THE EFFECTS OF EXTRACURRICULAR ACTIVITIES ON ACADEMIC PERFORMANCE AND RETENTION IN THE MIDDLE TENNESSEE STATE UNIVERSITY HORSE SCIENCE PROGRAM

by

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I dedicate this research to my parents and my husband.
I love you and thank you for believing in me.

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ABSTRACT

Student retention in college has been at the forefront of research for many years. Extracurricular activities (ECA) link the student to the institution, engage them at a level of comfort required to maintain their interest, provide greater access to mentors, and allow students to identify with peers. Students invested in an institution are more likely to persist to graduation. The objectives of this study were to explore effects of ECA in Horse Science students at Middle Tennessee State University (MTSU), and identify variables related to retention and persistence based on level of involvement. The hypotheses follow:

(1) Extracurricular activity participation will have a positive effect on student grade point average and increase the likelihood of students persisting to graduation.

(2) Students not involved in an MTSU Horse Science ECA will be less likely to persist to graduation.

(3) Students involved in an ECA will be more likely to identify with a peer group or mentor. Conversely, students not involved in an ECA will be less likely to identify with a peer group or mentor.

The study examined two types of data. In Part I, a 26-question survey was designed to collect student perceptions of ECA involvement and success. It was administered in the spring 2013 semester to obtain information from currently enrolled Horse Science students, with 70 surveys collected. The survey was approved by the MTSU Institutional Review Board. Questions included current extracurricular activity participation, self-reported GPA, length of commute, and whether students identified with a peer group or mentor. Data were analyzed using Pearson's correlation coefficient

and frequency counts using SAS. As commute increased, GPA tended to decrease (R^2 = -0.23; P = 0.08); ECA participation decreased (R^2 = -0.42; P = 0.001); and identification with a mentor decreased (R^2 = -0.31; P = 0.02). A positive correlation (R^2 = 0.28; P = 0.04) was observed from 1 to 15 hr/wk time spent studying and GPA. Total ECA positively correlated with mentor (R^2 = 0.34; P = 0.003) identification. A positive trend (R^2 = 0.26; P = 0.06) was found between ECA and GPA. Results of the survey suggest indicators of self-reported student success were influenced by ECA participation in the MTSU Horse Science Program.

Part II examined the effect of ECA participation on student performance using official transcript data. In Part IIA, a snapshot of official transcript data of all Horse Science majors enrolled in the spring 2013 semester were recorded and compared to data collected from students surveyed in spring 2013. In Part IIB, official transcript data were evaluated in three first-time full-time freshman cohorts longitudinally from to graduation or attrition, from fall 2007 to spring 2013. Of these students, 50% graduated, and 100% of graduates were members of at least one Horse Science ECA. Student members of at least one Horse Science ECA had higher cumulative GPA (P < 0.0001) in their last semester of enrollment, persisted longer (P < 0.0001), and earned more total hours (P < 0.0001) by the time they either graduated or stopped attending. Student members of at least one Horse Science ECA had higher first-year GPA (P = 0.0006) and earned more first-year hours (P = 0.0016). Results of this study indicate that student GPA, retention and persistence were influenced by ECA participation in the MTSU Horse Science Program. Student interest, involvement and investment, coined as i^3, leads to student success.

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CHAPTER I: REVIEW OF LITERATURE

Measures of Student Success and Retention

Student surveys are a longstanding means of gauging a student's opinion of their educational institution (Franklin, 1995). Research in student attrition and retention methods have been used to predict the chances of a student's likelihood of persistence. Attrition is a measure of the number of students who have departed from the institution (Tinto, 1997). Retention is defined as the institution's perspective of a student remaining at the same institution until graduation (Koon et al., 2009). Remaining in school regardless of institution(s) attended or length of time until degree completion is student persistence (Koon et al., 2009).

Research has found patterns and groups of variables that offer some indication of what students require to be successful throughout their college career. Instruments commonly used to determine student perceptions include the College Student Inventory (CSI), National Survey of Student Engagement (NSSE), the National Longitudinal Survey of Freshmen (NLSF), and the College Student Experience Questionnaire (Longden, 2006; Baker, 2008; Wakita, 2012). Each instrument employs self-reported student data, which is more suitable when evaluating student perceptions, values, and attitudes immeasurable by standardized tests (Kuh, 2001).

The College Student Inventory (CSI) is a 194-item instrument which seeks to improve retention of first-year college students by identifying factors leading to attrition. Most of the items are presented in a Likert format. The Likert scale is a 5- or 7- point

scale with balance of positive and negative positions indicating a level of agreement or disagreement with the question (Wakita, 2012). The CSI also provides academic and personal background information useful to advisors by allowing them to measure academic and social motivation and willingness to accept advising recommendations (Koon, et al. 2009).

The National Survey of Student Engagement explores the extent of involvement in educational practices leading to positive learning and personal development (Kuh, 2001). Dedication to coursework, ECA, and employment are among the areas of focus. Seniors are asked a separate set of questions inquiring about participation in internships, community service, and satisfaction with faculty interactions. Perceptions commonly related to satisfaction and persistence in a college environment are also measured (Kuh, 2001).

The College Student Experiences Questionnaire (CSEQ) measures the effects of student knowledge before entering the university, as well as academic engagement and social engagement while attending the university. Longden (2006) discusses the quality of CSEQ and use of the instrument to assess the quality of students' effort and the attainment of college-related goals in a population of first-year full-time freshmen. Responses to 14 scales covering 142 activities produce a measure effort invested in each of the aspects of college life (Kuh & Pace, 2003). Also covered are student background characteristics, including grades, aspirations, and financial arrangements. Student views of personal relationships, student satisfaction with college, and perceptions of the postsecondary institution (Kuh & Pace, 2003).

Extracurricular Activities and Academic Success

Extracurricular Activities and Student Retention

Academic and social engagements are indicators of student involvement and integration. Students involved in extracurricular activities (ECA) withdraw from college at a lower rate than those who are not involved (Cole & Fanno, 1999; Hunt, 2007). Some non-classroom interactions with peers have a positive impact on learning and have been reported in standardized and self-reported research (Pascarella & Terenzini, 2005, Elkins et al., 2011). Students involved in agriculture-related ECA before attending college often participate at a higher level when in college, leading to a decrease in attrition among these students (Cole & Fanno, 1999). Additionally, identification with a peer group through extracurricular activities increases persistence (Broh, 2002).

Students who become involved in ECA are more likely to become invested in the institution, which increases their commitment and provides a positive influence on persistence. Students who become involved earlier with ECA rather than later in their academic career are more likely to persist and be retained (Gerdes & Mallinckrodt, 1994; Pascarella & Terenzini, 2005). In a study by Cole and Fanno, (1999) 76% of individuals who withdrew from college reported not being involved in any ECA. Additionally, a cohort study in the early 1980s found that ECA involvement had a positive impact on freshman-to-senior-year degree aspirations (Ryan, 1989). Leadership opportunities often accompany ECA involvement, which are ideal introductions to expectations in most career fields. Extracurricular activities can contribute heavily to career choice (Pascarella

& Terenzini, 2005). Through ECA, students learn how to positively and productively interact with teammates, competitors and mentors, which also stimulate ethical and moral development (Lind, 1997; Rest & Narvaez, 1991).

Positive effects of student success and retention have been seen in activities directly related to students' course of study (Pascarella & Terenzini, 2005; Baker, 2008). Pascarella and Terenzini (1991) indicated a positive effect on persistence and social self-concept in a study where ECA involvement was a main focus. Baker (2008) used the National Longitudinal Survey of Freshmen to compare the dependent variable (academic performance) against an independent variable (ECA involvement), and no effect was found between academic performance and the category of activity in which students were involved (Baker, 2008).There is a tendency for students heavily involved in ECA to take longer to graduate (Pascarella & Terenzini, 2005). Conversely, students engaged in any sort of organized activity were more likely to persist to graduation than less involved peers (Shulman & Bowen, 2001).

Current Research

Reasons for Retention

Retention and student persistence are often used interchangeably, but there is a distinct difference between the two. According to the U.S. Department of Education (2000), retention is the institution's perspective on whether a student remains enrolled at the same institution, while persistence is the student's perspective of continuation to degree completion regardless of institution or length of time to graduation. Retention is

most often reported as enrollment of the student in the fall semester of their sophomore year. However, information from a single semester enrollment without tracking subsequent semesters is not the most reliable method of tracking students (Tinto, 1988; Koon et al., 2009).

There are a myriad of reasons students may take a hiatus for one or more semesters, but this does not mean that their withdrawal from school is permanent. These students should be tracked until the point of completion as they may return to the same institution or transfer to another (Tinto, 1975). Persistence has been attributed to many variables, including commuter status, financial security, study habits, receptivity to social enhancement, and receptivity to academic success (Koon et al., 2009). Patterns explaining persistence fluctuate based on variables such as type of institution, location, student enrollment, and course offerings (Cabrera et al., 1993). Commitment to the institution also provides a positive influence on persistence (Astin, 1993).

Students who enroll in colleges of agriculture are more likely to persist in their degree program if they were involved as youth (Fritz & Sandall, 1995). Agriculture Education majors who participated in 4-H and FFA programs in high school were more likely to enroll in a college of agriculture (Cole & Fanno, 1999; Dyer et al., 2000; Koon et al., 2009). Involvement in youth agriculture programs proved to be better indicators of persistence than traditional predictors such as ACT/SAT scores and high school GPA. (Fritz & Sandall, 1995; Koon et al., 2009). Students with strong backgrounds in agriculture-related extracurricular activities prior to college left the university of agricultural sciences at a lower rate than those without the background (Cole & Fanno,

1999; Dyer, et al., 2000; Fritz & Sandall, 1995). Students often enroll because of majors offered by a university, but the same could be said about ECAs. Extracurricular activities are an effective means of maintaining student interest. Often used as a method of recruitment, it has been shown that extracurricular activities also serve to retain a higher percentage of current students (Cole, 1999; Dyer et al., 2000; Hunt, 2007).

Additionally, Broh (2002) explained three theories that address influential roles of ECA on student persistence: the Developmental Model, the Leading-crowd hypothesis, and the Social Capital Model. The Developmental Model maintains that participation in ECA instills characteristics necessary for positive academic values and outcomes. Feldman and Matjasko (2005) agree that development is affected by participating in ECA through peer group influence and successive activity choices.

The Leading-crowd hypothesis maintains that participation in ECA increases student status among peers and promotes peer identification. Positive relationships have been determined between ECA participation and improved academic performance (Feldman & Matjasko, 2005). Thus, as social status is increased through sports participation and membership is extended to an academically focused peer group. This association facilitated an increase in academic performance and achievement (Broh, 2002).

The Social Capital Model maintains that participation in ECA provides networking opportunities which allow students to develop "social capital" in the form of increased interaction between peers, mentors, and others in their field of interest (Broh, 2002). Researchers have shown ECA participation provides the opportunity for students

to develop social capital through extended supportive networks (Feldman & Matjasko, 2005). Increased interactions with these supportive networks grant better visibility to potential employers. Social relationships also offer opportunities for the formation and strengthening of ties between students and the institution (Broh, 2002, Feldman & Matjasko, 2005).

Academic and Social Self-concepts

Self-efficacy, self-concept and self-esteem are used to explain a student's perceptions of their psychosocial environment. All three concepts have been shown promote a positive association between ECA participation and psychological well-being. Activities aligning with an individual's talents validate their sense of self through increasing self-efficacy, self-concept, and self-esteem (Bong & Skaalvik, 2003; Feldman & Matjasko, 2005).

Self-efficacy is the belief in an individual's ability to succeed at tasks with skill sets and abilities they possess (Bandura, 1977; Bong & Skaalvik, 2003). It also represents what the individuals believe they are capable of in certain situations. Academic self-efficacy is student perception of their capabilities relating directly to academic achievement, including persistence, motivation, academic performance (Caprara et al., 2008).

Self-concepts, like self-efficacy is thought to explain and predict actions, thoughts and emotions (Bong & Skaalvik, 2003). Self-concepts, however, are related more directly to experience-based self-perceptions. Self-esteem is an internal assessment of actual and desired behavior (Pascarella & Terenzini, 2005). Self-concept can be positively

influenced through peer interactions while discussing a class or during organized activities (Szelenyi, 2002).Self-esteem is often thought of as a cause and self-concept an effect. Students with positive academic self-concept often excel throughout their college career. These self-assessments are often made determined by the ease and comfort of social interactions among peers and faculty members (Astin, 1993; Szelenyi, 2002; Pascarella & Terenzini, 2005).

Similar to academic self-concept, social self-concept also increases as students progress from freshman to senior year (Kezar & Moriarty, 2000). Extracurricular activities are connected to increased social self-concepts as socialization has a positive and direct effect on freshman to senior year results (Chang 1997; Kezar & Moriarty, 2000). Diverse college experiences and their effects on student self-concepts shows that the institutional environment – including peers and mentors – increases self-confidence and leads to a more positive self-concept (Pascarella & Terenzini, 2005). Participation in intercollegiate athletics is another out-of-class activity that promotes positive social self-concepts (Kezar & Moriarty, 2000; Pascarella & Smart, 1991). Outside of academics, ECA provide a setting that maintains student involvement and allows them to develop additional skills and gain recognition (Feldman & Matjasko, 2005). Students with a more positive self-concept are more likely to seek involvement and believe in themselves than students who are withdrawn.

Interactions with Peers and Their Impact:

Interactions with peers have a significant impact on student separation, transition, and integration as described by Tinto's Stages of Student Departure Model (Tinto, 1988).

Separation from a student's previous associations and norms are necessary as the student adjusts, or transitions, to their new environment and begins to seek membership into their new community. The "transition" phase describes the student's desires of affiliation with those sharing similar beliefs or interests. Students are neither fully separated from their previous backgrounds, nor are they fully integrated into their new setting. Transitional students who are easily stressed and are less prone to commitment are at higher risk for attrition (Tinto, 1975). Acceptance from established peer groups and social interactions are necessary to develop these cohort relationships (Tinto 1975, 1988). Integration is the ultimate goal of students, and is marked as acknowledged membership or affiliation with the peer group of interest (Tinto, 1975). Academic and social integration are described as being complimentary to one another (Braxton et al., 1997). Likewise, involvement and peer identification can be a deciding factor in student enrollment for subsequent years, proving social affiliation is a reason for persistence. Students who interact outside of class, especially in ECA, often seek assistance with coursework from the same extracurricular activity peer group in which they are involved (Pascarella & Terenzini, 2005).

Mentor Identification and Faculty Interactions

Positive interactions with faculty and administrative personnel are fundamental to building mentor-student relationships and making students feel welcome and connected to any program (Chang, 1997). Mentor identification shares similarities with peer identification as interactions outside of class promote student perceptions of a supportive environment and interest in them as an individual (Mallette & Cabrera, 1991; Tinto,

1993; Kezar & Moriarty, 2000). Pascarella and Terenzini (2005) reported student interactions with faculty outside of class promote persistence and degree completion. Socialization with the values of the institution, as often shared by their mentors, leads to a sense of belonging, investment in the institution, higher degree aspirations and completion, and persistence (Tinto, 1997; Pascarella & Terenzini, 2005). Faculty-mentor programs have shown positive effects on learning and student persistence (Anderson et al., 1995; Campbell & Campbell, 1997, Gasman, 1997).

Reasons for Attrition

Cole and Fanno (1999) studied the responses of students who withdrew from the College of Agricultural Sciences at Oregon State University but remained at the university, and those who withdrew completely. Three reasons for student attrition were found. First, 85% stated a change in career objectives as the main reason for withdrawal from agricultural sciences while remaining enrolled at the university (Cole & Fanno, 1999). Although students tend to enroll based on the majors offered, it is not unusual for students to change their major at some point during their college career (Cole & Thompson, 1999). Researchers at Colorado State University stated an average of 37% of undergraduates change their major after their first year in college (Institutional Research, 2011). Other studies suggest 50% of students change majors two to three times prior to graduation (Ronan, 2005; Brooks, 2009; Leonard, 2010).

The second main contributor was a lack of financial resources with 47% of students claiming insufficient funding (Cole & Fanno, 1999). A study by the U.S. Department of Education's National Center for Education Statistics (NCES) stated 66%of

undergraduates received financial aid during the 2007 - 2008 academic year (NCES, 2009).

Last, 38% of students in the study claimed an inability to adapt to a more rigorous curriculum to be the final cause for attrition (Cole & Fanno, 1999). Predictive models have been developed to explain additional reasons for attrition. Psychosocial characteristics such as self-efficacy, self-concept, and self-esteem can serve as promoters or inhibitors of student success (Bong & Skaalvik, 2003; Feldman & Matjasko, 2005). Personality traits including impulsiveness, lack of commitment to education, lack of flexibility, and lack of profit from previous learning contribute to less successful academic performance (Tinto, 1975).

Many theories discuss the effects that a lack of academic or social integration can have on student decisions to persist (Tinto, 1975; Braxton et al., 1997; Astin, 1993). Predetermined goals, values, and aspirations also affect student persistence as those with set goals and aspirations tend to persist to graduation (Braxton et al., 1997; Broh, 2002). Weidman (1989) maintains that pressures from personal relationships must be balanced in order for students to obtain their goals (Bean and Metzner, 1985; Weidman, 1989). Certain demographic information such as age, gender, race and socioeconomic background are also heavily considered as predisposing factors of attrition (Tinto, 1975, 1993; Weidman, 1989).

Tinto's Theory of Student Departure and Weidman's Model of Undergraduate Study agree that students enter college with predetermined goals and characteristics that may allow or inhibit them from attaining those goals (Tinto, 1975, 1988; Weidman,

1989). Failure to modify behavior detrimental to academic success or to adapt to their new academic and social environment prevents integration into the academic community (Tinto, 1993). These acts also strengthen the level of investment between a student and their institution (Pascarella & Terenzini, 2005; Tinto, 1988, 1993). Negative interactions are more likely to impede integration, causing a student to revert back to the separation stage described by Tinto. An inability to adapt to and accept the new culture will inevitably inhibit them from being concerned with acceptance and increases the likelihood of withdrawal (Pascarella &Terenzini, 2005; Tinto, 1988).

Cause and effect can be used to summarize the attrition models researchers have studied for decades. Most attrition is ascribed to academic failure rather than voluntary withdrawal (Tinto, 1975). It should be realized, however, that attrition will continue to occur because it is impossible to expect an entire cohort population to persist given every unforeseen variable that could interrupt or terminate a student's college career (Tinto 1975). The U.S. Department of Education reported a 58% retention rate for first-time, full-time students who began a bachelor's degree at a 4-year institution. Degrees were completed over a six year span at the same institution, or 150% of the normal four-year degree completion time (NCES, 2012). There is a call for research in both academic and social aspects to determine a presence or lack of post matriculation commitment to their institution.

There is a need to identify causes for increased dropout rates as legislators who are responsible for appropriating funds often see it as a lack of accountability in undergraduate education (Ewell, 1991). Students leaving and returning, transferring to

another institution, or failing to return for other reasons are often placed into incorrect categories when reported by the institution. Thus, the cause of attrition cannot be determined as inversely related, unrelated or directly related to academic failure or voluntary withdrawal (Tinto, 1975). Higher education has met reluctance for funding for this reason.

