the equine medicine course grade. Thus, one would hope to see students expecting a high equine course grade also having high Mastery Approach scores in this context. Performance Approach generally would also be expected to correlate with the overall GPA. The correlations shown in Table 23 were calculated using dichotomous variables for the equine course grade being an A and the overall GPA being an A.

Table 23

Correlation of AGQ-R subscales (all scenarios) with Overall GPA is A, and Equine Course Grade is A, N = 648

Variable Name	1	2	3	4	5
1. Mastery Approach	--				
2. Performance Approach	.26 ***	--			
3. Performance Avoidance	.08	.66 ***	--		
4. Overall GPA is A	.05	.27 ***	.07	--	
5. Equine Course Grade is A	.25 ***	.37 ***	.10 ** ($p = .015$)	.47 ***	--

Note. ** $p < .01$; *** $p < .0001$

An earned or anticipated equine medicine lecture course grade of A was significantly positively correlated with all three subscales of the AGQ-R as well as with earning an overall GPA of A. The correlation between the equine-specific grade and Mastery Approach goal orientation to the equine lecture course is meaningful and significant ($r = .26, p < .0001$). There is not a significant association between overall GPA and Mastery Approach in the equine course which supports the theory that Mastery Approach is course-specific. There is a significant association between overall GPA and Performance Approach goal orientation which is about comparing oneself positively with classmates ($r = .27, p < .0001$).

Research Questions: Quantitative Phase with Current Students

Quantitative research question-1

How useful do veterinary students perceive the sharing of prior horsemanship experience of others to be in the context of an equine medicine course and how receptive are they to sharing their own experiences?

To examine this question, veterinary students were asked to respond to three scenarios where hypothetical students shared information from prior horsemanship experience.

Scenario responses for Usefulness, Learning, and Receptivity to Sharing

The scenarios were produced to resemble critical incidents that could be shared by veterinary students in classroom or clinic settings. There were three scenarios varying by setting (classroom or clinic) and valence (positive or negative experience) The first scenario is a shortened version of the one that was tested with the qualitative interview phase participants. The second and third scenarios were novel scenarios, with the third being a variation on a critical incident shared by one of the qualitative interview participants.

Scenario 1: (Classroom – sharing negative experience)

You are a veterinary student taking a mandatory equine medicine and surgery course. During a classroom lecture in equine medicine, the instructor reviewed how much tightness is needed to keep the bandage in place and doing its job without causing damage to the tendons. A student who competed in show jumping prior to entering veterinary school, raised her hand and was called upon by the instructor. She described a case of cording due to improper bandaging on a high-performance horse at her barn. The horse had a tendency to stock up after work and so the new barn manager had wrapped the legs with tight support bandages. The next day, when the horse was unbandaged there were visible ripples in the tendons in the back of one of the legs and the horse was “off.” When the veterinarian came out to examine the now lame horse, she took the time to demonstrate on a healthy leg the recommended amount of tension and then offered the barn manager the chance to wrap and have the wraps reviewed.

Scenario 2: (Classroom – sharing positive experience)

You are a veterinary student taking a mandatory equine medicine and surgery course. During a classroom lecture in equine medicine, the instructor was talking about a case of a horse that was lame under saddle when ridden, but not when worked without tack. A student who competed in dressage prior to entering veterinary school, raised her hand and was called upon by the instructor. She described a case when a horse at her barn had a similar problem and the veterinarian did thermography of the horse's back to look for the pressure from the saddle and recommended a consultation with the saddle fitter. She asked whether that approach might be appropriate for the case under discussion.

Scenario 3: (Clinical – sharing positive experience)

You are a veterinary student taking an equine medicine and surgery clinical rotation. During rounds a student presents the case of a show horse with a large jagged facial cut from an accident at the nearby horse facility. During the discussion of how to treat the wound after suturing, another student who showed halter horses on the Quarter Horse circuit mentioned that he remembered a horse with a similarly jagged wound on its leg and how the veterinarian treated it with a hydrogel product to reduce scarring which seemed to work well enough that the horse continued to win in the show ring after the injury healed.

The six response items following each scenario were previously described in Table 2 (pg. 88).

Five of these statements used a six-point Likert-type scale from one (*strongly disagree*) to six (*strongly agree*) and were analyzed as continuous data. The sixth item

(WILLINGNESS_EXTENT) used a 10-point scale. As planned, the scores for related items were aggregated into the Usefulness Index and the Receptivity to Sharing Index. The mean scores by scenario for each of these is shown in Table 24.

Overall the Usefulness, Time Concern (Not a waste of time), and Learning items scored higher than the measures for Receptivity to Sharing (Willingness and Likelihood) in this equine-specific context with similar amounts of variability reflected by the SD around the mean scores. I had expected responses to the item about learning something from the scenario to vary more to reflect the diverse equine knowledge and experience of the respondents, but the variation for this

item was similar to the others. Years of horse experience was slightly negatively correlated with learning ($r = -.03, p = .48$) but this relationship was not statistically significant.

Students reported confidence in their ability to share experiences and add value when posed the generic KSSE questions prior to the scenarios ($M = 4.6$) compared with their willingness to share scores after being prompted with an equine-specific scenario ($M = 3.7$). A paired t test comparing the overall mean KSSE scores with the mean Receptivity to Sharing index score rescaled over all three scenarios found the one-point difference in mean scores to be significant ($t = 26.68, df = 647, p < .0001$). When participants rated extent of their willingness to share on a scale from 0-10, the mean across participants who responded to all three scenarios ($n = 644$) was 4.7 ± 2.4 SD, a very neutral response. The scores for likelihood of sharing were about a half point higher for the clinic-based scenario which is significantly different from the first classroom-based scenario ($t = -10.76, df = 647, p < .0001$) as well as the second scenario which was also based in a classroom setting.

A repeated-measures ANOVA looking at whether the mean Usefulness Index score varied by the valence of the scenario found significant differences ($F = 56.22, df = 2, p < .0001$) among the classroom scenario with negative valence (8.2 [95% CI 8.1-8.3]), the classroom scenario with positive questioning (9.0 [95% CI 8.9-9.1]), and the clinics scenario with positive valence (8.8 [95% CI 8.7-8.9]). Although the values are statistically significant, having less than a single point difference on the index reflects falling along the continuum

Table 24

Student Usefulness, Learning, and Receptivity to Sharing Scores by Scenario Valence, N = 648 (unless n otherwise specified).

Item (Variable Name)	Scenario 1 Classroom Negative Mean \pm SD	Scenario 2 Classroom Positive Mean \pm SD	Scenario 3 Clinics Positive Mean \pm SD
This student's story of prior experience seems useful. (USEFULNESS)	4.3 \pm 1.1	4.6 \pm 0.9	4.5 \pm 0.9
If this story was shared in my course, I would have considered it a waste of time. (reverse coded) (TIME CONCERN)	3.9 \pm 1.2	4.4 \pm 1.0	4.3 \pm 1.0
I learned something from the student's story. (LEARNING)	3.9 \pm 1.1 (n = 647)	4.3 \pm 1.0	4.4 \pm 0.9
I would be willing to share a story from my own experience in this setting. (WILLINGNESS)	3.7 \pm 1.3	3.7 \pm 1.2	3.8 \pm 1.2
I would be likely to share a story from my own experience in this setting. (LIKELIHOOD)	2.9 \pm 1.3	3.1 \pm 1.3	3.4 \pm 1.3
Scale from 1-6 for above items; change to scale from 0-10 for next question			
How willing would you be to share a story from your own experience in a similar setting? Rate your willingness as a single number from 0 not at all willing, to 10 extremely willing. (WILLINGNESS_EXTENT)	4.5 \pm 2.6 (n = 646)	4.6 \pm 2.6 (n = 644)	5.1 \pm 2.5 (n = 646)
Aggregated scores (Scale range 2-12)			
Usefulness Index Combination of USEFULNESS and reverse-coded TIME CONCERN	8.1 \pm 2.2	9.0 \pm 1.8	8.8 \pm 1.8
Receptivity to Sharing Index Combination of WILLINGNESS and LIKELIHOOD	6.6 \pm 2.4	6.8 \pm 2.4	7.2 \pm 2.4

from somewhat agree to agree response. While this is likely not a meaningful enough difference to warrant separating out the scenario scores by positive or negative valence in the multiple regression analysis, the ANOVA $R^{2Adj} = .407$, Greenhouse-Geisser epsilon = .9351, was significant ($p < .001$). Therefore, in addition to the primary models with the combined score as the dependent variable, I regressed the scores for each scenario separately. I also examined these novel and modified items through an exploratory factor analysis.

Factor analysis of the scenario response items.

The exploratory factor analysis used the data available from survey respondents who answered all questions for scenario 1 ($N = 699$), scenario 2 ($N = 675$) and scenario 3 ($N = 655$), regardless of whether they completed the rest of the survey. I expected to find either two or three factors based on the structure of the measures, however the proportion of variance and cumulative proportion of variance were used to support the appropriate number of factors to be retained. The minimum proportion of variance for this study was set at 10% and ideally cumulative variance for the retained factors will approach 100%.

Principal factors analysis (rotated, oblique promax) was performed on the five questions that used the same response scale from one (*strongly disagree*) to six (*strongly agree*): Usefulness, Time Concern-reverse coded (aka “Not a Waste of Time”), Learning, Willingness and Likelihood for each of the three scenarios. Each analysis generated nine parameters from the five items and retained two factors. Each of these two factors explained more than 10% of the variance for each of the three scenarios, Factor 1 (84%, 77%, and 78%) and Factor 2 (71%, 69%, and 67%). Rotated factors were correlated. Interitem correlations ranged from a low of .51 for Scenario 2 to a high of .56 for Scenario 3.

Table 25 shows each variable produced a factor loading greater than or equal to the minimum of .40, and each variable loaded on only one factor. Loadings on Factor 1 for Usefulness, Time Concern, and Learning were very similar ranging from 0.76 for Usefulness to 0.79 for Time Concern, while the values switched for Scenarios 2 and 3 with Time Concern slightly lower than Learning and Usefulness for Scenario 2 (0.71 to 0.82) and Scenario 3 (0.79 to 0.85). Factor 2 showed positive loadings across all three scenarios for Willingness (0.80, 0.84, 0.85) and Likelihood (0.78, 0.86, 0.88). Uniqueness for all items ranged from a low of 21% in Scenario 3 to a high of 41% in Scenario 1 suggesting that there is a lot of commonality among these items in terms of other possible explanatory factors. Mean Cronbach's alpha for each of the three scenarios was .84, .84, and .86 respectively.

In general, this suggests that Usefulness, Time Concern and Learning are well explained by Factor 1, and that Willingness and Likelihood are well explained by Factor 2 which supports my original structure of Usefulness Index representing Factor 1, the combination of Usefulness and Time Concern, and Receptivity to Sharing Index, Factor 2, the combination of Willingness and Likelihood. as separate factors in the model. Although it appears from the factor analysis that learning something from the scenario loads as heavily on Factor 1 as the other two items in the Usefulness Index, I did not include it due to the original hypothesis that learning may be explained by other factors such as experience and therefore should be analyzed separately. These two factors, Usefulness and Receptivity, will be examined as separate predictors in the multiple regression analysis. The item Learning will not be considered part of the Usefulness Index even though it loaded on the Usefulness factor in this analysis, and it will not be analyzed in the regression model.

Table 25

Usefulness Index, Learning, and Receptivity to Sharing Items with Corresponding Factor Loadings, and Uniqueness by Scenario

Scenario and Item	Factor 1 Usefulness	Factor 2 Receptivity	Uniqueness
Scenario 1, $N = 699$, $\alpha = .84$, $icc = .52$			
Usefulness	0.76	0.07	0.37
Not a Waste of Time	0.79	0.07	0.32
Learned Something	0.78	-0.03	0.41
Willingness to Share	0.01	0.80	0.35
Likelihood of Sharing	0.06	0.78	0.33
Scenario 2, $N = 675$, $\alpha = .84$, $icc = .51$			
Usefulness	0.82	0.01	0.32
Not a Waste of Time	0.71	0.07	0.44
Learned Something	0.78	0.01	0.38
Willingness to Share	0.04	0.84	0.25
Likelihood of Sharing	-0.00	0.86	0.27
Scenario 3, $N = 655$, $\alpha = .86$, $icc = .56$			
Usefulness	0.85	0.01	0.27
Not a Waste of Time	0.79	0.05	0.34
Learned Something	0.80	0.03	0.33
Willingness to Share	0.07	0.85	0.21
Likelihood of Sharing	-0.01	0.88	0.24

icc = intraclass correlation coefficient

Another way to look at diversity in responses is to look at the proportion of students who responded in each category for the Usefulness and Receptivity to Sharing questions. Within items about usefulness/not a waste of time, the rates increased along the continuum from a few

strongly disagreeing (1-3%) to the largest proportions in agreement (29-39%) with 6-10% strongly agreeing. Respondents disagreed more about their willingness to share (38%) and likelihood of sharing (63%); there is a strong distinction between willingness and likelihood with 25% of those who agreed they were willing to share going on to disagree that they would be likely to share.

