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Students' Perceptions of Online Equine Courses and Their Impacts on Learning Outcomes

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STUDENTS' PERCEPTIONS OF ONLINE EQUINE COURSES AND THEIR IMPACTS ON LEARNING OUTCOMES

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STUDENTS' PERCEPTION OF ONLINE EQUINE COURSES AND HOW IT AFFECTS THEIR LEARNING OUTCOMES

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Post-secondary education is always changing and evolving. Over the last few years, significant changes in education have resulted in an increased number of online courses. Approximately 28% of students seeking higher education participate in at least one online course and 14% are enrolled exclusively in distance or online programs (Allen & Seaman, 2016). However, courses that are typically hands-on, like equine science, may be more challenging online. The hands-on experiences in equine science classes help prepare students for future careers. Due to an increase in students choosing to take courses online, a review of online teaching methods was conducted to determine students' preferred teaching tools in an online equine course. The survey was sent out to approximately 10 universities that offer equine science courses online through members of the National Association of Equine Affiliated Academics (NAEAA) and equine program directors to solicit student participation. Participation was limited to college students that had previously or were currently enrolled in an online equine-focused course and was completely voluntary. Of the 77 respondents, 71 (92%) were female, 6 (8%) males, and the majority (96%) white. The primary reasons students chose an online equine science course was because it fit their schedule better (n = 8; 24.5%) and the course was only offered online (n = 36; 23.2%). Students found videos (n = 62; 92.5%) and readings (n = 57; 85.1%) were extremely or somewhat beneficial teaching methods in online equine courses. Half (n = 34; 50.8%) of the students felt they learned as much in

their online courses as in a traditionally taught equine course. Additionally, students indicated they received a quality education in equine science courses whether taught online (n = 55; 82.1%) or in a traditional in-person (n = 49; 73.1%) format.

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Chapter 1. Introduction

Online learning has become the new "normal" when it comes to post-secondary education. Over the last few years, significant changes in education and the world have resulted in more online courses being offered. Approximately 28% of students seeking higher education participate in at least one online course in their program and 14% of higher education students are enrolled exclusively in distance or online programs (Allen & Seaman, 2016). Online education continues to gain momentum as a preferable method to access higher education and has started to be studied extensively in the last 20 years (Hurlbut, 2018). Since 2020, a sharp increase in online courses has occurred due to the impacts of COVID-19. In the Fall of 2019, the Department of Education's Integrated Postsecondary Education Data System started collecting distance learning numbers. In the 2019-2020 academic year, 51.8% of students took an online course which was the beginning months of COVID-19 (Smalley, 2021). With increased use of online teaching, student learning in this environment needs to be assessed.

Online learning can be viewed as having several human/nonhuman entities interact together through computer-based instructional systems to achieve the goals of the course (Eom et al., 2006). Additionally, Allen and Seaman (2008) referred to traditional learning as courses with little to no online technology used and content is delivered in writing or orally. Students may perceive online courses differently than traditional courses. When students have a negative perception of a course, it can lead to a decrease in learning outcomes as well as motivation (Kauffman, 2015). Robinson and Hullinger (2008) mentioned that students' experiences in online classes are different than

traditional and the patterns of engagement and perception seem to differ between the two as well.

Many equine focused courses have been taught in a traditional format. With equine courses typically being hands on, it presents a challenge to teaching online. The hands-on experiences in traditional equine science classes help prepare students for future careers. Since online courses do not allow students to get hands-on experience, equine instructors must find interactive ways to still provide students with a quality education.

This research project analyzes students' perceptions of online learning in equine science courses and the influence it has on student learning satisfaction. A quantitative survey was used to investigate and analyze students' perception of equine science courses offered online compared to a traditional format. Students evaluated course content, learning interactions, support, and overall satisfaction. Surveys provide a quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of that population (Creswell, 2017). The survey will use a set of questions for data collection with the intent of generalizing the data. The survey analyzes the responses using the 5 scale Likert system as well as an effectiveness scale with 1 being effective to 5 being not effective. This study will provide teachers with an idea of how to improve their online equine courses and how students perceive online learning through in-depth analysis of students' perception and learning satisfaction with online courses.

Chapter 2. Literature Review

More than three-quarters of the nation's colleges and universities now offer online classes (Parker et al., 2011). In the last decade, enrollment in online courses in the United States has grown at a higher rate than overall higher education enrollment (Parker et al., 2011). Online learning has significantly increased the flexibility of learning which allows non-traditional students to pursue a higher education (Kemp & Grieve, 2014). Online learning has broadened the access of education to those that might be attending school while employed, are located further from campus, or cannot get to campus as easily such as disabled, active military students, and nontraditional students (Bacow et al., 2012). Faculty can also benefit from the flexibility of online learning because they are not bound to a specific location or schedule (Bacow et al., 2012). Student enrollment in distance learning continues to increase in the United States, but there is a growing concern that students enter these courses without adequate background knowledge or experience in the technological application necessary to be successful in an online learning environment (Rothman et al., 2011). There is a large debate for online versus in-person learning and which can be more beneficial environments, which makes comparing the learning effectiveness of online versus traditional methods a challenge. Hullinger (2008) mentioned that student's experiences in online classes are different than traditional, and the patterns of engagement seem to differ between the two as well.

Defining Online, Traditional Learning, and Blended Learning

Online learning is viewed as having several human/nonhuman entities interact together through computer-based instructional systems to achieve the goals of the course

(Eom et al., 2006). Online courses use various delivery methods such as guest speakers, videos, and interactive web-based platforms to teach material in online courses.

Allen and Seaman (2008) referred to traditional learning as courses with little online technology used and content is delivered in writing or orally. The traditional classroom allows for more modifications of lecture plans based on moment-to-moment feedback from learners (Hannay & Newvine, 2006). Students also can interact with each other face to face as well as the instructor. Having students present for classes in person allows the instructor to facilitate the learning environment they desire.

Blended learning is defined as combining traditional face-to-face classes, learning over the internet, and learning supported by other technologies (Nguyen, 2015). In a blended learning course, students might go to in-person class, but also complete supplemental assignments or activities online outside of the classroom. In recent years, blended learning is one of the most modern types of education. It utilizes traditional methods as well as modern technology to capture students' attention in many different forms (Hamad, 2017). Teachers utilize online lectures from other universities or facilities, videos to promote or enforce a topic, tele-coursing, and much more to create a blended learning environment. Tele-coursing is defined as “courses where the professor lectures in one classroom, and that lecture is then transmitted to a studio or classroom where another group of students is watching” (Hannay & Newvine, 2006).

Benefits of Online Learning and Blended Learning Compared to Traditional Learning

In fields where information is constantly changing, the use of distance learning and online learning allows professionals the ability to improve their credential skills

without having to travel long distances to complete additional training (Bisciglia & Monk-Tyrner, 2002). In 2009, the U.S. Department of Education compiled data from 51 independent courses between 1996 and 2008 and found no significant difference between online or traditional course effectiveness when it came to performance. Since there was not an effect on students' learning in the online section versus the traditional section, being able to offer a course online can allow for more flexibility (Means et al., 2009). Hurlburt (2018) found students can receive quantitatively the same outcome when taking a course online or in person.

One benefit of having online education is that students can work on class content according to their own schedules and locations (Watson, 2008). Learner-instructor interaction is a major part of students' success (Bulter & Winnie, 1995). Learner-instructor interaction is defined as the human interaction between the learner and the instructor (Moore & Kearsley, 1996). Instructors, when teaching online, have greater opportunity to diversify their instruction and provide greater learning experiences in their classroom. There is also the advantage of instructors having constant access to online material. In their online courses, online materials can be updated or changed immediately by the instructor which allows students to see the changes right away. Also, when students have access to technology, instructors can better direct students to information based on their needs (Anderson, 2004). Instructors and students have access to supplemental material to increase knowledge and practice in their online courses. This also allows for more communication with outside experts in a field of interest (Anderson, 2004). The most significant feature of online learning is the ability for teachers to promote learner independence. This creates learning beyond the provision of teachers and

allows students to engage with a greater variety of materials, experts, support tools and fields (Coomey & Stephenson, 2001).

Another advantage to online learning is the ability for everyone to respond to information in discussion posts or chats. In a traditional classroom, every student will not be permitted time to answer questions or share feedback, however, in online classrooms, they can. Kemp and Greive (2014) found students who would not speak out in traditional classrooms felt more open to doing so online. Dengler (2008) found that by utilizing online discussion boards, it allows non-native English speakers and students in general a chance to be more active in discussions. Students can check their vocabulary and sentence structure to feel confident in how they are responding to questions. It also allows students the ability to utilize research to back up the statements they are making (Dengler, 2008). Other scholars found that student interaction in an online environment promotes student-centered learning, active participation, as well as critical discussions that may not have been had in a traditional format (Smith & Hardaker, 2000).

However, there are disadvantages to only having in person classes. By only having in person class, students that are sick or have outside obligations may result in them not attending class. This may ultimately lead to students getting behind in course work and material. Hannay and Newvine (2006) found that one of the primary reasons students were drawn to online learning was because they had other commitments that limited their ability to take classes in a traditional format. Additionally, around 20% of the students indicated limited offerings of the courses that fit their schedule, so they chose the online course. Around 6% of the students are inclined to choose an online course because they think it is easier than the traditional course. Finally, around 4% of

students had a variety of other reasons for choosing the online course over the traditional course (Hannay & Newvine, 2006). This research indicated that many students prefer distance learning, however there are still students who enjoy traditional classroom instruction. Distance learning may be most applicable to an older student population or to commuter campuses rather than to those who have traditional options available (Hannay & Newvine, 2006). Navarro and Shoemaker (2000) found that students' learning outcomes for online learning were just as good if not better than traditional learning. A team of researchers at Stanford collected over a thousand studies of online learning. They then used meta-analysis to compare online learning to traditional through quantitative research. The collection of studies analyzed measured student learning outcomes and researchers found that students in an online format performed slightly better than those in the traditional format (Nguyen, 2015).

Challenges of Online Learning Environment

A key concern with online education is the challenge of the instructor's capacity to develop and manage an online course. Allen and Seaman (2008) found that faculty felt they needed additional support from the college for instructional technology and design to provide quality online courses. Along with instructors having to overcome challenges with technology, some students have to as well. Student participation can be affected by computer literacy which is also directly correlated to student success (Fedynich, 2013). Students may have problems comprehending course information that is technical, quantitative, or scientifically oriented (Baker, 1986).