Financial Aid

Financial aid is surprisingly a less researched effect on student persistence to graduation. It is surprising because during the 1999-2000 academic years, 73% of all full-time undergraduate students received financial aid while only 66% received funding during the 2007-2008 year (Berkner et al., 2002; NCES, 2009). A majority of students majoring in engineering, computing, or the natural sciences are more likely to lose a scholarship than students in other disciplines (Dee & Jackson, 1999). An estimated 23% will fail to achieve the 3.0 GPA necessary to meet most financial aid requirements during the first year, with a total of 57% failing to do so over the course of their academic career (Dee & Jackson, 1999). DesJarndis et al., (2002) explained financial aid could directly affect academic motivation based on short and long-term goals. Maintaining grants and scholarships are considered a short term effect, while student loans are considered a long term effect for motivation. Additionally, loans are known to have a negative effect on persistence while scholarships and grants have a positive effect on retention (DesJarndis et al., 2002).

Employment

In 1996, it was estimated that only 11% of students were not employed at some point throughout their academic career (NCES, 1996). The loss of financial aid or other unforeseen financial circumstances can cause students to seek part-or full-time employment. Pascarella and Terenzini's (2005) research showed there is an inverse relationship between the number of hours worked and the number of credit hours in which the student is enrolled. More time spent working means less time for academic endeavors. Students are more likely to decrease the number of credit hours from full to part-time as their time spent working increases. Students who are employed more than 15 hours per week are much less likely to persist than those who do not work or work 15 hours or less per week (Pascarella & Terenzini, 2005). There are some students who are capable of balancing both work and academics, but these are uncommon exceptions to the rule. Pascarella and Terenzini (2005) explained it could be due to better time management or organizational skills gained through employment, or a realization that less time available to study means a need for more concentrated study sessions.

Residency

On-campus residency is defined by students living in a dormitory or other school operated housing facility. Off-campus residency is a rented or purchased domicile in which the student may live alone, with roommates, or relatives (parents, husband, wife, children, etc.). Commuting has a detrimental effect on learning as compared to a more positive effect of living on-campus. This is due mainly to the lack of academic and social

interactions available to commuter students (Pascarella & Terenzini, 2005; Gross et al., 2007).

Many colleges and universities incorporated learning communities or living-learning centers (LLCs) into campuses and dormitories. Learning communities "provide shared course organization linked around a theme or single large topic" (Tinto, 1997). Living-learning centers consist of a floor or wing of on-campus housing dedicated to a specific major. These students are often enrolled in the same classes and offer the same positive effects on persistence as seen with on campus housing research. Collaboration occurs and connections are made among students due to enrollment in common courses allowing students an immersive experience. Research shows advanced problem solving and content knowledge in learning communities as compared to students not involved in both self-reported and standardized measures of student success (Cross, 1998; Pascarella & Terenzini, 2005; Tinto, 1993).

United States Horse Industry and Extracurricular Horse Activities at U.S. Universities

The Role of Horses in the Industry

Horses were often used for work and transportation until the invention of the first vehicle, specifically the Ford Model T in 1908. In the early 1900s, nearly 50 percent of Americans lived on farms or in rural settings and there were approximately 17 million horses in the United States (Kreitler, 2000). But, even from the establishment of the Triple Crown races in the late 1800s to the incorporation of equestrian sports in the

Olympics in 1912, horses have been seen as a form of entertainment more than a necessity. From then until today, horses have seen a shift from farm work to recreation, and their numbers have decreased to approximately 9.2 million today (Deloitte, 2005). During the 1970s and ‘80s horse shows, show circuits and breed associations began to grow and draw the horse enthusiasts in greater numbers. This provided a community for owners, trainers, riders and others interested in the industry.

Today, there are horses in every state, and at least 20,000 in forty-five of those states with some states claiming as many as hundreds of thousands. The current highest ranking state based on total number of horses is Texas, with 979,000 horses. California reports a total of 698,000 horses, making them the second highest ranking state, and Florida is third with 500,000 horses (AHC, 2010). The horse industry contributes $102 billion to the gross domestic product each year. There are 4.6 million people are directly involved in the industry, 2 million as owners (AHC, 2010). This growth has initiated a greater need for research dedicated to improving the health, genetics and performance of horses both nationally and internationally (Bump, 2003).

The Role of Horses in Academia

Until the 1970s, horses were somewhat overlooked as an area of useful study in agriculture (Kreitler, 2000). Academically, equine science programs have met several obstacles in the lack of funding, administrative support, and availability of horses and facilities. Also, many equine courses are targeted as less important than courses geared toward food animals (dairy and beef cattle, small ruminants, swine and poultry). In 2000, the United States Department of Agriculture (UDSA) reported an approximately 40%

increase in enrollment in agriculture programs at land-grant institutions between 1989 and 1998. An increase in student interest in agricultural studies is significant since fewer students are enrolling from a rural background (National Research Council, 1995).

The Role of Horses in Collegiate Extracurricular Activities

The Intercollegiate Horse Show Association is comprised of 37 regions and eight zones in nearly 400 colleges and universities across 45 states and Canada (IHSA, 2013). The Western and Hunter Seat divisions host over 9,300 riders at shows during the academic school year, with the National Championship Show (Nationals) at the end of the show season. IHSA members must be full-time undergraduate students or alumni who competed as an undergraduate. Riders accumulate points throughout the season and top riders compete at Regionals, then Zones, with the top two in each region advancing to Nationals (IHSA, 2013).

IHSA offers several academic scholarships as well as merit based awards. There are several academic scholarships awarded annually, worth from $1,000 to $1,500. Coaches are also encouraged to nominate a student for the separate Jon Conyers Memorial Scholarship as well. Students who maintain a 3.5 GPA and meet membership requirements can submit an essay to be considered for the Senior Award. An entire team can be recognized for overall academic achievement through the IHSA National All-Academic Award which gives certificates and recognition at Nationals to schools with the highest GPA averages. The association also hosts a knowledge based competition each year in the form of a written exam, the IHSA EQUUS Challenge Test, which demonstrates the rider's horse knowledge (IHSA, 2013).

The American Stock Horse Association (ASHA) Collegiate Division is comprised of teams nationwide. Fifteen teams from across the country competed in the 2013 National Collegiate Championship Show. The Nathan Belcher Scholarship is awarded to the highest placing collegiate entry in the all-around of the ASHA National Championship show (ASHA, 2013).

Intercollegiate Horse Judging teams are supported by several leading industry sponsors including the American Quarter Horse Association (AQHA), Merial, John Deere, Purina, SmartPak Equine and many more. The largest competitions are the Reichert Celebration in September, the All American Quarter Horse Congress in October, the AQHA World Championship Show in November, and the Reining Horse Futurity in November. Students learn more about horses while improving their speaking abilities and decision making skills. Scholarships are available at several universities and colleges across the country. Scholarships awarded range from $750 to $2,000, and students also receive ribbons, trophies and other prizes (AQHA, 2013; NRHA, 2013; Reichert, 2013).

The American Collegiate Horsemen's Association (ACHA) is comprised of several schools across the nation. Each year a different school hosts that ACHA National Convention, inviting students to explore different aspects of the horse industry nationwide. Scholarships are awarded on an individual college basis (ACHA, 2013).

Information about MTSU

Since it was founded in 1911, Middle Tennessee State University has graduated over 108,000 students as of January 1, 2011. Located in Murfreesboro, MTSU attracts students both nationwide and internationally and is accredited by the Commission on

Colleges of the Southern Association of College and Schools. The School of Agribusiness and Agriscience offers a Bachelors of Science in Animal Science, Plant and Soil Science, or Agribusiness, and a teaching certification in Agricultural Education. Within Animal Science, students may choose a concentration in either Animal Science Industry or Horse Science.

CHAPTER II: RESEARCH GOALS AND HYPOTHESIS

In an effort to measure the effects of extracurricular activities (ECA) on student success and retention in the MTSU Horse Science program, a student self-reported survey instrument was designed to collect student perceptions of ECA involvement and success. Chapter III will discuss research objectives, significance and hypotheses.

Purpose of the study

The goal of this study was to explore the effects of ECA in a cohort of Horse Science students at MTSU, and identify the variables related to retention and attrition based on involvement. In Part I, a student survey instrument was designed to obtain information from current Horse Science students of all levels, including demographic data and current extracurricular activity participation, at the beginning of the spring 2013 semester.

Part II examined the effect of ECA participation on student performance using official transcript data. In Part IIA, a snapshot of official transcript data of all Horse Science majors enrolled in the spring 2013 semester were recorded and compared to data collected from students surveyed in spring 2013. In Part IIB, official transcript data were evaluated in three first-time full-time freshman cohorts longitudinally from to graduation or attrition, from fall 2007 to spring 2013 with data collected each fall semester in addition to the semester the student graduated or stopped attending.

Hypothesis

This study had three hypotheses:

1. Extracurricular activity participation will have a positive effect on student grade point average and increase the likelihood of students to persist through graduation.

2. Students not involved in an MTSU Horse Science ECA will be less likely to persist to graduation.

3. Students involved in an ECA will be more likely to identify with a peer group or mentor. Conversely, students not involved in an ECA will be less likely to identify with a peer group or mentor.

CHAPTER III: METHODS AND PROCEDURES

The MTSU Horse Science Center, built in 2003 is located separately from the main campus and is adjacent to the Tennessee Miller Coliseum. This teaching facility houses the program's classrooms, faculty offices, lesson horses, lesson arenas, and lab area. Although the facility was completed in 2003, the Horse Science major has been offered at MTSU for over 40 years.

Extracurricular activities offered by MTSU Horse Science

The Horse Science Center is home to four extracurricular activity teams and organizations including the MTSU Horse Judging Team, MTSU Intercollegiate Horse Show Association Equestrian Team, MTSU Stock Horse Team, and MTSU Horsemen's Association. The Horse Judging Team was started in 1976. The team has won many champion and reserve champion titles over the years (Whitaker, 2013). The IHSA Equestrian Team was started in 1977. With many high point team and rider placings, as well as Zone, Regional championships, the team's success is obvious (Henry, 2011). The Stock Horse Team began in 2010. They have won High Point Team and have had several High Point Horse and Rider combinations. The team competes across the southeast—as well as a handful of home hosted ASHA shows. The MTSU Horsemen's Association was started in the 1976. Horsemen's Association is a student organization for students who want to learn more about the different areas of the horse industry. The club's monthly meetings feature speakers, demonstrations, and trips.

Part I. Student Self- Reported Survey Data

Subject Selection

Students in the Horse Science concentration and enrolled in eight Horse Science course during the spring 2013 semester were surveyed. Classes surveyed included some required (REQ) for graduation, some commonly selected in an "either/or" course option (OPT) for graduation and some were electives (ELC), as follows: ABAS 2110 Basic Horsemanship (ELC), ABAS 2400 Fundamentals of Horsemanship (REQ), ABAS 3300 Equine Health (REQ), ABAS 3430 Horse Production (OPT), ABAS 4090 Equine Reproduction and Breeding (OPT), ABAS 4400 Advanced Horsemanship: Equitation (ELC), ABAS 4450 Techniques of Teaching Horsemanship (ELC) and ABAS 4580 Advanced Judging of Horses (ELC).

I*nstrumentation*

A survey addressing several issues identified as commonly coinciding with student retention and persistence was developed and administered. The Likert scale was chosen because respondents are able to indicate their level of agreement or disagreement with a given statement. Multiple choice questions were also used, and were fashioned after questions from National Association of Equine Affiliated Academics (NAEAA) Graduating Student Survey and American Horse Publications survey (NAEAA, 2007; AHC, 2010). The 26 question survey, with an additional 5 question section for seniors, was approved by the MTSU Institutional Review Board (Protocol #13-190, see Appendix C). Variables examined in the survey included demographic data, previous horse experience, current and cumulative extracurricular activity participation, length of

commute, time spent studying, self-reported GPA, and whether students identified with a peer group or mentor. The full survey is included in Appendix A and B.

Survey administration

The survey instrument was administered during the third week of classes at the beginning of the 2013 spring semester to current Horse Science Students. The proctor read the welcome page to participants, handed out the survey, and waited for them to complete and pass back. Anonymity and voluntary nature of the survey were stressed during the welcome and instructions.

Data collection and analysis

Seventy surveys were collected and compiled into a Microsoft Excel spreadsheet. Data were analyzed using Pearson's correlation coefficient and the PROC FREQ option of SAS (SAT Inst., Inc., Cary, NC). A General Linear Models procedure was used to test the effects of Horse Science ECA and total number of ECA on GPA, using a Tukey-Kramer adjustment for uneven group numbers. Results were considered statistically significant at $P < 0.05$, with a tendency towards significance at $0.05 < P < 0.10$.

Limitations

Not all students were surveyed because they did not attend class on the day the surveys were given or were not enrolled in a Horse Science class during the spring 2013 semester when the surveys were administered.

Part II. Student Cohort Transcript Data

II A. Comparison of official transcript data of Horse Science students enrolled in Spring 2013 with Horse Science students surveyed.

A snapshot of official transcript data of all Horse Science majors enrolled in the spring 2013 semester were recorded and compared to data collected from the spring 2013 students surveyed. Since the survey was administered in spring 2013, it was assumed that enrolled students would have self-reported their cumulative GPA as of the end of fall 2012. Thus, self-reported GPAs of Horse Science students surveyed in spring 2013 were compared to fall 2012 GPAs of Horse Science students enrolled in spring 2013. While it would have been optimal to pair the self-reported GPA to actual transcript GPA of the each student, the anonymity of the survey did not provide identifying information to pair the data, so a GLM procedure with a Tukey-Kramer adjustment was used to compare means of self-reported to actual transcript GPAs.

II B. Longitudinal study of official transcript data in a combined cohort of Horse Science majors.

Official transcript data were evaluated in three first-time full-time freshman cohorts longitudinally from to graduation or attrition, from fall 2007 to spring 2013. Cohort 1 was followed for 6 yrs, from fall 2007 to spring 2013. Cohort 2 was followed for 5 yrs, from fall 2008 to spring 2013. Cohort 3 was followed for 4 yrs, from fall 2009 to spring 2013. Cohort groups included only first-time, full-time freshman Horse Science majors for each year of matriculation in 2007 to 2009. Grade point average and cumulative hours earned were recorded for each fall semester (first year through sixth

year as applicable) for each student who remained enrolled. Additionally, the last recorded GPA and cumulative hours earned were recorded for the last semester of enrollment of students who graduated or stopped attending. The status of each student for their last enrolled semester was tagged as either graduated or not graduated, with the latter also tagged as continuing, stopped attending, on probation, suspended, or initiated formal withdraw.

Official transcript data from each student was then cross referenced to ECA membership lists in the MTSU Equestrian Team, Stock Horse Team, Horse Judging Team, and Horsemen's Association. After the transcript data was tagged with each student's respective Horse Science ECA memberships, and total number of Horse Science ECAs noted, all information that identified the individual students was removed from the file.

All statistical analyses were completed using SAS (SAS Inst. Inc., Cary, NC). Results were considered statistically significant at $P < 0.05$, with a tendency towards significance at $0.05 < P < 0.10$. Analysis of variance using a GLM procedure with a Tukey-Kramer adjustment for uneven group numbers indicated no effect of year of matriculation on last recorded GPA, cumulative hours earned, first year GPA, first year hours earned, or ECA participation in the three separate cohort groups ($P > 0.32$), so the data from the three cohorts were combined for further analysis, resulting in a combined cohort of 42 first-time full-time Horse Science majors that matriculated in 2007, 2008 and 2009.

Statistical analysis of the combined cohort of 42 students included simple frequency counts and an analysis of variance with a GLM procedure with a Tukey-Kramer adjustment. The model effects included participation in a specific ECA (Equestrian Team, Stock Horse Team, Horse Judging Team or Horsemen's Association), total number of ECAs joined, or participation in ANY ECA, and dependent variables were cumulative GPA, first year GPA, first year hours earned, and total years enrolled.

Graduated students within the combined cohort were examined using a mixed model with repeated measures analysis with student as the subject, first year through final cumulative GPA as the dependent repeated variable, and effects of specific ECA or total number of ECA as the main effects. Participation in ANY ECA could not be considered as a main effect because 100% of graduated students had joined at least one Horse Science ECA.

CHAPTER IV: RESULTS AND DISCUSSION

The results of this study, including 70 enrolled student surveys, a snapshot of official transcript data from 81 Horse Science majors enrolled in spring 2013, and a longitudinal examination of a combined cohort of 42 students matriculated in 2007 to 2009, strongly indicate that involvement in ECA positively influences GPA and persistence in university Horse Science students.

Part I. Student Self-Reported Survey Results

Demographic Information:

The demographic information collected from the survey is shown in Figures 1 through 3. These questions were based on age, gender, race, academic level and enrollment status at the time of the survey. Of the students surveyed, 70% were between 18 and 21 years of age 21% were between the ages of 22 and 25, and nine percent were over 25 years old (Figure 1).

The female population greatly surpasses the male population at 95 and 5% respectively (Figure 2). Responses indicated 91% Caucasian, 3% African American, 2% Hispanic, and 4% Other (Figure 3).

Academic level of surveyed students indicated the largest population was 33% Seniors, followed closely by 30% Juniors, 25% Sophomores, 9% Freshmen and 2% indicating Other, which were likely non-degree seeking students (Figure 4). The majority of students surveyed (93%) were enrolled full-time and were 7% enrolled part-time (Figure 5).

Sixty percent of students reside off-campus alone or with roommates, 28% live off-campus with family and only 12% live on-campus (Figure 6). One-way commute time (in minutes) to the Horse Science campus indicated that 65% of students live less than 15 min away, 23% reside between 15 and 30 min away, with 5% each living 30 to 45 minutes and 45 – 60 minutes away, and 2% of students live more than an one-way hour's drive from campus. As commute time increased, GPA tended to decrease (R^2 = -0.23; P = 0.08); ECA decreased (R^2 = -0.42; P = 0.001); identification with a mentor decreased (R^2 = -0.31; P = 0.02); and time spent with friends tended to decrease (R^2 = -0.23; P = 0.07).

Most students indicated MTSU as their first university, with 56% indicating they were not transfer students. Nearly half (44%) were transfer students (Figure 8).

Family attitudes toward college attendance have been shown to influence student aspirations and goal setting. Eighty-two percent of students surveyed were not the first in their family to attend college, while 16% were the first, and 2% percent were unsure, selecting "I don't know."

Financial aid can play a crucial role in the persistence of students to graduation. Student loans are known to have a negative effect on retention, while scholarships are proven to have a positive effect on retention (DesJarndis et al., 2002). Through their responses to the financial status question, 40% of students confirmed that scholarships significantly fund their education while 30% indicated that it was a challenge to afford tuition, 14% claimed they could afford tuition, 9% indicated they were barely able to afford college, and cost was not an issue to 7% (Figure 10).

Students were asked to self-report their GPA based on a 4.0 scale. Of students surveyed, 2% indicated their GPA was less than 2.00, and 6% reported their GPA was between 2.00 and 2.49. Thirty-one percent indicated their GPA was between 2.50 and 2.99, with 16% indicating their GPA ranging from 3.00 to 3.24. Five percent reported their GPA between 3.25 and 3.49, with 26% indicating their GPA between 3.50 and 3.74. Another 16% reported their GPA 3.75 or greater (Figure 11).

Because some students could have been attending Horse Science in order to fulfill requirements for a Minor in Agriculture, it was important to determine which students surveyed were Horse Science majors. Survey data from students who indicated that they were not Horse Science majors were removed from the study. Of the remaining surveys, 84% of students indicated they were Horse Science majors while the remaining 16% indicated they were Horse Science majors completing Pre-Veterinary medicine preparatory classes (Figure 12).

Students were then asked to indicate whether they identified with a peer group with similar interests. The question used a five-option Likert scales, ranging from strongly disagree to strongly agree. Increased total ECA participation positively correlated with peer ($R^2 = 0.42$; $P= 0.001$) identification, likely due to students feeling connected to peers. Seven percent of students strongly disagreed with the statement and nine percent disagreed that they identified with a peer group. Of the students surveyed, 14% indicated they neither agreed nor disagreed with the statement. Students indicated a strong sense of peer identification, with 70% either agreeing or strongly agreeing. Of that total, 30% agreed and 40% strongly agreed with the statement (Figure 13).

