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An Evaluation of the Racer Academy of Agriculture and its Effectiveness

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An Evaluation of the Racer Academy of Agriculture and its Effectiveness

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Abstract

Through this thesis research study, an evaluation of the Racer Academy of Agriculture (RAA) is performed to get a better understanding of how well it is doing in several key areas. One of the focus areas for the RAA as well as most other dual credit programs includes allowing high school students to attain college credit through participation in a class that counts both towards high school and collegiate degree completion. Other key objectives for these programs include aiding in the recruitment of students to the participating university, preparing the students to succeed at a higher rate once becoming full-time college students, accelerating the time that it takes a students to progress through their undergraduate degree program, and assisting the student in completing their degree and graduating from their college or university. In order to examine the RAA on these focus areas, data was collected which allowed RAA participants to be analyzed to know how they compared to their peers across Murray State University (MSU) and within the Hutson School of Agriculture (HSOA). It was found that between the 2013 and 2018 graduating classes there was a 200% increase in student participation in the RAA, reaching a high of 404 in the 2018 class. Through this time period approximately 20% of students matriculated into becoming full-time students at MSU. These students performed well once becoming full-time students and achieved higher GPAs than their peers in the HSOA and across the University. Not only did these students perform well in classes, they were able to complete their degree program faster and at a higher rate than those who did not participate in the program. Through this research it was found that the Racer Academy of Agriculture is succeeding in achieving the goals that have been set out for the program.

Table of Contents

List of Tables

Chapter I

Introduction

Introduction

The Smith-Hughes Act was signed into law in February 23rd, 1917 by the United States Congress with the support of Senator Hoke Smith, Representative Dudley M. Hughes, and President Woodrow Wilson. This significant piece of legislation has made a tremendous impact on the educational system throughout the United States.

> An Act to provide for the promotion of vocational education; to provide for cooperation with the states in the promotion of such education in agriculture and the trades and industries; to provide for cooperation with the states in the preparation of teachers of vocational subjects; and to appropriate money and regulate its expenditure (Smith-Hughes Act, 1917, p. 375).

Through the passing of the Smith-Hughes Act, an emphasis was placed on teaching vocational agriculture, as well industries and trades, throughout the country. Because of this, more individuals learned about these topics and took what they had learned back to the farm or into exciting new careers. Without this new emphasis on vocational education, they would have never had the training and education needed for this to take place. “Generations of students have been afforded the opportunity to delve into the world of agriculture—from farm to table and everything in between (Fristoe, 2017).

As time passed, it became apparent that there was a need to add new challenges into the educational system for a variety of reasons. Several options have become commonplace in high schools today which are used to challenge students and keep them engaged. Programs such as Advanced Placement (AP) and Dual Credit were instituted to meet this need. These programs started between the 1950s and 1970s to bolster the educational offerings of schools across the nation (Kim, Kirby, & Bragg, 2004; Mokher & McLendon, 2009). Advance Placement courses are administered by The College Board and have been offered in high schools across the United States since 1955. The classes which are offered through this program offer high students the opportunity to take rigorous college level courses while still in high school (Bowers & Foley, 2018). For students of these classes to earn college credit because of their participation in the program, they must take and pass the AP Exam which corresponds with the class taken. Dual credit courses allow students to take college level courses while still in high school and receive both high school and college credit (Karp, 2013). Unlike Advance Placement classes, students who participate in dual credit classes earn college credit by passing their class, exactly as if they were taking the class while a student of the university which offered the course.

In order to meet the needs of high school students in West Kentucky, the Murray State University Hutson School of Agriculture created the Racer Academy of Agriculture to provide a dual credit opportunity for students who are interested in completing collegiate level agriculture classes while still in high school. The program started with a few classes under a pilot program in the 2010-2011 school year, and then was fully initiated in the 2011-2012 school year. The Racer Academy of Agriculture has grown

into offering 7 different classes in high schools in almost every county in Kentucky, and a few different high schools out-of-state. The program has seen tremendous growth over recent years, including a growth of 200% in the number of participants between the 2013 and 2018 high school graduating classes.