Lack of instructor face-to-face time has also been seen as a downside to online learning especially for students with learning disabilities therefore, making online learning not an ideal environment (Fedynich, 2013). Interaction between student and teacher is a key component of learning. Sometimes, online courses create a barrier to live communication. Being able to ask questions, share opinions, and participate in activities is an important part of students learning (Ni, 2013).

Student success in courses may be related to the teacher's ability to convert their traditional classrooms to online classes in an effective and positive manner. Even though there are frustrations with online teaching, it is important for teachers and faculty to see both the advantages and disadvantages so they can make the appropriate choice on how they are going to teach their classes. However, in an online course the instructor cannot control the environment like they can in a traditional classroom causing there to be more distractions outside of the classroom. Midwestern State University completed a distraction analysis using mind wandering probes. Participants were put through three complex tasks while watching two online fourteen-minute lectures. From the wandering probes, participants experienced on-task thinking 36.9% of the time, task-related interference 20.1%, and off-task thinking 43.0%. Technology which was referred to as laptop use, mobile devices, and social media alone was 12.5% of off-task thinking (Hollis & Was, 2016). From this research, they were able to find that mind wandering leads to a decrease in performance, especially in demanding tasks (Hollis & Was, 2016)

Kemp and Grieve (2014) found students preferred to do the written activities online, but discussion face–to-face. Students indicated that completing written activities online is more convenient, but they preferred to discuss the course content in the

classroom face-to-face. Students expressed that they felt more engaged and received more immediate feedback compared to online discussions. However, students did mention that online discussions had more detailed responses and that it was nice to be able to read everyone's experiences and thoughts (Kemp & Grieve, 2014).

Ni (2013) completed a study that compares learning effectiveness in six classes all taught by the same instructor either online or in person to compare student performance in interaction and efficacy. Ten percent of students failed online classes, whereas only four percent of students failed the in-person classes (Ni, 2013). When students were asked to evaluate their learning experience, all (100%) students in the traditional course considered that their learning experience was successful. However, only 87% of the online students thought that their learning experience was successful. This could have been because students had to complete more writing in the online course than in the traditional course. Most of the communication in the online course was done by writing and then posting (Ni, 2013). The difficulties in controlling exogenous factors make comparing the learning effectiveness of online versus in person classes a challenge. Some exogenous factors can be instructors, course content, assignments, and teaching objectives. These factors can sway students' opinions on their self-evaluation of learning effectiveness (Ni, 2013). This study overall indicated that even though performance is independent of in-person and online learning, some courses are more challenging to students in a virtual environment than in the classroom (Ni, 2013).

Results of studies comparing online vs traditional in-person courses are mixed in which provides a better learning experience. Even though education is changing rapidly, there is a wide range of growth and understanding of both methods that needs to continue

to be done to properly compare the two. There are advantages and disadvantages of both online and traditional teaching styles. Many faculty members may begin utilizing both online learning and traditional learning to create a blended learning classroom. Student satisfaction with online and traditional courses depends on the quality and types of learner-content, learner-instructor, and learner-learner interactions.

Learner-Content Interaction

Learner-content interaction is defined as the non-human interaction the student has with the course content and subject matters (Moore & Kearsley, 1996). Careful consideration of alignment of content is critical to successful learning both online and in traditional courses. The course objectives should have a direct correlation and alignment with the delivery of content for students to get the most out of each learning outcome. When students receive valuable feedback about course content, the online course design becomes less critical (Eom et al., 2006). There are more online class sessions offered because of the increasing ability to deliver course material and facilitate learning online. Learning is greatly affected by the behavior and support of the instructor and by other external factors like course content. Students thrive from approval, support, and learning in a step-by-step process (Hoic-Bozic et al., 2008). Support for student learning is a key element in optimizing student learning experiences in any learning environment. Students may perceive the same support differently and this may either facilitate or hinder their engagement in learning. Some factors that may cause students' perception to be different are course formats, structures, communication tools, and the number of students (Lee et al., 2011). Students at a large Southeastern University were more likely to be satisfied

with their online course when they perceived online courses supported their learning through course format and material (Lee et al., 2011). A student's perception of course support correlates directly to their course satisfaction and learning outcomes. Moore and Kearsley (1996) believe that online teachers' key role is to present content that will promote interaction between students and the content in a way that will make them think critically. Learner-content interaction cannot occur if the learners do not understand the content being presented (Ariza & Hancock, 2003).

Learner-Instructor Interaction

Learner-instructor interaction is defined as the human interaction between the learner and the instructor (Moore & Kearsley, 1996). Learner-instructor interaction is used most for content clarification, student feedback, and to facilitate learning (Strachota, 2015). One of the main interactions that students think of when it comes to learner-instructor interaction is instructor feedback. Teaching requires instructors to find different methods of relaying their knowledge to students, no matter the location of the student. This transition is important for both instructors and students. The instructor should empower students with the freedom and responsibility that comes with online learning along with emphasizing individualized learning, rather than focusing soley on the delivery of material (Huynh, 2005). According to Bulter & Winnie (1995), instructor feedback is providing students with information that targets their thinking and engagement in the course to improve student learning. Eom et al., (2006) utilized the structural equation model to look at student satisfaction and their perceived learning outcomes in online courses through six antecedent variables: student self-motivation,

student learning style, instructor knowledge and facilitation, instructor feedback, interaction, and course structure. Out of these six factors, only instructor feedback and learning styles were significant (Eom et al., 2006). Meaningful feedback from other students or teachers may have a greater impact on students' perception of learning outcomes compared to the ease of utilizing course content online.

Coomey and Stephenson (2001) identified four major features of online learning that were essential to practice adequate learning. These features were: dialogue, involvement, support, and control. Teachers control the online dialogue and interaction between students which is usually task-oriented problem solving. Involvement is generally structured by teachers as a way for students to learn specific information. Support is assumed to come only from the teacher through email, zoom, or face-to-face interactions. Lastly, learners control how they respond to tasks and the amount of information they get from the course. However, teachers have control over the material and content that students are learning throughout the course (Coomey & Stephenson, 2001). Support was seen as secure, active involvement of the learner and teachers providing personal support and feedback to enable the learner to exercise the degree of control expected (Coomey & Stephenson, 2001). There are many forms of support, but the researchers focused on faculty and peer support. Faculty support refers to faculty-to-student interaction whereas peer support refers to peer-to-peer interactions as well as support for academic or non-academic issues (Lee et al., 2011). Support for student learning is an imperative element when it comes to optimizing student learning experiences in any learning environment. The support that students receive is closely related to student motivation and learning (Lee et al., 2011). The quality of support also

has a direct correlation with students' perception of courses. Student support was once regarded as an add-on to courses; however, it has now been recognized that it should be considered and integrated into course design (Thorpe, 2002).

Learner-Learner Interaction

Learner-learner interaction is defined as the human interaction between one learner and another learner (Moore & Kearsley, 1996). Learner-learner interaction also refers to peer-to-peer learning or student-to-student. This includes students supporting each other in both an academic and non-academic environment (Lee et al., 2011). This helps the students create a sense of community that they can lean on, especially in an online environment. Peer support becomes even more important in online learning environments since there is a lack of social interaction between students (Muilenburg & Berge, 2005). This includes students supporting each other in an academic environment as well as in a non-academic environment (Lee et al., 2011). Social interaction has an almost direct correlation to learning enjoyment and effectiveness, as well as the likelihood of taking another course (Muilenburg & Berge, 2005). Students that are used to more traditionally delivered courses seem to expect more traditional feedback when in an online course which leaves them frustrated and results in negative student perception. As students grow more accustomed to distance learning, students seem more prepared to receive non-traditional support and feedback. When courses allow students to develop strong working groups, they perceive the course in a brighter light and see themselves as a community (Coomey & Stephenson, 2001). Even though students prefer feedback from instructors, peer to peer feedback can be just as beneficial (Eom et al., 2006). This

evidence further shows that when there is increased peer to peer interaction in online courses, students have an increased positive perception overall. In an online survey looking at students' perception of their online courses examining satisfaction with the course, perceived learning, perceived interaction with instructor, perceived interaction with classmates, and personal activity in the course, 76% of students said they had 'a great deal' or 'sufficient' interaction with their classmates in the online courses (Swan, 2001). Students who reported high levels of interaction with their classmates also reported higher levels of satisfaction and higher levels of learning from the course.

Overall Satisfaction

To improve overall course satisfaction, students need authentic learning environments, faculty-student interaction in online learning, engagement of students, and valuable feedback (Rothman et al., 2011). In a School of Education at a private university in the northeastern United States with a high rate of online teaching, 281 students enrolled in 34 different online graduate courses reported a general positive perception in online courses with means ranging from 3.75 to 4.44 on a 1-5 scale (Rothman et al., 2011). To determine student's perception of their online courses, six factors were analyzed: appropriateness of readings and assignments, technological tools, instructor feedback and communication, course organization, clarity of outcomes and requirements, and content format. Students in their online courses reported lower levels of satisfaction with instructor feedback than they rated other aspects of the course. When students were asked about interactive media, links to external readings, and online assignments, students rated this portion of technology lower than other aspects of their

online courses. Instead, technological tools should focus more on student's ability to navigate with ease and success (Rothman et al., 2011). Lastly, faculty-student interaction was found to be one of the most crucial aspects of overall satisfaction when it comes to learning online. An evaluation tool that exhibits high reliability should be utilized by instructors when creating an online course in order to analyze all aspects of student's overall satisfaction (Rothman et al., 2011).

Online learning has conflicting findings in the range from positive, negative, or even no significant difference in students' performance and satisfaction between online and traditional classes (Elfaki et al., 2019) (Sharpe et al., 2006). One study found the overall satisfaction with the traditional lectures to be 6.26 while the overall satisfaction with e-learning was 8.74 indicating that learners were highly satisfied with e-learning because it enhanced their learning outcomes (Elfaki et al., 2019). Students who are more active in their online courses will have a higher satisfaction rate and will learn more from the material (Swan, 2001). Overall satisfaction is continuing to increase in online learning as a better understanding of learning concepts is developed. Rothman et al. (2011) provides evidence that overall satisfaction is a quality way to test a student's overall perception.

Traditional vs Online Equine Courses

Distance education is fast becoming a popular way for students to take courses including animal science and equine science courses (Allen and Seaman, 2008). Until recently, most equine courses were taught in a traditional face-to-face format. These courses often provided equine students with hands-on experiences in the classroom.