The Middle Tennessee State University (MTSU) Horse Science Program excels in student mentoring due to availability and visibility of faculty and staff on the Horse Science campus. The unique small Horse Science Center campus setting allows students to foster mentorships in a less intimidating atmosphere. Studies show a larger number of students persist to graduation if they identify with at least one mentor and are able to gain assistance outside class (Mallette & Cabrera, 1991). Participation in ECA strengthens mentorship bonds and student comfort level, increasing the likelihood that a student will request assistance outside of class (Pascarella & Terenzini, 2005). Each of the teams and organizations are coached or advised directly by a Horse Science faculty member, so the likelihood of mentor identification is high. This direct contact with faculty allows students additional opportunities to obtain assistance or clarification of material from class during ECA lessons, practices or meetings. The MTSU Horse Science Center is similar in criteria to Tinto's learning communities due to being on a separate campus, thus allowing students to engage others in common courses and social interests (1997).

Students were also asked to indicate whether they identified with mentor in the Horse Science Program and if they felt comfortable talking to this mentor about academic or personal situations. The question used a five-option Likert scales, ranging from strongly disagree to strongly agree. Five percent of students strongly disagreed with the statement, with 18% strongly disagreeing. Twenty-three percent neither agreed nor disagreed with mentor identification. Over half of the students surveyed identified with a mentor, indicating that 33% agreed and 21% strongly agreed with the statement. Increased total ECA participation positively correlated with mentor ($R^2 = 0.34$; P =

0.003) identification, likely due to students feeling connected to peers and faculty (Figure 14).

Figure 15 shows student-reported time spent studying in hr/wk. There was no correlation between overall time spent studying and GPA, but students reporting <1 hr/wk skewed the data. A positive correlation ($R^2 = 0.28$; $P = 0.04$) between GPA and time spent studying was observed over a range of study time from 1 hr to 15 hr per week.

Sixteen percent of survey respondents indicated they spent less than one hour per week on average with friends. Twenty-seven percent indicated spending between one and three hours with friends, while 28% spent 4 to 6 hours with friends. Twelve percent of students indicated spending 7 to 9, or 10 to 12 hours each. No students reported spending between 13 and 15 hours, with the remaining 5% indicating more than 15 hours spent with friends (Figure 16).

Figure 17 represents the average hours per week a student spends working for payment either on- or off-campus. Forty percent worked less than one hour per week, five percent worked one to four hours per week, and nine percent worked five to ten hours per week. Of students surveyed, 19% indicated working 11 to 20 hours, and 18% indicated working 21 to 30 hours. Seven percent of student work between 31 and 40 hours, with two percent working over forty hours per week on average.

Extracurricular activity involvement is reported in Figures 18 through 22. Fifty-four percent of students surveyed were involved in ECA while 46% of students were not. Figure 18 indicated self-reported time spent on average per week participating in MTSU ECA. Of students surveyed, 37% indicated spending less than one hour of involvement,

while 33% indicated between one and four hours of involvement. Twenty-three percent of students were involved five to ten hours per week, and the remaining 7% reported between 11 and 20 hours of involvement (Figure 18).

Figure 19 shows membership of students on the MTSU Equestrian Team. Of students surveyed, 65% indicated being a member and 35% indicated being a non-member of the team. Figure 20 reports the membership of students on the MTSU Stock Horse Team. Of students surveyed, 9% indicated being a member and 91% indicated being a non-member of the team. This is likely due to the team being only a few years old as compared to all other MTSU Horse Science ECA. Figure 21 shows the membership of students on the MTSU Judging Team. Of students surveyed, 16% indicated being a member and 84% indicated being a non-member of the team. Figure 22 indicates the membership of students on the MTSU Horsemen's Association. Of students surveyed, 12% indicated being a member and 88% indicated being a non-member of the team.

A positive trend was found between total ECA participation and GPA ($R^2 = 0.26$; $P = 0.056$). Previous involvement with horses ($R^2 = 0.36$; $P = 0.006$) and owning horses ($R^2 = 0.31$; $P = 0.02$) increased the likelihood of student participating in equine related ECA, either at MTSU or in the horse industry with breed associations, riding clubs, etc.. Some aspects of the ECA in the Horse Science program offer additional practice for students to strengthen their skills in the classroom, especially in the Horsemanship classes. This is a benefit for the student that many other ECA cannot claim. Many students are active in equine activities before attending MTSU, as the self-reported

results indicated 63% of students were involved in equine activities through youth organizations including FFA, 4-H, IEA, USEF, breed associations, and Pony Club.

Figure 23 shows percentages of students surveyed residing on-campus, off-campus alone, or off-campus with family. There was no effect of type of residence on self-reported GPA ($P > 0.73$)

Figure 24 indicated self-reported GPA and one-way commute time of MTSU Horse Science majors surveyed in Spring 2013. GPA tended to decrease as commute time increased ($R^2 = -0.02$; $P = 0.08$).

In Figure 25, the perception of peer identification versus type of ECA membership (Equestrian Team, Stock Horse Team, Horse Judging Team, or Horsemen's Association) is shown on a Likert Scale ranging from 0 to 5. A Likert score of 0 indicated that students strongly disagreed and 5 indicated that students strongly agreed with the statement that they identified with a group of peers having similar interests. While there was no effect of type of ECA membership on identification with peers ($P > 0.13$), there were some differences between specific teams compared to students who were not members of any ECA. Stock horse team members tended to identify with a peer group ($P = 0.09$) more than students who were not members of any ECA. The perception of peer identification was greater in Equestrian team members than students who were not members of any ECA ($P = 0.02$). Involvement in ECA and Peer Identification of MTSU Horse Science majors surveyed in Spring 2013 supports other results of this study, as ECA involvement and peer identification had a positive correlation with persistence.

Mentor Identification compared to type of Horse Science ECA in MTSU Horse Science majors surveyed in Spring 2013 is shown in Figure 26. The Likert Scale included 5 steps, with 0 indicating that students strongly disagreed, and 5 indicating that students strongly agreed with the perception that they identified with a mentor, defined as someone the student felt comfortable talking with about academic situations. While there was no effect ($P > 0.24$) of Horse Science ECA type on mentor identification, Equestrian Team members were more likely to identify with a mentor, compared to students who were not a member of any Horse Science ECA ($P = 0.01$).

Figure 27 included self-reported GPA and time spent studying (hrs/wk) of MTSU Horse Science majors enrolled in Spring 2013. There was no difference in GPA between categories of time spent studying ($P > 0.40$). There was no correlation between self-reported GPA and time spent studying across all categories, but when the "Less than 1 hr/wk" category was removed from the analysis, there was a positive correlation between GPA and time spent studying and 1 to 3 hr/wk through more than 15 hr/wk ($R^2 = 0.28$; $P = 0.04$).

Self-reported GPA and time spent with friends (hrs/wk) of MTSU Horse Science majors enrolled in Spring 2013 is shown in Figure 28. There was no correlation or difference in GPA between categories of time spent with friends ($P > 0.74$).

There was no correlation or difference ($P > 0.11$) between self-reported GPA and time spent working (hrs/wk) of MTSU Horse Science majors surveyed in Spring 2013 (Figure 29).

There was a positive trend ($R^2 = 0.26$; $P = 0.0561$) between participation in total number of extracurricular activities and self-reported GPA in MTSU Horse Science majors surveyed in Spring 2013 (Figure 30). This is compatible with Tinto's learning community theory which discusses increased retention through involvement. Students in learning communities enroll in the same classes and spend most of their time together, easing the transition process and increasing likelihood of integration. Although MTSU Horse Science does not qualify as the exact definition of a learning community, it certainly simulates the positive aspects.

Senior Questions

Senior students were asked to complete an additional five question section of the survey. The first question examined the self-reported length of time a student had been enrolled in college, from first college entrance to their current point of completion. Figure Of the Horse Science seniors surveyed in the spring 2013 semester, 26% attended college for less than three years, 5% percent attended for three years, 16% for four years, 16% attended four and a half years, 21% had been in college for five years, and 16% of seniors attended for more than five years (Figure 31).

Figure 32 indicated the number of seniors intending to work in the horse industry upon graduation. Forty percent of Horse Science seniors surveyed intend to be employed in the horse industry, while 60% do not intend to seek employment in the horse industry,

The last three questions for seniors asked about their experience with ECA while in college. The questions included five-option Likert scales, ranging from "strongly disagree" to "strongly agree" with the statement in each question. The first question

stated that students were not involved in any MTSU ECA and were glad they had not. Of students surveyed, 53% indicated that they strongly disagreed with the statement, and were satisfied with their level of involvement. Thirty-one percent disagreed with the statement, while 16% neither agreed nor disagreed (Figure 33).

The next question stated that students wished they had been more involved in MTSU ECA and may have missed out on good opportunities due to lack of involvement. Twenty-two percent disagreed with the statement indicating they were satisfied with the level of involvement and did not feel they missed out on any opportunities, while 34% neither agreed nor disagreed with the statement. A combined 45% felt they had missed out on opportunities and wished they had been more involved in MTSU ECA, as 33% agreed and 11% strongly agreed with the statement (Figure 34).

The last question stated that students wished they had been less involved in MTSU ECA, as their ECA involvement may have negatively affected their ability to do well in college. The majority (56%) disagreed with the statement that MTSU ECA involvement had a negative impact on their academic career. Of these students, 17% strongly disagreed and 39% disagreed. The remaining 44% had no opinion, stating that they neither agreed nor disagreed (Figure 35).

Limitations of the study

Not all students were surveyed because they did not attend class on the day the surveys were given or were not enrolled in a Horse Science class during the semester the surveys were administered.

Part II. Student Cohort Transcript Data

II A. Comparison of official transcript data of Horse Science students enrolled in Spring 2013 with Horse Science students surveyed.

A comparison of self-reported GPA from the student survey and official transcript GPA of Horse Science students enrolled in spring 2013 is shown in Figures 11 and 36. There was no difference (P = 0.86) between mean cumulative transcript GPA (2.97 ± 0.07) and self-reported GPA (2.99 ± 0.08) in Horse Science students currently enrolled and surveyed in the spring 2013 semester. Based on official transcripts and ECA membership lists in spring 2013, students tended (P = 0.070) to have higher cumulative GPA at the time of the survey (Figure 37) if they were members of at least one Horse Science ECA (3.10 ± 0.10) compared to non-members (2.85 ± 0.10).

II B. Longitudinal study of official transcript data in a combined cohort of Horse Science majors.

Transcript data from the combined cohort included 42 Horse Science students who matriculated from 2007 to 2009 and were followed until spring 2013 (Figure 38). Of these students, 50% graduated, 5% were still continuing, 26% stopped attending, 15% were placed on probation (and stopped attending), 2% were suspended, and 2% initiated a formal withdraw from all classes (Figure 39).

Students who were members of at least one Horse Science ECA (3.02 ± 0.13) compared to non-members (1.81 ± 0.31) had higher (P < 0.0001) cumulative GPA in their last semester of enrollment (Figure 40). Students who were members of at least one Horse Science ECA compared to non-members persisted longer (P < 0.0001), with

enrollments of 3.8 ± 0.2 yrs and 1.4 ± 0.2 yrs, respectively (Figure 41). Students who were members of at least one Horse Science ECA compared to non-members, earned more total hours ($P < 0.0001$) by the time they either graduated or stopped attending (105 ± 7 hrs versus 26 ± 5 hours, respectively, Figure 42). It is compelling to note that 100% of Horse Science students that graduated were involved in at least one Horse Science ECA.

Students who were members of at least one Horse Science ECA (3.07 ± 0.11) compared to non-members (2.04 ± 0.34) had higher ($P = 0.0006$) GPA at the end of their first year of enrollment (Figure 43). Similarly, students who were members of at least one Horse Science ECA, compared to non-members, earned more hours ($P = 0.0016$) in their first year of enrollment (28 ± 1 hrs versus 19 ± 3 hrs, respectively, Figure 44).

There was a positive correlation ($r^2 = 0.27$; $P = 0.016$) between total number of ECA per student and official transcript GPA. Students who were members of at least one Horse Science ECA had higher ($P < 0.004$) cumulative GPA than non-members, but as long as students were members of at least one ECA, there was no effect of multiple ECA memberships on GPA ($P > 0.22$; Figure 45). There was a strong positive correlation ($r^2 = 0.70$, $P < 0.0001$) between total number of ECA per student and total hours earned. Students who were members of at least one Horse Science ECA, compared to non-members, earned more total hours ($P < 0.0001$) by the time they either graduated or stopped attending, but as long as students were members of at least one ECA, there was no effect of multiple ECA memberships on total hours earned ($P > 0.12$; Figure 46).

Of the four Horse Science ECA (MTSU Equestrian Team, Horse Judging Team, Stock Horse Team, and Horsemen's Association), there was no effect ($P > 0.39$) of type of ECA on cumulative GPA (Figure 47). There was also no effect of type of ECA on years attended ($P > 0.17$), total hours earned ($P > 0.16$), first year GPA ($P > 0.49$) or first year hours earned ($P > 0.33$).

Similarly, in students in the combined cohort who graduated, repeated measures student GPA data over time throughout their persistence indicated no effect of type of ECA ($P > 0.38$) or total number of ECA memberships ($P > 0.14$).

The lack of effect of type of ECA indicated that MTSU Horse Science ECA appear to be equal, despite different amounts of time spent for different ECA. The Equestrian team meets each week at Horse Science to discuss upcoming events, usually horse industry related, and horse show schedules. They also ride in lessons several times each week, increasing the amount of contact between their peer group and mentor(s). The Stock Horse team rides together twice a week to practice, as well as attend and host stock horse shows and clinics. The Horse Judging team meets weekly as well, and travels to competitions. The Horsemen's Association offers the least contact for students as this ECA hosts fewer meetings and events than other Horse Science ECA. Although each ECA offers a different level of peer and mentor contact, involvement is the factor indicated to have the largest impact on positive GPA and student persistence. Ensuring students feel connected is key in retaining students.

CHAPTER V: CONCLUSIONS AND RECOMMENDATIONS

Significance of the study

Student retention, attrition and persistence in college have been at the forefront of research for many years. Extracurricular activities (ECA) link the student to the institution, engage them at a level of comfort required to maintain their interest, provide greater access to mentors, and allow students to identify with peers. Students invested in an institution are more likely to persist to graduation. The objectives of this study were to explore effects of ECA in Horse Science students at Middle Tennessee State University, and identify variables related to retention and persistence based on level of involvement.

Restatement of hypotheses

Extracurricular activity participation will have a positive effect on student grade point average and increase the likelihood of students to persist through graduation. This was shown to be accurate as 100% of students graduated were a member of at least one ECA. Also, ECA involvement was shown to have a positive effect on GPA and persistence to graduation.

Students not involved in an MTSU Horse Science ECA will be less likely to persist to graduation. This was also shown to be an accurate hypothesis as students who were not involved showed lower indicators of student success and persistence.

Students involved in an ECA will be more likely to identify with a peer group or mentor. This was also correct as 70% of students surveyed indicated that they either agreed or strongly agreed that they identified with a peer group and 54% indicated the same level of agreement in relation to mentor identification. Conversely, students not

involved in an ECA will be less likely to identify with a peer group or mentor was also seen, especially in students who commuted to school.

Conclusion

It can be concluded that student involvement in Horse Science extracurricular activities at MTSU are increases student success and persistence to graduation. These students build peer and mentor relationships that keep them interested and involved, both socially and academically. Student participation has shown a positive impact on GPA, regardless of type of ECA. It can also be concluded that distance from campus, measured as commute time, was a contributing factor to many negative impacts on ECA participation. Examples include less involvement in ECA a lack of identification with a mentor or peer group. Although increasing retention will continue to be a goal for colleges and universities, more information on factors leading to attrition and methods to prevent it is necessary. Targeted recruitment may increase retention, but with a program already as specialized as Horse Science, that may be difficult.

Recommendations

This study can be summarized in one concept, that is, student interest, involvement and investment, coined as i^3, leads to student success.

Interested – Gain student interest to assist in separation from previous norms. The MTSU Horse Science Program has many promotable points of interest for potential and current students. Making students more aware of the ECA offered, especially those on main campus, will increase interest. Also, the simulation of a learning community should be

Involved – Increasing student involvement in ECA increases ease of transition.

Invested – Integrated students will feel a stronger sense of connection, becoming invested in the institution and continuing to degree completion. This study has shown that overall student perceptions of the program are very positive. Also, the Horse Science Program must continue its investment in students which increases connectedness and positively impacts student retention and persistence.

I suggest this be referred to as: "iNTERESTED, iNVOLVED, and iNVESTED! **i**^{3}"

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APPENDIX A: Survey Cover Letter

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Welcome to the MTSU Horse Science Student Survey. Thank you for taking the time to assist with this project on extracurricular activities and student success. The survey should take no more than 15 minutes of your time as it consists primarily of multiple choice questions. This survey is completely optional and we appreciate your assistance. If you choose to withdraw from this study at any time, it will have no impact on you. This is an anonymous survey, and we will not collect or keep any data that can be used to personally identify you. Your responses will be stored in a secure computer and only summary statistical analysis, that cannot be used to identify individuals, will be available to the public upon completion of the study. Your participation in this survey and your answers will have no impact on your grade or academic standing.

We hope to use this survey to develop a better understanding of how the extracurricular activities offered by the MTSU Horse Science program affects academic performance and can be used to help students succeed. Your opinion and experiences with this program are important to us and we value your feedback in order to make improvements. Please complete the entire survey and answer all questions to the best of your ability. If you have any questions about this study please email Lacey Hubbs at ljh3b@mtmail.mtsu.edu or call (615) 898-2832.

By completing this survey, please understand that you have given implied consent for participation in this study.

APPENDIX B: Survey

APPENDIX B: Survey

For the following questions, please CIRCLE the response that best describes you.

1. What is your age?
   - Under 18
   - 18 - 21
   - 22 - 25
   - Over 25

2. What is your gender?
   - Male
   - Female

3. What is your current academic level?
   - Freshman
   - Sophomore
   - Junior
   - Senior
   - Other

4. Are you a part-time (6 – 11 hours) or full-time (12 or more hours) student?
   - Full-time
   - Part-time

5. Are you an on-campus resident or an off-campus commuter?
   - On-campus
   - Off-campus alone or with roommates
   - Off-campus with family

6. If you live off-campus, how long do you commute **one-way** to get to MTSU?
   - <15 min
   - 15-30 min
   - 30-45 min
   - 45-60 min
   - More than 1 hour each way

7. Have you previously been a student at another college/university?
   - Yes
   - No

8. Are you the first person in your family to attend college?
   - No
   - Yes
   - I don't know

9. Which of the following best matches your (or your family's) financial status related to Middle Tennessee State University attendance?
   - I/we are barely able to afford MTSU
   - It is a challenge, but I/we can afford MTSU
   - I/we can afford MTSU
   - The cost of MTSU attendance was not an issue for me/my family
   - Scholarships significantly fund my attendance to MTSU

10. How would you describe your cumulative college GPA?
   - Less than 2.00
   - 2.00 – 2.49
   - 2.50 – 2.99
   - 3.00 – 3.24
   - 3.25–3.49
   - 3.50–3.74
   - 3.75 or greater

11. What is the primary focus of the program you are completing? Please choose only one.
   - Animal Science
   - Animal Science - Horse Science
   - Animal Science – Pre-Vet
   - Plant and Soil Science
   - Agribusiness
   - Agricultural Education Certificate
   - Other, please specify. _____

12. While at MTSU, have you identified yourself with a group of peers with similar interests?
   - Strongly disagree
   - Disagree
   - Neither Agree Nor Disagree
   - Agree
   - Strongly agree

13. Do you have a mentor in the Horse Science Program? Someone you look up to and feel comfortable talking to about any academic or personal situations?