Statement of the Problem

Dual credit programs have been started for a variety of different reasons, as discussed in the introduction, but for the Racer Academy of Agriculture there are a few initiatives that stand out. Those include recruiting high-achieving high school students to become full-time students at Murray State University, helping those students to succeed once they become full-time college students, and to facilitate a student's desire to graduate college early or on time if they so choose. With the financial environment that many institutions of higher education are facing, it is important to research programs which are offered by universities to be able to better understand the effectiveness in achieving the goals which were set forth at the genesis of those programs. This is no different when it comes to the Racer Academy of Agriculture, offered by the Hutson School of Agriculture at Murray State University. It is important to look at the Racer Academy to see if it is performing in the ways that it was intended to, and if there are any modifications deemed necessary to improve the performance of the program in order to better serve those who participate.

Purpose of the Study

The purpose of this study is to evaluate the Racer Academy of Agriculture and its effectiveness. This will be to lead to a better understanding of the impact that the Murray State University Hutson School of Agriculture Racer Academy of Agriculture dual credit

program has on those who chose to participate. This study will focus on several topics related to the overall effectiveness of the Racer Academy of Agriculture. These topics include (1) the effectiveness of the Racer Academy of Agriculture in matriculating program participants into full-time students at Murray State University, (2) the impact that the Racer Academy of Agriculture dual credit program has on student success for those who participated, (3) the influence that participation in this program has on students in terms of time to graduation, and (4) how involvement in the program impacts the graduation rate of students who participated in the Racer Academy of Agriculture.

Research Questions

The study will be guided by the following questions.

1. At what rate are dual enrollment students in the Racer Academy of Agriculture matriculating into degree study at Murray State University after they graduate from high school?
2. How do students who dually enrolled in Racer Academy of Agriculture classes while in high school perform in college compared to their peers within the Hutson School of Agriculture and across Murray State University?
3. What is the length of time to graduation for students who dually enrolled in Racer Academy of Agriculture classes while in high school compared to their peers within the Hutson School of Agriculture and across Murray State University?
4. How does the graduation rate of students who participated in Racer Academy of Agriculture classes compare with students within the Hutson School of Agriculture and across Murray State University?

Definition of Terms

Dual Credit – the approach by which students receive both high school and college credit for the same course (Kim, Kirby, & Bragg, 2004)

Dual Enrollment – the enrollment of high school students in postsecondary courses (Kentucky Council on Postsecondary Education, 2006)

Grade Point Average (GPA) - an indication of a student's academic achievement, calculated as the total number of quality points earned over a given period divided by the total number of hours attempted (MSU Registrar's Office)

Matriculation – To enroll as a member of a body and especially of a college or university; To enroll as a student at an institution of higher learning once graduating from high school

Murray State 18 County Service Region – The Murray State Service Region consists of 18 Western Kentucky counties which the university has placed an enhanced focus on for recruitment and retention purposes. The 18 counties included in the service region are: Ballard, Caldwell, Calloway, Carlisle, Christian, Crittenden, Fulton, Graves, Henderson, Hickman, Hopkins, Livingston, Lyon, Marshall, McCracken, Trigg, Union, and Webster Country (Murray State University).

Racer Academy of Agriculture – the dual credit agriculture program operated by the Hutson School of Agriculture at Murray State University (Hutson School of Agriculture, 2013)

Student Success – the ability of a student to perform at a high level and achieve their educational goals; Academic achievement measured by grade point average (GPA) (Wilson, Babcock, & Saklofske, 2019)

Scope of the Study

This study included participants in dual credit courses offered through the Racer Academy of Agriculture of the Murray State University Hutson School of Agriculture. Each of the participants have taken at least one Racer Academy of Agriculture class while at their respective high school.