Teachers and students believe that skill sets vital for future careers in the industry are learned through hands-on experiences (Merson et al., 2020). According to a panel of equine professionals and educators, the top five most important skills to be successful in the equine industry included: practice basic barn safety; recognize bad hay/feed; identify unsafe environments; catch, halter, and lead a horse; and provide a physical exam including vital signs. They also found that the least important skills were related to training and riding (Gadd et al., 2018). Examples of traditional equine courses taught at many universities include: equine management, equine first aid, equine nutrition, basic and advanced equitation, judging, and more. However, as equine courses begin to be offered online, professors must create a course that provides students with the same learning outcomes as a traditional course.

To create a successful equine program, the objectives, courses, resources, and curriculum must prepare students to be successful. The three most important factors for successful equine courses and programs are they must prepare students to compete for employment in the equine industry, develop skills needed by utilizing hands-on experiences and applied study, and produce students who have knowledge about all facets of equine management (Long & Morgan, 2010). Whether the course is taught online or in-person is not as important as the material learned and the hands-on experience backing up the classroom theories (Long & Morgan, 2010). During in-person equine courses, teachers could utilize an equine facility and live animals to practice the hands-on skills taught in the lecture. Students can not only learn about equine but perform tasks to improve their learning and retention of material (White et al., 2017).

Depending on the equine course, participating in hands-on activities is a large component with students working hands on with horses. To effectively increase students' knowledge and confidence in the equine industry, courses need to incorporate many different teaching methods. This includes traditional lectures, supplemental videos, and most importantly hands on laboratories (Merson et al., 2020). It allows students to watch live, in-person, demonstrations by the instructor as well as practice skills such as equitation, providing medical care and handling and be able to ask questions (Jones, et al., 2021). Problem solving abilities, creative and critical thinking, communication skills, and teamwork are important aspects needed when creating an online course. Without the ability to provide students with hands-on experiences, it brings up the question of if students are still able to find value and effectiveness through online courses. After the outbreak of COVID-19 and courses moving online, students in an Equine Reproduction and Foaling course with a laboratory no longer had the hands-on experiences previously received by students. Traditionally, students had the opportunity to foal out four mares as part of their in-person laboratory, but an alternative method was needed to provide the students with the same learning objectives. A surveillance system was then installed to allow students to observe the four mares to give them an effective and positive experience. At the end of the course, all thirteen students felt that the teaching was greatly effective with a rating of 5 out of 5 (Jones et al., 2021). The opportunity to provide students with a virtual real-life experience can improve students learning during their online course. If hands on skill building is not possible in an online course, instructors need to determine the best ways to provide alternative skill development to meet the same learning outcomes to be effective.

Engagement in an online equine science course is important to student success. Over a period of 3 years, a distance education equine course was analyzed and data showed a significant positive relationship between the time spent in their online course either working on material or watching classes with their final grade (Pratt-Phillips, 2011). There was also a significant difference in the number of sessions started ($P < 0.05$), files viewed ($P < 0.05$), and total time spent online ($P < 0.05$) between students who were successful and those who failed (Pratt-Phillips, 2011). Online equine courses must be designed in a way that students stay engaged and involved so they spend more time with the material.

A major aspect of traditional learning that online learning lacks is the face-to-face interaction between students and teachers (Lee et al., 2011). By including activities that encourage learner-learner interactions such as creating an equine digestive tract in groups, labeling actual saddles and bridles, labeling parts of a live horse, and more, teachers can create engagement with the students. Students that experience hands-on activities show higher interest in material being learned (Holstermann et al., 2010). Horses have been a foundation of human societies for thousands of years but now horses are used more for pleasure, recreation and animal assisted therapies. Equine-assisted activities and equine facilitated learning have been shown to improve physical, mental, and spiritual wellbeing of human participants through equine interactions (Stauch et al., 2019).

In order to be successful in many undergraduate disciplines, students must retain base knowledge from lower-level courses and apply that knowledge in upper-level courses (White et al., 2017). Equine instructors can improve student education through

problem-based learning and completing real-world projects. An effective problem that promotes higher thinking should give students a clear purpose of mind of what they are trying to accomplish. First, problem-based learning should enhance and promote the goals of a course as well as student's knowledge and skills learned (Weiss, 2003). Second, a problem may serve as a test which creates a situation where students must apply course knowledge by addressing concepts (Weiss, 2003). Third, a problem should be used to illustrate and enforce concepts that focus on the problem. Fourth, a problem should promote critical thinking skills. Lastly, a problem should also be an activity that engages students to solve the problem. Engaging students in problem-based activities makes students think on a higher level (Weiss, 2003). In equine in-person classes, students can create a real-world project based learning assignment based on owning a horse. This type of project is done at many universities that offer equine science courses. In an introductory equine science course, students were given the real-world project that consisted of creating an educational bulletin for horse owners. The topics that are covered include: identification, behavior, health, nutrition, hoof care, parasite/disease, and reproduction (White et al., 2017). The goal of the real-world project was to compare student retention of base equine knowledge presented in a traditionally taught course when adding a real-world project as a learning tool. Students earned higher ($P<0.001$) grades on the exam covering the material from the educational bulletin compared to the traditionally taught course exam (White et al., 2017). Additionally, students felt that by creating the bulletin ($x=4.72$), they understood the information taught in the course. Students also felt they were more likely to retain the material ($x=4.5$) and enjoyed the assignments ($x=4.5$). By incorporating a real-world problem, students were able to take

ownership of their learning and flexibility to complete their individualized project. When students enjoy topics, they will put effort into completing them (White et al., 2017). By following the problem-based learning steps, equine professors can use this activity to increase students' learning. By increasing student learning and retention, student success in advanced equine courses is increased (White et al., 2017).

Remote teaching has presented a challenge in the field of equine science. Information that was normally taught and demonstrated in-person now must be transferred to an online platform. During the peak of COVID-19, University of California Davis moved their equine riding class, normally taught in person, to online. At the end of the semester, students were asked to take a survey responding to questions about their perception of the equine riding course taught entirely online. Students at the undergraduate and high school level preferred their online equine riding course to be taught by the instructor live through Zoom over watching recordings of classes. Students at both the precollege and undergraduate level found it much easier to grasp equine concepts taught online compared to in-person classes and found the recorded sessions helpful. Even though teaching this equine riding course online is not ideal, students still found value through guest speakers, interacting with the professor through questions, and supplemental videos (Merson et al., 2020). Instructors found it helpful to record lectures to create short videos to supplement online learning. By including a camera in courses, it also allows students the possibility to watch and experience live hands-on labs if they are not able to attend in-person.

Even though online equine courses lose the important hands-on experiences, students still find value in online equine education. This is done through virtual

experiences, spending time reviewing supplemental course work and readings, guest speakers, recorded lectures, real-world problem-based learning and more. Continued research on the effectiveness of online equine courses compared to traditional equine courses is needed in order to give educators enough information on how to provide students with a quality education.

Summary

Students' perception of online education is always changing with research supporting both online and traditional learning. In fields where information is constantly changing, the use of online learning allows professionals to remain current (Bisciglia & Monk-Tyrner, 2002). When teaching online, instructors have a greater opportunity to diversify their learning material and give students a variety of experiences (Anderson, 2004). It also allows students the opportunity to take courses according to their own schedule or that may not be offered at their university or college (Hurlbut, 2018). However, online learning does bring challenges to education. More specifically the interaction between student and teacher which is a key component of learning. Being able to ask questions, share opinions, and participate in activities is an important part of student learning (Ni, 2013). When students take courses online, it takes away the peer-to-peer interaction which helps students create a sense of community. However, when courses allow students to develop strong working groups, students perceive the course in a brighter light and it helps them see themselves as a community (Coomey & Stephenson, 2001). As more equine courses are offered online, course instructors will need to determine when to best utilize online or in person learning based on course content,

accessibility of resources, and learning outcomes. The hands-on aspect of equine courses is taken away when courses are online. Learning how to provide students with a valuable experience without knowing how they feel about online courses brings about a challenge. The only way to learn about students' satisfaction in their online equine courses is to analyze them through a variety of questions. As research continues to ask vital questions, instructors will learn and discover what different teaching methods, activities, and support they can give to students in order to provide them with the best education.

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Chapter 3.

Students' Perception of Online Equine Courses and How It Affects Their Learning

Abstract

Post-secondary education is always changing and evolving. Over the last few years, significant changes in education have resulted in an increased number of online courses. Approximately 28% of students seeking higher education participate in at least one online course and 14% are enrolled exclusively in distance or online programs (Allen & Seaman, 2016). However, courses that are typically hands-on, like equine science, may be more challenging online. The hands-on experiences in equine science classes help prepare students for future careers. Due to an increase in students choosing to take courses online, a review of online teaching methods was conducted to determine students' preferred teaching tools in an online equine course. The survey was sent out to approximately 10 universities that offer equine science courses online through members of the National Association of Equine Affiliated Academics (NAEAA) and equine program directors to solicit student participation. Participation was limited to college students that had previously or were currently enrolled in an online equine-focused course and was completely voluntary. Of the 77 respondents, 71 (92%) were female, 6 (8%) males, and the majority (96%) white. The primary reasons students chose an online equine science course was because it fit their schedule better (n = 8; 24.5%) and the course was only offered online (n = 36; 23.2%). Students found videos (n = 62; 92.5%) and readings (n = 57; 85.1%) were extremely or somewhat beneficial teaching methods in online equine courses. Half (n = 34; 50.8%) of the students felt they learned as much in their online courses as in a traditionally taught equine course. Additionally, students

indicated they received a quality education in equine science courses whether taught online (n = 55; 82.1%) or in a traditional in-person (n = 49; 73.1%) format.

Introduction

Online learning has become the new "normal" when it comes to post-secondary education. Over the last few years, significant changes in education and the world have resulted in more online courses. Approximately 28% of students seeking higher education participate in at least one online course in their program and 14% of higher education students are enrolled exclusively in distance or online programs (Allen & Seaman, 2016). Online education continues to gain momentum as a preferable method to access higher education and has started to be studied extensively in the last 20 years (Hurlbut, 2018). Since 2020, a sharp increase in online courses has occurred due to the impacts of COVID-19. According to the Department of Education's Integrated Postsecondary Education Data System, in the 2019-2020 academic year, 51.8% of students took an online course which was the beginning months of COVID-19 (Smalley, 2021). Online learning has increased the flexibility of learning in higher education. With increased use of online teaching, student learning in this environment needs to be assessed. Most equine focused courses have been taught in an in-person format. With equine courses, often being more hands on, teaching online presents a challenge. The hands-on experiences in traditional equine science classes help teach critical skills and prepare students for future careers. Since online courses do not allow students to get hands-on experience, equine instructors must find interactive ways to provide students with quality education and gain necessary skills.