- Strongly disagree
- Disagree
- Neither Agree Nor Disagree
- Agree
- Strongly agree

14. How many hours per week, *on average*, do you spend studying?

- Less than 1
- 1 – 3
- 4 – 6
- 7 – 9
- 10 – 12
- 13 – 15
- More than 15

15. How many hours per week, *on average*, do you spend going out/spending time with friends?

- Less than 1
- 1 – 3
- 4 – 6
- 7 – 9
- 10 – 12
- 13 – 15
- More than 15

16. How many hours per week, *on average*, do you spend working for payment, either in an on-campus or off-campus job?

- Less than 1
- 1 – 4
- 5 – 10
- 11 – 20
- 21 – 30
- 31 – 40
- More than 40 hours

17. Is your employment related to the horse industry? (Includes employment relating to tack, feed, equipment, clothing stores, barn work, training, teaching lessons, show management, etc.)

- Yes
- No

18. How many hours per week, *on average*, do you spend participating in extracurricular activities sponsored by Horse Science? (This includes travelling for Judging competitions, horse shows, club or team trips, etc.)

- Less than 1
- 1 – 5
- 6 – 10
- 11 – 20
- 21 – 30
- 31 – 40
- More than 40

19. Which (if any) of the following equine organizations have you been involved with as a college student? Please select all that apply.

- MTSU Equestrian Team
- MTSU Stock horse Team
- MTSU Judging Team
- MTSU Horsemen's Association
- 4-H
- USEF
- Breed Associations
- Riding clubs
- Pony Club
- None
- Other, please specify _____

20. Which ABAS organizations have you been involved with outside of Horse Science?

- MTSU FFA
- MTSU Block & Bridle
- MTSU Pre-Vet Club
- MTSU Plant & Soil Science Club
- MTSU SAGA
- Sigma Alpha
- Alpha Gamma Rho
- None
- Other, please specify _____

21. How many MTSU organizations have you been involved with outside of Horse Science and ABAS?

- 0
- 1
- 2
- 3
- 4 or more

22. If you are not involved in extracurricular activities, which of the following statements is most true? Please select all that apply.

- I prefer not to be involved
- I would like to be involved but I:
  - Commute too far
  - Have to work too many hours
  - Need to spend time studying
  - Have too many family responsibilities

23. How long have you been involved with horses?

- Not involved
- Less than 1 year
- 1+ to 2 years
- 2+ to 3 years
- 3+ to 5 years
- 5+ to 7 years
- 7+ to 9 years
- 9+ to 11 years
- More than 11 years

24. Which (if any) of the following youth organizations with equine activities were you involved with **before** being a college student? Please select all that apply.

- FFA
- 4-H
- IEA
- USEF
- Breed Associations
- Riding clubs
- Pony Club
- None
- Other, please specify _____

25. How many horses do you personally own or lease?
- 0
- 1
- 2
- 3
- 4 or more

26. Did you bring your horse with you to MTSU (boarded either on-campus or off-campus)?
- I don't have a horse
- No, I left my horse at home
- Yes, for 1 year
- Yes, for 2 years
- Yes, for 3 years
- Yes, for 4 years or more
- If your horse was boarded on-campus, please indicate the length of time: _____

SENIORS ONLY: Please circle the response that best describes you.

1. How long did it take for you to complete your first degree/program from first college entrance to current point of completion?
- Less than 3 years
- 3 years
- 3 1/2 years
- 4 years
- 4 1/2 years
- 5 years
- More than 5 years

2. Do you intend to work in the horse industry upon graduation?
- Yes
- No
- Unsure

With regard to your experience with extracurricular activities while in college, mark the best answers to the following with respect to MTSU extracurricular activities:

3. I was not involved in any MTSU extracurricular activities, and I'm glad I wasn't.
- Strongly disagree
- Disagree
- Neither Agree Nor Disagree
- Agree
- Strongly agree

4. I wish I had been involved in more MTSU extracurricular activities. I may have missed out on some good opportunities.

- Strongly disagree
- Disagree
- Neither Agree Nor Disagree
- Agree
- Strongly agree

5. I wish I had been less involved in MTSU extracurricular activities. I may have stretched myself too thin and affected my ability to do well in college.

- Strongly disagree
- Disagree
- Neither Agree Nor Disagree
- Agree
- Strongly agree

APPENDIX C: IRB forms

APPENDIX C: IRB forms

February 4, 2013

Lacey Hubbs, Rhonda Hoffman
Department of Horse Science
ljh3b@mtmail.mtsu.edu, Rhonda.Hoffman@mtsu.edu

Protocol Title: "The Effects of Extracurricular Activities on Academic Performance and Retention in the MTSU Horse Science Program: A Longitudinal Study"

Protocol Number: 13-190

Dear Investigator(s),

The exemption is pursuant to 45 CFR 46.101(b) (2). This is because the research being conducted involves the use of educational tests, survey procedures, interview procedures or observation of public behavior.

You will need to submit an end-of-project report to the Compliance Office upon completion of your research. Complete research means that you have finished collecting data and you are ready to submit your thesis and/or publish your findings. Should you not finish your research within the three (3) year period, you must submit a Progress Report and request a continuation prior to the expiration date. Please allow time for review and requested revisions. Your study expires on February 4, 2016.

Any change to the protocol must be submitted to the IRB before implementing this change. According to MTSU Policy, a researcher is defined as anyone who works with data or has contact with participants. Anyone meeting this definition needs to be listed on the protocol and needs to provide a certificate of training to the Office of Compliance. If you add researchers to an approved project, please forward an updated list of researchers and their certificates of training to the Office of Compliance before they begin to work on the project. Once your research is completed, please send us a copy of the final report questionnaire to the Office of Compliance. This form can be located at www.mtsu.edu/irb on the forms page.

Also, all research materials must be retained by the PI or faculty advisor (if the PI is a student) for at least three (3) years after study completion. Should you have any questions or need additional information, please do not hesitate to contact me.

Sincerely,

Andrew W. Jones

Compliance Office
615-494-8918
Compliance@mtsu.edu

Appendix D: List of Figures

Part I. Student Self-Reported Survey Data

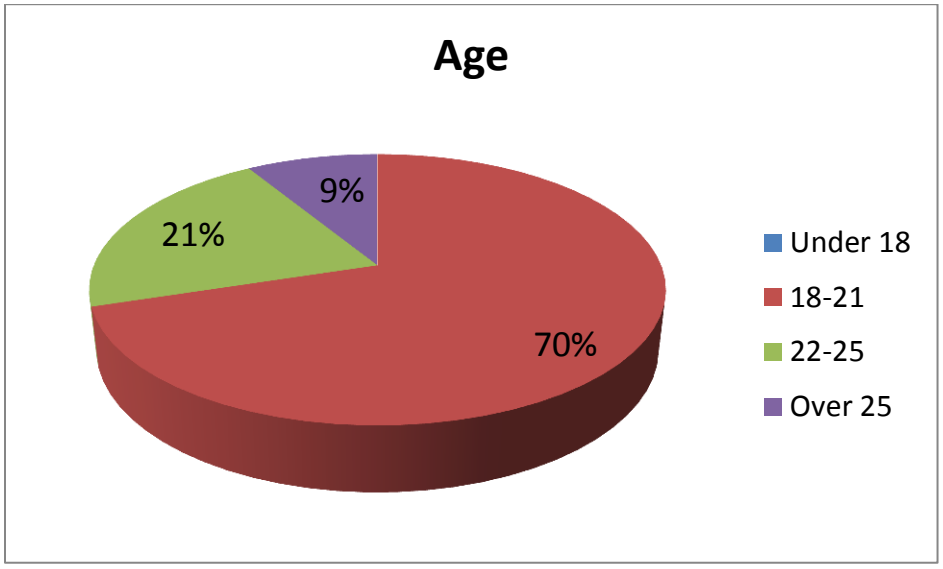

Figure 1. Age of MTSU Horse Science majors surveyed in Spring 2013.

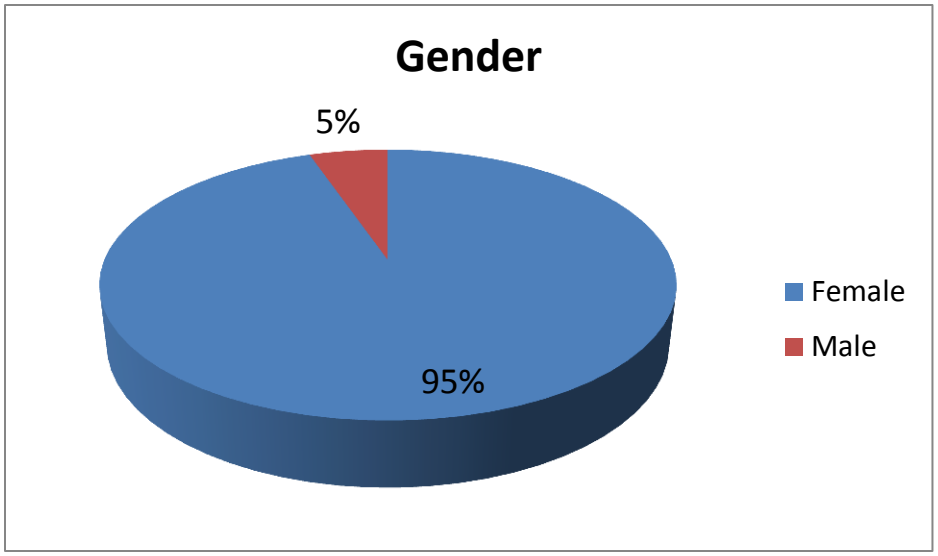

Figure 2. Gender of MTSU Horse Science majors surveyed in Spring 2013.

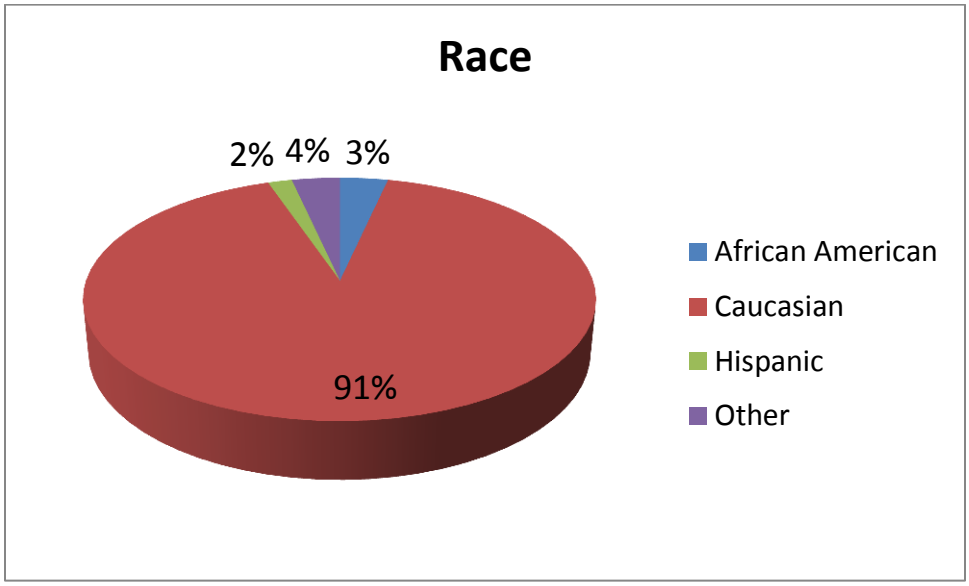

Figure 3. Race of MTSU Horse Science majors surveyed in Spring 2013.

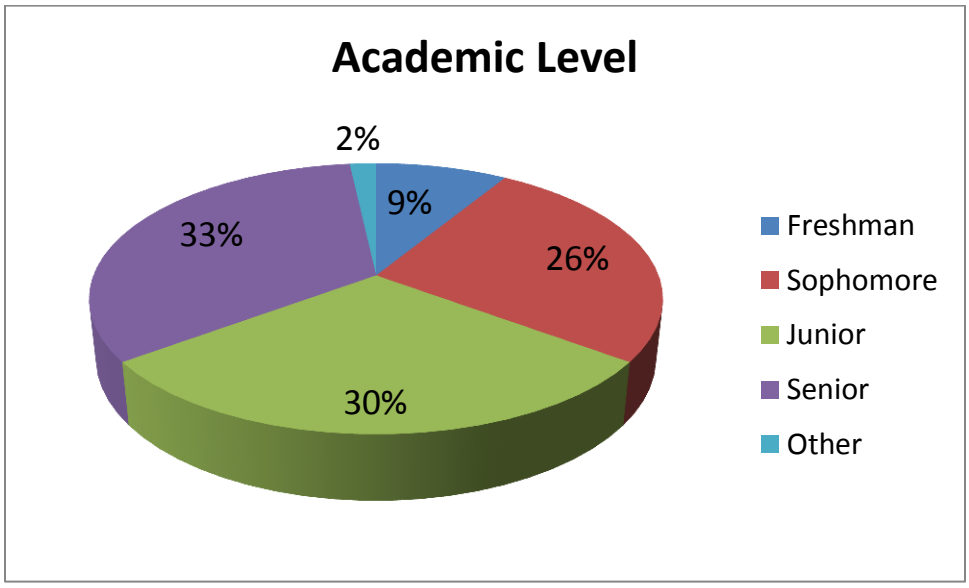

Figure 4. Academic level of MTSU Horse Science majors surveyed in Spring 2013.

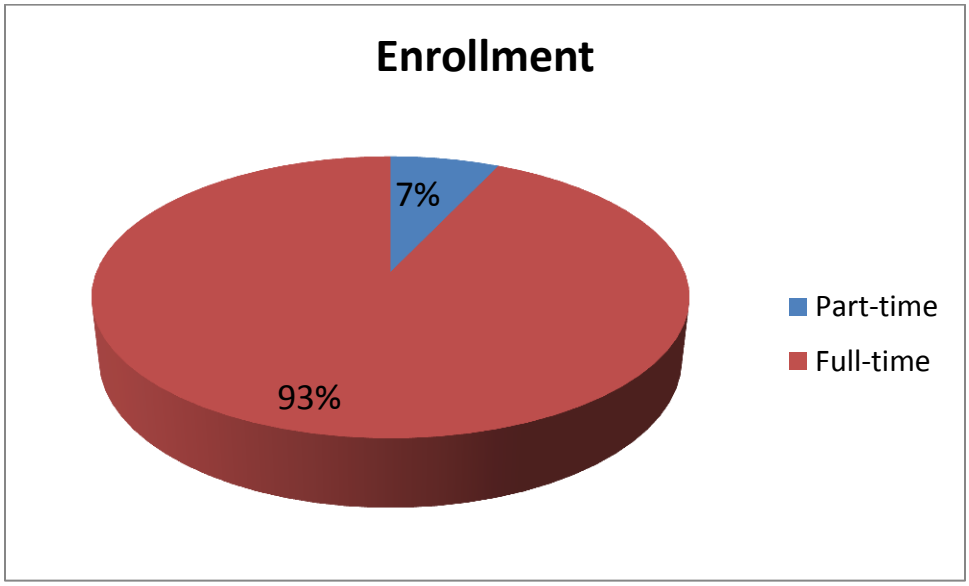

Figure 5. Enrollment status of MTSU Horse Science majors surveyed in Spring 2013.

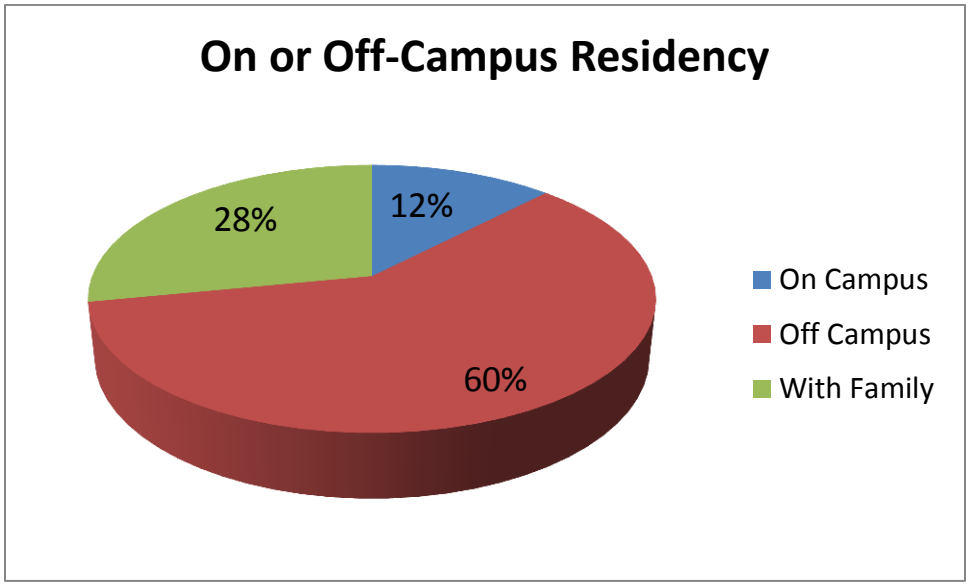

Figure 6. Residency of MTSU Horse Science majors surveyed in Spring 2013, designated as on campus, off campus (alone) or with family (also off campus).

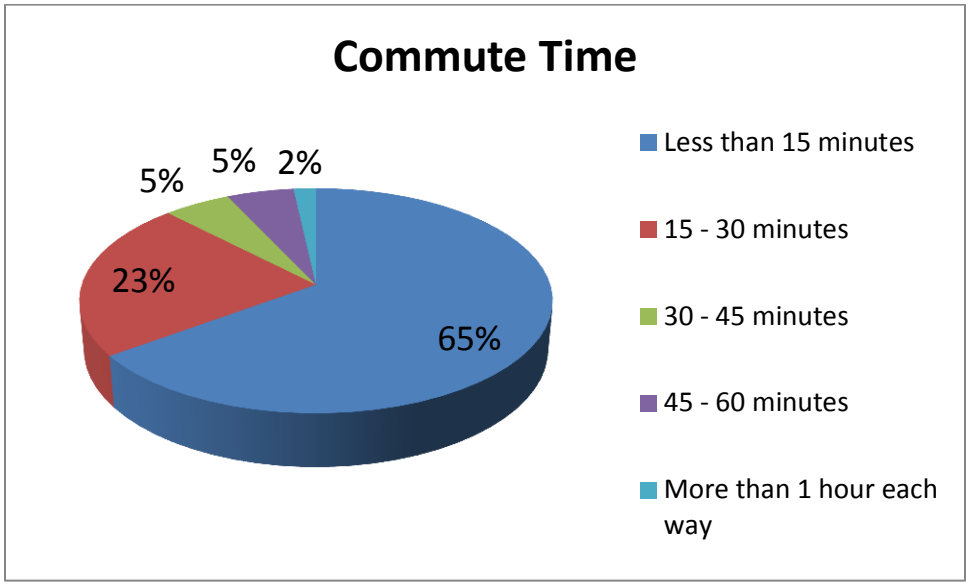

Figure 7. One way commute time of MTSU Horse Science majors surveyed in Spring 2013.