Table 26

Proportion of Student Agreement with Scenario Responses (all scenarios), N = 648

Item	Strongly disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree
This student's story of prior experience seems useful .	1.0%	3.9%	7.3%	34.1%	43.0%	10.8%
If this story was shared in my course, I would have considered it a waste of time . (reverse-coded)	2.0%	7.2%	15.4%	30.3%	36.6%	8.5%
I learned something from the student's story.	1.0%	6.6%	10.4%	39.5%	36.5%	5.9%
I would be willing to share a story from my own experience in this setting.	5.1%	15.9%	15.8%	32.4%	27.3%	3.4%
I would be likely to share a story from my own experience in this setting.	11.4%	23.0%	21.8%	28.0%	13.7%	2.2%

Quantitative research question-2

How do personal, motivational and environmental factors such as career plans, achievement goal orientation, classroom practices, and other factors raised during the qualitative interviews explain students' perception of the usefulness of prior horsemanship experience shared by others and willingness to share their own prior experiences?

This question has two arms that I analyzed using data from novel measures as well as standard measures in multiple regression analyses to look at variables that might explain student: 1) perception of usefulness of experience shared by others, and 2) willingness and likelihood of sharing their own experiences. We have already seen in the previous analyses that there are similar responses across all three scenarios. The correlation analyses are based on the Usefulness Index and Receptivity to Sharing scores averaged from all three scenarios (score from 2-12). For the regression models, the primary omnibus tests reported used the combined and averaged scores from all three scenarios, but the models were also run independently for each scenario to see if the scenario setting and valence was associated with additional predictors.

Perception of the usefulness of experience shared by others.

As shown in Figure 3 (p. 86) I suspected that how much students found shared equine scenarios useful would be associated with their career plans for equine work, their achievement goal orientation, their academic performance, their knowledge sharing self-efficacy and their horsemanship experience. Other variables I considered possibly important to explaining the association were gender, years in veterinary education, internship/residency plans, being non-traditional age, and quality of their veterinary program. The number of equine-only students was small ($n = 42$, 6.5%) compared to those with some focus on large

Table 27

Correlations of Usefulness Index with Potential Predictor Variables, N = 648

Variable	Correlation	<i>p</i>
Usefulness Index (<i>all scenarios</i>)	1.00	N/A
AGQ-R Mastery Approach ***	.18	< .0001
AGQ-R Performance Approach	.05	.21
AGQ-R Performance Avoidance	.03	.51
Knowledge Sharing Self-Efficacy ***	.16	.0001
Equine Career Focus-High (equine only)	.06	.10
Equine Career Focus-Medium (large animal exclusive of equine-only)	.03	.39
Horse Experience (Years) **	.12	.0023
Horse Ownership (Yes) *	.11	.0227
Horse Experience Self-Rating Score **	.14	.0005
Internship/Residency Planned (Dichotomous)	-.04	.26
Years in Veterinary Education ***	-.17	< .0001
Traditional Age (<27 years)	-.03	.51
Gender (Female) ***	.13	.0007
GPA Overall is A	-.01	.87
<i>Equine Course Grade is A</i>	<i>.07</i>	<i>.0579</i>
Faculty Asked in Lecture	.05	.25
DVM Program Quality Score	-.01	.74

Note. Bolded items have statistically significant correlations and italicized variables are trending to significance.. * $p < .05$; ** $p < .01$; *** $p < .001$

animal which would include equine ($n = 224, 34.6\%$) and no focus on equine ($n = 382, 59.0\%$), so for the purposes of this analysis, I looked at these as equine-only (High) or those containing some equine excluding the equine-only (Medium). In neither was career focus significantly correlated with Usefulness Index (see Table 27).

As anticipated, KSSE, AGQ-R Mastery Approach, and Equine Course Grade is A had positive correlations with Usefulness Index scores that were either significant or trending to significance. All three of the horse experience measures were significantly associated with Usefulness, with Horse Experience Self Rating ($r = .14, p = .0005$) and Horse Experience (Years) ($r = .12, p = .0023$) performing almost equivalently. Based on the more reliable reports of years of experience rather than the self-rating score, I chose Horse Experience (Years) for the multiple regression models. Surprisingly, Years in Veterinary Education was significantly negatively correlated ($r = -.17, p < .0001$). Female gender was also significant, but it is unclear whether this is a function of the very large number of females in the study (87% of participants) or represents a real difference in how women view the usefulness of information shared by others.

AGQ-R Performance subscales showed minimal positive correlations rather than the negative correlations anticipated in Figure 3, though none were statistically significant. Three variables predicted to be negative were dichotomous variables (Internship Planned, Traditional Age, and GPA Overall is an A) and the ordinal variable DVM Program Quality Score. These were all slightly negatively correlated as predicted to be associated with Performance Goal Orientation, but none of the correlations was significant. A new variable not in Figure 3 was added from a question added due to the qualitative phase findings about whether

the student recalled being asked by an instructor to share in a lecture; this item was not significantly correlated.

Models for multiple regression analysis.

Two multiple regression analyses using Stata 12.1 (College Station, TX) were planned to test the predicted associations for research question one: Model 1 to understand Usefulness, and Model 2 to understand Receptivity to Sharing. To simplify the regression analysis interpretation, I standardized (mean centered) the continuous independent variables of AGQ-R Mastery Approach, AGQ-R Performance Approach, AGQ-R Performance Avoidance, Knowledge Sharing Self-Efficacy (KSSE), and Horse Experience (Years) by subtracting the mean score from each student's score. This results in standardized coefficients where -1 SD represents low values on these measures and +1 SD indicates high values. The coding of the dichotomous and ordinal variables was described in Chapter Three (p. 79-81). The coefficients are shown as unstandardized and standardized for ease of interpretation and comparison.

Model 1: Usefulness Index Scores and potential predictor variables

The dependent variable Usefulness Index—All Scenarios was transformed back into a 6-point scale by calculating the mean of the Usefulness Index items for ease of interpretation. Mean Usefulness Index was regressed on the standardized focal variables AGQ-R Mastery Approach score, AGQ-R Performance Approach score, AGQ-R Performance Avoidance score, KSSE, the standardized moderating variable Horsemanship Experience (Years) as well as the control variables Years in Veterinary Education, Equine Career Focus-High, Equine Career Focus-Medium, Internship Planned, Overall GPA is an A, Equine Course Grade is an A, Traditional Age, and Female, as well as the environmental variables Faculty Asked in Lecture and DVM Program Quality Score. Results appear in Table 28.

The omnibus test for Model 1 showed that this combination of variables explained 8% of the variance in Usefulness Index score across all scenarios, $F(15, 632) = 4.82, p < .001, R^2_{adj} = 0.081$. Four of the fifteen variables contributed significantly. The strongest contributors to understanding how useful respondents found other students' experiences were the respondent's own Knowledge Sharing-Self Efficacy which predicted a small increase in scores and Years in Veterinary Education which predicted a slight decrease in scores for each year the respondent had completed in the DVM program. Each SD increase in KSSE is associated with an increase of 0.16 in Usefulness Index on the six-point Likert-type scale from strongly disagree to strongly agree. Similarly, each SD increase in AGQ-R Mastery Approach scores predicts a tenth of a point increase in Usefulness Index. Neither is likely to signify a difference between levels of agreement on the item, nor is the other important predictor that for every additional year in the DVM program, the Usefulness Index decreases 0.11. Being female was associated with a Usefulness Index score about a third of a point higher ($b = 0.28, t(632) = 3.27, p = .001$) but it is not clear how this is impacted by the very high proportion of women in the study. Horse Experience (Years) was not significant in this model, $b = 0.004, t(632) = 0.90, p = .368$, though it was positively correlated (Table 27).

I also regressed independently the Usefulness score for each scenario using the same model predictors (not shown). For Scenario 1, the classroom negative valence scenario, the omnibus test for the model performed less well, explaining only 4% of the variance in Usefulness Index, $F(15, 632) = 2.66, p = .0006, R^2_{adj} = .0371$. The only predictor that performed differently was Faculty Asked in Lecture which trended towards significance ($b = .164, t(632) = 1.94, p = .052$) for Scenario 1 unlike in the overall model where it was not

Table 28

Regression Analysis of Usefulness Index on Standardized Knowledge Sharing Self-Efficacy, AGQ-R Subscales, and Other Predictor Variables, N = 648

Usefulness Index (Scaled 1-6)	b	β	SE	95% Conf. Int.		p
				Low	High	
Constant	4.395	.	0.146	4.109	4.682	.000
AGQ-R Mastery Approach^a	0.103*	0.103	0.044	0.016	0.189	.020
AGQ-R Performance Approach ^a	-0.028	-0.038	0.042	-0.110	0.055	.514
AGQ-R Performance Avoidance ^a	0.037	0.049	0.039	-0.040	0.114	.348
Knowledge Sharing Self-Efficacy^a	0.160***	0.180	0.036	0.090	0.230	<.001
Horse Experience (Years) ^a	0.004	0.040	0.005	-0.005	0.014	.368
Equine Career Focus-High ^b	0.029	0.010	0.132	-0.231	0.288	.828
Equine Career Focus-Medium ^b	-0.012	-0.008	0.068	-0.145	0.121	.859
Internship Planned	0.002	0.002	0.067	-0.129	0.134	.970
Years in Veterinary Education	-0.112***	-0.172	0.027	-0.164	-0.059	<.001
Traditional Age	-0.106	-0.060	0.071	-0.245	0.032	.131
Female^b	0.278**	0.127	0.085	0.111	0.445	.001
GPA Overall is A	-0.050	-0.033	0.067	-0.181	0.081	.456
Equine Course Grade is A	0.037	0.025	0.071	-0.103	0.177	.604
Faculty Asked in Lecture	0.055	0.037	0.056	-0.056	0.165	.331
DVM Program Quality Score	0.000	0.000	0.024	-0.047	0.047	.995
<hr/>						
R^2	.1026					
R^2_{adj}	.0813					
$F(15, 632)$	4.82***					

* $p < .05$; ** $p < .01$; *** $p < .001$

b = unstandardized coefficient

β = standardized coefficient

^a Standardized continuous variables

^b Variables dummy coded

significant. For Scenario 2, classroom positive valence, there were no changes in predictors from Model 1 with all scenarios, but the omnibus test showed the model captured 11% of the variance in Usefulness Index, $F(15, 632) = 5.37, p < .0001, R^2_{adj} = .1131$. For Scenario 3, the clinical positive valence example, the overall model performance is the lowest, $F(15, 632) = 2.26, p = .0042, R^2_{adj} = .0284$. AGQ-R Mastery Approach is no longer a significant predictor, although KSSE, Year in Veterinary Education, and Female gender remain relevant. Equine Career Focus-High trends to significance, $b = .317, t(632) = 1.90, p = .057$.

Model 2: Receptivity to Sharing and potential predictors

The process described for analyzing Usefulness was also used with the dependent variable Receptivity to Sharing Index (12-point scale rescaled to six-point scale) across all scenarios. Table 29 shows that many significant correlations are shared with the Usefulness model. Of those unique to the Receptivity to Sharing model, Equine Course Grade is A is strongest ($r = .16, p < .001$) followed by Faculty Asked in Lecture ($r = .12, p = .002$) and Equine Career Focus-High ($r = .09, p = .016$). Surprisingly, AGQ-R Performance Approach ($r = .11, p = .0041$) and Internship Planned ($r = .10, p = .0094$) were positively correlated with sharing. A possible explanation mentioned by one of the interviewees is that you want instructors to see you perform well for internship recommendations. Being a traditional age student ($r = -.12, p = .0027$) is negatively correlated with Receptivity.

The dependent variable Receptivity to Sharing Index—All Scenarios was transformed back into a 6-point scale by calculating the mean of the Receptivity to Sharing Index items for ease of interpretation. Mean Receptivity to Sharing Index was regressed on the standardized focal variables AGQ-R Mastery Approach score, AGQ-R Performance Approach score, AGQ-R Performance Avoidance score, KSSE, the standardized moderating variable Horsemanship

Table 29

Correlations of Receptivity to Sharing Index (all scenarios) with Potential Predictor Variables, N = 648

Variable	Correlation	<i>p</i>
Receptivity to Sharing Index (<i>all scenarios</i>)	1.00	.
AGQ-R Mastery Approach ***	.19	< .001
AGQ-R Performance Approach **	.11	.0041
AGQ-R Performance Avoidance	.03	.4499
Knowledge Sharing Self-Efficacy ***	.35	< .001
Equine Career Focus-High *	.09	.0160
Equine Career Focus-Medium	.03	.3998
Years of Horse Experience ***	.22	< .001
Horse Ownership (Yes) **	.14	.0019
Horse Experience Self-Rating Score	.23	< .001
Internship/Residency Planned (Dichotomous)**	.10	.0094
Years in Veterinary Education *	-.09	.0181
Traditional Age (<27 years) **	-.12	.0027
<i>Gender (Female)</i>	.07	.0593
GPA Overall is A	.04	.3398
Equine Course Grade is A ***	.16	< .001
Faculty Asked in Lecture **	.12	.0020
DVM Program Quality Score	-.02	.6885

Note. Bolded items have statistically significant correlations and italicized variables are trending to significance. * $p < .05$; ** $p < .01$; *** $p < .001$

Experience (Years) as well as the control variables Years in Veterinary Education, Equine Career Focus-High, Internship Planned, Overall GPA is an A, Equine Course Grade is an A, Traditional Age, and Female, as well as the environmental variables Faculty Asked in Lecture and DVM Program Quality Score (see Table 30).