Through this research project, students' perceptions of online learning in equine science courses and their influence on student learning satisfaction will be analyzed. The study utilized quantitative questions to analyze students' perception of online learning in equine science courses. Students evaluated course content, learning interactions, support, and overall satisfaction. This study will provide teachers with an idea of how to improve their online equine courses and how students perceive online learning through in-depth analysis of students' perception and learning satisfaction with online courses.

Materials and Methods

Design of Survey

An online survey was provided to students who had or were currently enrolled in an online equine course to collect data on student satisfaction, student perception, and delivery methods to determine best practices for online equine courses (Appendix 1).

Information was collected on student perceptions of online equine courses. The assessment tool included multiple sections. The first section looked at the benefits of multiple teaching methods and activities that were either provided in their online course or they wish were provided. These questions were based on a negative to positive Likert-type scale. Students were able to express if they felt teaching methods like videos, readings, guest speakers, virtual office hours and more were beneficial (e.g., a response of -2, indicates "extremely detrimental", whereas a response of 2, indicates "extremely beneficial", and a response of 99, indicates "method was not used"). A Friedman's Two-Way Analysis of Variance by Ranks test was run first and then an ANOVA test was ran to compare distributions and see if there was a distributional difference between teaching methods. Students were asked to respond to statements regarding the importance of

assignments and activities in their online equine course in relation to their learning. Again, the Friedman's test was ran first followed by an ANOVA test to compare distributions of assignments and activities. Additional questions targeted the quality of education they felt they were receiving and reasons they enrolled in an online equine course. There was a mix of 5-point Likert scale response questions (e.g., a response of 1, indicates a response of "strongly disagree", whereas a response of 5, indicates "strongly agree"), text entry questions, and multiple responses. A Wilcoxon's Signed Rank Test was used to test the median difference in groups and looking at distributions.

In the last section, students were asked to respond to eleven perception-based questions. The source of these questions was the *Student Satisfaction Survey* (Strachota, 2006). This evaluated learner-content interaction, learner-instructor interaction, learner-learner interaction, and overall satisfaction. Data was analyzed on a negative to positive Likert scale: 2= Strongly Agree, 1= Somewhat Agree, 0=Neither Agree nor Disagree, -1=Somewhat Disagree, -2= Strongly Disagree. All statements were looked at individually by running a Friedman's 2-Way Analysis of Variance by Ranks Test followed by an ANOVA frequency test to analyzing the mean and standard deviation. The *Student Satisfaction Survey* resulted in a Cronbach's alpha of 0.89 meaning this survey instrument was highly reliable and valid (Strachota, 2006).

Respondents of the Survey

The survey was sent out to approximately ten universities that offer equine science courses online through members of the National Association of Equine Affiliated Academics (NAEAA) and equine program directors to solicit student participation.

Participation was limited to college students that had previously or were currently enrolled in an online equine-focused course. Participants were required to be of the age to be considered an adult by the state they reside in. Survey participation was completely voluntary. However, to attempt to increase the response rate, twenty $20 and one $100 Amazon gift card were given out, and recipients were drawn from the pool that provided an email address to send the gift card to.

An online survey through Qualtrics was provided to students via email from the recruiter. Data was collected both Fall 2021 and Spring 2022 for this study. Survey participants answered survey questions which included demographics, assessment of their current or past course(s) and subjective assessment of student satisfaction.

Procedure

Participants were informed of the goal to explore student's perceptions of online equine courses and their influence on student learning satisfaction. The survey was digital through Qualtrics with the link included in the email provided for faculty and equine programs to send to their students. Four reminder emails were sent out to recruiters and recruiters forwarded the message to students to remind them to complete the survey. Students provided consent before starting the survey. If a student began the survey and had not taken an online equine course, Qualtrics did not proceed with the remainder of the questions on the survey. It took around 10-15 minutes to complete, and all completed surveys were analyzed anonymously. Populations were not grouped dependent on their university; all the data was compiled into one group to be analyzed.

Statistical analysis

Once all the surveys were completed, the answers were grouped into themes and analyzed. Statistical tests analyzed in this study included: Independent T-test, Friedman's Two-Way Analysis of Variance by Ranks, Wilcoxon's Signed Rank Test, and Frequencies. Independent T-test analyzed individual activities and assessments as well as teaching methods. Beneficial teaching methods utilized in courses as well as activities and assessments were analyzed with a Friedman's Two-Way Analysis of Variance by Ranks test followed by an ANOVA test to compare distributions. An Independent T-Test was then run between two variables until there was a distributional difference found. The independent t-test compared two-sample means to see if there was a statistical difference. A Wilcoxon's Signed Rank Test was used to analyze participant's response to the quality of education they received in their online and traditional equine courses.

Student's perception of course lessons and lecture notes, assignments and/or projects, and preparation for quizzes/exams were gathered from three separate questions and a Friedman's Two Way Analysis of Variance by Ranks test was ran on them individually and then an ANOVA frequency test was run after to compare distributions. Students were also asked to analyze how much they agree or disagree with a variety of learner-instructor interaction statements. Each statement was analyzed individually with a descriptive frequency test and then organized by highest to lowest mean in the table. Descriptive frequency tests were run on each individual learner-learner interaction question in order to look at distributions.

Students were then asked a variety of overall satisfaction questions and asked to rate how much they agreed with the statements. Each statement was looked at

individually and student's overall satisfaction ratings were analyzed with descriptive frequencies. This survey was validated with questions directly correlated to content, learning outcomes, interactions, and overall satisfaction.

Results and Discussion

Eighty-nine students completed some or all of the survey. All surveys were analyzed by individual questions. The majority of students enrolled in online equine courses were female at 93% (n= 83) with the remaining 7% (n=6) being male (Figure 1). Most of the participants were white at 96% (n = 85; Figure 2). The age ranges of 27 years or older (41% of respondents; n=36) and 19–21-year-old (40%; n=36) were the largest (Figure 3). Ages 22-26 made up 18% (n=16), and the remaining 1% (n=1) declined to answer. When comparing class level, the split was fairly even across freshman (n=26), senior (n=22), and juniors (n=20) with fewer sophomores (n=14), and master students (n=7) completing the survey (Figure 4). Similar gender results were noted when looking at undergraduate equine interested students with 87% (n=109) female and only 13% (n=17) male at Massey University (Gronqvist et al., 2017). However, that study found that the majority of students ages were under 20 years old (79%; n=100) followed by 21-25 making up 18% of the results (n=23; Gronqvist et al., 2017). In a faculty perception survey study related to equine students at the Ohio State University, demographics showed that the typical student enrolled in an equine course was a white, female freshman, and 18-20 years old (Southworth, 2014). With a large percentage of the participants 27 years old or older in the current study, there may be a higher number of non-traditional students who are taking online equine courses. Online education allows

the flexibility for these students to either further their career or begin one. The average age of online students is now 29 compared to an average age of 26 among all undergraduates (Doyle, 2009). Also, online students are more likely (63%) to be female (Doyle, 2009).

Figure 5 shows the universities that participated in the equine online course survey. As seen on the chart, Post University had the largest number of responses at 47.1% (n=41). This was to be expected due to the considerable number of online equine courses that Post University offers. The University of Nebraska-Lincoln had the second largest number of responses at 41.2% (n=37) which was to be expected due to the survey originating from this university.

As expected, the majority of participants were in animal or equine science related majors with Equine Science at 47.1% (n=41) followed by Animal Science at 24.1% (n=21; Figure 6). Students had to be enrolled in an online equine science course in-order to participate in the survey study. Similar to other data in an undergraduate success survey in a horse management course, 46% of participants were equine science majors (Lavoie, 2019). In The Ohio State University's survey, students in the equine course had declared an agriculture major with an equine minor or equine concentration (Southworth, 2014). It would be expected that most students enrolled in these courses would be taking them as part of an animal related undergraduate or graduate program.

Participants were asked what teaching methods utilized in their online equine course were most beneficial (Table 1). Questions were scaled on a negative to positive Likert scale with extremely beneficial being 2, extremely detrimental being –2, and neutral being 0. Students found videos ($x=1.66$; $p<0.001$) most favorable of the teaching

methods used. Other teaching methods that students found valuable were supplemental reading (x=1.31; p=0.05), interactive web-based platforms (x=1.15), streaming video platforms (x=1.14), guest speakers (x=1.13), virtual office hours (x=1.04), instructor telephone availability (x=0.90), live chats (x=0.85), and web conferencing tools (x=0.75). In similar studies, students found value through guest speakers, interacting with the professor through questions, and supplemental videos greatly beneficial (Merson et al., 2020). Students in equine classes may find additional value in videos where instructors can demonstrate hands-on skills and students may re-watch the videos to reinforce information.

Students rated the importance of activities and/or assessments used in online equine courses in relation to participants learning (Table 2). Data was analyzed on a negative to positive Likert scale as previously described. Students found online quizzes to be the most effective assessment tool (x=1.36). Students' ratings of online case studies (x=1.32), individual student projects (x=1.34), and small written assignments (x=1.26) were equally beneficial in online equine courses to improve participant learning. Students viewed peer discussions (x=1.09), research papers (x=1.10), discussion board posts (x=1.10), students' presentations (x=1.05), and traditional online exams (x=0.95) as less beneficial, but still positive. Lastly, students found group projects (x=0.58) and traditional in-person exams (x=0.57) to be the least beneficial ($P > 0.05$) in their online equine courses. Similar research showed that by engaging students in case studies and individual problem-based projects, it helped students think on a higher level and retain information longer (Weiss, 2003). In similar studies, written assignments, online peer discussion, research papers, and tests/quizzes/exams were seen to be effective activities

and assessments to evaluate student success (Kearns, 2012; Suen, 2014). Research in higher education also found that students did not feel as though group projects enhanced their learning or engagement in their online courses (Jones & Blankenship, 2017).

Students were asked two separate questions about the quality of education they felt they received in their traditional or online equine science courses (Figure 7; n=77). No statistical difference was noted between online and traditional equine courses ($P<0.05$). Students felt they received quality education in both their online and traditional equine courses. Navarro and Shoemaker (2000) found that students' learning outcomes and overall quality of education for online learning were just as good if not better than traditional learning. In 2009, the U.S. Department of Education compiled data from 51 independent courses between 1996 and 2008 and found no significant difference between online or traditional course effectiveness when it came to performance. Since there was not an effect on students' learning in the online section versus the traditional section, being able to offer a course online can allow for more flexibility (Means et al., 2009). Hurlburt (2018) found students can receive quantitatively the same outcome when taking a course online or in person. Navarro and Shoemaker (2000) found that students' learning outcomes for online learning were just as good if not better than traditional learning. Determining whether to teach equine courses online or in person should be decided based on course learning objectives and if they require a more hands-on format. For example, equine equitation courses would be difficult to provide the same quality online compared to other equine courses such as management or reproduction.