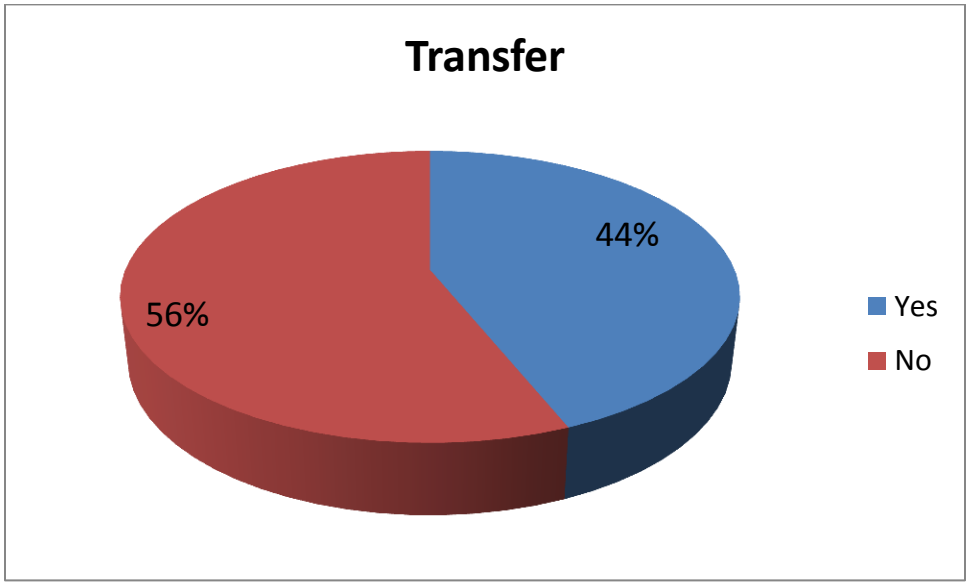

Figure 8. MTSU Horse Science majors surveyed in Spring 2013 indicated if they had transferred from another institution.

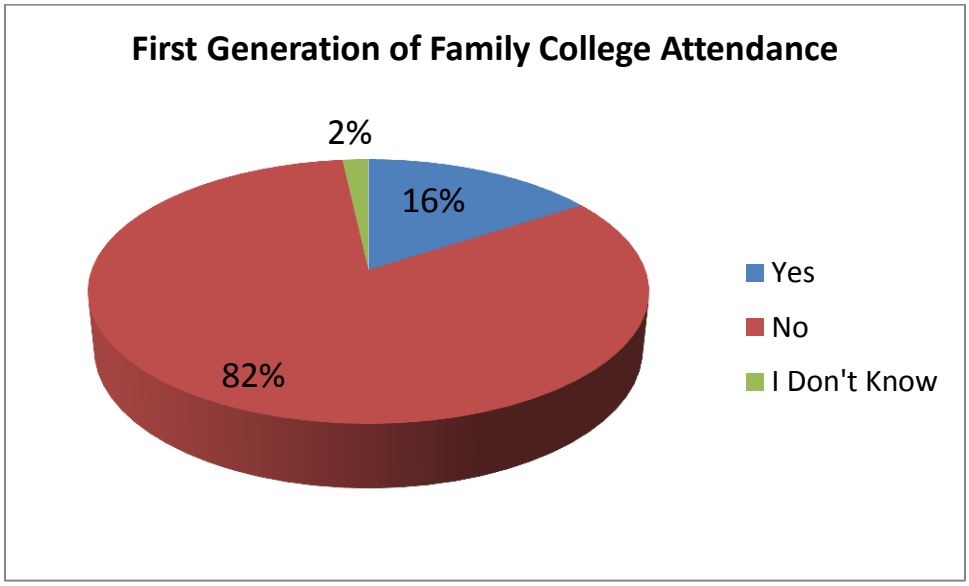

Figure 9. MTSU Horse Science majors surveyed in Spring 2013 were asked to indicate if they were the first member of their family to attend college.

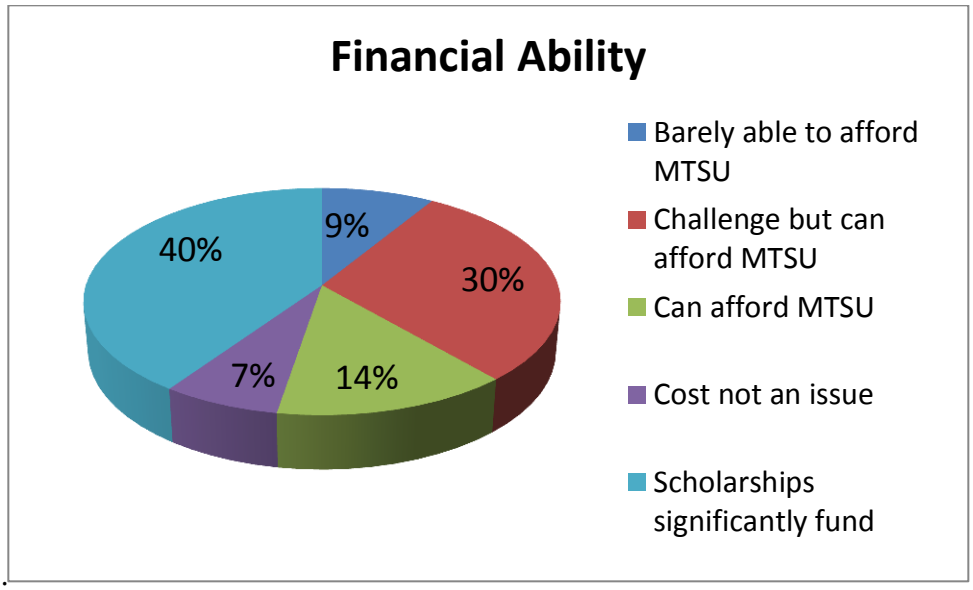

Figure 10. Perceptions of financial ability in MTSU Horse Science majors surveyed in Spring 2013.

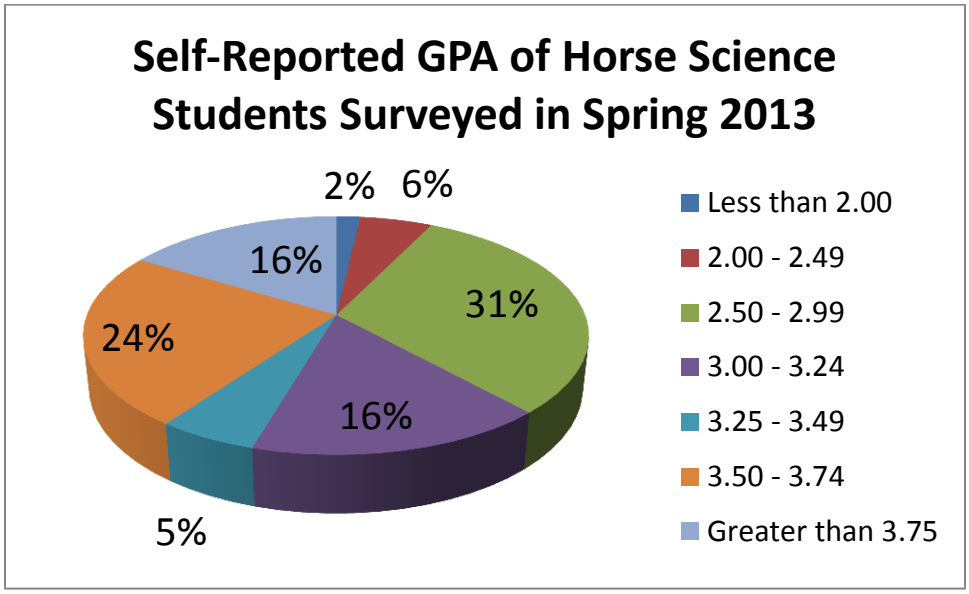

Figure 11. Self-reported GPAs in Horse Science majors surveyed in Spring 2013. These data are compared to official transcript GPAs in Horse Science majors enrolled in Spring 2013 in Figure 36.

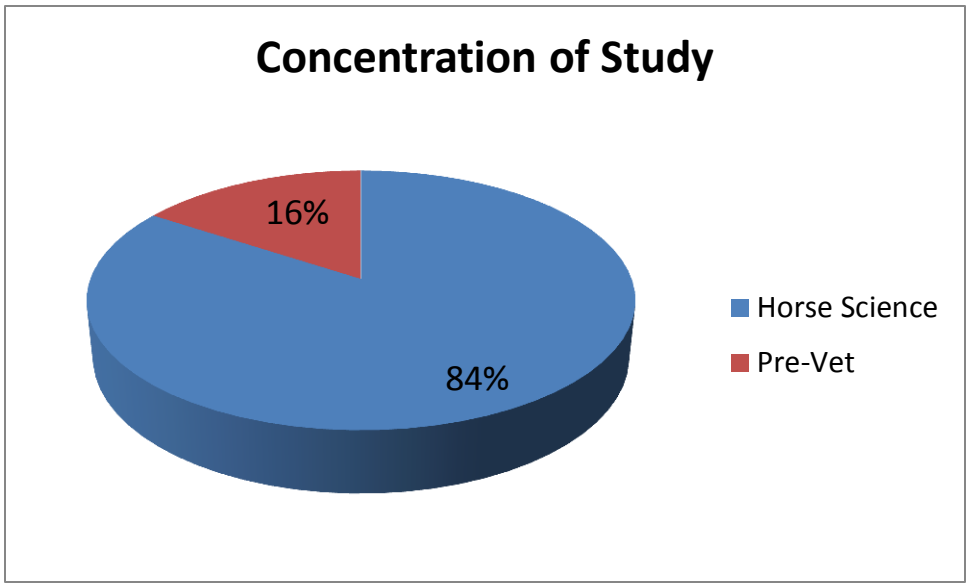

Figure 12. Concentration of study in MTSU Horse Science majors surveyed in Spring 2013.

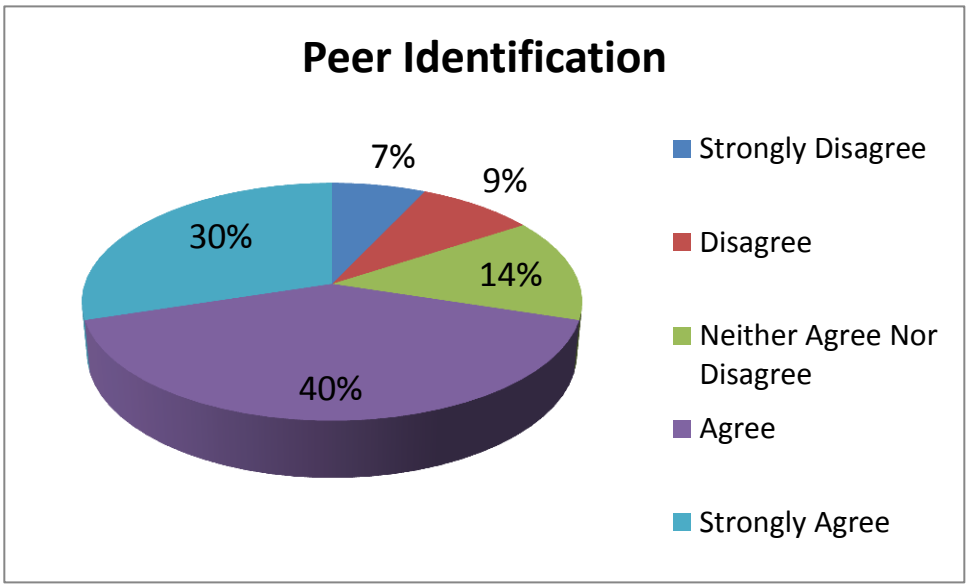

Figure 13. MTSU Horse Science majors surveyed in Spring 2013 were asked if they felt that they identified with a group of peers with similar interests.

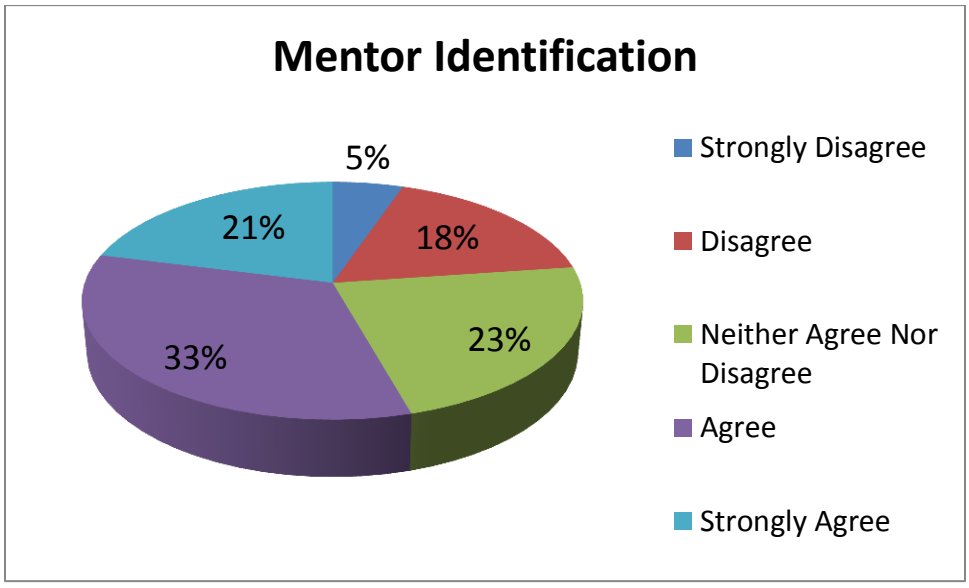

Figure 14. MTSU Horse Science majors surveyed in Spring 2013 were asked if they identified a mentor in the Horse Science Program, defined as someone they feel comfortable talking to about any academic or personal situations.

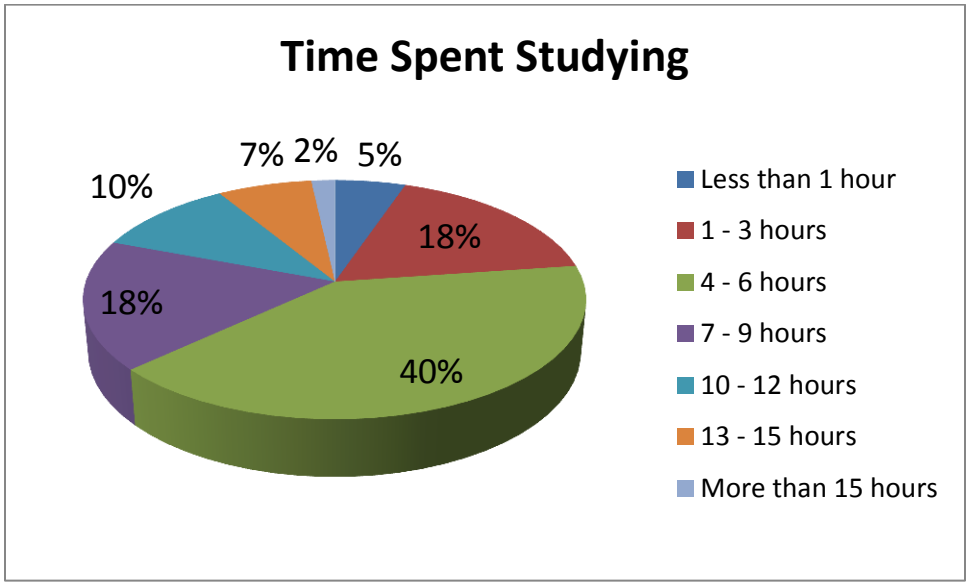

Figure 15. Time spent studying of MTSU Horse Science majors surveyed in Spring 2013, self-reported as average hours per week.

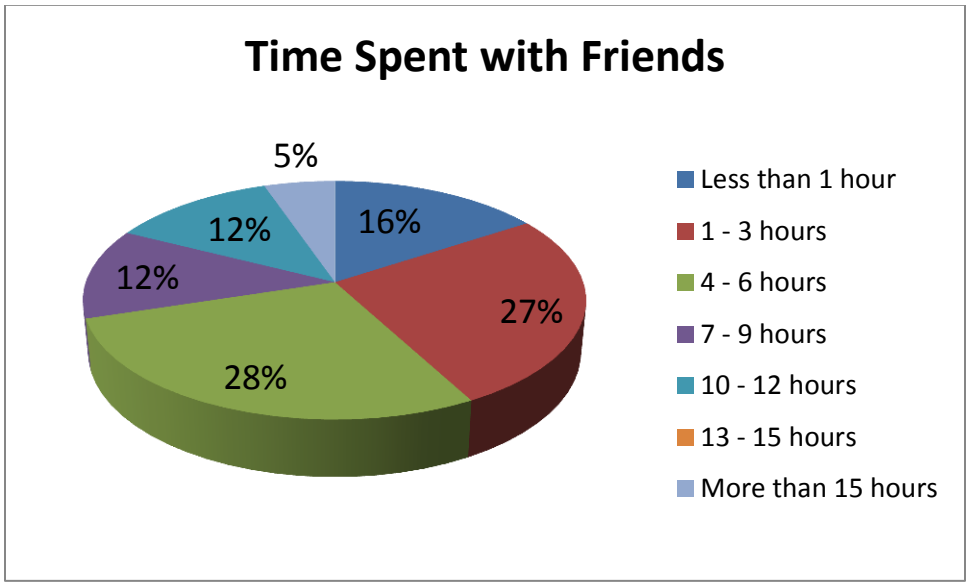

Figure 16. Time spent with friends of MTSU Horse Science majors surveyed in Spring 2013, self-reported as average hours per week.

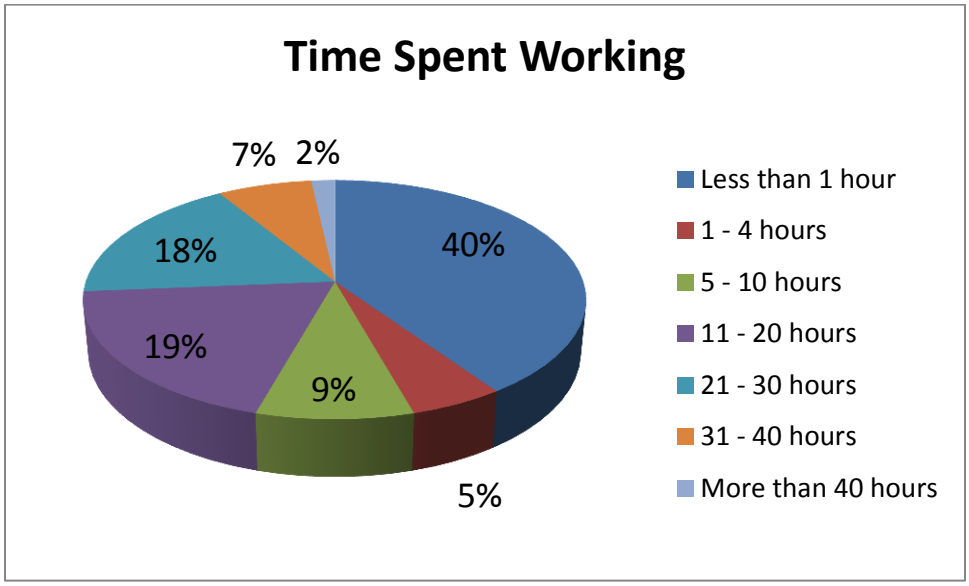

Figure 17. Time spent working for payment, either in an on-campus or off-campus job of MTSU Horse Science majors enrolled in Spring 2013, self-reported as average hours per week.