Limitations

The research will be restricted by the following limitations:

1. This study will consist of students who participated in the Racer Academy of Agriculture in the 2012-2013 through 2017-2018 school years.
2. The students who participated in the 2012-2013 and 2013-2014 school years will be the only participants considered for graduation related metrics to allow for the time needed for program completion.
3. The control group of students used in statistical comparisons will be made up of students enrolled at Murray State University as well as students within the Hutson School of Agriculture.
4. Data obtained from these programs are limited to the time in which the research was performed. Therefore, care should be taken not to assume the results of this study upon either the Hutson School of Agriculture in the future or the Racer Academy of Agriculture in the future as well.
5. Data collection is limited to the data that is available from Murray State University and is considered official data.

Assumptions

The following assumptions were made concerning this study:

1. Students who participated in the Racer Academy of Agriculture program receive no special treatment once they enroll as full-time students at Murray State University.
2. All students worked to the best of their abilities throughout their classes, whether it be dual credit classes through the Racer Academy or once they become full-time students at Murray State University.

Significance of the Study

This study has produced significant research because it was able to help those within the Hutson School of Agriculture and Murray State University to understand the effectiveness of the Racer Academy of Agriculture and its importance to the institution. There were many factors which were compiled together to get a better understanding of the dual credit program, including recruitment, student success, and graduation metrics.

Chapter 2

Review of Relevant Literature

Introduction

The purpose of this chapter is to present a review of the related literature for this research study. This review will touch on the history and origins of agricultural education and then dive into dual credit education programs to understand their effectiveness throughout different situations. The review is divided into the following sections: (1) The Need for Agricultural Education, (2) Beginnings of Vocational and Agricultural Education at the High School Level, (3) The Origins of Dual Credit and Similar Programs and Their Implementation (4) Dual Credit and its Potential Impact on Student Success Factors, and (5) Summary.

The Need for Agricultural Education

From our roots, the United States of America was an agriculturally based economy that depended heavily on the production of food and fiber. During the early years of our country, subsistence farming practices were the norm; farmers were solely focused on providing for their families and ensuring that there was enough food produced that they would be able to survive until the next growing season. Subsistence agriculture was labor intensive, and it took place on many small, diversified farms in rural areas of the country where more than half of the U.S. population lived. These farms employed most of the U.S. workforce, requiring a large number of individuals to ensure that our

nation's nutritional needs were met (Dimitri, Effland, & Conklin, 2005). As time went on, farmers became more efficient and more productive to the point where they began to produce more than what they needed to provide for their family. This led to farmers selling or trading their surplus production so that they would be able to obtain items which would improve the quality of life for their family. Throughout this time period, the agriculture industry which we know today was starting to spread its roots. Although farmers were becoming more productive as the years went by, they were doing it without much formalized training. Throughout the country, there started to be a need for increased formalized agricultural education in order to help farmers and the like to improve on the practices which they already employ. In fact, George Washington, the first president of the United States, brought forth some of the earliest ideas for establishing institutions for agricultural education (Duemer, 2007). Many more presidents and governmental officials who followed our first president held this sentiment to be true, such as Thomas Jefferson and Henry Clay. Legislation was brought before congress many times seeking an increase in aid to agriculture, to no avail. "The struggle to advance agricultural education provides rich detail of the agricultural needs of the nation in the late eighteenth and early nineteenth centuries (Duemer, 2007, pp. 135-146)." One individual was persistent in following through in advancement of agricultural education in our country, though, and that was Congressman Justin Smith Morrill of Vermont. Morrill was one of the longest serving members of Congress in his day, having served Vermont in the United States House of Representatives from 1854 until 1866, after which he was elected to serve in the United States Senate where he remained until his death in 1898 (Parker, 1924). Earle Ross surmised in his book, *Democracy's college:*

The land grant movement in the formative Stage, that many of Morrill's congressional activities were based on the ideas that public lands could be more efficiently operated, farming techniques and practices were not as productive as they could be, and that the educational facilities were inadequate to meet the needs of growing population in the United States (Ross, p. 49). Therefore, it was no surprise that Morrill led the charge to improve upon the educational system which would go on to impact all of these previously mentioned areas of concern. The Morrill Land Grant Act of 1862 was created to establish Land-Grant Institutions in order to better serve those working in agriculture and other mechanic arts (Tomlin, 2017). Over time there came to be at least one land-grant institution in each state and U.S. territory in order to best serve the individuals in each unique area (Association of Public and Land-grant Universities). Through land-grant institutions, regional universities, and community college systems, there has been a large educational system created in order to provide for the educational needs of the agricultural industry.