The omnibus test for Model 2 showed that this combination of variables explained 20% of the variance in Receptivity to Sharing across all scenarios, $F(15, 632) = 11.94, p < .0001, R^2_{adj} = 0.20$. Five of the nine variables contributed at a level with statistical significance, three positive and two negative. Knowledge Sharing-Self Efficacy was the strongest contributor to understanding how respondents were receptive to sharing, predicting a meaningful increase in scores. For every SD increase in KSSE, Receptivity increases by almost half a point (0.43). An increase of a quarter point is predicted by respondents recalling having been asked by instructors to share experiences in a lecture setting, $b = 0.23, t(632) = 3.06, p = .002$. Horse Experience (Years) showed a 0.02 increase associated with every SD increase in years of experience. As in the Usefulness model, Years in Veterinary Education predicted a slight decrease in scores for each year the respondent had completed in the DVM program, $b = -0.133, t(636) = -3.71, p < .0001$. Being traditional age also explains a meaningful decrease of a third of a point in Receptivity, $b = -0.359, t(636) = -3.8, p < .0001$.

I also regressed independently the Receptivity to Sharing score for each scenario using the same model predictors (not shown). For Scenario 1, the classroom negative valence scenario, the omnibus test for the model performed slightly less well, explaining 17% of the variance in Receptivity to Sharing Index, $F(15, 632) = 9.55, p < .0001, R^2_{adj} = .1655$. All the significant predictors performed similarly. Female which had trended towards significance in the overall model, was not significant for Scenario 1 or 2. For Scenario 2, classroom positive

Table 30

Regression Analysis of Receptivity to Sharing Index on Standardized Knowledge Sharing Self-Efficacy, AGQ-R Subscales, and Other Predictor Variables, N = 648

Receptivity to Sharing Index (Scaled 1-6)	b	β	SE	95% Conf. Int. Low High		p
Constant	3.752	.	0.196	3.367	4.136	.000
AGQ-R Mastery Approach ^a	0.091	0.063	0.059	-0.025	0.207	.125
AGQ-R Performance Approach ^a	0.030	0.029	0.057	-0.081	0.141	.592
AGQ-R Performance Avoidance ^a	0.025	0.023	0.053	-0.079	0.128	.640
Knowledge Sharing Self-Efficacy^a	0.431***	0.335	0.048	0.336	0.525	< .001
Horse Experience (Years)^a	0.022***	0.145	0.006	0.010	0.035	< .001
Equine Career Focus-High ^b	-0.034	-0.008	0.177	-0.382	0.314	.848
Equine Career Focus-Medium ^b	-0.010	-0.004	0.091	-0.188	0.169	.914
Internship Planned	0.040	0.017	0.090	-0.137	0.217	.657
Years in Veterinary Education	-0.133***	-0.142	0.036	-0.203	-0.062	< .001
Traditional Age	-0.359***	-0.140	0.095	-0.545	-0.173	< .001
<i>Female^b</i>	<i>0.206</i>	<i>0.065</i>	<i>0.114</i>	<i>-0.018</i>	<i>0.430</i>	<i>.072</i>
GPA Overall is A	-0.018	-0.008	0.090	-0.194	0.158	.844
Equine Course Grade is A	0.105	0.049	0.096	-0.083	0.293	.275
Faculty Asked in Lecture	0.231**	0.108	0.076	0.083	0.379	.002
DVM Program Quality Score	-0.034	-0.039	0.032	-0.098	0.029	.286
<hr/>						
R^2	.2208					
R^2_{adj}	.2023					
$F(15, 632)$	11.94***					

* $p < .05$; ** $p < .01$; *** $p < .001$

b = unstandardized coefficient

β = standardized coefficient

^a Standardized continuous variables

^b Variables dummy coded

valence, there were no changes in predictors from Model 1 with all scenarios and the omnibus test showed the model captured 16% of the variance, $F(15, 632) = 9.37, p < .0001, R^2_{adj} = .1625$. In this setting AGQ-R Mastery Approach trended towards significance, $b = .126, t(632) = 1.84, p = 0.067$. For Scenario 3, the clinical positive valence example, the overall model performance is the lowest, $F(15, 632) = 8.59, p < .0001, R^2_{adj} = .1497$, though still explaining 15% of the variation in Receptivity. The five significant predictors remain, and are joined by Female, $b = .261, t(632) = 2.00, p = .046$. Equine Course Grade is an A trends to significance, $b = .213, t(632) = 1.94, p = .053$.

Summary of regression model results.

The general variables KSSE and Years of Veterinary Education were significant across both Model 1 and Model 2 explaining both Usefulness and Receptivity to Sharing for the overall models with all scenarios, as well as each of the individual scenarios. The standardized β coefficients for Years were very similar, -0.172 and -0.142 respectively, while KSSE showed a large difference in coefficients from 0.180 for Usefulness to 0.335 for Receptivity to Sharing. Mastery goal orientation predicts Usefulness, but not Receptivity. In Model 2 exploring receptivity to sharing one's experience in an equine learning setting, the Horse Experience (Years) variable was explanatory although the associated difference in score was not large. Model 2 also has the most explanatory variables related to student-faculty dynamics (being asked by faculty about your experience) and student demographics (being non-traditional age or female).

The patterns for the scenario-specific regressions were very different for Usefulness than for Receptivity to Sharing. The Usefulness scores for each separate scenario were very different, much lower for Scenarios 1 and 3, and higher for Scenario 2, whereas the Receptivity scenarios

all scored similarly, but slightly lower than the all scenarios model. In the clinical scenario, predictors changed most with AGQ-R Mastery Approach no longer significantly predicting Usefulness and others trending towards predicting Receptivity.

Limitations to the survey findings

Limitations in the quantitative stage were primarily a function of the pattern of participation across the U.S. and responses already discussed, specifically the lack of midwestern, middle-ranked institutional participation, that most of the veterinary colleges in the Northeast Region are private schools that were not included in this data analysis, and that the sample is underrepresented in small animal and overrepresented in specialty areas and zoological/wildlife medicine compared to the national data from NAVLE. There is also a lower percentage of male students (13%) than the 20% nationally. That only 29% of the respondents planned on an internship or residency, with an additional 33% being unsure, shows this population from public universities differs from the average veterinary student population where 44% in 2013 were pursuing internship/residency/PhD as their first-year employment (American Veterinary Medical Association, 2013b). The difference between the study population may be even larger if you consider that 29% includes those who plan to apply and the 44% is those who were successful at achieving residencies and completed the AVMA survey. To compare with those who applied for residencies not just those who were successful, in 2015, 2,388 veterinarians applied to the Veterinary Internship and Residency Matching Program (VIRMP, 2015) and there were 2,895 graduates of U.S. veterinary colleges that year (AAVMC, 2015) the rate of considering internship/residency nationally could be as high as 82%; note the pool of applicants is broader than the 2015 graduates since it includes students from non-U.S. veterinary

colleges and those who graduated in prior years. However, if unsure and pursuing are combined as considering, then the 62% rate is more in line with the national numbers.

The response rate to individual questions decreased as participants got deeper into the survey; only 648 of the 843 respondents completed all the questions to be included in the regression models. The focus on horsemanship in the later questions in a survey that was advertised as being more generally about prior experience was perhaps seen as deceptive based on the drop off rate for those questions and a few comments at the end. This was a conscious tradeoff in terms of recruiting non-large animal students to participate. I felt that if I advertised it as a large animal prior experience study that would limit participation. In retrospect, I could have asked more questions about performance dogs, etc. on the survey to balance the coverage but was concerned with keeping the question count around 50.

No post-quantitative survey cognitive interviewing was pursued to see whether current students completing the survey found recall challenging or had questions about the survey questions. However, several respondents provided feedback about survey question structure and meaning in the open ended questions, for example: “I was a little confused regarding questions about sharing personal experience stories—was this specifically asking about stories for that scenario—as in, do I need to have had relevant experience to the given scenario or is the question more about whether I would share a story in a similar situation, but maybe on a topic I have more experience with? I would NOT have any stories to share in the three supplied scenarios, BUT if the topic were slightly different (or about small animals), I WOULD be more willing and more likely to share experiences.” I also could not ascertain how interpretation of the vignettes may have varied by student experience. A recent survey of equine professionals including veterinarians using short vignettes about equine welfare situations found that these were

interpreted very differently by equine experts from different backgrounds (DuBois, Hambly-Odame, Haley, & Merkies, 2017). There was also uncertainty about the horsemanship scoring question, “I do not think that question for 0-100 was very good—I was not sure how to compare my experience to the absolute pinnacle of an equestrian discipline. Perhaps creating pre-set experience values with descriptions would have been better.”

Comparisons Among Findings from Participants in Both Phases

Before bringing together findings from recent graduates of a single southeastern veterinary college ($N = 11$) and current students nationally ($N = 648$), I compared some of the demographic and motivational attitude data to see if the populations are similar. The recent graduates interviewed were more horse-experienced than the current students surveyed, with higher rates of ever owning a horse (55% vs. 29%) and having participated in schooling shows (56% vs. 40%). However, comfort with general horse handling activities such as grooming (100% vs. 82%) and participation in 4-H (45% vs. 42%) were similar leading me to conclude that the populations may be sufficiently alike to consider the streams of data together while keeping those differences in mind.

Their motivation also seems similar. Average AGQ-R Mastery Approach scores for the recent graduates ($M = 4.3$) are very similar to those of current students responding to the survey ($M = 4.2$), suggesting that age and recall time lag does not impact attitude to mastery very much. Looking at the AGQ-R Performance subscales which are more grade-oriented or academically-focused, there were meaningful differences between recent graduates and current students, with current students averaging almost a point higher score for both Performance Approach ($M = 2.6$ vs. 3.5) and Performance Avoidance ($M = 3.0$ vs. 3.8). Although the score differences were not large and the standard deviations were similar, the pattern of scores of the AGQ-R subscales with

the lowest value for Performance Approach ($M = 3.5$) makes sense with the discussion of the items from the interview participants. Except for three interviewees who reported being very competitive, most respondents did not want to compare themselves to others in terms of trying to be better than others. The next highest value was for Performance Avoidance ($M = 3.8$) and this resonates with the reports from almost all the interviews that even though they might not want to compare themselves to other students, they definitely did not want to be the worst at anything, regardless of whether the course content was of interest. The highest average scores were associated with Mastery Approach ($M = 4.2$) and this also had the least variability in the current students suggesting that veterinary students view mastery as a goal regardless of whether the content is in their specific career area.

Mixed Method Interpretation and Connection of Research Results.

How do current student views on usefulness of sharing prior experience and willingness to share their own experiences relate to the picture of the educational environment created from sharing experiences provided by former students?

A comparison of recent graduate ($N = 12$) and current student ($N = 648$) perceptions of Usefulness and Receptivity to Sharing in an equine-specific scenario can be made evaluating the scores from the first scenario which was completed by both the recent graduates and the survey participants. Using a t test for unequal variances, the 10-point WILLINGNESS_EXTENT variable showed that recent graduates are very different from current students in their willingness to share a story from their own experience averaging 6.3 compared to 4.5, an almost 2-point difference which was statistically significant ($t = 2.7002$, $df = 10$, $p = 0.0224$). The responses to the other items needed to be rescaled since the recent graduates answered on a five-point scale and the current students used a six-point scale. Once rescaled, the recent graduates Usefulness

Index score for scenario 1 was 10.4 out of 12 possible points compared to 8.1 for the current students surveyed ($t = 6.6283$, $df = 11$, $p < 0.00001$) a significant difference of over two points. The Receptivity to Sharing Index score was 7.8 out of 12 compared to 6.6 for current students and this 1.2-point difference was not statistically significant ($p = 0.117$). For current students, re-scaled scores based on the equine-scenario context (4.1 Usefulness; 3.3 Receptivity) were lower than the general KSSE scores which were consistently at a mean of 4.6 on the six-point scale.

These differences, whether statistically significant or not, likely reflect distinct characteristics of these populations, first, that the recent graduates have had a longer time in years and the prompt of the interview to reflect on the value of experiences shared by others and therefore may be more likely to consider shared experiences useful, and that people who are willing to participate in interviews may have a more positive view of sharing experiences than those who were willing to participate in an anonymous survey. Overall, the numerical scores of Usefulness being higher than Receptivity play out with the narrative and thematic discussions where participants say they are comfortable if other people share within reason, but that they themselves are often not comfortable in sharing whether that is because they feel time pressure, or sharing is just not in their nature.

Other insights can be gained from comparing narrative responses of recent graduates with the matrix question on the survey (Table 18) about whether students recalled being asked about experiences by instructors in various settings. Several of the settings that interview participants mentioned as places they had been asked to share experiences also had high scores on the survey such as small group breakouts (42.9%), wet labs (42.7%) and club meetings (50.2%), as well as the highest scored item for fourth-year students, beginning on clinical rotations (83.1%).

Surprisingly, over half of survey respondents reported being asked in lecture classes (52.8%) whereas very few recent graduates recalled being asked in lecture classes. Surveyed students reported low rates of being asked about their prior experiences by their advisors (19.9%) and this corresponds with the reports of several of the recent graduates saying that they could not recall discussing their experiences with their advisors. These are opportunities for veterinary educators to do a better job eliciting and building on veterinary student prior experiences.