To determine the best learner-content interaction in equine courses, students were asked how well they felt their online equine course content (lessons, lecture notes,

assignments, projects, and preparation for quizzes and exams) facilitated their learning (n=74). Students felt that course lessons and lecture notes (x=1.43), assignments and/or projects (x=1.42) and preparing for quizzes and exams (x=1.22) helped with their learning similarly (Table 3). Students at a large southeastern university similarly perceived online courses supported their learning through course format and material such as lessons, notes, and supplemental assignments, they were more likely to be satisfied with their online course (Lee et al., 2011). Careful consideration of alignment of content is critical to successful learning both online and in traditional courses. The course objectives should have a direct correlation and alignment with the delivery of content for students to get the most out of each learning outcome. When students receive valuable feedback about course content, the online course design becomes less critical (Eom et al., 2006). Learning is greatly affected by the behavior and support of the instructor and by other external factors like course content. Students thrive from approval, support, and learning in a step-by-step process (Hoic-Bozic et al., 2008).

Students (n= 74) currently or previously enrolled in an online equine science course were also asked questions focused on learner – instructor interaction (Table 4). Students were generally positive about learner-instructor feedback rating many items at or above a 1.0 (agree/strongly agree). Students agreed they were able to get individualized attention from the teacher when needed (x = 1.05; SD= 1.31), the teacher was an active member of the discussion groups offering direction and encouraging communication (x=1.03; SD=1.34), they received timely feedback (within 24-48 hours) from the teacher (x= 0.96; SD=1.37), and although they could not see the teacher in my online classes, they felt his/her presence (x=0.95; SD= 1.13). When asked if they felt

frustrated by the lack of feedback from the teacher, students were neutral (x=0.47; SD= 1.48). The large standard deviation indicates some concerns with instructor feedback. Students that are used to more traditionally delivered courses seem to expect more traditional feedback which may leave them frustrated. Variation between instructors' levels of feedback can lead to differences in student satisfaction. Overall, there was a positive response when looking at learner-instructor interaction data. Support for student learning is an imperative element when it comes to optimizing student learning in any environment. The support that students receive is closely related to student motivation and learning (Lee et al., 2011). Meaningful feedback from other students or teachers may have a greater impact on students' perception of learning outcomes compared to the usability of the course online (Eom et al., 2006).

When considering learner-learner interactions, a majority of students neither agreed nor disagreed (n= 10) or strongly agreed (n= 48) that the course encouraged students to discuss ideas and concepts covered with other students (n= 73). The remaining students selected somewhat agree (n=9) or somewhat disagree (n=5) with the final student saying they strongly disagree (n=1) when asked if they felt their equine science course encouraged students to discuss ideas and concepts with other students (Figure 8). When students were asked if they felt their online equine course created a sense of community amoung students (Figure 9), a majority of students strong agreed (n=33/73). Students strongly agreed (n= 41/73) they were able to ask for clarification from a fellow student when needed (Figure 10). As students continue to receive distance learning, students seem more prepared to receive non-traditional support and feedback. When courses allow students to develop strong working groups, they then perceive the

course in a better light and see themselves as a community (Coomey & Stephenson, 2001). By supporting each other in an online academic environment, it helps the students create a sense of community that they can lean on. Since online learning environments are different than traditional environments, peer support becomes even more important since there is a lack of social interaction between them (Muilenburg & Berge, 2005)

Students' satisfaction with online equine courses is presented in Table 5 (n= 73). Students indicated they were very satisfied with online equine courses (x = 1.21; SD = 1.18). Students were likely to take another online equine course (x=0.93) and recommended taking an online equine course (x=0.89). However, students were neutral (x=0.37) on whether online courses were as effective as traditional courses. Students also felt that they did not learn as much in their online course as they did in their traditional course with a mean of 0.32. However, students rated if they felt their online course did not meet their needs as negative (x = -0.73) which indicates that students felt their online equine course somewhat met their learning needs. While the effectiveness of online teaching in equine courses had mixed ratings from students, it appears that students will continue to take and demand online courses in this area. To have overall satisfaction within the course, there needs to be authentic learning environments, faculty-student interaction in online learning, engagement of students, and valuable feedback (Rothman et al., 2001). Equine instructors should focus on improving the overall learning environment in online courses to improve student learning.

Summary and Implications

When looking at beneficial teaching methods in online equine courses, videos were found to be the most favorable. Other teaching methods that students also found valuable were supplemental reading, interactive web-based platforms, streaming video platforms, guest speakers, virtual office hours, instructor telephone availability, live chats, and web conferencing tools. Due to these findings, equine instructors should incorporate supplemental videos and readings in their online courses in order to engage students learning. The activities and assessments students found most beneficial to their learning were online quizzes, case studies, individual student projects, and small written assignments equally beneficial in online equine courses in relation to participants learning. Peer discussions, research papers, discussion board posts, students' presentations, and traditional online exams were not seen as beneficial as the rest. Lastly, students found group projects and traditional in-person exams to be the least beneficial in their online equine courses. Students tended to prefer smaller individual assignments and assessments in the course over larger or group projects. Equine professors can utilize frequent smaller assessments such as case studies, individual student projects, and small written assignments in their online courses to help students retain information and stay engaged in their online course. Giving group projects as assignments in online courses is not beneficial to students learning and satisfaction. Teachers should lean away from online group projects unless the course is taught in-person. Even though providing students with course information in-person is the traditionally preferred method, this research study shows that students felt they received the same quality of education in their online and traditional equine courses.

As instructors think about learner-content interaction of their students, the study shows evidence that course lessons, lecture notes, assignments, projects, preparation for quizzes and exams facilitate students learning. Instructors must focus on the quality of learner-instructor interactions to improve student engagement in the course. Students' felt that it was important to get individualized attention when needed, for the teacher to be an active member in discussion groups and to receive timely feedback from instructors supported their learning and successfulness in their online equine courses.

Students were also asked a series of questions looking at learner-learner interaction. The majority of students agreed that their online equine courses encouraged students to discuss ideas and concepts covered with other students. Students also felt they could ask clarifying questions from a fellow student when needed. However, a majority of students said they somewhat agreed or neither agreed nor disagreed when asked if they felt their online equine courses created a sense of community. Instructors should include more opportunities for students to build a sense of community and an open space to ask questions when needed.

Lastly, a majority of students felt they were satisfied with their online equine courses. However, responses leaned more towards somewhat agree when asked if they would take another online equine course as well as when they were asked if they would recommend taking an online equine course. When students were asked if they felt their online equine course was as effective as their traditional courses and if they felt they learned as much in their online courses compared to their traditional courses, student's response was closer to neither agree nor disagree. The result from the study shows evidence that even though students feel satisfied with their online equine courses, they

did not feel as though the online courses were as effective or that they learned as much when compared to traditional courses. With this, students neither agreed nor disagreed that the course was meeting their learning needs. Overall, if instructors are having a challenging time meeting students learning needs, they should utilize beneficial teaching methods and activities found in this study in order to increase student satisfaction.

One limitation in this study is that recruitment was limited especially at the University of Nebraska Lincoln since the principle investigator and co-investigator were currently teaching equine courses, which could introduce a potential source of bias from students. Ideally, an increase in participation would be desired and result in more accurate data. Also, analyzing qualitative data would give us specific examples and reasoning behind student's responses. Also, by having participants in a variety of equine courses, it is difficult to analyze specific assignments and activities.

Equine instructors have a significant impact on the academic and future success of equine students. However, when equine courses are normally taught traditionally, it presents a challenge for equine instructors to teach online. This research highlights different activities and teaching methods that students find beneficial in order to supplement their online learning. The main activities and teaching methods that students found beneficial are videos, readings, interactive web-based platforms, streaming video platforms, online quizzes, case studies, individual student projects, and small written assignments. All of these may encourage students' success in courses.

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Figures

Figure 1. Gender of student participants currently or previously enrolled in an online equine science course at the time of the survey (n= 89).

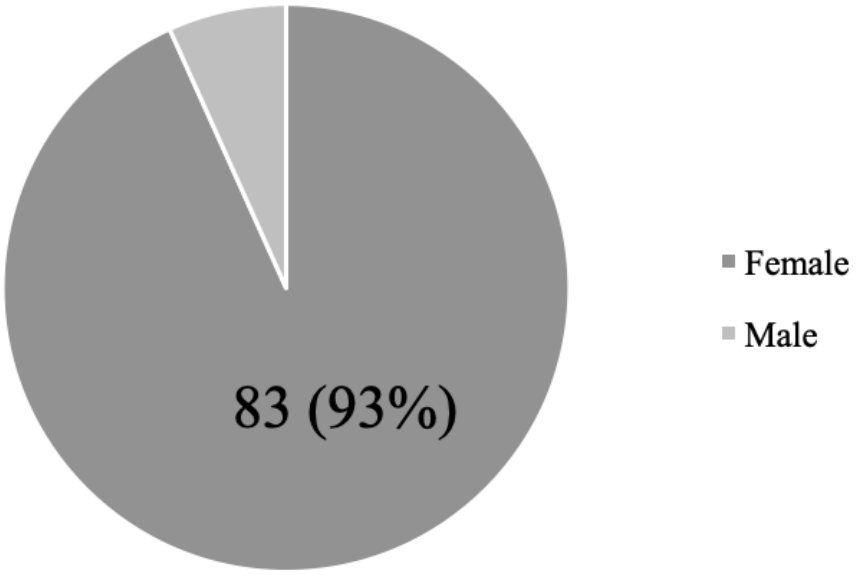

Figure 2. Race of students currently or previously enrolled in an online equine science course at the time of the survey (n=89).