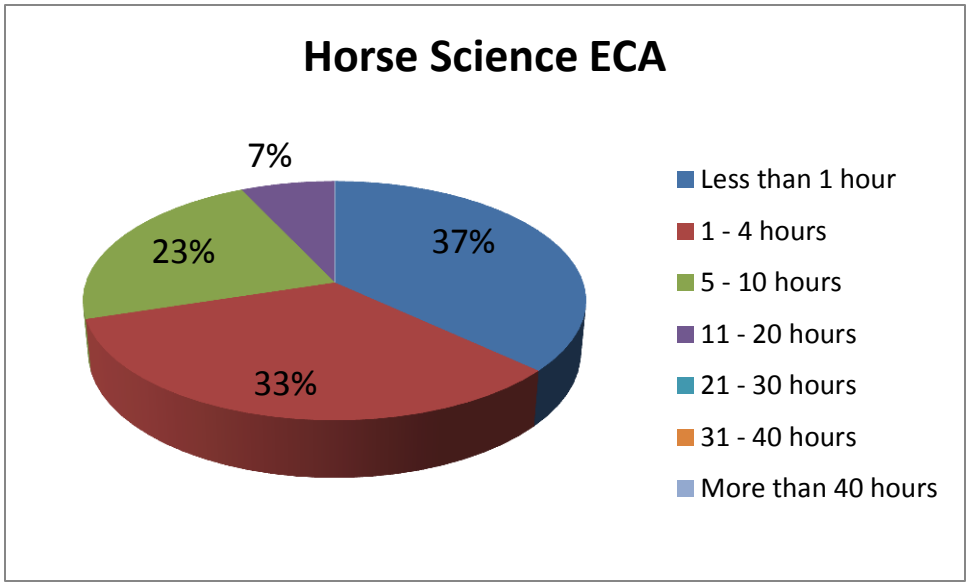

Figure 18. Time spent participating in MTSU Horse Science ECA by Horse Science majors surveyed in Spring 2013, self-reported as average hours per week.

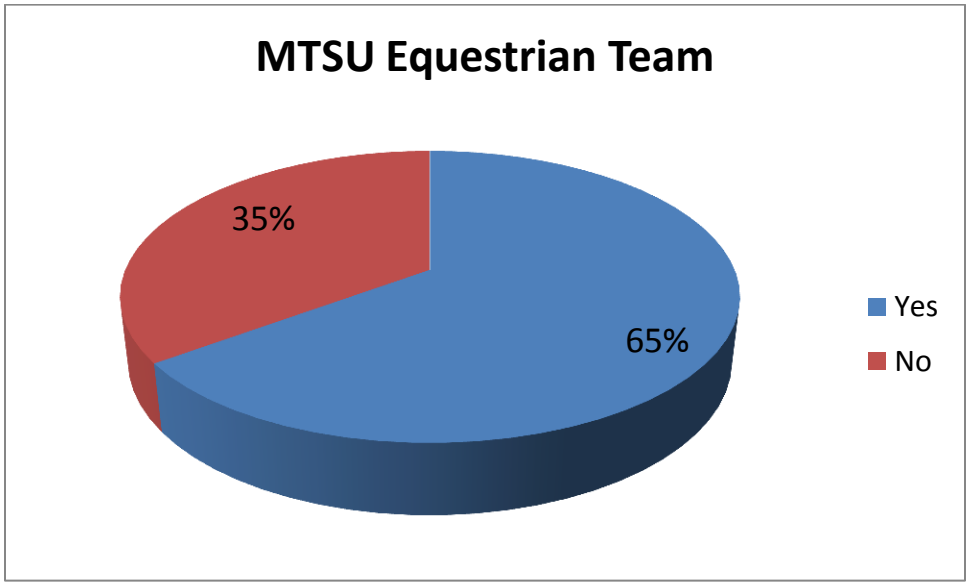

Figure 19. Frequency of membership in the MTSU Equestrian Team of MTSU Horse Science majors surveyed in Spring 2013.

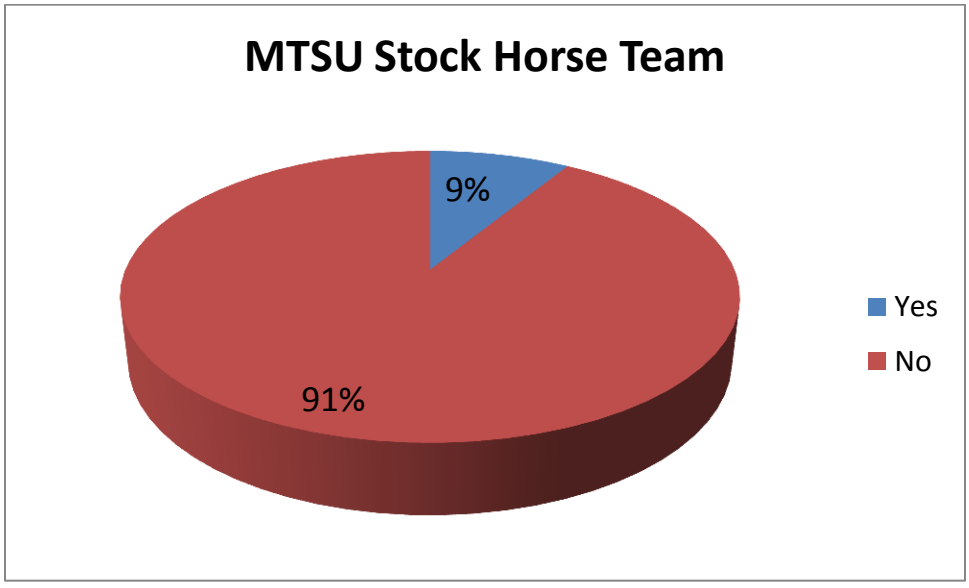

Figure 20. Frequency of membership in the MTSU Stock Horse Team of MTSU Horse Science majors surveyed in Spring 2013.

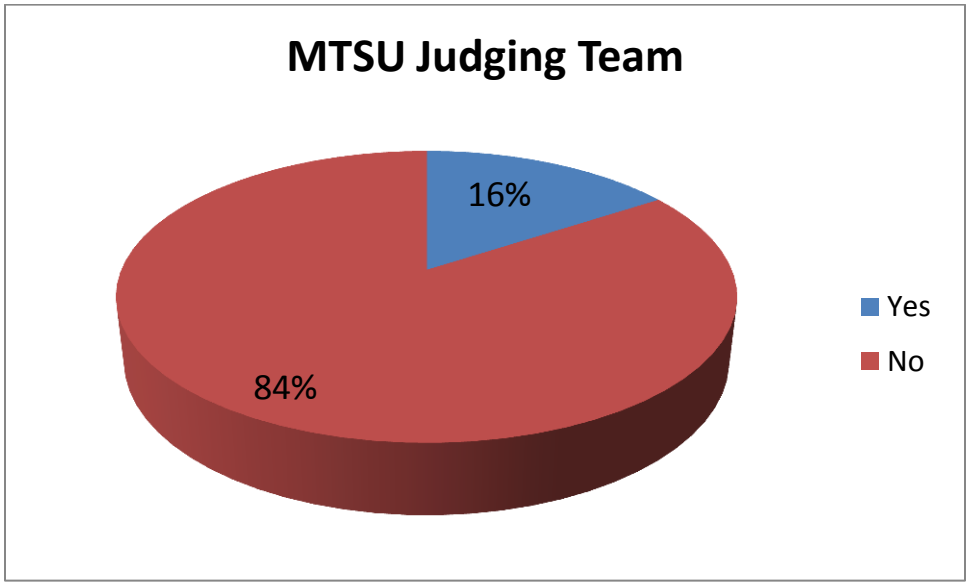

Figure 21. Frequency of membership in the MTSU Judging Team of MTSU Horse Science majors surveyed in Spring 2013.

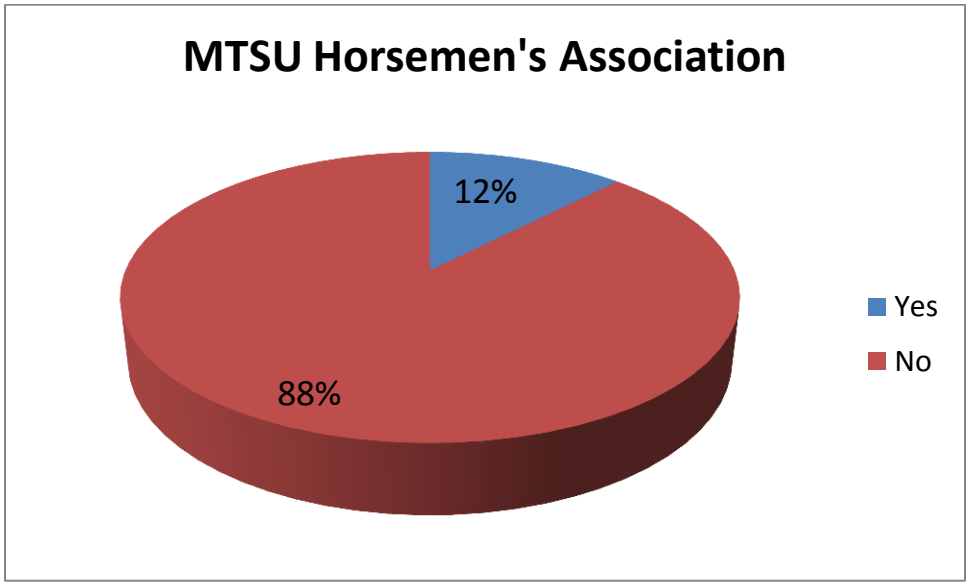

Figure 22. Frequency of membership in the MTSU Horsemen's Association of MTSU Horse Science majors surveyed in Spring 2013.

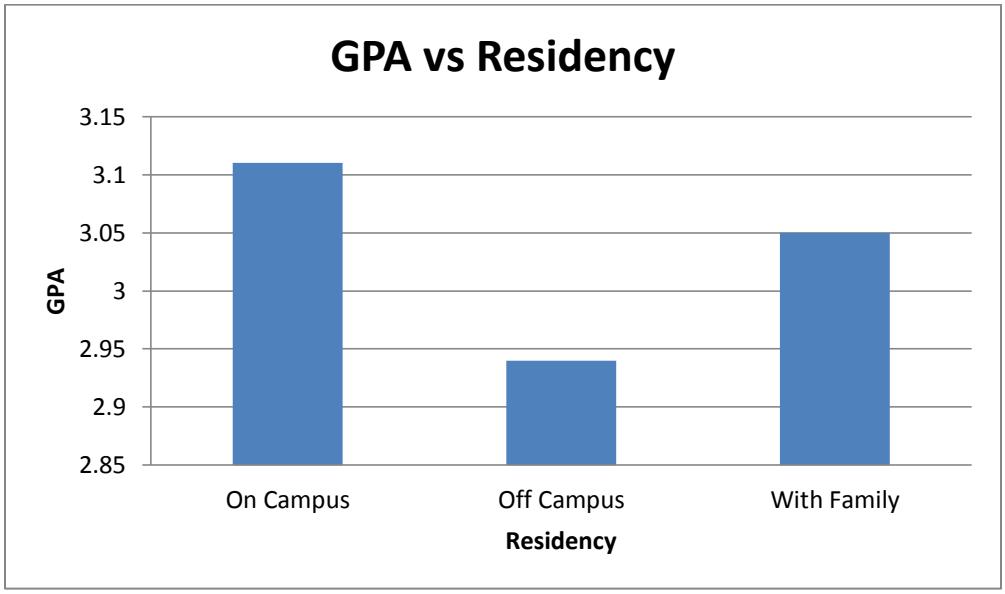

Figure 23. Self-reported GPA versus residency of MTSU Horse Science majors surveyed in Spring 2013. There was no difference in GPA of students living on-campus or off-campus alone, or off-campus with family ($P > 0.73$).

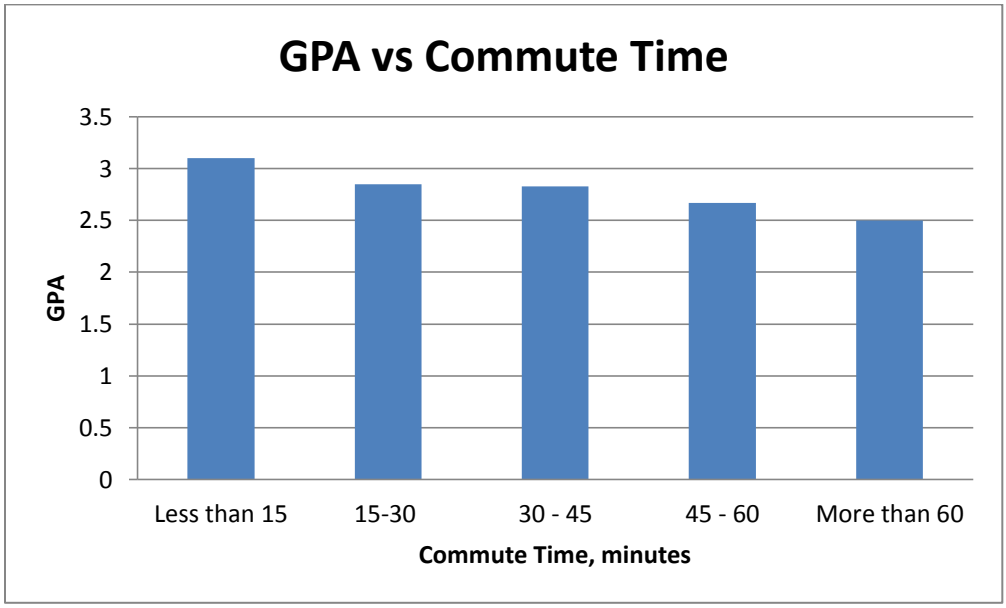

Figure 24. Self-reported GPA versus one-way commute time in minutes of MTSU Horse Science majors surveyed in Spring 2013. GPA tended to decrease as commute time increased ($R^2 = -0.02$; $P = 0.08$), but there was no difference between categories of commute times reported ($P > 0.68$).

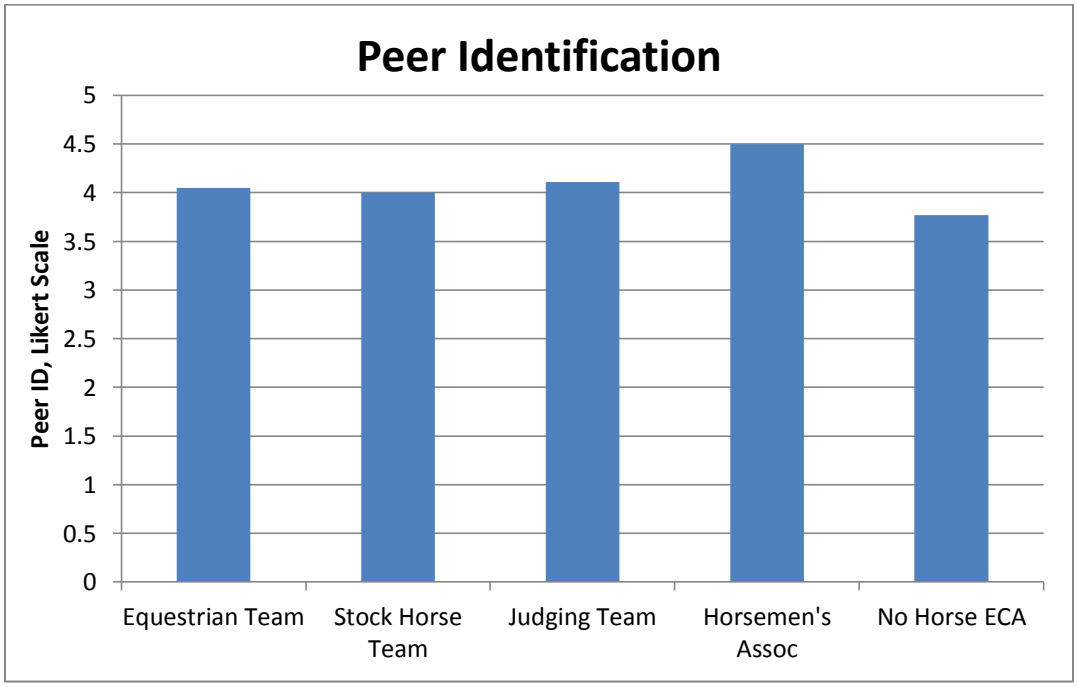

Figure 25. Peer Identification compared to type of Horse Science ECA in MTSU Horse Science majors surveyed in Spring 2013. The Likert Scale included 5 steps, with 0 indicating that students strongly disagreed, and 5 indicating that students strongly agreed with the perception that they identified with a group of peers with similar interests. There was no effect ($P > 0.13$) of Horse Science ECA type on peer identification, but Stock Horse team members tended to identify with a peer group ($P = 0.09$) more than students who were not members of any ECA.

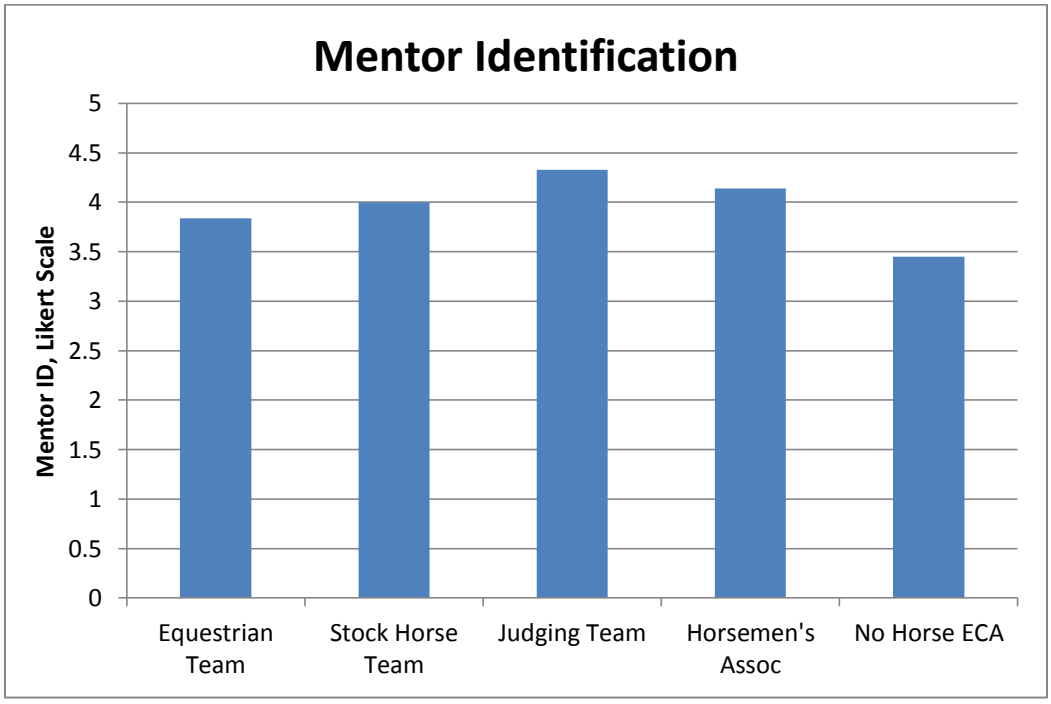

Figure 26. Mentor Identification compared to type of Horse Science ECA in MTSU Horse Science majors surveyed in Spring 2013. The Likert Scale included 5 steps, with 0 indicating that students strongly disagreed, and 5 indicating that students strongly agreed with the perception that they identified with a mentor, defined as someone the student felt comfortable talking with about academic situations. While there was no effect ($P > 0.24$) of Horse Science ECA type on mentor identification, Equestrian Team members were more likely to identify with a mentor, compared to students who were not a member of any Horse Science ECA ($P = 0.01$).