Summary

Individual student characteristics are associated with perception of Usefulness of information shared by others and Receptivity to Sharing. Both individual and environmental factors contribute to veterinary student Receptivity to Sharing. There are many opportunities in veterinary education for instructors to draw on student prior experience and perhaps positively direct students' inherent KSSE to specific sharing in situations in veterinary education. For non-instructors, advising is a prime opportunity for veterinary educators to do a better job eliciting and building on veterinary student prior experiences, and also to encourage students with significant experiences to share those with other students through the venues available for hands-on experiential learning and vicarious learning at each of our veterinary programs.

CHAPTER SIX: DISCUSSION

There are many findings from this multi-phase, multi-population study to consider in terms of the broad existing literature on prior experience, vicarious learning in health professions, and veterinary education. I discuss how what participants shared adds to what we know about equine experience that students bring to their education, motivation of veterinary students compared to other health professional students, and how HP students can leverage prior experiences in education and in practice. After revisiting some of the limitations that affect the generalizability of these findings, I introduce implications of this work for HP educators, suggest specific applications for veterinary medicine educational institutions, and indicate future areas of research in methodology and implementation.

Safety Drives Questions about Student Equine Experience

This study is not unique in finding that safety concerns motivate questions about student prior experience with large animals. Although safety concerns mentioned in the research were mostly about horse handling during educational experiences, it is likely that a proportion of veterinary students have also been injured competing in horse sports. A survey of horse-related injuries over the lifetimes of collegiate equestrian participants was sent to 43 NCAA and IHSA equestrian coaches in the Eastern United States who passed it on to their athletes achieving a 10% response rate ($n = 73$) (Pilato, Henry, & Malavasse, 2016). On average, each rider had incurred 6.9 horse-related injuries (507 injuries for 73 responses). The most reported riding styles were English (41.1%), Hunter Seat (38.4%) and Western (15.1%). Most respondents, mean age 20.3 years, had been riding 11-14 years (31.5%), followed by 15-18 years (26.0%). Since 15.4% of the veterinary student participants ($n = 59$) reported competing in intercollegiate equestrian athletics, it is likely a proportion have been injured while riding.

Former veterinary student interviewees mentioned that prior experience with horses is asked about at the beginning of clinical rotations primarily from a safety and staffing perspective. Their perception corresponds with a review of the challenges of using horses for veterinary teaching purposes by students who lack prior experience handling horses and other large animals, where accidents reflect a lack of experience or ability to observe and rapidly respond to behavioral cues displayed by the horse (Gronqvist, Rogers, Gee, Bolwell, & Gordon, 2016). In proposing a conceptual model to optimize equine welfare and student safety, three New Zealand authors reiterated that most veterinary students come from an urban background with little previous large animal handling experience. They cite student self-report of inexperience and inattention as being responsible for 39% and 30% of accidents, respectively (Riley, Liddiard, & Thompson, 2015). Gronqvist et al. (2016) state that improvements in quantifying “skill” are needed as the literature lacks consensus on what are good, acceptable or poor equine handling skills. Doherty, McGreevy, and Pearson (2017) also suggest that equitation science and learning theory are important topics for veterinarians practicing equine medicine.

Animal handling skills were the topic of a special issue of the *Journal of Veterinary Medical Education* in 2007. Although that literature is not reviewed here, White and Chapman (2007) provided relevant insight into the relationships students identify between prior experience handling large animals and their career aspirations. This survey of 17 undergraduate veterinary students in their final year addressed their perceptions of their skill in handling several different animal species. Upon entry, only one student was confident handling horses compared with 76% ($n = 13$) being confident handling dogs. After their veterinary training, 59% were confident handling horses and 100% were confident handling dogs. Only 71% of students considered large-animal handling skills necessary for their future practice; interestingly nine of the 17 (53%)

indicated that they had changed their initial career choice because they had gained confidence in handling large animals during the program. Students also reported where they had learned basic animal-handling skills most effectively. All considered their final-year clinical rotations an important source of learning. A smaller number of students (76%, $n = 13$) rated practical classes in large animals as important, and 65% ($n = 11$) rated extramural practical work and some non-clinicians such as farmers as important. None indicated fellow students as a source of learning, but that is not surprising given the low levels of confidence in the population of students at entry and the lack of prior experience to be leveraged.

In my research, interviewee responses suggested that large animal-experienced students play a significant role in sharing their animal handling skills with less experienced students in practical classes and clinics. This occurred on both a proactive basis by experienced students assigning themselves to less experienced groups, as well as reactively when other students recognized their expertise and asked for their assistance. Veterinary programs would benefit from having at least a certain percentage of students with identified levels of large animal experience to be part of team learning or small groups focused on hands-on experiential learning in those species.

Awareness of the large number of equine veterinary injuries (Lucas, Day, & Fritschi, 2009) and safety concerns for students and animal welfare concerns for horses motivated a recent study that asked first-year veterinary students about their horse experience (Gronqvist, Rogers, Gee, Martinez, & Bolwell, 2017). Previous horse experience was categorized as “None-never interacted with a horse prior to the start of this paper,” “Little-interacted with or ridden horses a few times under supervision,” “Some-interacted with or ridden horses regularly under supervision.” “Experienced-interacted with or ridden horses regularly unsupervised,” or “Very

Experienced-competitive rider or worked in the horse industry.” The rates of experience reported suggest selective recruitment of students interested in horses since their participants were more experienced than the low levels of experience they lamented at the beginning of the article: 10% with no experience, 35% with little, 10% with some, 24% experienced and 20% very experienced. Comparatively, 20% of the first-year respondents in my veterinary student survey reported no horse experience, and my study likely overrepresented students interested in equine or large animal.

Gronqvist et al. (2017)’s other categories do not match up with any of my horsemanship experience categories in a way that facilitates comparison. They suggest that developing standardized measures for horsemanship experience would be helpful and that we should explore how much and what type of experience, ridden versus husbandry skill, is potentially useful for veterinary students. This dissertation represents one such effort to describe the currently available measures of horsemanship experience and assess agreement among multiple measures. Exploration and participation by a larger worldwide survey sample would facilitate future research and conversations among veterinary educators.

Veterinary Students Identified as “Horse People”

“Horse people” (Korda, 2003) resonates as self-identification and identification by peers and clients. Several of the interviewees spoke about being recognized by fellow students and clients as horse people, and that extended to when their partners/spouses and technicians were also viewed as part of the equestrian community, with the caveat that it is possible to take this too far and be viewed as a competitor to your clients. The non-equine veterinary graduates interviewed spoke about knowing which of their classmates were “horse people” and going to them for extra assistance and information.

Current horse ownership or full leasing in the veterinary student population that responded to this survey (16.6%) is much higher than the U.S. average of 1.5% percent of households owning a horse (AVMA, 2012). The combined current and past equestrian discipline activity reported by veterinary students was comparable to national data from the Equine Industry Survey about how horse owners/leasers use their horses (Stowe, 2015). Trail/pleasure riding was the primary activity nationally (71.7%) and highest reported by students (67.2%). Dressage was the second most reported use nationally (27.5%) while less common among veterinary students (14.3%). Combining the separate Hunter and Jumper categories in the 2015 national data ($14.0 + 11.7 = 25.7\%$) results in almost the same rate as the Hunter Seat category which was second among veterinary students (24.3%). Western performance was a single category for students (17.7%) whereas the national equine industry survey reported greater involvement in specific Western performance categories such as Barrel Racing (11.1%), Reining (6.8%), Team Penning (4.6%), Rodeo (4.4%), Roping (4.2%), and Cutting (3.4%).

The veterinary student survey provides very limited data on the regional distribution of prior experience and assumption that students' geography may be associated with their primary horse discipline, e.g. Western horse activities are more common in the West. For example, the primary equestrian activity had double the respondents for Hunter/Jumper than for Western disciplines. This may be related to the predominant area of the country of respondents (South, $n = 449$, Midwest, $n = 159$, West, $n = 40$) or be related to the limited choices we provided in the survey for specific Western equestrian activities. No Northeastern veterinary schools were included in this study because they are all private.

Knowledge gaps for equine-focused veterinary students raised by the qualitative phase interviewees included working with gaited horses/Saddlebreds and gaming and endurance

horses. Lack of exposure to these disciplines is confirmed by the small numbers of students having Saddleseat ($n = 5$, 1.3%) or Endurance ($n = 2$, 0.5%) as primary activities or reporting experience with these disciplines, 5.7% and 3.3% respectively. McGreevy and McLean (2010) outline the unique demands of various disciplines and fields of work that create a different set of challenges for horses and their breeders, trainers, grooms and riders. This list is somewhat different than the survey as it is industry-focused and breaks out Show Jumping from other types of Jumping, Harness Racing as separate from Flat Racing, has Mounted Games as its own category, separates out Reining and Stockwork from other Western Work, and adds categories of Police Work, Rodeo, and Mining. None of these were categories on the veterinary student survey. However, Barrel Racing was mentioned by several of the interviewees as a sport with diverse level of competition and performance challenges due to footing and injury patterns. Weninger and Dallaire (2017) suggest that serious barrel racers claim legitimate status as athletes through dedication to horse care and skilled riding. While it is unlikely that an individual veterinarian would have substantial direct experience engaging in each discipline, most of the recent graduates reported efforts to become familiar with the diversity of demands of equestrian sports common in their area to best advise owners of performance animals. This type of education about performance sports and breeds could be provided regionally or nationally by SCAAEP, veterinary continuing education, equine extension, or competition associations like the United States Equestrian Federation.

Practice Implications of Leveraging Prior Non-Clinical Skills and Knowledge

A survey of over 800 U.S. equine practitioners about their skills confirms the frequent application of client education and business skills in private practice. Respondents often added professionalism, communication and personnel management. This led the investigators to

recognize that performance of technical tasks comprised only one component of the educational outcomes expected by employers in equine practice (Hubbell, Saville, & Moore, 2008). Talking about things other than disease can be very important to clients (Paul, 2017). Alumni view extracurricular activities as important for employability, and this trust in social networks can come from credentials, such as career experience or qualifications, or it might come from the language in which the advice is given, similar to tacit knowledge (Polanyi, 1967) where credibility is related to the shared experiences of the parties and their common 'language' (Clark, Marsden, Whyatt, Thompson, & Walker, 2015, p. 135).

Prior knowledge or knowledge from extracurricular activities may need to be activated by instructors or advisors to help students see their relevance for career applications. At the NCSU CVM, the Director of Veterinary Career Services and Professional Development frequently helps students draw these connections, but it takes a community to reach all students equitably.

Qualitative research on pharmacy students in leadership positions in extracurricular organizations found that prior leadership experience played a major role in their pursuing leadership positions (Moore & Ginsburg, 2017), suggesting it is not just prior knowledge or skills, but also prior experience in leading and other non-technical skills that students may need to be encouraged to apply in new contexts.

Veterinary Students with Experience Leverage It Similarly to Medical Students

The Receptivity to Sharing model using the current veterinary student survey data shows that non-traditional age veterinary students are more willing and likely to share experiences than their traditional age counterparts. There is very little information published showing how either veterinary students or medical students leverage their prior experience to gain deeper levels of learning for themselves. Recent graduates interviewed for this study suggest that they had few

opportunities to surface or use their experience in the didactic classroom. Instead they used wet labs and clinical rotations to take advantage of the opportunities afforded to them by their experience to pick up more clinically or behaviorally difficult cases or work on higher-level technical skills. While anecdotally seen in medical education that students with healthcare workforce experience as emergency medical technicians, nurses, or other health professions leverage that experience during rotations, it is less clear how those professionals-turned-students use experiences in the classroom or how other students try to incorporate relevant experience not from direct healthcare labor.

Mature-aged medical students interviewed about their engagement on clinics readily cited past personal life events relevant to their role as a medical student (Jurjus, Butera, Abdelnabi, & Krapf, 2017). “Third year I finally get to be normal again and be myself and use my life experience that I already have for patient care...” (Jurjus et al., p. 29). These medical student interviewees also reported taking initiative and autonomy with more confidence and viewing every encounter as a learning experience. This resonates with the interviewees who mention that they were able to have autonomy in clinic due to their prior horse handling experience while other students with less experience would have to coordinate to receive assistance or guidance from hospital technicians, residents or faculty. One caveat raised by Jurjus et al. that did not come up in the veterinary interviews was the idea that previous life experience may make it harder for mature-aged students to conform to hospital hierarchy. This may differ for at least two reasons. First, this has been reported in other studies of mature-aged medical students (Kay & Blythe, 1984; Kick et al, 2000) and may be a factor of age rather than experience as the interviewees in my study were primarily traditional age but with a great deal of experience. Another possibility

is a difference between the formality and perception of hierarchy in human hospitals compared to veterinary hospitals which tend to be smaller and have fewer types of personnel.

Limitations on the Findings

Limitations arose from the delimitation of the study by the investigator in terms of the experience level of the participants and the time frame and depth of experiences elicited. Participants in the qualitative phase did not include veterinarians practicing the highest level of performance horse medicine. This somewhat reflects the delimitation of recruiting participants located in North Carolina, as veterinarians practicing high-performance medicine primarily reside in the major horse competition states such as Florida, California, Kentucky, Pennsylvania, and New York. The university from which interviewees were recruited has not been traditionally viewed as focused on high-performance horses, although this is evolving with a new emphasis on Sport Horse Medicine and Rehabilitation. Therefore, there were few recent graduates located in North Carolina practicing at this level, and of those contacted, none responded to the interview request. The survey included respondents ($n = 42$, 6.5%) with a self-reported horsemanship score above 80 where 100 is nationally competitive. What is missing through the absence of interviews with high-performance recent graduates is the deeper understanding of how high-performance students perceived sharing, and whether they felt they learned anything from sharing with each other or the students with diverse experiences from other equine disciplines. However, other interviewees spoke about what they learned from the sharing of experiences by a few high-equine performance students both generally and on clinics.