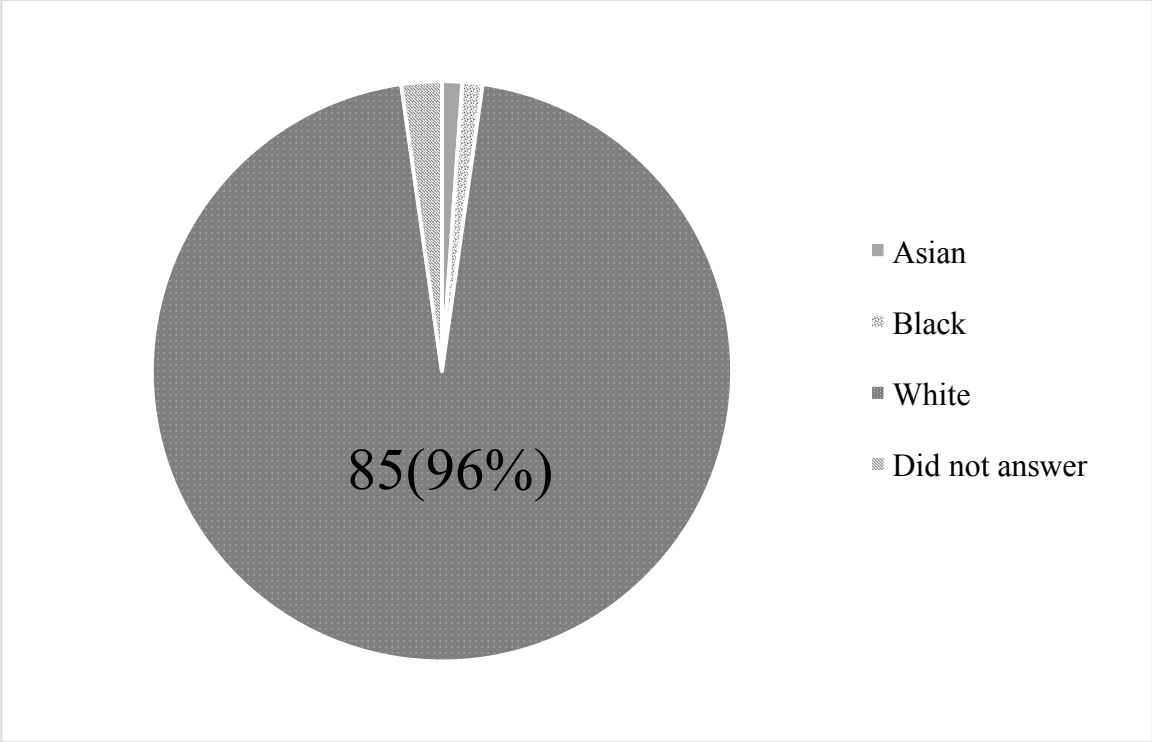

Figure 3. Age of students currently or previously enrolled in an online equine science course at the time of the survey (n= 89).

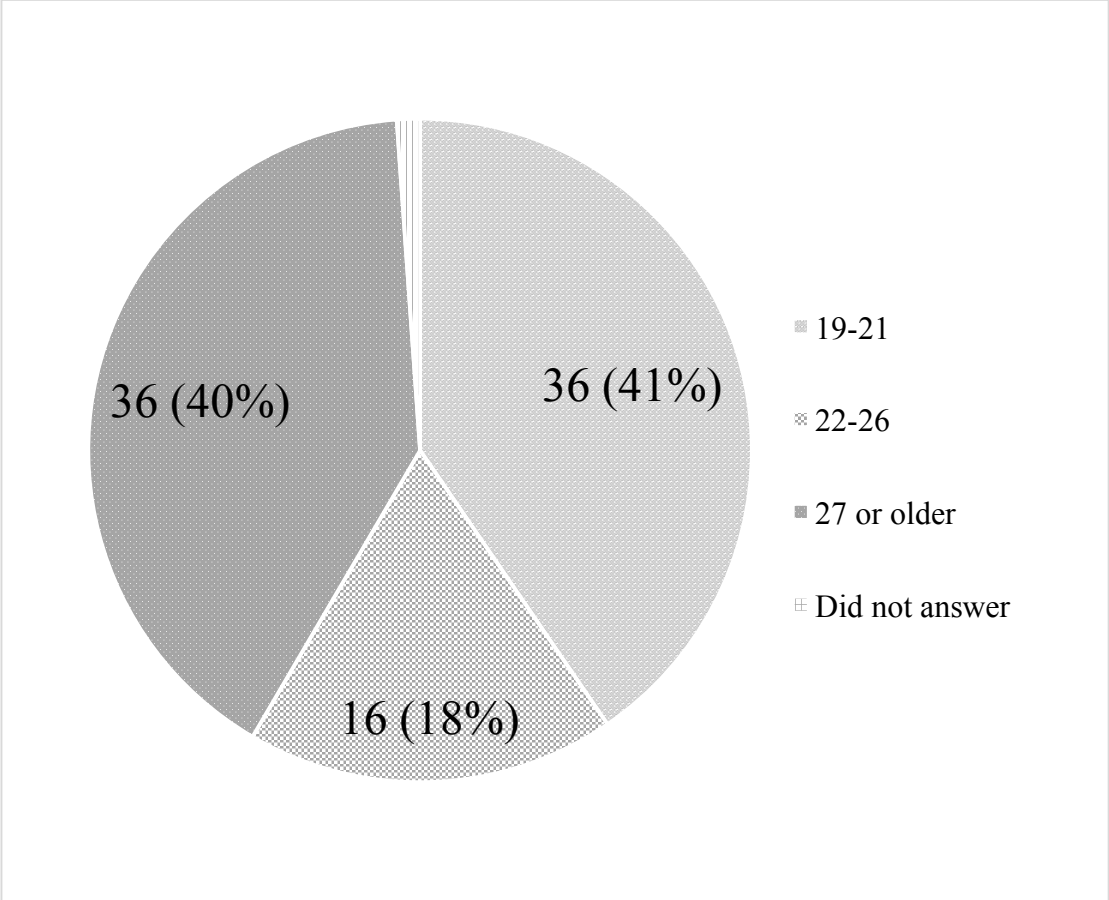

Figure 4. Students' year in school currently or previously enrolled in an online equine science course at the time of the survey (n= 89).

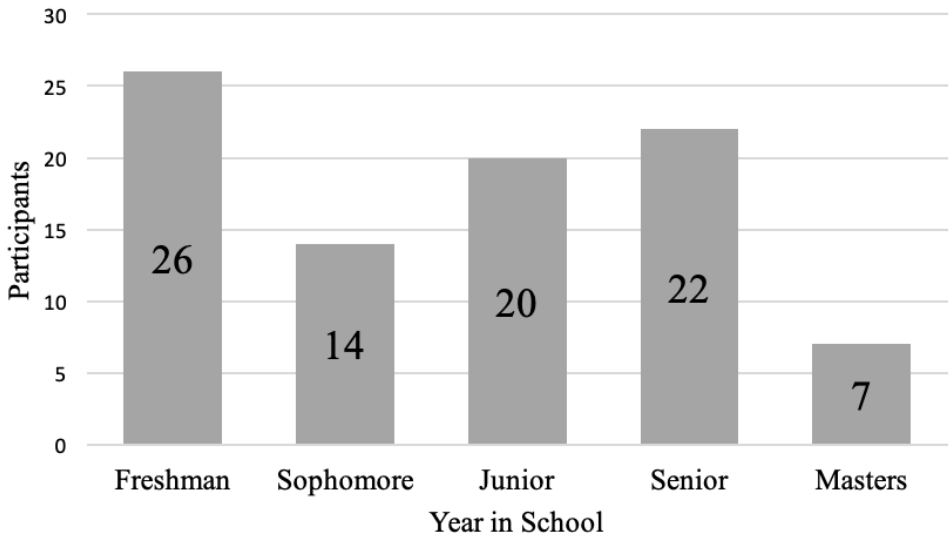

Figure 5. Universities and/or colleges of students currently or previously enrolled in an online equine science course at the time of the survey (n=87).

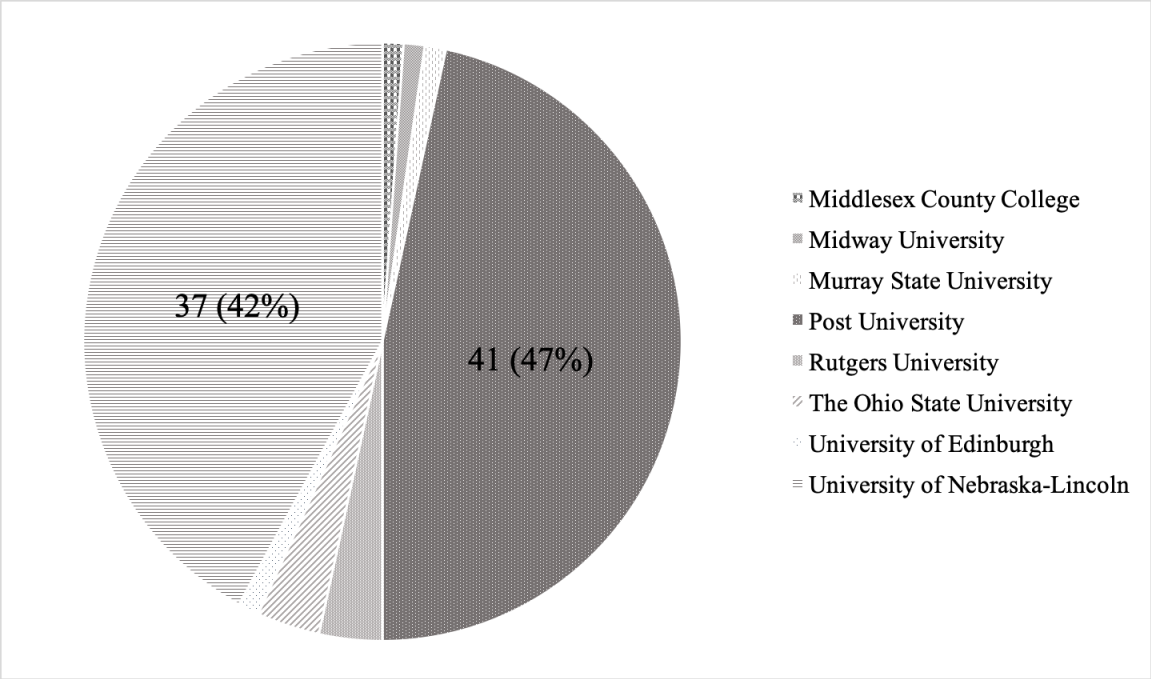

Figure 6. Self-reported majors of students currently or previously enrolled in an online equine science course at the time of the survey (n= 89).