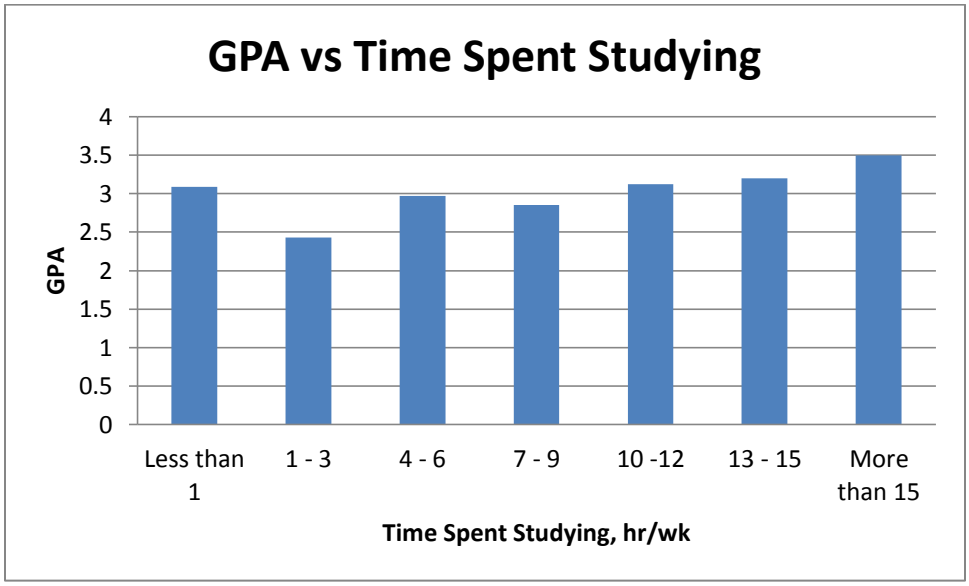

Figure 27. Self-reported GPA and time spent studying, reported as average hr/wk) of MTSU Horse Science majors surveyed in Spring 2013. There was no difference in GPA between categories of time spent studying ($P > 0.40$). There was no correlation between self-reported GPA and time spent studying across all categories, but when the "Less than 1 hr/wk" category was removed from the analysis, there was a positive correlation between GPA and time spent studying and 1 to 3 hr/wk through more than 15 hr/wk ($R^2 = 0.28$; $P = 0.04$).

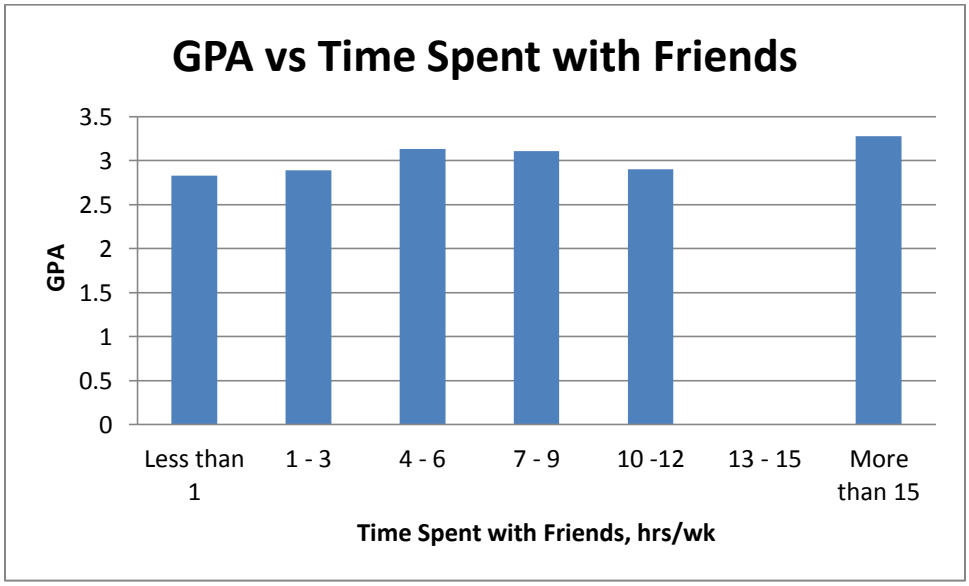

Figure 28. Self-reported GPA and time spent with friends, reported as average hr/wk, of MTSU Horse Science majors surveyed in Spring 2013. There was no correlation or difference in GPA between categories of time spent with friends ($P > 0.74$).

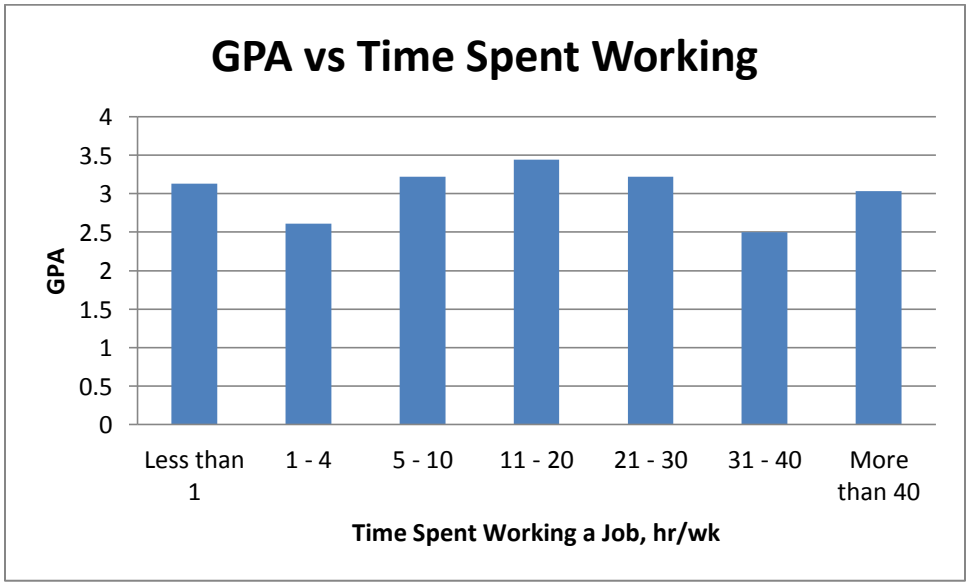

Figure 29. Self-reported GPA and time spent working a job, either on-campus or off-campus, of MTSU Horse Science majors surveyed in Spring 2013. There was no correlation or difference in GPA between the categories of time spent working ($P > 0.11$)

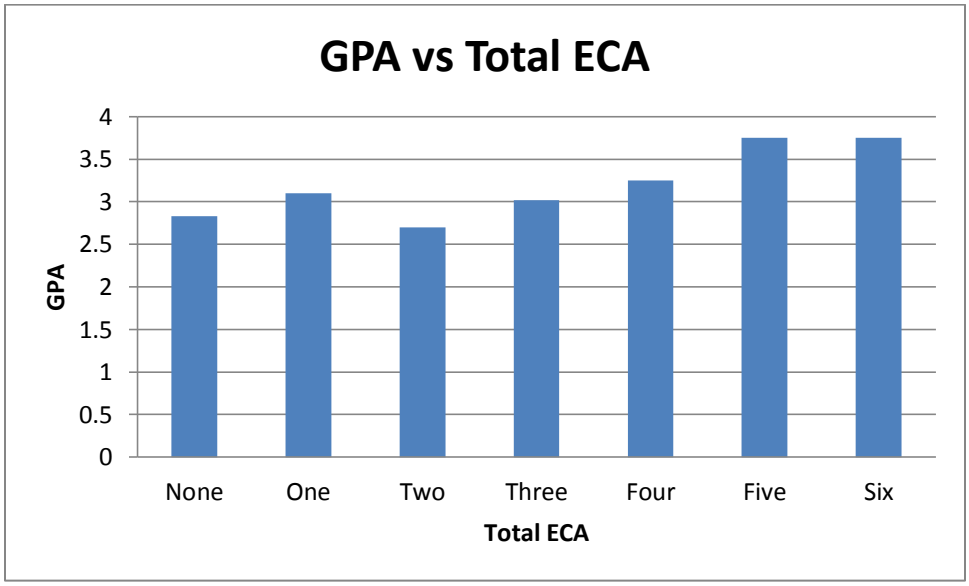

Figure 30. Self-reported GPA and total number ECA memberships of MTSU Horse Science majors surveyed in Spring 2013.

Seniors:

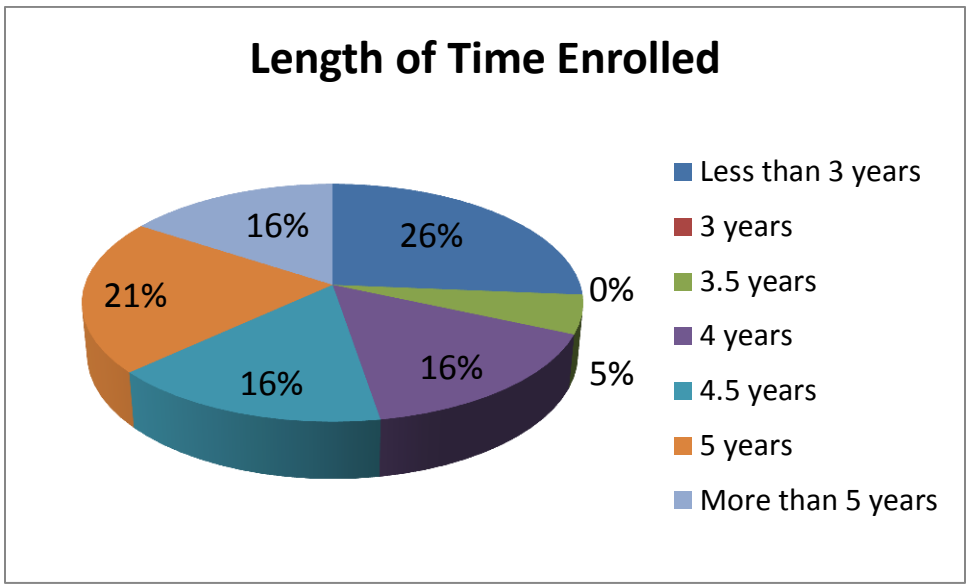

Figure 31. Self-reported total length of time in college in MTSU Horse Science seniors surveyed in Spring 2013.

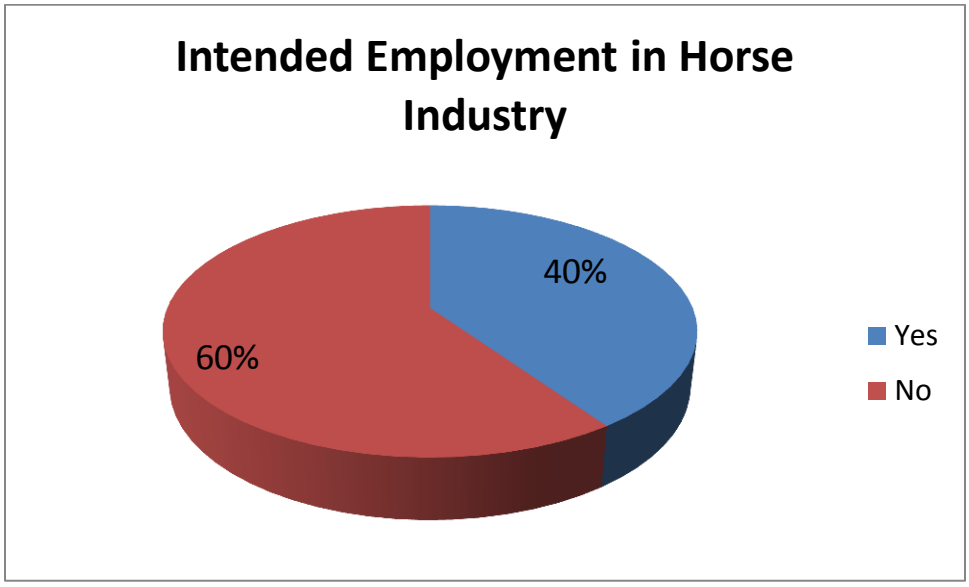

Figure 32. MTSU Horse Science seniors surveyed in Spring 2013 were asked if they intended to work in the horse industry after graduation.

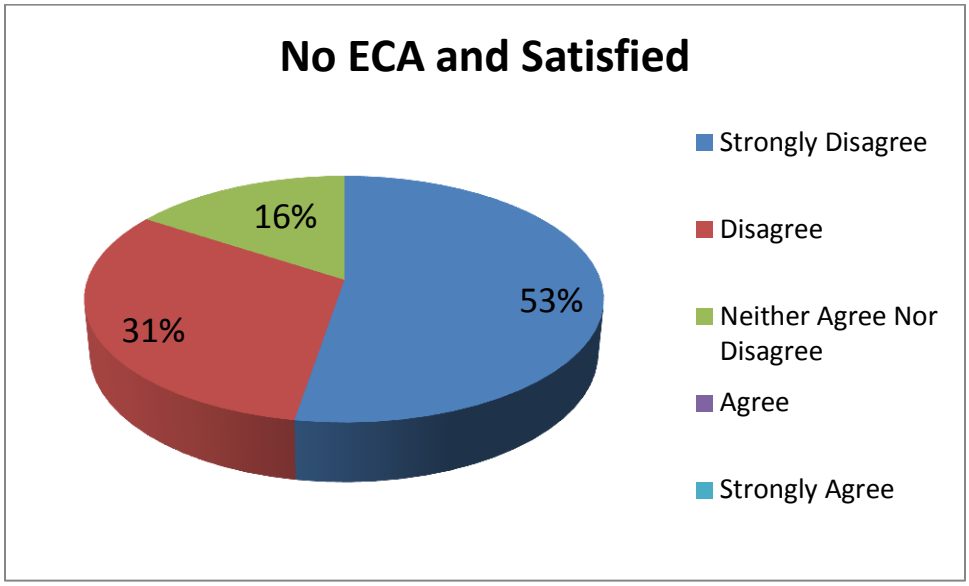

Figure 33. Self-reported satisfaction with no involvement in MTSU Horse Science seniors surveyed in Spring 2013. Student perceptions were in answer to the following wording: "I was not involved in any MTSU extracurricular activities, and I'm glad I wasn't."

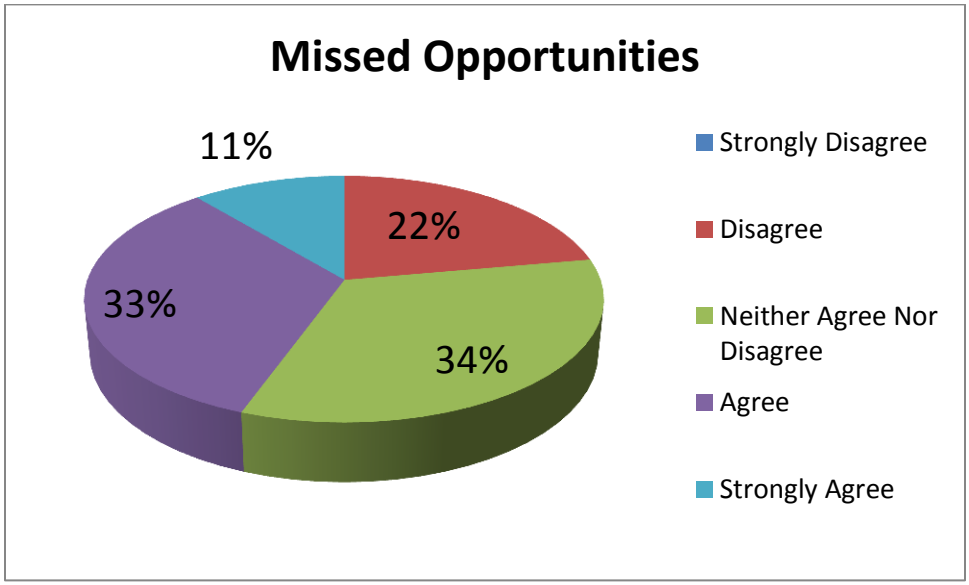

Figure 34. Perceptions of MTSU Horse Science seniors surveyed in Spring 2013, regarding ECA membership and missed opportunities. Students responded to the following wording: "I wish I had been involved in more MTSU extracurricular activities. I may have missed out on some good opportunities."

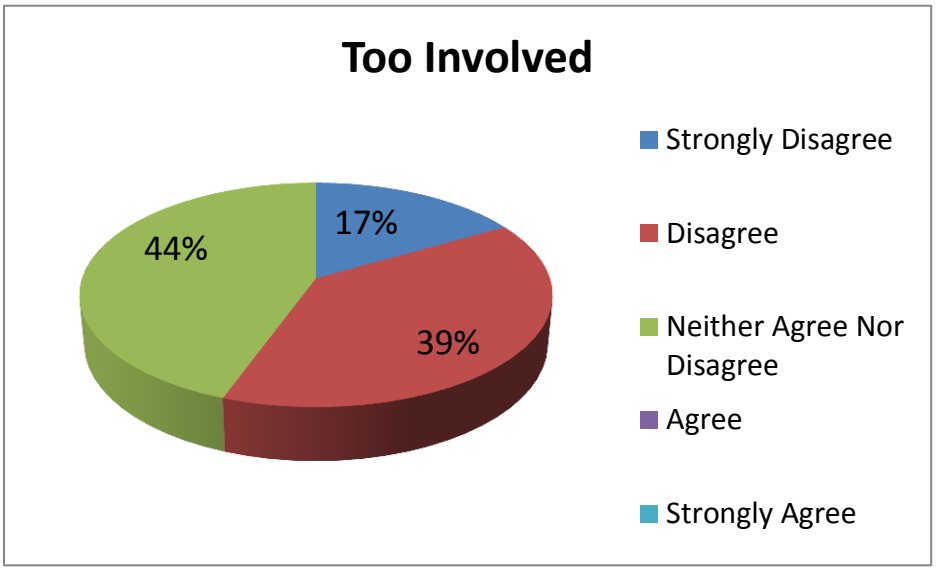

Figure 35. Perceptions of MTSU Horse Science seniors surveyed in Spring 2013, regarding potential negative impact of ECA membership on academic success due to being too involved. Students responded to the following wording: "I wish I had been less involved in MTSU extracurricular activities. I may have stretched myself too thin and affected my ability to do well in college."

Part II. Student Transcript Data

Part II A. Snapshot of Horse Science Majors Enrolled in Spring 2013.

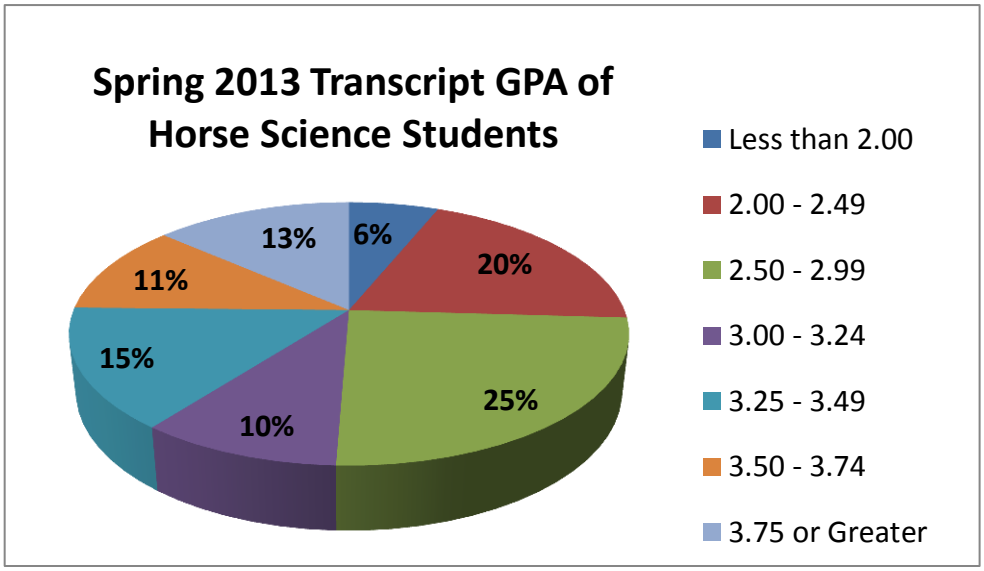

Figure 36. Frequency of official transcript GPAs in Horse Science majors enrolled in Spring 2013 at the time of the survey. Compare with self-reported GPA in students surveyed (Figure 11).