The interview protocol focused on experiences with horses prior to veterinary school. As seen with other types of interviews, the interview was part of the graduates' reconstruction of their experience and provided some continuity between the past and current sharing of

experience with others (Ginsburg, 1993). Graduates suggested that they might be aggregating experiences from prior to veterinary school, during school, or during internships. Although some participants shared learning experiences that occurred within their veterinary program anyway, it was clear from this response to the open-ended question about what a participant wished I had asked about that she did not feel that the interview process invited sharing experiences gained during school: “It would have been cool to share which experiences were most fun for me and what I learned the most. But unfortunately for me, I didn’t learn those until vet school and after and the questions didn’t pertain to that time period, so I didn’t get to share what I wanted to share.” [C] This leaves open the opportunity to consider later how students learn about horsemanship during and after veterinary education through methods in addition to vicarious learning. This might be especially valuable to veterinary educators who would like to know the most effective ways for learners to develop horsemanship knowledge and expertise during veterinary education.

Recall varied with several participants struggling to recall anything salient, while other students reported very vivid recollections, e.g. “God it’s crazy how those memories stick in your head.” [SH] Those who struggled saw this as their own personal issue: “Again, I probably can’t give you good, specific examples like I said...I have a terrible memory, I can barely remember what I did on a day-to-day basis sometimes.”[N-W] Other recalled that things were shared, but couldn’t think of specifics and offered to generate a generic example: “I mean I could probably make one up for you, but nothing that [no, no] not make it up, but you know there was just nothing that stands out.” [C] As the interview progressed, a few students began to second guess themselves while responding: “Probably not that often, but I’m sure, and maybe that just my takeaway. It might not even be true because sometimes I think I’m oversensitive.”[C] Horror

stories are a common conversational method of sharing learning experiences in medicine (Bosk, 1979). Negative stories were much more commonly shared as memorable experiences by the interviewees in the study and they had shared those experiences widely with their fellow veterinary students, some instructors, and even some of their clients. This precluded using those critical incidents since they were potentially identifiable and might be too personal to share in open class discussions if the appropriate culture of safe disclosure has not been established.

Interviewees did not seem to be aware of the transition between the open interview protocol and the “explain what you are thinking” approach of the cognitive interviewing which had limited, specific prompts. While the cognitive interviewing approach provided evidence of the extent to which recent graduates had shared interpretations of items that were consistent with the conceptual framework underlying AGO, the process and the analysis also revealed potentially problematic aspects of particular items that could not be explored when participants asked whether they had comprehended the meaning appropriately (Campanelli, Gray, Blake, & Hope, 2016; Knafl et al., 2007; Meitinger & Behr, 2016). The process also did not allow for clarification to dig deeper into the meaning being offered by participants, even when what they brought up in the cognitive interview was relevant to the larger issues of the interview around valuing and sharing prior experience. If future interview research is done using this protocol, but absent cognitive interviewing for the AGQ-R, additional questions about achievement goals and learning strategies may need to be added to the interview protocol to elicit similar depth of understanding respondent motivation.

Veterinary Student AGO Is Similar to Other Health Professions Students

Veterinary student motivation as measured by the AGQ-R trends more towards Mastery Approach than other health professions but follows similar patterns regarding relationships

among constructs. Veterinary student average scores for Mastery Approach ($M = 4.2 \pm 0.7$), Performance Avoidance ($M = 3.8 \pm 1.0$), and Performance Approach ($M = 3.5 \pm 1.0$) follow the same pattern seen in UK pharmacy students (Hall, Hanna, Hanna, & Hall, 2015) where after adjusting to put the scores on the same scale as used by the veterinary students, the highest mean scores were found for Mastery Approach ($M = 3.8$) and Performance Avoidance ($M = 3.8$) and then Performance Approach ($M = 3.3$). Veterinary recent graduates' comprehension of Mastery Avoidance was similarly problematic as seen with other populations (Baranik et al., 2010; Strunk, 2014; Senko & Freund, 2015) so Mastery Avoidance was not compared.

A study of Mastery and Performance goal orientations in occupational therapy students over time showed no difference in the average Mastery and Performance orientations at the beginning, and only a non-significant change over time. However, there was a lot of within-student variability in Mastery orientation among students at time one which the authors thought was likely due to factors within individual students (Umbarger, 2015). There was between-year variability in Mastery Approach scores in the veterinary student survey results with the highest mean score in year one (4.3), decreasing by 0.2 each year to a low of 3.9 in year four. However, the variability between years in factors such as equine career orientation could explain these differences. Performance Approach ($M = 3.5$ to 3.6) and Performance Avoidance ($M = 3.7$ to 3.9) were consistent over all four years.

Performance orientation seems to be lower after graduation. With the interviewees both discussing their attitudes towards learning and completing the AGQ-R and their social interdependence with their classmates, I considered their attitudes in light of work on social interdependence attitudes linkage to situation-specific achievement goals (Elliot et al., 2016). Similar to Elliot et al. (2016), a few recent veterinary graduates interviewed reported a

competitive attitude that was positively associated with Performance Approach goals. However, recent graduates scored approximately one point lower on average on the five-point scale for Performance Approach ($M = 2.6$) than first through fourth year veterinary students ($M = 3.5$ or 3.6). This is not surprising given the focus on performance and class rank common in DVM education, especially for those planning internship or residency.

Encouraging Professional Students to Integrate Prior Knowledge and Identity

Regardless of whether a student has deep prior knowledge, it is worth considering how students can assess, attend to, and observe how learners in other disciplines use prior knowledge as a building block. Young (2012) investigated how successfully practicing exhibition developers in building their professional expertise. Learning through daily practice was key, though they also consulted with mentors and relied on visitor studies to gauge the effectiveness of their work. They were adept at integrating prior knowledge gained from many aspects of their lives into their practice. The developers described several internal factors that contributed to their expertise development including the desire to help others, a natural curiosity about the world, a commitment to learning, and the ability to accept critique. This attitude of welcoming feedback towards ever better performance is similar to that of musicians discussed in the literature as a difference in approach to learner self-assessment.

The relationship between identities and the classroom also matter. Travers (2000) studied several relevant questions in the context of preservice teachers' identities in a course focused on teaching and learning: a) What prior knowledge and experience about education, teachers, teaching, teacher education, subject matter, schools, and learning did each preservice teacher bring to the course? b) How did this prior knowledge and experience influence the construction and formation of their teacher identities? c) What effects did the structure, content and

experiences of my university classroom have on the development of my teacher identity and on my teaching and learning practices? Identity was analyzed looking at three conceptual domains: self in relation to: (1) others; (2) knowledge; and (3) the profession. Implications for teacher education that are also relevant to HPE include engaging future practitioners in discussions of how they relate to their subject matter but also aspects of their prior knowledge and experience, and commitment to the profession.

Subject matter interest, prior experience, and commitment to focus areas within the multi-faceted veterinary profession all arose during the recent graduate interviews as factors. This makes changes to HPE a complex proposition and raises an introductory opportunity for us as HP educators to make a difference. We must show our students that we are aware of how the DVM educational environment and its performance expectations and assessment strategies can inhibit students from surfacing or reflecting on prior knowledge. We can ask students to reflect on their prior experiences and identity formation as practitioners using questions similar to those outlined above by Travers for teacher identity.

Changing the Educational Environment to Leverage Prior Experience

Several current students shared in open-ended survey comments that their experiences are not valued, and how they would like to see their educational environments change:

(1) “I’m not what most vet schools are looking for these days, a competent professional who has not grown up taking very detailed multiple-choice exams. I hope vet schools in the future move away from the intense focus on taking exams and work more on developing the physical skills we will need/use as future vets. It is frustrating to always come in at the bottom of my class, when I know that because of my past experience, I’ll be better qualified as a day-one practicing veterinarian.”

(2) “I believe practical experience is underutilized in school and we are not taught enough hands-on skills, this is why equine students are almost required to complete an internship after school.”

(3) “I think this survey failed to recognize or ask why students participate or do not in class. In the classrooms at [UNIVERSITY REDACTED], surgery professors fail to engage students and are demeaning. The school as a whole does not foster equine learning. I am fortunate to have horse experience and it makes the equine sections easier and more manageable for poor teaching. However, many classmates struggle and the professors fail to educate on basic horse concepts. Also, the survey failed to recognize the professor response to students in classroom settings.”

Response three demonstrates the important potential impact of instructor response which was also raised by one of the interviewees and added to the pathway shown in Figure 6 (p. 116). Collectively the three responses quoted above suggest that not all veterinary colleges classroom and clinic narratives look like what was offered in the collective narrative analysis of classroom experiences from the qualitative phase. We as instructors should closely examine the environments in which we teach, as well as our own practices and how they may be perceived by, and therefore impact, students.

Surfacing prior experience.

Apps (1991) recognizes that while instructors of adults realize that life experience represented in any group of learners is a valuable resource, there may be difficulties in trying to tap it in two ways. The first relates to this study’s research on Receptivity to Sharing, that is, figuring out “how to get this subject matter out on the table and accessible to all.” The second and more challenging is “how to help the group sort out what is relevant to the session and what is not” (p. 32). As a strategy for instructors to foster awareness of others to facilitate authentic and transformative learning, Cranton (2006) recommends chatting with students about their interests and background before or after class or during breaks. Her other recommendations for getting to know students individually include having students write on an index card their special interests in relation to the course, asking for frequent feedback from students, and incorporating

an online component into the course that encourages participants to write about their reactions to discussions, readings or class activities.

The narrative analysis of recent graduates suggests that in lecture settings students have difficulty figuring out what is welcome for sharing and useful to classmates, whereas in hands-on sessions the learning opportunities are much more obvious. All students can benefit from having the appropriate depth of sharing modelled to increase usefulness and alleviate time concerns. Specific sharing prompts from instructors can lead to useful information being shared by peers who are slightly more experienced. They likely remember better than the instructor what it was like to have learned from the experience, and perhaps can share in “near peer” terms how they made the connection with the information.

Using student experience has long been a principle of exemplary teaching of adult students, and Apps (1981, p. 147) emphasized “*the need to take into account the older student’s work and life experience as a beginning place for learning*” [italics his]. Incorporating the life experiences of mature/returning/non-traditional age students would also enhance the environment for traditional age students with prior experience. Although 44% of students of the type who responded to this survey would be at least somewhat likely to share in situations like the scenarios, interviewees raised several perceived risks of uninvited sharing. Students with expertise need to be asked to make it available through participation in formal and informal mechanisms. Instructors inviting students to share prior experiences reduces these risks and increases the perceived relevance of the information, especially if the instructor reinforces the value of what was shared.

Creating environments that welcome sharing.

Instructors are crucial to creating an environment where knowledge sharing is valued. Assisting students in identifying academic areas where they can take greater control and direction is one way to welcome sharing. In human medicine, these students often increase educational experiences for peers through enhancing group discussion in courses like psychiatry and behavioral sciences, human sexuality, history-taking, and physical diagnosis (Kay & Blythe, 1984). While the value to students learning from their more experienced colleagues has been documented in this research, the understanding of co-creation as raised by Myers (2015) as expanding the understanding of those who shared their knowledge initially was not reached. I hoped to understand how sharing knowledge with fellow students impacted those who shared both in terms of how they saw themselves as coaches or improving their sense of their ability to teach others, and in whether experiencing positively received sharing influenced their desires to share or be a role model in future interactions. While students reported enjoying sharing their expertise, they did not take the introspection further to see how they changed or learned through the process of sharing. A few interviewees highlighted how they now ask their own externs or shadowing students about prior experience similarly to how they were once asked on clinics or internships.

More intensive exposures such as advising, club mentorship, and extended field trips are another way students may choose to share their expertise. The impact of the bovine education trip mentioned by a few interviewees has been investigated from the perspective of content acquisition and career choices. The focus was on what the students learned from the instructor as a role model engaging with producers. There is an opportunity to more fully consider the

experiences the students the students share with each other and the instructors (Foster, Sylvester, & Schoenfeld-Tacher, 2018).

Interviewees named small group educational settings as a place where there was more opportunity for students to learn from each other. Two approaches that can be used to leverage expertise in small groups are a) to be aware of student expertise and distribute experienced students with specific expertise to particular teams or groups, or b) encourage less experienced students to put themselves in situations (such as voluntary wet labs) to learn from more experienced peers. Medical educators recognize that working in small groups brings together individuals with varied experiences, backgrounds, values and knowledge and that participation and interaction with others are critical factors for learning from each other in those groups (Iqbal, Velan, O'Sullivan, & Balasooriya, 2016). Their qualitative study of activities that had a positive impact on medical students' collaborative learning included several of the strategies mentioned by our interviewees: contributing to the discussion, sharing information with group members, and asking questions during a discussion. One caveat, was that even though the group may interact well, a perceived lack of respect for the learning activity can have a negative influence on learning.