Beginnings of Vocational and Agricultural Education at the High School Level

When tracing the roots of vocational and agricultural education in this country, the origins can be traced all the way back to the beginning of our country. Agriculture was first taught in this country when the Pilgrims landed at Plymouth Rock in 1620. They did not know anything about the area, crops which were grown there, or how to grow them. They enlisted the help of the Native Americans who were familiar with the area in order to teach them how to grow crops in the most efficient way possible (Stimson & Lathrop, 1942). This pattern continues throughout the history of our country where native inhabitants are looked to for education on proper agricultural techniques and

methods in order to achieve success. Agriculture first began being taught in a school setting in Georgia in the 1730s and then slowly grew in presence until the time of the civil war when there was a decline (Moore, 1987). The Morrill Act, which created Land-Grant Institutions to teach agriculture and the mechanical arts, at the time of passage did not benefit those trying to grow agriculture and vocational education at the high school level. Anyone who was interested in promoting the idea of agricultural education was devoting their attention to the establishment of the previously mentioned Land-Grant Institutions. Herbert Hamlin observed this notion in his book *Agricultural Education in Community Schools* when he said, "Those interested in agricultural education centered their attention for many years before and after 1862 upon getting state institutions for agricultural education established and functioning, and attention to agricultural education in the secondary schools languished (Hamlin, 1949, p. 418)." In fact, many people started to believe that there was no need for agricultural related topics to be taught at the high school level now, due to the ability of interested students to attend a Land-Grant Institution to acquire the knowledge and skills which they desired (Moore, 1987). Due to this, there was only a slight momentum for the increase of agriculture and vocational education in public schools. Over the years there were a few events which inspired an increase in the propagation of agricultural education related programs. One of those sparks that spurred along the cause of spreading these types of programs was the passage of the Hatch Act in 1887. The Hatch Act is most notably known for the creation of agriculture experiment stations across the country to help Land-Grant Colleges with research and diffusion of new ideas to the public, but it also assisted in creating momentum within agriculture leaders for spreading agriculture education programs in

public schools across the country (Moore, 1987). This led to the United States Department of Agriculture taking a more active role in educating our youth by providing resources to teachers and promoting agricultural education programs in their publications. This momentum led to more programs starting across the country whether they be located in public schools or on the campus of the Land-Grant Colleges. States were adopting legislation that made it easier to or mandated the creation of agriculture programs at the high school level. The piece of legislation which pushed the adoption of agriculture programs into the mainstream was The Smith-Hughes Act of 1917. The individuals who were the face of this legislation were Senator Hoke Smith and Representative Dudley M. Hughes, both of Georgia. They both used their political power and presence in Washington to win final support for this piece of legislation, which was discussed in various forms throughout Congress for many years prior. Dr. John Hillison, then Associate Professor of Agricultural Education at Virginia Polytechnic Institute, explained his thoughts on how this piece of legislation impacted agriculture education as we know it today.

> The Smith-Hughes Act legitimized a trend occurring in 1917. It recognized an increasing interest in the study of agriculture. The Act picked up that trend and gave it a new momentum. While not starting the study of agriculture at the secondary level per se, it certainly gave such study a new vigor and increased further the interest in agriculture as a secondary school subject (Hillison, 1987, p. 4).

This new vigor for the creation and strengthening of agriculture programs across the country created a movement that has grown into agriculture topics being taught at

approximately 8,500 schools across the country, according to a study conducted by the National Association of Agricultural Educators (Smith, Lawver, & Foster, 2018).