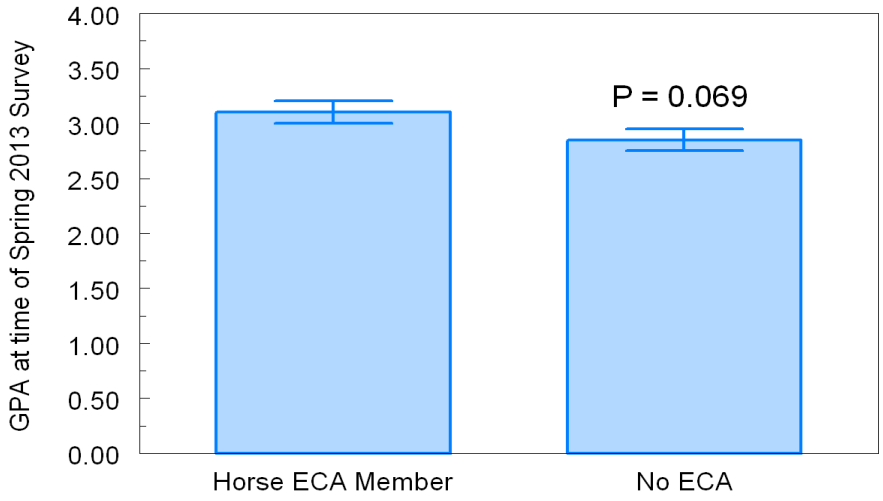

Figure 37. Official transcript GPA (mean ± SE) of Horse Science majors enrolled in Spring 2013 at the time of the survey. Students who were members of at least one Horse Science ECA tended to have higher cumulative GPA at the time of the survey.

Part II B. Combined Cohort Transcript Data

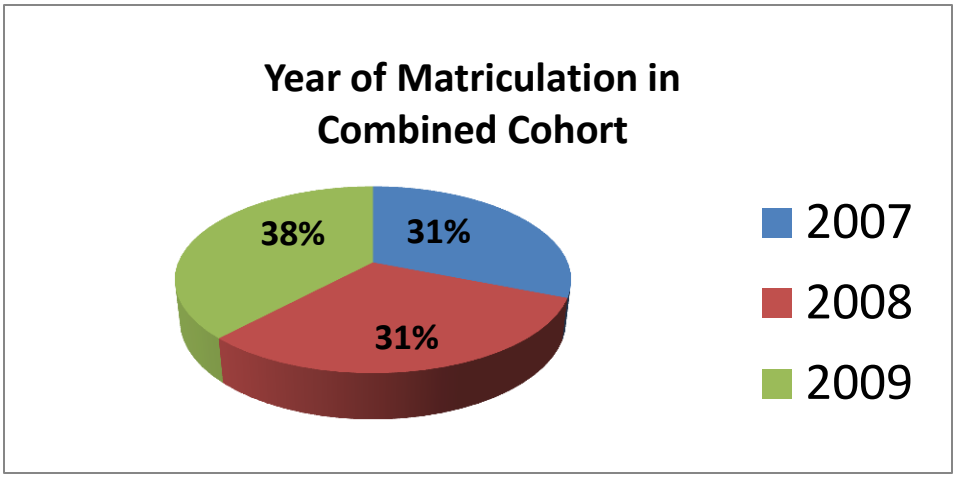

Figure 38. A total of 42 students in the combined cohort analyzed matriculated in 2007, 2008 and 2009. There was no effect of year of matriculation on last recorded GPA, cumulative hours earned, first year GPA, first year hours earned, or ECA participation in the three separate cohort groups ($P > 0.32$), so the data from the three cohorts were combined for later analysis.

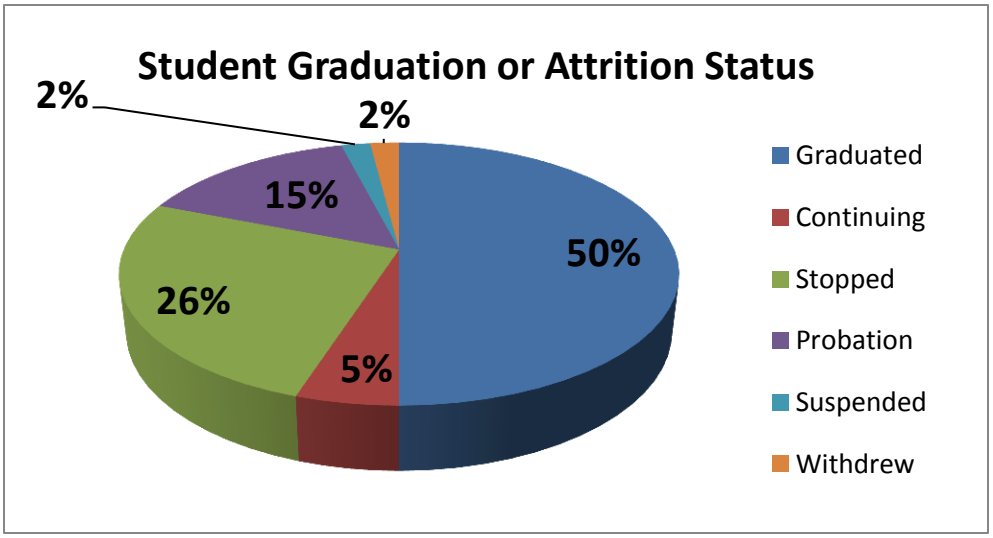

Figure 39. Student graduation or attrition status in combined cohorts of Horse Science students matriculated in 2007 to 2009 and followed through spring 2013, based on official transcripts.

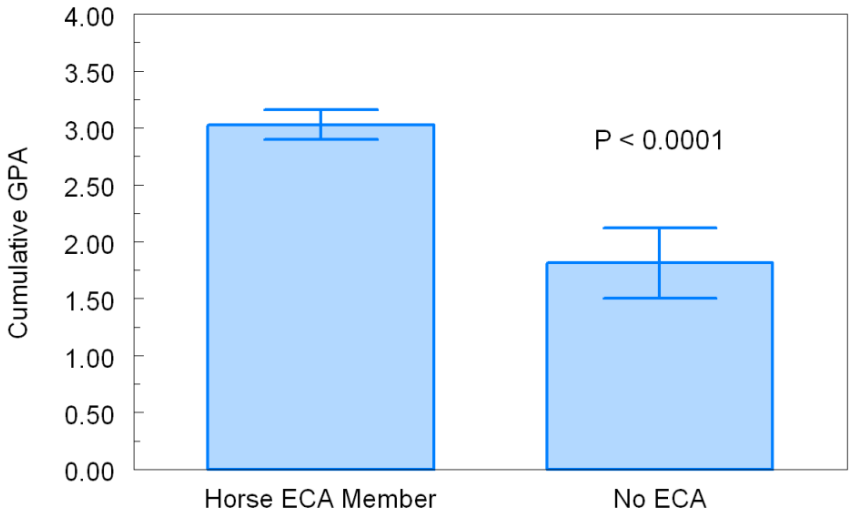

Figure 40. Students who were members of at least one Horse Science ECA had higher cumulative GPA in their last semester of enrollment based on official transcripts and ECA membership lists.

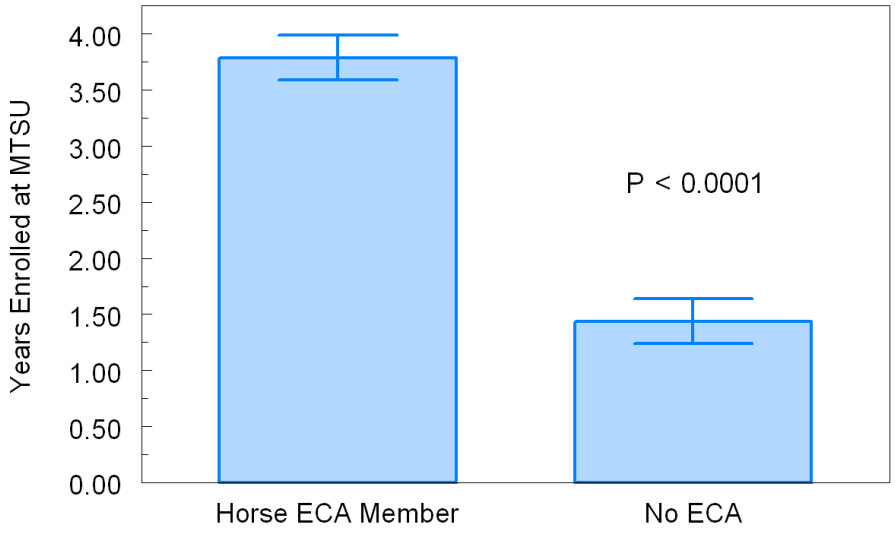

Figure 41. Students who were members of at least one Horse Science ECA persisted longer, based on years of enrollment at MTSU.

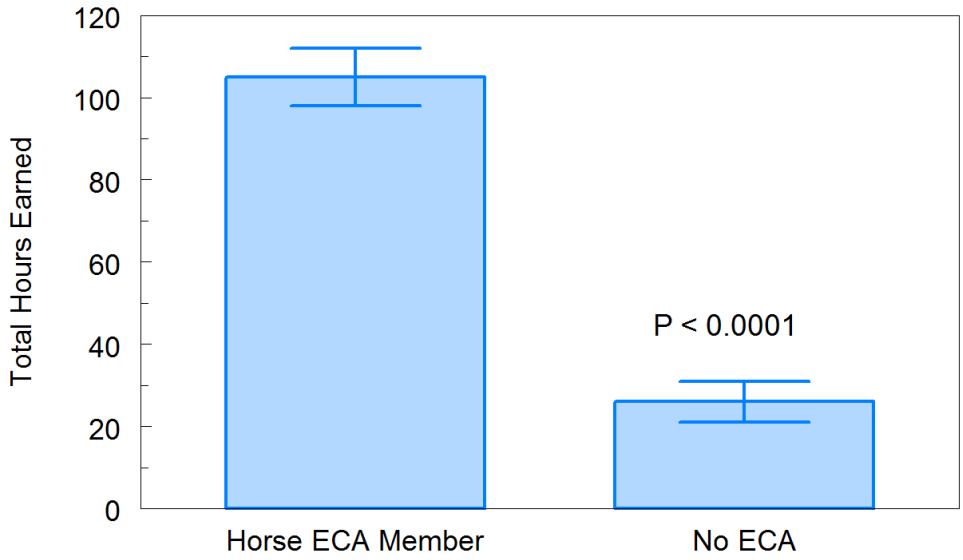

Figure 42. Students who were members of at least one Horse Science ECA earned more total hours while at MTSU, based on official transcript data and ECA membership lists.

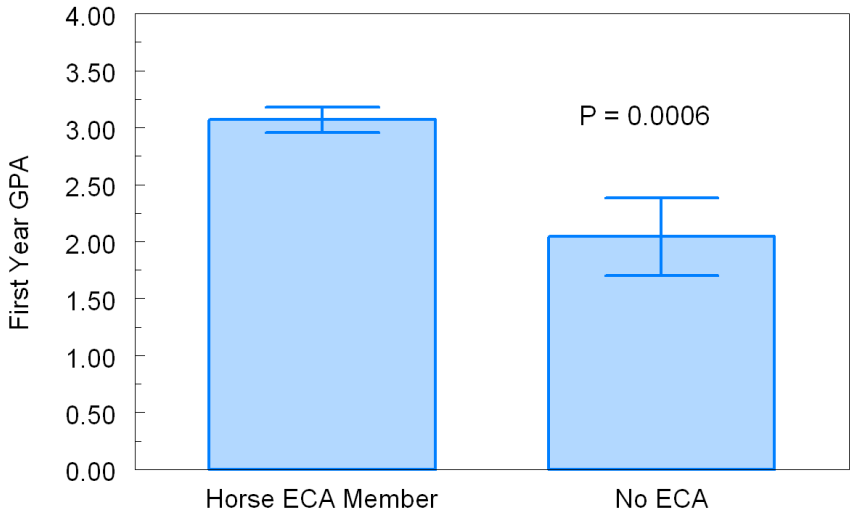

Figure 43. Students who were members of at least one Horse Science ECA had higher GPA at the end of their first year of enrollment, based on official transcripts and ECA membership lists.

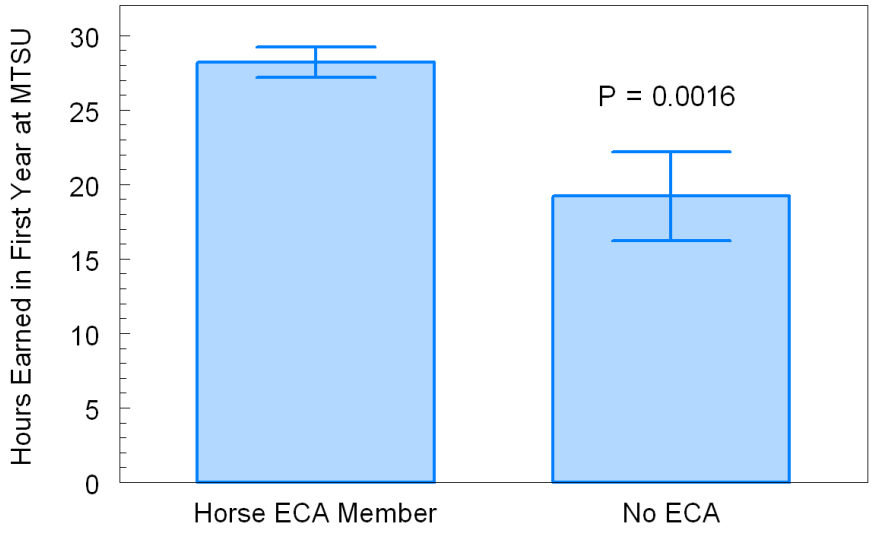

Figure 44. Students who were members of at least one Horse Science ECA earned more hours during their first year of enrollment.

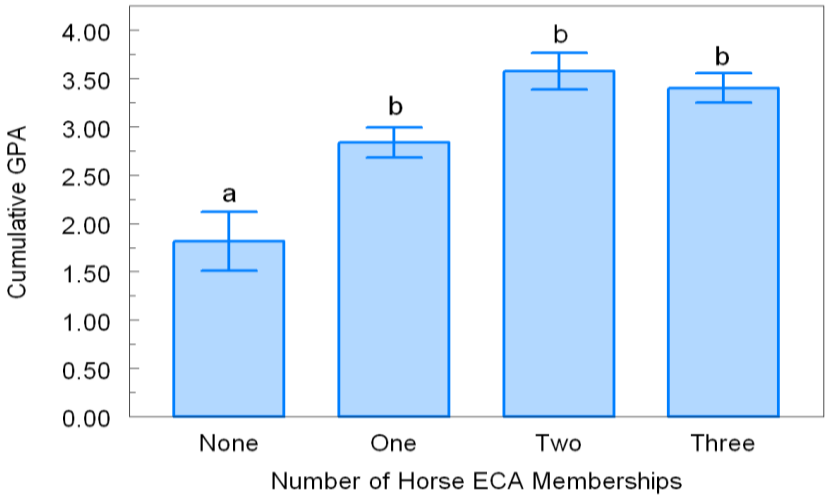

Figure 45. Students who were members of at least one Horse Science ECA had higher cumulative GPA than non-members. Bars noted by different letters indicate differences in GPA ($P < 0.004$). Bars with the same letter are not different ($P > 0.22$)

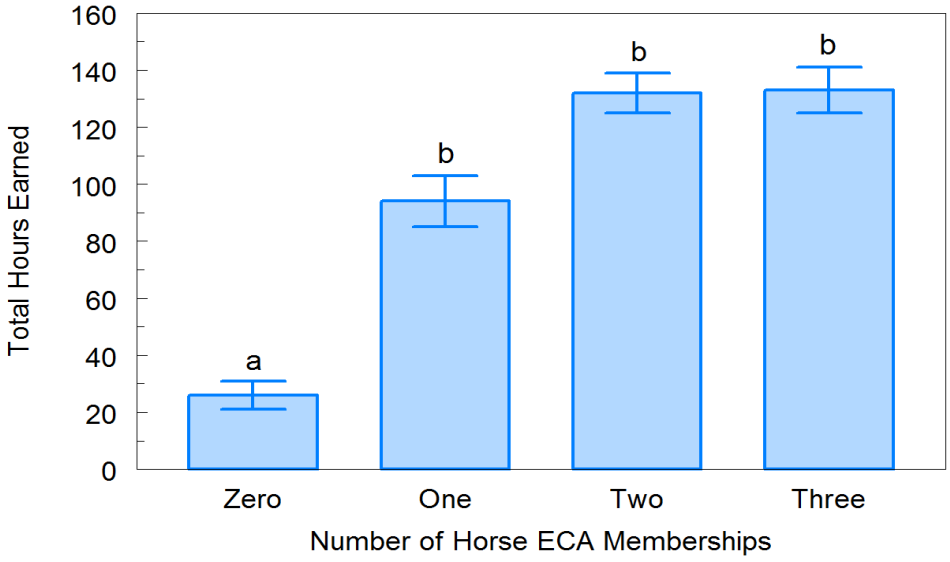

Figure 46. Students who were members of at least one Horse Science ECA earned more total hours than non-members. Bars with different letters indicate differences in GPA ($P < 0.0001$). Bars with the same letter are not different ($P > 0.12$)

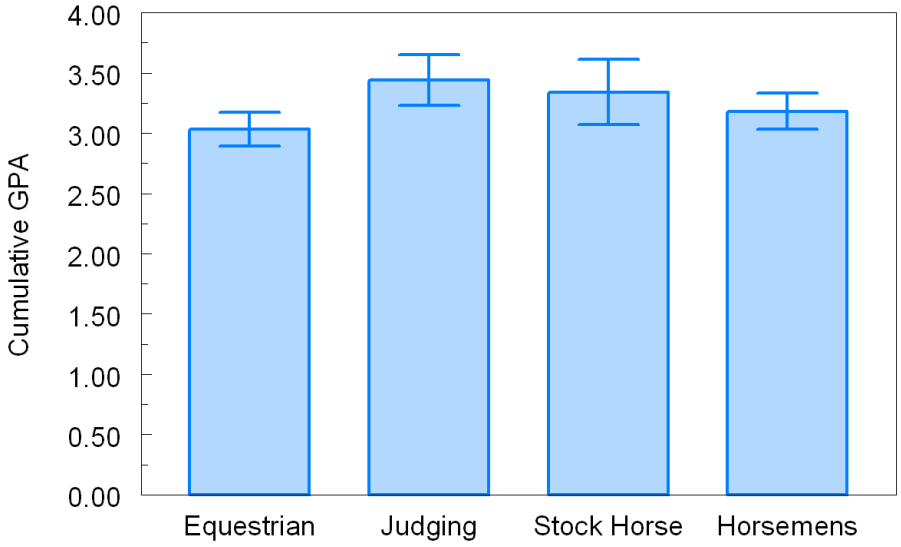

Figure 47. Cumulative GPA of student members in Horse Science ECA. If a student was a member of more than one ECA, then their GPA data was included in the average for each ECA where they were a member. There was no difference in GPA between the ECA ($P > 0.038$).