The subject matter of equine medicine is problematic in a veterinary education environment where a large proportion of learners find little to no relevance in the subject matter. Many equine students perceived a lack of respect for equine medicine courses from the small-animal focused students; it is possible that this negatively impacts their learning more broadly than the specifics they already mentioned. Specifically, the language used by interviewees was concern about sharing equine knowledge in courses being viewed as a waste of time by the predominantly-small animal students. For this reason, an item about being perceived as a waste

of time was measured in the scenarios. There was 75% agreement that the knowledge shared in the scenario was NOT a waste of time. In terms of responding to what is shared, Brookfield (1995) reminds us as instructors that our silence is never meaningless or innocent to students as it either implies tacit approval or signifies condemnation, and therefore we need to say out loud what we are thinking.

Both the interview responses and the survey of current U.S. veterinary students highlight a meaningful distinction between willingness to share (63%) and likelihood of sharing (44%). This indicates that sharing may need to be externally stimulated in order to elicit sharing from students who are willing to do so but would otherwise be unlikely to share on their own. Regardless of whether experienced students ever share, it is a role of the instructor to help adult learners become aware of and appreciate the personal knowledge that they have already acquired (Apps, 1991). Interviewees suggested that some of the sharing of personal experience that was too specifically focused for a classroom lecture should occur after class through individual discussion between students and instructors. Instructors should make themselves available after class for the time between classes (about 15 minutes at our institution) and make it known to students that they will be available during that window of time, as well as encouraging individual contact via email. This is especially important for students who are too shy to bring up a relevant point for in-class discussion.

Areas for Additional Research on Veterinary Learners' Prior Experience

Several avenues of additional research are needed to build on the awareness raised during this focused study. Specific to veterinary education, research specific to deeper expertise in this domain of horsemanship, and experience in domains other than horsemanship would provide insight into whether these findings about experience are generalizable to a broader range of

veterinary learners. As suggested by Gronqvist et al., better measures of student experience are needed, not only for horsemanship, but also for performance animals handled during veterinary education. Addressing knowledge gaps specific to prior veterinary student experience in horsemanship, it would be valuable to pursue a qualitative study of high-performance students absent from this study to see how their experiences impacted their learning from instructors and each other. Is there a cap to the level of expertise that is useful in terms of sharing? If one's expertise is so far advanced beyond the average student, is there the potential that it is no longer useful?

This dissertation focused on students and graduates of public universities and therefore excluded private universities that may have different levels of performance animal activities. Private university veterinary students in the U.S. were surveyed using the same questionnaire contemporaneously with this survey in public universities and their achievement goal orientations and perceptions of Usefulness and Receptivity to Sharing will be analyzed in a future comparative study.

Broadening out to the general veterinary student population, the question of how to efficiently elicit other types of prior experience remains. When asked about other types of performance animal experience, several mentioned performance dogs. In the interviews, several of the former students distinguished between horses as companion animals and working animals in terms of whether certain types of expertise matters or was considered valuable. One could study whether there is a similar distinction with dogmanship. Dogmanship is a relatively recent term for an individual's ability to interact with dogs. (Payne, Bennett, & McGreevy, 2017; www.companionanimalpsychology.com/2017/02/timing-and-attention-matter-in-dog.html). Dogmanship could perhaps provide a relevant context for exploring veterinary student prior

experience since all veterinary students work substantially with dogs during their education and those dogs represent both pets and working animals.

Expanding Educational Research on HP Learners' Prior Experience

There is a methodological opportunity to test critical incident scenario-based measures of Usefulness and Receptivity to Sharing in other HPE contexts. Examples that come to mind include athletic experience as relevant to orthopedics/sports medicine/physical therapy or work with children or older adults as relevant to pediatric or geriatric rotations for medical students or specialty nurse practitioners. Exploring whether the main predictor from the model, Knowledge Sharing Self-Efficacy, is similar among HP students and whether it and years in the educational program similarly predict Usefulness or Receptivity to Sharing in HP students from other disciplines would be important to generalizing these findings outside of veterinary education.

In the applied educational research realm, two areas that seem ripe for additional investigation are a) the HP student classroom environment as perceived by students, and b) the view of the instructors who are a major component of creating that environment. Several of the questions in the Dundee Ready Education Environment Measure (Pelzer et al., 2014) relate to how students and recent graduates discussed the classroom environment and it may be an appropriate measure to couple with questions about peer sharing to assess the classroom environment in HPE. The question remains as to whether non-supportive classroom practices noted by students impact their learning at the highly motivated professional student level, as all the items relevant to sharing and participation scored low enough in a prior study of public veterinary students that the researchers assumed they were not of concern to student respondents. However, the open-ended survey responses highlighted (p. 222-223) suggest that some students

perceive poor environments and instructors that hinder their learning in spite of their prior experience.

It would also be valuable to take a more expansive view of how students and instructors participate together in the learning enterprise. Now that this study has considered the student point-of-view on sharing and learning from others' experience, gathering the instructor view is important. A survey of large animal-focused instructors at public and private university veterinary programs in the United States based on some of the items explored in this dissertation was undertaken in Summer 2017. Data from those instructors will be analyzed, and responses compared with the survey data from veterinary students at both public and private universities. Additional qualitative studies observing HP classrooms and interviewing students and instructors with diverse prior experiences across professions would be an important effort to gain deeper insight into the potential for changes in HP education.

As I share implications and applications for educators from this research, it will be important to assess locally and more broadly how educators respond to this information. What suggestions do they adopt, what responses do they observe from their own students, and is anyone positively or negatively impacted? Veterinary educator champions of leveraging student prior experience will be needed to encourage broader adoption of any of these strategies.

Conclusion

This research has attempted to explore and respond to many aspects of veterinary students as adult learners with significant prior experiences to share and leverage for their own increased learning. While limited in participation and scope, these initial explorations provided learner-suggested strategies for instructors to engage student prior experience in health professions education. Additional research towards both ends of the experience spectrum in a

broader experience domain than horsemanship would be necessary to increase the relevance of these findings to the veterinary education audience and to other health professions. We have much to learn about positive and negative instructor behaviors and how they impact student receptivity to sharing and ability to learn from others in HP education classroom and clinical settings.

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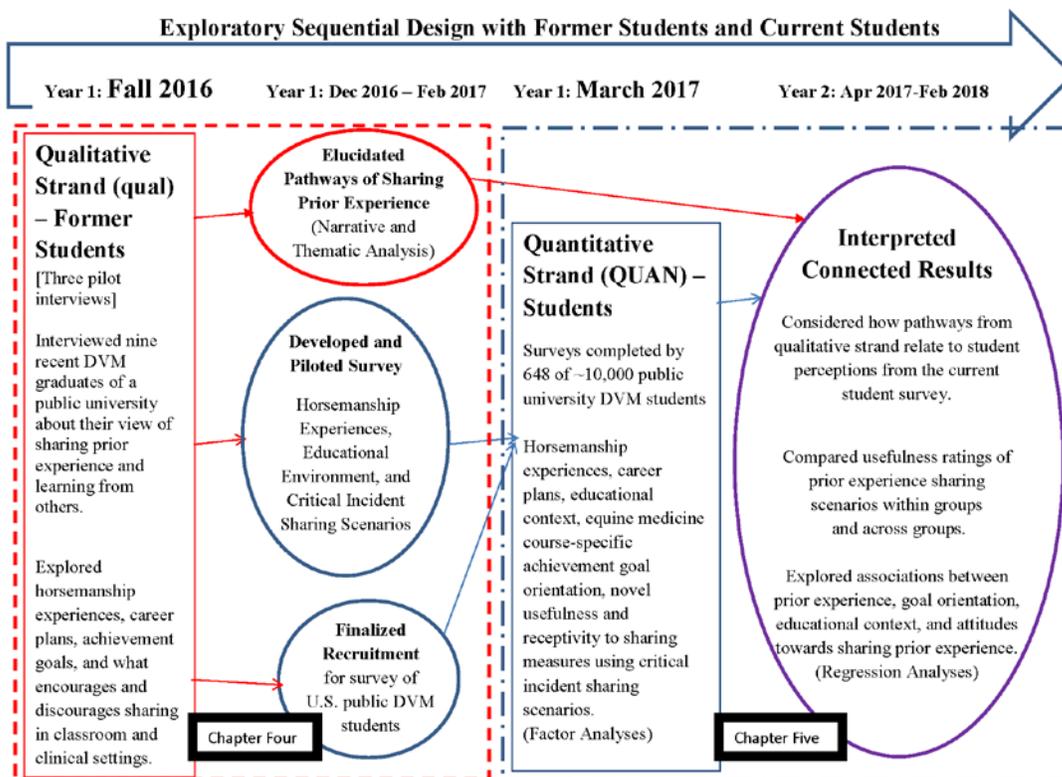
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APPENDICES

Appendix A

Exploratory Sequential Design with Former and Current Students



Appendix B

Consent Form for Former Student Interview

**North Carolina State University
INFORMED CONSENT FORM for RESEARCH**

Title of Study **Learning from Others' Prior Experience in Veterinary Education (Phase 1)**
Principal Investigator Kristine Alpi Faculty Sponsor Dr. Duane Akroyd & Dr. Sue Barcinas

What are some general things you should know about research studies?

You are being asked to take part in a research study. Your participation in this study is voluntary. You have the right to be a part of this study, to choose not to participate or to stop participating at any time without penalty. The purpose of research studies is to gain a better understanding of a certain topic or issue. You are not guaranteed any personal benefits from being in a study. Research studies also may pose risks to those that participate. In this consent form you will find specific details about the research in which you are being asked to participate. If you do not understand something in this form, it is your right to ask the researcher for clarification or more information. A copy of this consent form will be provided to you. If at any time you have questions about your participation, do not hesitate to contact the researcher named above.

What is the purpose of this study?

The purpose of this study is to explore through interviews with recent veterinary graduates your knowledge and experience with performance animals prior to pursuing formal veterinary education, as well as your views of leveraging prior experience as a way to learn from others. This information will be used to refine a survey and develop scenarios to elicit veterinary student prior knowledge and experience with performance animals, as well as student views of leveraging prior experience as a way to learn from others. Aggregate findings will demonstrate how sharing of students' prior experience is viewed. I also need to make sure that the survey questions measure what I think they measure. I hope to learn how former veterinary students like you understand the questions I ask so that I may improve questions that are unclear, and better understand the responses I receive when I ask these questions of current students.

What will happen if you take part in the study?

If you agree to participate in this study, we will first discuss several aspects of your horsemanship and performance animal experience prior to and during veterinary school. Then you will be presented with a paper version of a scenario with questions, and 13 unique survey questions. For each of the 13 questions, I will ask you what you think the question is asking you, and after you respond or skip the question, why you responded the way you did. This study may take between 45-60 minutes. You may skip any question or stop the interview at any time. (NB: The time window will be adjusted after the first few procedures when I have a better sense of the actual time) This interview will be audio recorded if you give permission. It is your decision to participate or not participate, and you can stop participating at any time in the process.

Risks

You will be asked to describe a situation where pre-veterinary knowledge or experience affected how you responded to or handled a case during your veterinary education or post-graduation practice. You need not disclose any aspects that would be recognizable to others. Any names mentioned during the interviews will not be transcribed. They will be replaced by the appropriate generic term (client, student, colleague, etc.). You will have the opportunity to review your interview transcript and remove any specifics that you think are sensitive or that could be recognized. For the review of the survey questions, disclosing that you do not know what questions are asking is part of the purpose of the study. Therefore, we hope there will not be a risk of embarrassment for sharing with the researcher that a question or item does not make sense, or if you think that a question might make respondents uncomfortable.

Benefits

If you are interested in research or developing questionnaires, participating may provide you familiarity with these methods. Although no direct benefit is anticipated, reflection on your expertise and learning from others may encourage further reflection that affects your approach to learning in practice or promoting your expertise.

Confidentiality

You will be asked to assign yourself a pseudonym which will be the only identifier with your data, however, audiorecorded files are not considered anonymous. The audio recordings will be moved off the portable device onto a password protected folder on my personal home desktop computer until they are analyzed and portions transcribed. The transcribed files will be stored on a password protected folder on my personal home desktop computer and securely backed up. The print scenario and survey responses will be stored in a locked cabinet in my home office. The members of my dissertation committee may request access to the recordings and transcripts which they would be required to keep confidential. No members of my committee are veterinarians or tied to the College of Veterinary Medicine. After my dissertation is complete and approved, the audio files will be deleted. The information in the study records will be kept confidential to the full extent allowed by law.

Compensation

You will not receive anything for participating.

What if you are a NCSU student?

Participation in this study is not a course requirement and your participation or lack thereof, will not affect your class standing or grades at NC State. Your participation or lack thereof will not be identified to anyone at NCSU.

What if you are a NCSU employee?

Participation in this study is not a requirement of your employment at NCSU, and your participation or lack thereof, will not affect your job.

What if you have questions about this study?

If you have questions at any time about the study or the procedures, you may contact the researcher, Kristine Alpi, at kmalpi@ncsu.edu or 919-673-4588.

What if you have questions about your rights as a research participant?

If you feel you have not been treated according to the descriptions in this form, or your rights as a participant in research have been violated during the course of this project, you may contact Deb Paxton, Regulatory Compliance Administrator, Box 7514, NCSU Campus (919/515-4514).

Consent To Participate

“I have read and understand the above information. I certify that I am 18 years old or older. I have received a copy of this form. I agree to participate in this study with the understanding that I may choose not to participate or to stop participating at any time without penalty or loss of benefits to which I am otherwise entitled.”