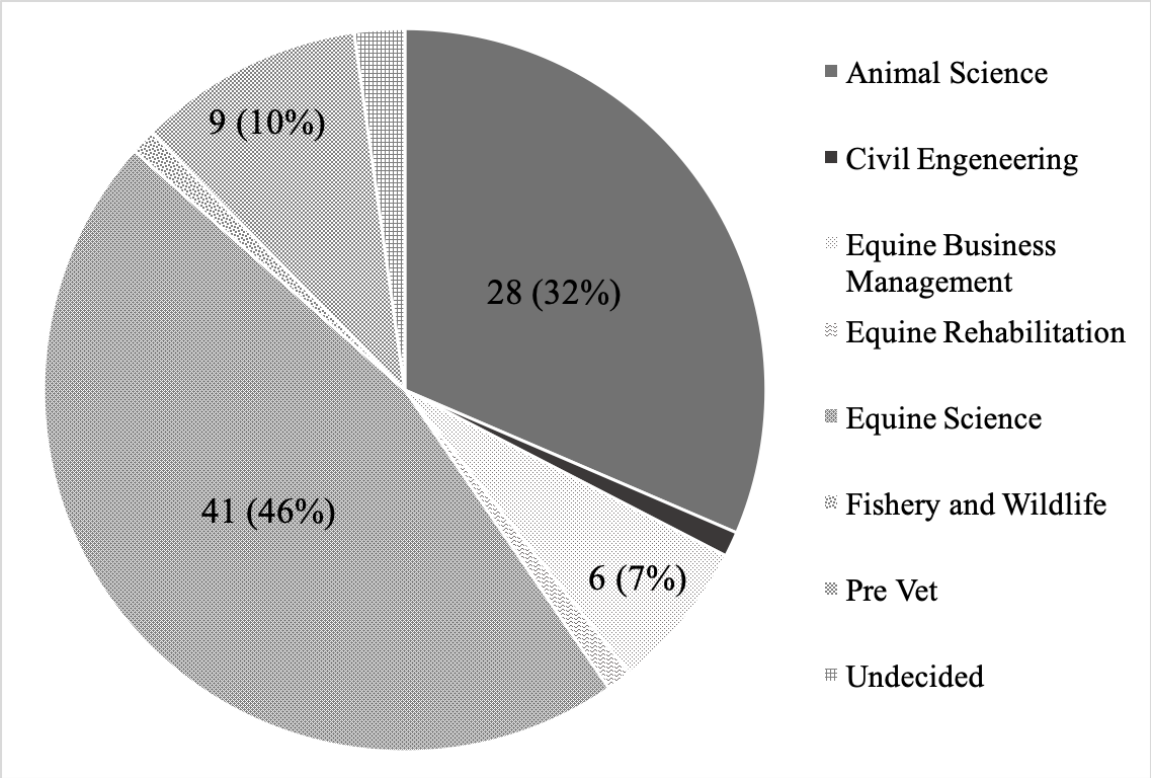

Table 1. Teaching methods students currently or previously enrolled in an online equine science course at the time the survey found to be the most beneficial in online equine courses in relation to their learning (n=77-55).

Item	N	Mean[a]	Median	SD
Videos	77	1.66[b]	2	0.60
Readings	77	1.31	1	0.78
Interactive Web-based Platforms	71	1.15	1	0.92
Streaming Video Platforms	70	1.14	1	0.87
Guest Speakers	55	1.13	1	0.86
Virtual Office Hours	73	1.04	1	0.99
Instructor Telephone Availability	69	0.90	1	1.02
Live Chats, Individually or Course Wide	68	0.85	1	1.01
Web Conferencing Tools	65	0.75	1	0.99

[a] Likert scale: 2= Extremely beneficial, 1= Somewhat beneficial, 0=Neutral, -1=Somewhat detrimental, -2= Extremely detrimental
[b] Videos were rated higher than all other teaching methods by students ($P<0.001$)

Table 2. Students' importance of activities and/or assessments used in online equine courses in relation to participants learning (n=76-46).

Item	N	Mean[a]	Median	SD
Online Quizzes	76	1.36[b]	1	0.67
Case Studies	75	1.32[b]	2	0.84
Individual Student Projects	71	1.34[b]	2	0.79
Small Written Assignments	70	1.26[b]	2	0.86
Peer Discussions	76	1.09	1	1.02
Research Papers	70	1.10	1	0.90
Discussion Board Posts	73	1.10	1	1.06
Student Presentation	65	1.05	1	0.89
Traditional Online Exams	75	0.95	1	0.88
Group Projects	62	0.58	1	1.08
Traditional In-Person Exams	46	0.57	0	0.94

[a] Likert scale: 2= Extremely beneficial, 1= Somewhat beneficial, 0=Neutral, -1=Somewhat detrimental, -2= Extremely detrimental

[b] Tools rated as more beneficial (P>0.05)

Figure 7. Students currently or previously enrolled in an online equine science course at the time the survey was asked in two separate questions the quality of education they felt they received in their traditional and online equine science courses (n=77).

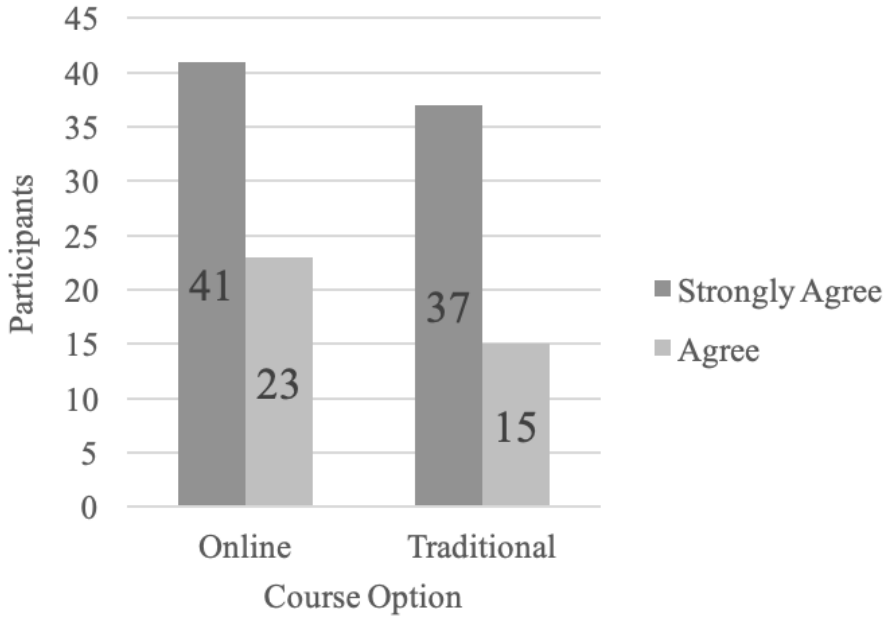

Table 3. Students perception of learner-content interaction in online equine courses (n=74).

Item	N	Mean[a]	Median	SD
Course Lessons and Lecture notes	74	1.43	2	0.89
Assignments and/or projects	74	1.42	2	0.86
Preparation for quizzes/exams	74	1.22	2	1.04

[a] Likert scale: 2= Strongly Agree, 1= Somewhat Agree, 0=Neither Agree nor Disagree, -1=Somewhat Disagree, -2= Strongly Disagree

Table 4. Students' perception of learner-instructor interactions in online equine science courses (n= 74).

Item	N	Mean[a]	Median	SD
I was able to get individualized attention from my teacher when needed	74	1.05	2	1.31
The teacher was an active member of the discussion groups offering direction and encouraging communication	74	1.03	2	1.34
I received timely feedback (within 24-48 hours) from my teacher	74	0.96	2	1.37
Although I could not see the teacher in my online classes, I felt his/her presence	74	0.95	1	1.13
I felt frustrated by the lack of feedback from my teacher	74	0.47	1	1.48

[a] Likert scale: 2= Strongly Agree, 1= Somewhat Agree, 0=Neither Agree nor Disagree, -1=Somewhat Disagree, -2= Strongly Disagree

Figure 8. Students currently or previously enrolled in an online equine science course at the time the survey was taken were asked if their online equine science courses encouraged students to discuss ideas and concepts covered with other students (n= 73).

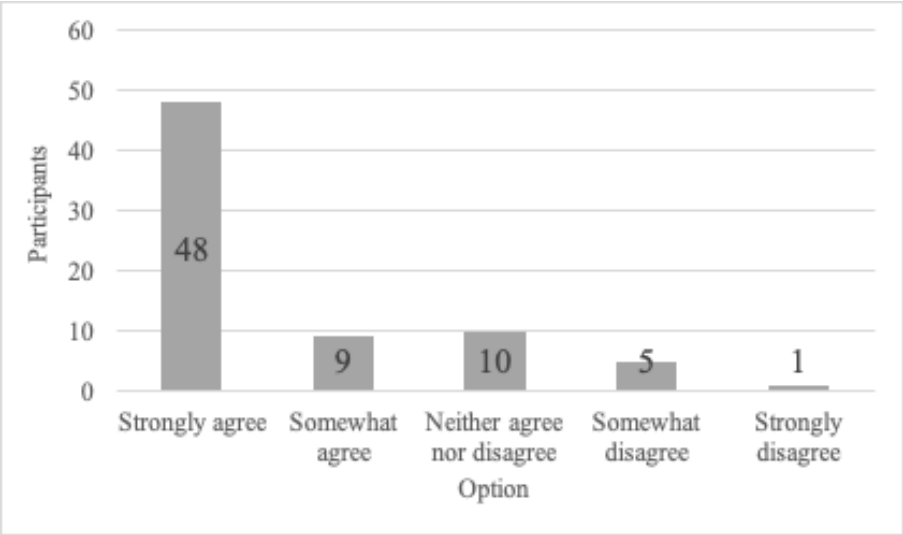

Figure 9. Students currently or previously enrolled in an online equine science course at the time the survey was taken asked if their online equine courses created a sense of community among students (n= 73).

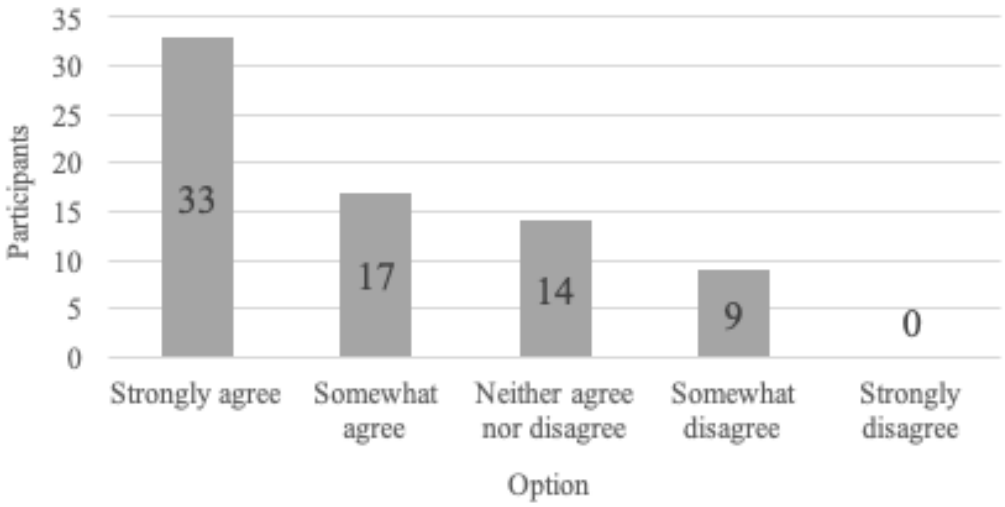

Figure 10. Students currently or previously enrolled in an online equine science course at the time the survey was taken asked if they were able to ask for clarification from a fellow student when needed (n= 73).