Initial by YES if you give permission to have the interview audiorecorded, by NO if not:

_____ **YES** _____ **NO**

Subject's signature _____ **Date** _____

Investigator's signature _____ **Date** _____

Appendix C

Semi-Structured Interview Questions for Former Students

[NB: I've put in headings for the domains here, but would not have them on the interview guide]

Thank you for taking the time to talk with me about your experiences. Unless I specify otherwise, I am talking about your personal experiences, not experiences that you had working in or shadowing a veterinarian.

Part 1: Prior history

Would you start by telling me about any experiences you had working with or showing horses or other performance animals prior to or during veterinary school? [probe for expansion)

If you are willing to discuss them, I am also interested in any personal experiences you recall where you were an owner/rider/show of a performance animal patient?

[probe, what do you recall about the knowledge of your sport discipline by the veterinarian or veterinary technician....)

Please describe your knowledge of horsemanship.

If you can recall any situation in your practice where your knowledge or experience in riding/training/horsemanship or with performance animals affected how you responded to or handled a case, please describe it.

[NB: choice of wording riding/training/horsemanship will try to mirror what interviewee used earlier to describe his or her experience Optional prompt for "handled a case": How you diagnosed or treated a case or communicated prognosis of future performance to a client.

Part 2: Experiences

Workforce experiences

NB: If no performance animal experience, ask about prior experience in other areas not specific to horses.

Have you shared any of your experiences or stories from working with or showing performance animals with your colleagues in veterinary practice?

[if yes) Tell me more about that (when, where, how, and why).

[if no) Have you ever thought about sharing your experiences but decided not to? Can you give me an example of the context and why you decided not to share?

Back in vet school, had you shared any of those experiences with fellow veterinary students?

[if yes) Tell me more about that (when, where, how, and why).

[if no) Have you ever thought about sharing them but decided not to? Can you give me an example of the context and why you decided not to share?

Have you shared any of those experiences with your veterinary school instructors?

[if yes) Tell me more about that (when, where, how, and why).

[if no) Have you ever thought about sharing them but decided not to? Can you give me an example of the context and why you decided not to?

Have you heard other students share their experiences with showing or riding or owning performance animals or other pre-veterinary prior experiences?

[if no, move on) [if yes) Tell me more about that (when, where, how, and why). What did you think about what they shared? What, if anything, did you learn from the experience that student shared?

Classroom environment

Could you please describe what student participation in your class environment looked like in your Equine or Large Animal Medicine and Surgery course?

Do you recall any time that the instructor asked you or other students if anyone had an example from prior experience, personally or professionally to share?

[if no) If not in that class, can you recall an instructor asking this in other classes?

How have you observed your instructors respond when students voluntarily share experiences in the classroom? [Respond - body language or spoken or whatever you noticed)

How have you observed your fellow students respond when other students volunteer to share experiences in the classroom?

Clinic environment

Could you please describe what student participation in your clinical rotation looked like in Equine Medicine? [if Equine Medicine not taken, then any large animal rotation)

Do you recall any time that the instructor asked the students if anyone had an example from prior experience, personally or professionally to share?

If not in that rotation, are there examples from other rotations?

How have you observed your instructor respond in clinical rotations (body language or spoken or whatever you noticed) when students voluntarily share experiences?

How have you observed your fellow students respond when other students volunteer to share experiences?

Outside of the classroom or clinic, are there other places that you shared your experiences with other students? Tell me more about X.....

Part 3: Definition of vicarious learning

Can you describe any situation where you have learned something relevant to veterinary practice from “listening in” on others as they discussed a topic? Specifically one in which you were not participating in the discussion, observing them doing an activity related to the topic, or in a CE setting. [probe)

Part 4. Scenario Valuing Example: (hand them written scenario to evaluate)

PART 4: SAMPLE SCENARIO

You are a veterinary student taking a mandatory equine medicine and surgery course. During classroom lecture in equine medicine, the instructor reviewed how much tightness is needed to keep the bandage in place and doing its job without causing damage to the tendons. The instructor mentioned that all staff working on the horse must understand the correct tightness. A student who competed in show jumping prior to entering veterinary school, raised her hand and was called upon by the instructor. She described a case of cording due to improper

bandaging on a high-performance horse at her barn. The horse had a tendency to stock up after work and so the new barn manager had wrapped the legs with tight support bandages. After working the horse who seemed a bit “off” they unbandaged the horse and saw visible ripples in the tendons in the back of the leg. When the veterinarian came out to examine the now lame horse, she demonstrated on a healthy leg the recommended amount of tension and then offered the barn manager the chance to wrap and have the wraps reviewed.

Questions: [NB: variable name in parentheses would not be visible]

This student’s story of prior experience seems useful. ** (USEFULNESS – A)

Strongly disagree Disagree Neutral Agree Strongly Agree

If this story was shared in my course, I would have considered it a waste of time. (TIME CONCERN)

Strongly disagree Disagree Neutral Agree Strongly Agree

I learned something from the student’s story. ** (USEFULNESS – B)

Strongly disagree Disagree Neutral Agree Strongly Agree

I would be willing to share a story from my own experience in this classroom setting.

(WILLINGNESS) [Use pre-testing to decide on thermometer OR Likert]

Strongly disagree Disagree Neutral Agree Strongly Agree

I would be likely to share a story from my own experience in this classroom setting

(LIKELIHOOD)

Strongly disagree Disagree Neutral Agree Strongly Agree

How willing would you be to share a story from your own experience in a relevant classroom setting? Rate from 0 not at all, to 10 extremely willing on this 10-point thermometer.

0 1 2 3 4 5 6 7 8 9 10

Collect the scenario paper, return to interview questions:

After the valuing of the scenario, ask: Have you experienced a classroom sharing of information similar to the experience described in the scenario? How was it similar or different?

Did you specifically seek any additional horsemanship or performance animal knowledge or experience to supplement what you knew coming out of vet school?

Have clients ever referred to your horsemanship or performance animal expertise in talking about why they come to you?

When you hire personnel, veterinary or non-veterinary, what are you looking for in terms of horsemanship or performance animal knowledge or experience?

Part 5. Survey Pre-Test of AGQ-R and Demographics

I'm going to ask you to complete an Achievement Goal Orientation questionnaire so that we can talk about the items. (give AGQ-R and demographics on paper)

Please respond to the following items recalling the context of your equine medicine course using a five-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*).

1. My aim is to completely master the material presented in this class.

What is this question trying to find out from you?

Which answer is the right answer for you?

1 (*strongly disagree*) 2 3 4 5 (*strongly agree*)

Can you explain to me why you chose that answer? [prompt]

2. My aim is to avoid learning less than I possibly could.

1 (*strongly disagree*) 2 3 4 5 (*strongly agree*)

3. I am striving to do well compared to other students.

1 (*strongly disagree*) 2 3 4 5 (*strongly agree*)

4. My goal is to avoid learning less than it is possible to learn.

1 (*strongly disagree*) 2 3 4 5 (*strongly agree*)

5. My goal is to avoid performing poorly compared to others.

- 1 (*strongly disagree*) 2 3 4 5 (*strongly agree*)
6. I am striving to avoid an incomplete understanding of the course material.
1 (*strongly disagree*) 2 3 4 5 (*strongly agree*)
7. My goal is to learn as much as possible.
1 (*strongly disagree*) 2 3 4 5 (*strongly agree*)
8. My aim is to perform well relative to other students.
1 (*strongly disagree*) 2 3 4 5 (*strongly agree*)
9. I am striving to understand the content of this course as thoroughly as possible.
1 (*strongly disagree*) 2 3 4 5 (*strongly agree*)
10. My goal is to perform better than the other students.
1 (*strongly disagree*) 2 3 4 5 (*strongly agree*)
11. I am striving to avoid performing worse than others.
1 (*strongly disagree*) 2 3 4 5 (*strongly agree*)
12. My aim is to avoid doing worse than other students.
1 (*strongly disagree*) 2 3 4 5 (*strongly agree*)

Demographics

DVM graduation year: _____

Specialty training (internship/residency) completed: _____

Further Specialization planned: _____

Age: Under 28 ____ 28-35 ____ 36 or older ____ Do not wish to respond ____

Gender: _____ Do not wish to respond

Appendix D

Former Student Recruitment Messages

Former Students:

Subject: Your participation requested for study of prior experience in veterinary education

Dear Dr. [Insert name]

I hope that you are doing well since I last saw you [insert last connection]. I am contacting you about the possibility of participating in my doctoral research project on prior experience use in veterinary education because you are a recent graduate who is working in equine or mixed animal practice here in NC. [alt text for negative examples would be “practicing rehabilitation medicine” here in NC].

The research consists of a 45-60 minute interview session where we would discuss your performance animal experiences prior to vet school and how you used or shared your experience during vet school. All discussion would be confidential. My dissertation committee does not include any faculty from the College of Veterinary Medicine. Aggregated information from the interviews would provide background information that I would use to refine a survey that will be distributed to veterinary students nationally. They would also be compared with the survey findings. I would come to you at a time and location of your preference, and provide beverages and snacks if desired.

If you are willing to participate, please contact me at kmalpi@ncsu.edu or 919-673-4588 and advise me of the best way and time to connect with you further. If you are not interested, please let me know, and you will not receive any further contact about participating.

Thank you for your consideration.

Kristine Alpi
Doctoral candidate, College of Education, North Carolina State University
kmalpi@ncsu.edu, 919-673-4588

Appendix E

Horsemanship Experience Questions

1. For each of the following equestrian disciplines, please indicate the following:

	Never participated	Currently participate	No longer participate	Length of participation in years
Hunter Seat (includes Jumpers)				
Western				
Dressage				
Therapeutic Horsemanship				
Saddle Seat				
Eventing				
Driving				
Vaulting				
Natural Horsemanship				
Showmanship/Halter				
Other (please indicate)				

2. Designate (circle or mark) primary equestrian discipline

Hunter Seat (includes Jumpers)

Western

Dressage

Therapeutic Horsemanship

Saddle Seat

Eventing

Driving

Vaulting

Natural Horsemanship

Showmanship/Halter

Multiple Areas

Other (not listed)

Not Applicable

3. Have you ever owned or full leased a horse?
 No Yes currently own/lease Yes in the past
4. How many years have you done the following, (does not have to be consecutive, enter 0 if have not participated, use decimals for part of a year, e.g. 6 months would be 0.5)?
- Had riding instruction _____
 Owned or full leased a horse _____
 Part leased a horse _____
 Bred horses or worked on a breeding operation _____
 Worked as a groom or barn employee with direct horse contact _____
 Worked as a trainer or riding instructor _____
 Worked in a tack store or other equine industry position (non-veterinary) _____
 Worked as another equestrian professional, please specify _____
-
5. Have you ever participated in any of the following? Please circle (or mark) all that apply.
- 4H
 Pony Club
 Volunteer at a therapeutic riding center
 Interscholastic Equestrian Association or Other High School Equestrian Organization
 Intercollegiate Horse Show Association or Other College Equestrian Organization
 Local or schooling shows
 USEF recognized competitions
 AQHA or other breed association recognized competitions
 NRHA recognized competitions
 USDF recognized competitions
 USEA recognized competitions
6. Please circle (or mark) all of the things you would feel comfortable doing with an appropriately trained horse.
- Grooming or bathing
 Lunging
 Loading/Unloading a horse trailer
 Bandaging for shipping or for support
 Trimming hooves

7. Please indicate your highest-ever level of horsemanship experience on this 100-point experience line where zero is no experience and 100 is being viewed by others as nationally competitive or expert in your discipline.

0= No experience

100 = Nationally expert

8. If you have other horse-related experience that we have not already asked about, please share it here:

Appendix F

Subject Matter Experts Consulted Regarding Survey Design

Horsemanship

Amy McLean, PhD
Equine Operations Supervisor, Equine Lecturer, Department of Animal Science
University of California, Davis
acmclean@ucdavis.edu

Becky Blikslager (English)
Windcroft Farm, Apex, NC
United States Dressage Federation (USDF) bronze and silver medalist, USDF L grad with
distinction (Judging); 40 years of horse ownership and training.
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Survey reviewers

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Appendix G

Categories of Survey Questions for Current Students

- Closed-ended questions about barriers and encouragements raised by interviewees
- Knowledge-sharing self-efficacy measure (3 items)
- Questions about Usefulness and Receptivity to Sharing after scenarios developed using QUAL findings, sample in Appendix C, part 4.
- Validated measure of achievement goal orientation: three subscales (9 items) from the 12-item version of the AGQ-R
- Demographics
- One open-ended question to elicit other experiences similar to interview protocol.

Appendix H

Current Student Survey

Dissertation Survey

You are invited to participate in a research study exploring veterinary student experience with performance animals (horses, show livestock, working dogs, etc.) conducted by Kristine Alpi, Doctoral Candidate in the Department of Educational Leadership, Policy and Human Development at North Carolina State University. Your participation will help us better understand veterinary student prior experience and motivation and how universities can support the goals of veterinary students.

Your participation is anonymous and involves responding to 50 questions about your previous experiences, plans for your veterinary career, and experience with horses or other performance animals. The survey takes about 20-30 minutes and if you are interrupted, you can continue in the same browser window later. Each question is optional. When you complete the survey, there will be a link to a separate form to enter in the drawing for one of three \$100 Amazon gift cards. Data will be reported in aggregate in my dissertation and possibly at a research symposium or published in a professional journal. There are no risks to participating beyond those that exist in daily life using web browsing software, and the possibility of feeling uncomfortable reflecting on courses and prior experiences.