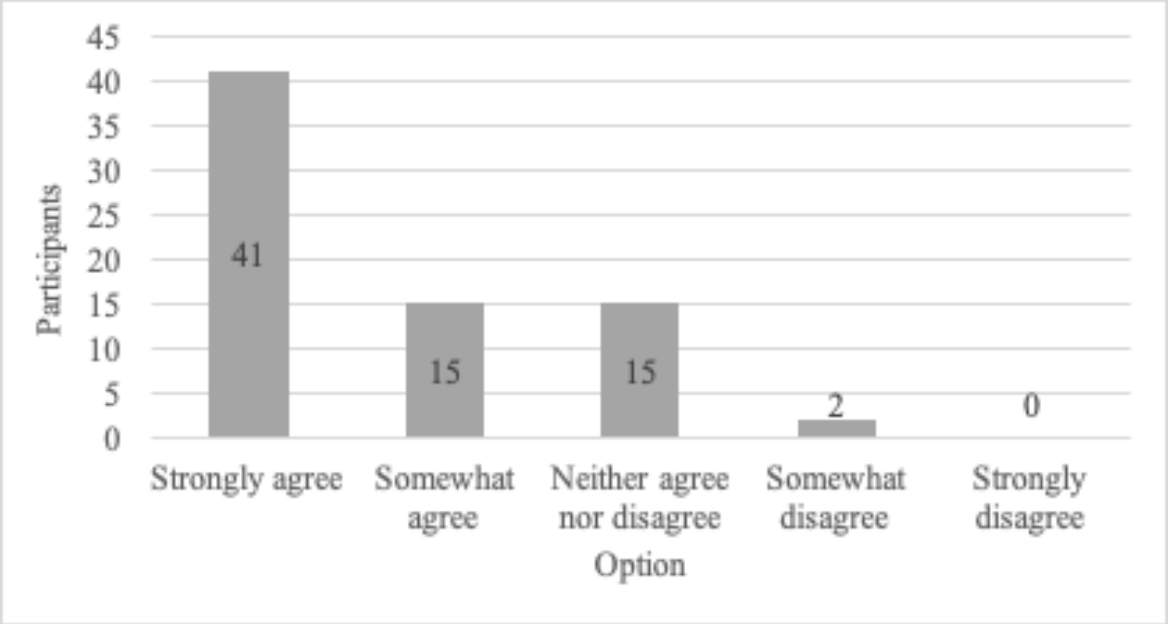

Table 5. Overall satisfaction of students currently or previously enrolled in an online equine science course (n= 73).

Items	N	Mean[a]	Median	SD
I am very satisfied with my online equine science courses	73	1.21	2	1.18
I would like to take another equine science course online	73	0.93	2	1.44
I would recommend taking equine science courses online	73	0.89	2	1.39
I feel online equine science courses are as effective as face-to-face courses	73	0.37	1	1.51
I learned as much in my online equine science courses as compared to a face-to-face course	73	0.32	1	1.36
My online equine science courses did not meet my learning needs	73	-0.73	-1	1.39

[a] Likert scale: 2= Strongly Agree, 1= Somewhat Agree, 0=Neither Agree nor Disagree, -1=Somewhat Disagree, -2= Strongly Disagree

Appendix

Appendix 1. Survey tool provided to students previously or currently enrolled in online equine science courses.

Q2 What University do you attend?

o Click to write Choice 1 (1) _____

Q3 How old are you?

o 19-21

o 22-26

o 27 or older

o Decline to answer

Q4 What gender do you identify with?

o Male

o Female

o Non-binary / third gender

o Prefer not to say

Q5 Do you identify as being of Hispanic, Latino/a/x or Spanish origin?

o Yes

o No

o Other, please specify

o Decline to answer

Q6 How would you best describe yourself?

- o American Indian or Alaska Native
- o Asian
- o Black or African American
- o Native Hawaiian or Other Pacific Islander
- o White
- o Other, please specify
- o Decline to answer

Q7 What year in school are you?

- o Freshman
- o Sophomore
- o Junior
- o Senior
- o Masters
- o PhD

Q8 What is your college/university major and minor?

- ▢ Major
- ▢ Minor

Q9 At your University, which of the following types of opportunities are offered for equine science? Choose all that apply

	Choose all that apply		
	Within your Animal Science Department	Outside your Animal Science Department	I don't know
Equine Behavior and Handling	o	o	o
Equine Judging	o	o	o
Equine Management	o	o	o
Equine Nutrition	o	o	o
Equine Reproduction	o	o	o
Equine Riding	o	o	o
Equine Training	o	o	o
Equine Business	o	o	o
Equine Exercise Physiology/Science	o	o	o
Other, please explain	o	o	o

Q10 Rate the importance of the following teaching method used in your online equine courses in relation to your learning.

	Online					
	Extremely beneficial	Somewhat beneficial	Neutral	Somewhat detrimental	Extremely detrimental	Method not used in online equine courses
Guest Speakers	o	o	o	o	o	o
Readings	o	o	o	o	o	o
Videos	o	o	o	o	o	o
Interactive web-based platforms	o	o	o	o	o	o
Streaming video platforms	o	o	o	o	o	o
Live chats, individually or course-wide	o	o	o	o	o	o
Web conferencing tools	o	o	o	o	o	o
Instructor Telephone availability	o	o	o	o	o	o
Virtual office hours	o	o	o	o	o	o
Other, please explain	o	o	o	o	o	o

Q11 Rate the importance of the following activities and/or assessments used in your online equine courses in relation to your learning.

	Online					
	Extremely beneficial	Somewhat beneficial	Neutral	Somewhat detrimental	Extremely detrimental	Method not used in online equine courses
Peer discussions	o	o	o	o	o	o
Case studies	o	o	o	o	o	o
Online Quizzes	o	o	o	o	o	o
Group projects	o	o	o	o	o	o
Individual student projects	o	o	o	o	o	o
Traditional in-person exams	o	o	o	o	o	o
Traditional online exams	o	o	o	o	o	o
Research papers	o	o	o	o	o	o
Student presentation	o	o	o	o	o	o
Discussion board posts	o	o	o	o	o	o
Small written assignments	o	o	o	o	o	o
Other, please explain	o	o	o	o	o	o

Q12 Rate the importance of what you would like to see be offered from the following delivery methods in relation to your learning.

	Online					
	Extremely beneficial	Somewhat beneficial	Neutral	Somewhat detrimental	Extremely detrimental	Method not used in online equine courses
Guest speakers	o	o	o	o	o	o
Readings	o	o	o	o	o	o
Videos	o	o	o	o	o	o
Interactive web-based platforms	o	o	o	o	o	o
Downloadable pre-recorded lectures	o	o	o	o	o	o
Microsoft PowerPoint presentations with or without voice-over	o	o	o	o	o	o
Forums and discussion boards	o	o	o	o	o	o
Google Drive and similar collaborative tools	o	o	o	o	o	o
Tools for off-hour support, like virtual tutoring centers and virtual resource centers	o	o	o	o	o	o
Other, please explain	o	o	o	o	o	o

Q13 How likely would you say you receive a quality education from online classes in your equine science courses?

o Strongly agree

o Somewhat agree

o Neither agree nor disagree

o Somewhat disagree

o Strongly disagree

Q14 How likely would you say you receive quality education from in-person classes in your equine science courses?

o Strongly agree

o Somewhat agree

o Neither agree nor disagree

o Somewhat disagree

o Strongly disagree

Q15 Describe the teaching approaches that you view as most helpful to your learning in your online equine science courses? 3-4 Sentences

_____

Q16 What were the reasons for enrolling in your online equine science courses? (check all that apply - think of many different ones)

- ☐ Course only offered as online course
- ☐ Fit my schedule better
- ☐ Tuition and or fees is cheaper in online course
- ☐ Saved me commuting/driving to campus
- ☐ Instructor of course was the one I wanted
- ☐ Fit my distance delivered degree (I do my degree online)
- ☐ I wanted to try an online course
- ☐ I feel more comfortable taking courses online
- ☐ Online courses are easier

Q17 Would you take another online equine science course? Yes or no and why or why not - briefly explain

_____

Q18 Do you think you learn as much in your online equine science course compared to your traditional course? yes (no - explain why)

- o Yes
- o No
- o Click to write Choice 3

Q19 Your online equine science course documents - lessons or lecture notes used in class facilitated my learning.

o Strongly agree

o Somewhat agree

o Neither agree nor disagree

o Somewhat disagree

o Strongly disagree

Q20 The assignments and/or projects in my online equine science course facilitated my learning.

o Strongly Agree

o Somewhat agree

o Neither agree nor disagree

o Somewhat disagree

o Strongly disagree

Q21 The learning activities in my online equine science courses required the application of problem-solving skills which facilitated my learning.

o Strongly agree

o Somewhat agree

o Neither agree nor disagree

o Somewhat disagree

o Strongly disagree

Q22 The learning activities in my online equine science courses required critical thinking which facilitated my learning.

o Strongly agree

o Somewhat agree

o Neither agree nor disagree

o Somewhat disagree

o Strongly disagree

Q23 Preparation for quizzes/exams in my online equine science course facilitated my learning.

o Strongly agree

o Somewhat agree

o Neither agree nor disagree

o Somewhat disagree

o Strongly disagree

Q24 How likely would you agree with these statements based on online equine science courses:

	Strongly Agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
In your classes, the teacher was an active member of the discussion groups offering direction and encouraging communication.	o	o	o	o	o
I received timely feedback (within 24-48 hours) from my teacher.	o	o	o	o	o
I was able to get individualized attention from my teacher when needed.	o	o	o	o	o
I felt frustrated by the lack of feedback from my teacher	o	o	o	o	o
Although I could not see the teacher in my online classes, I felt his/her presence.	o	o	o	o	o