By selecting "Yes" and clicking the red arrows on the lower right to enter the survey, you certify that you are 18 years old or older and are willing to participate. If you have questions, contact Kristine Alpi, at kmalpi@ncsu.edu or 919-513-6219.

- Yes
- No

Please indicate your focus area or area of primary interest in which you intend to seek employment after graduation.

- Small animal only
- Large animal only
- Mixed animal (all species)
- Companion animal (both small animal and equine)
- Equine only
- Food animal only
- Wildlife/zoological/exotics
- Research
- Specialty – non-species specific
- Other.... _____

Please indicate your year in veterinary education. Choose one.

- 1st year
- 2nd year
- 3rd year
- 4th year
- Other _____

Do you intend to apply for an internship or residency?

- Yes
- No
- Unsure
- Already applied

Did a faculty member or instructor ask about your prior experience with horses or performance animals (show livestock, working dogs, etc.) in any of the following settings? Check all that apply.

	Yes	No	Setting not applicable
Orientation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lecture Class, at the beginning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lecture class, after the first class	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Small Group Breakouts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Clinical Rotation, at the beginning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Clinical Rotation, after the first session	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wet Lab	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Club Meeting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
First Meeting with Advisor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other Educational Activity, please specify:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please respond to the next three questions using a **six-point** scale from Strongly disagree to Strongly agree.

I feel confident in my ability to provide knowledge that other veterinary students may consider valuable.

- Strongly disagree
- Disagree
- Somewhat disagree
- Somewhat agree
- Agree
- Strongly agree

I have the expertise, experiences, or insights needed to provide knowledge that may be valuable for other veterinary students.

- Strongly disagree
- Disagree
- Somewhat disagree
- Somewhat agree
- Agree
- Strongly agree

I feel confident in responding or adding comments to information shared by other veterinary students.

- Strongly disagree
- Disagree
- Somewhat disagree
- Somewhat agree
- Agree
- Strongly agree

Scenario 1: You are a veterinary student taking a mandatory equine medicine and surgery course. During a classroom lecture in equine medicine, the instructor reviewed how much tightness is needed to keep the bandage in place and doing its job without causing damage to the tendons. A student who competed in show jumping prior to entering veterinary school, raised her hand and was called upon by the instructor. She described a case of cording due to improper bandaging on a high-performance horse at her barn. The horse had a tendency to stock up after work and so the new barn manager had wrapped the legs with tight support bandages. The next day, when the horse was unbandaged there were visible ripples in the tendons in the back of one of the legs and the horse was “off.” When the veterinarian came out to examine the now lame horse, she took the time to demonstrate on a healthy leg the recommended amount of tension and then offered the barn manager the chance to wrap and have the wraps reviewed.

Please circle or mark your response for each statement from strongly disagree to strongly agree.

This student's story of prior experience seems useful.

- Strongly disagree
- Disagree
- Somewhat disagree
- Somewhat agree
- Agree
- Strongly agree

If this story was shared in my course, I would have considered it a waste of time.

- Strongly disagree
- Disagree
- Somewhat disagree
- Somewhat agree
- Agree
- Strongly agree

I learned something from the student's story.

- Strongly disagree
- Disagree
- Somewhat disagree
- Somewhat agree
- Agree
- Strongly agree

I would be **willing** to share a story from my own experience in this classroom setting.

- Strongly disagree
- Disagree
- Somewhat disagree
- Somewhat agree
- Agree
- Strongly agree

I would be **likely** to share a story from my own experience in this classroom setting

- Strongly disagree
- Disagree
- Somewhat disagree
- Somewhat agree
- Agree
- Strongly agree

How willing would you be to share a story from your own experience in a similar classroom setting? Rate your willingness as a single number from 0 not at all willing, to 10 extremely willing. _____

Scenario 2: You are a veterinary student taking a mandatory equine medicine and surgery course. During a classroom lecture in equine medicine, the instructor was talking about a case

of a horse that was lame under saddle when ridden, but not when worked without tack. A student who competed in dressage prior to entering veterinary school, raised her hand and was called upon by the instructor. She described a case when a horse at her barn had a similar problem and the veterinarian did thermography of the horse's back to look for the pressure from the saddle and recommended a consultation with the saddle fitter. She asked whether that approach might be appropriate for the case under discussion.

Please circle or mark your response for each statement from strongly disagree to strongly agree.

This student's story of prior experience seems useful.

- Strongly disagree
- Disagree
- Somewhat disagree
- Somewhat agree
- Agree
- Strongly agree

If this story was shared in my course, I would have considered it a waste of time.

- Strongly disagree
- Disagree
- Somewhat disagree
- Somewhat agree
- Agree
- Strongly agree

I learned something from the student's story.

- Strongly disagree
- Disagree
- Somewhat disagree
- Somewhat agree
- Agree
- Strongly agree

I would be **willing** to share a story from my own experience in this classroom setting.

- Strongly disagree
- Disagree
- Somewhat disagree
- Somewhat agree
- Agree
- Strongly agree

I would be **likely** to share a story from my own experience in this classroom setting

- Strongly disagree
- Disagree
- Somewhat disagree
- Somewhat agree
- Agree
- Strongly agree

How willing would you be to share a story from your own experience in a similar classroom setting? Rate your willingness as a single number from 0 not at all willing, to 10 extremely willing. _____

Please answer the following items putting yourself in the place of being enrolled in a required **equine medicine lecture course** using a **five-point** scale from strongly disagree to strongly agree.

My aim is to completely master the material presented in this class.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

I am striving to do well compared to other students.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

My goal is to learn as much as possible.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

My aim is to perform well relative to other students.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

My goal is to avoid performing poorly compared to others.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

I am striving to understand the content of this course as thoroughly as possible.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

My goal is to perform better than the other students.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

I am striving to avoid performing worse than others.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

My aim is to avoid doing worse than other students.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

Please indicate what grade you anticipate earning or earned in your equine medicine lecture course

- A
- B
- C
- D or F
- Pass/Satisfactory
- Unsatisfactory/Fail
- Other _____

Scenario 3: You are a veterinary student taking an equine medicine and surgery clinical rotation. During rounds a student presents the case of a show horse with a large jagged facial cut from an accident at the nearby horse facility. During the discussion of how to treat the wound after suturing, another student who showed halter horses on the Quarter Horse circuit mentioned that he remembered a horse with a similarly jagged wound on its leg and how the veterinarian treated it with a hydrogel product to reduce scarring which seemed to work well enough that the horse continued to win in the show ring after the injury healed.

Please circle or mark your response for each statement from strongly disagree to strongly agree.

This student's story of prior experience seems useful.

- Strongly disagree
- Disagree
- Somewhat disagree
- Somewhat agree
- Agree
- Strongly agree

If this story was shared in my rotation, I would have considered it a waste of time.

- Strongly disagree
- Disagree
- Somewhat disagree
- Somewhat agree
- Agree
- Strongly agree

I learned something from the student's story.

- Strongly disagree
- Disagree
- Somewhat disagree
- Somewhat agree
- Agree
- Strongly agree

I would be **willing** to share a story from my own experience in this clinical setting.

- Strongly disagree
- Disagree
- Somewhat disagree
- Somewhat agree
- Agree
- Strongly agree

I would be **likely** to share a story from my own experience in this clinical setting

- Strongly disagree
- Disagree
- Somewhat disagree
- Somewhat agree
- Agree
- Strongly agree

How willing would you be to share a story from your own experience in a similar clinical rotation setting? Rate your willingness as a single number from 0 not at all willing, to 10 extremely willing. _____

Please mark all of the things you would feel comfortable doing with an appropriately trained horse.

- Grooming or bathing
- Tacking a horse in a familiar discipline's equipment
- Lunging
- Loading/Unloading a horse in a trailer
- Bandaging for support or for shipping
- Trimming hooves

Have you ever owned or full leased a horse?

- No
- Yes, currently own/lease
- Yes, in the past

Which of the following have you done? Check the boxes of those you have done.

- Had riding instruction
- Owned a horse
- Full leased a horse
- Part leased a horse
- Bred horses or other performance animals or worked on a breeding operation
- Worked as a groom or stable employee with direct horse or performance animal contact
- Worked as a performance animal trainer or riding instructor
- Worked in a tack store or other equine industry position (non-veterinary)
- Worked as another equestrian professional, please specify: _____

For these activities you have done, please indicate your length of participation in years. It does not have to be consecutive; use decimals for part of a year, e.g. 6 months would be 0.5.

	Length of participation in years
Had riding instruction	
Owned a horse	
Full leased a horse	
Part leased a horse	
Bred horses or other performance animals or worked on a breeding operation	
Worked as a groom or stable employee with direct horse or performance animal contact	
Worked as a performance animal trainer or riding instructor	
Worked in a tack store or other equine industry position (non-veterinary)	
Worked as another equestrian professional, please specify	

For each of the following equestrian disciplines/activities, please select the most applicable column.

	Never	Currently	No longer participate
Hunter Seat (includes Jumpers)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Western Performance (anything other than recreational trail riding)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recreational trail riding (any style)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Endurance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dressage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Saddle Seat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eventing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Driving	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vaulting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Natural Horsemanship	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Showmanship/Halter	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Therapeutic Horsemanship	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (please indicate)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

For these activities which you marked "Currently" or "No longer participate," indicate your length of participation in years. It does not have to be consecutive; use decimals for part of a year, e.g. 6 months would be 0.5.

	Length of participation in years
Hunter Seat (includes Jumpers)	
Western Performance (anything other than recreational trail riding)	
Recreational trail riding (any style)	
Endurance	
Dressage	
Saddle Seat	
Eventing	
Driving	
Vaulting	
Natural Horsemanship	
Showmanship/Halter	
Therapeutic Horsemanship	
Other (please indicate)	

Which of the following represents your **primary** equestrian activity?

- Hunter Seat (includes Jumpers)
- Western Performance (not recreational trail riding)
- Recreational Trail Riding
- Endurance
- Dressage
- Saddle Seat
- Eventing
- Driving
- Vaulting
- Natural Horsemanship
- Showmanship/Halter
- Therapeutic Horsemanship
- Multiple Areas
- Other (not listed)
- Not applicable

Have you ever participated in any of the following? Please mark all that apply.

- 4H or international equivalent
- Pony Club or international equivalent
- State fair livestock showing or equivalent
- Volunteer at a therapeutic riding center
- Interscholastic Equestrian Association or other High School Equestrian Organization
- Intercollegiate Horse Show Association or other College Equestrian Organization
- Local or schooling shows
- USEF recognized competitions
- AQHA or other breed association recognized competitions
- NRHA recognized competitions
- USDF recognized competitions
- USEA recognized competitions
- FEI recognized competitions

42. Please consider your horsemanship experience and give a number to represent it using a scale from 0-100 where 0 represents having no experience with horses and 100 would be nationally competitive/expert in your equestrian discipline. Provide the number for when you were at your highest skill level with horses. _____

If you have other performance animal-related experience that we have not already asked about, please share it here:

Please indicate your age:

- 18-26
- 27-30
- 31 and older

Please indicate your gender identity:

- Female
- Male
- Other _____

What is your overall grade point average at the end of your most recent semester?

- A
- B
- C
- Below C
- Pass/Satisfactory
- Do not recall
- Grading system not applicable
- Other _____

Were you a resident of the state in which you attend veterinary school when you applied for admission?

- Yes
- No
- Unsure

Were you a member of the American Pre-Veterinary Medical Association when you applied for admission to your veterinary education program?

- Yes
- No
- Unsure

Please indicate what percentile rank you expect to achieve on the NAVLE.

- Top 1-25%
- Top 26%-50%
- Expect to pass but not in the top 50%
- Don't have an expectation
- Not applicable--don't plan to take the NAVLE

If there is any other information you think I should have asked, please share it here.

If you have questions about the study and would like a response, please contact the researcher, Kristine Alpi, at kmalpi@ncsu.edu or 919-673-4588 as the survey is anonymous. Thank you! If you wish to anonymously comment on any aspect of the research, please do so here.

Click the red arrows at the bottom right corner to submit your completed survey. The link to enter into the drawing for one of three \$100 Amazon gift cards will appear in your completion message on the following screen.

Appendix I

IRB Approvals and Dates

Qualitative Interview Phase with Recent Graduates

The qualitative phase of the research (Protocol #6623) was originally designated exempt by the North Carolina State University Institutional Review Board on January 5, 2016 before the start of pilot interviewing. Changes were made to the interviewing protocol and recruitment plan after the pilot interviews. See Appendix B for the IRB-approved consent form for former student interviews. The revised protocol and consent forms for “Learning from Others’ Prior Experience in Veterinary Education: A Mixed Methods Study of Motivational and Environmental Influence (Phase 1: Qualitative).” IRB#: 6623, PI: Duane Akroyd were submitted to the NC State Institutional Review Board and approved on August 26, 2016.

Quantitative Phase –Survey of Currently Enrolled Veterinary Students

The quantitative phase “Learning from Others’ Prior Experience in Veterinary Education: A Mixed Methods Study of Motivational and Environmental Influence (Phase 2: Quantitative)”;

Protocol #11715, PI Duane Akroyd was submitted January 20, 2017 and designated exempt on January 26, 2017.