The Origins of Dual Credit and Similar Programs and Their Implementation

Through review of literature and brief history there is not a consensus to when dual credit programs began in our education system, or where they started. Some believe that community colleges in Illinois were the first to introduce dual credit starting in the 1970s (Barnett, Gardner, & Bragg, 2004), while others believe that it started in California in 1976 (Mokher & McLendon, 2009). It is also thought by some that dual credit programs evolved from "curricular enhancement for academically gifted students". Regardless of their origins, dual credit programs have spread across the country throughout different educational institutions in order to provide high school students access to higher education to challenge those students while still in high school, and to support them in preparing for college. One reason for the success in the implementation of dual credit programs across the country is the interest which has been taken by state legislatures in promoting dual credit policies through their state departments of education. According to a study conducted by Karp, Bailey, Hughes, and Fermin, there are forty states overall that have some type of legislation on the books relating to dual credit programs (2004; 2005)

Dual Credit and Its Potential Impact on Student Success Factors

As pointed out in previous sections, there is a longing for the continual implementation of dual credit programs. Many states across the country are undergoing periods of large growth in participation in dual credit programs, which is impacting both rural and urban students (Karp, Calcagno, Hughes, Jeong, & Bailey, 2008). One thing to

keep in mind, though, while administering these programs is their effectiveness in serving the students involved and the potential impact that involvement in these programs can have on the students. Although dual credit programs began in the 1970s, there is still a need to understand the impact that these programs have. Research is needed to examine its effectiveness and demonstrate its outcomes (Kim, Kirby, & Bragg, 2004). Like many research topics in academia, there have been a few studies conducted on this topic, but not enough to understand the full breadth of the situation. In recent years, schools across the country have seen financial stresses which have created the need to investigate all programs campus wide to see if they are fulfilling their purposes and creating value to the university and its students. Included in with this process, there has been increased re-examination by scholars about the effectiveness of dual credit education on students' future academic performance in higher education, post high school (Zehr, 2009). In recent years, more investigation has taken place and further data and results have been produced which point toward the positive effect that participation in a dual credit programs can have on a student once they matriculate into college. One study concluded that dual enrollment students have been found to be more emotionally and behaviorally prepared for the change which takes place between high school and college compared to non-dual enrollment students (Karp, 2015). Another study found that dual credit promotes increased high school graduation rates, higher enrollment rates into college, and overall greater student success (Lichtenberger, Witt, Blankenberger, & Franklin, 2014). With that being said, it is important to examine the Racer Academy of Agriculture to truly understand the impact that it has on its participants like other studies have done with

their programs of interest. The ability to promote student success is one of the highest priorities that is found within Racer Academy of Agriculture.

Summary

Through this chapter, a review of related literature was provided that tells the background story behind this research project. It started with explaining the need for and early development of agricultural education in the United States, detailed the early stages of vocational and agricultural education at the high school level and how it has become what it is today, then the roots of dual credit and similar programs was discussed, and lastly, the potential impact which dual credit programs can have on student success and the reason for this study was explained.

Chapter 3

Methodology

Introduction

This chapter contains information pertaining to the methods which were used to conduct the study. The methodology described hereafter will provide the framework used to study the Murray State University Hutson School of Agriculture Racer Academy dual credit program for its effectiveness in recruiting participants to become full-time students and promoting student success once they have become college students. The methodology is broken down into following sections: (1) Research Questions, (2) Context of the Study, (3) Research Design, (4) Subject Selection, (5) Data Collection Procedures, (6) Data Analysis Procedures, and (7) Budget and Time Schedule.

Research Questions

The study was guided by the following questions.

1. At what rate are dual enrollment students in the Racer Academy of Agriculture matriculating into degree study at Murray State University after they graduate from high school?
2. How do students who dually enrolled in Racer Academy of Agriculture classes while in high school perform in college compared to their peers within the Hutson School of Agriculture and across Murray State University?

3. What is the length of time to graduation for students who dually enrolled in Racer Academy of Agriculture classes while in high school compared to their peers within the Hutson School of Agriculture and across Murray State University?

4. How does the graduation rate of students who participated in Racer Academy of Agriculture classes compare with students within the Hutson School of Agriculture and across Murray State University?

Context of the study

Since the creation of the Racer Academy of Agriculture in the fall of 2010 and the full implementation in the fall of 2011, the program has worked with hundreds of high school students each year to provide dual credit agriculture classes to students across the state of Kentucky. These students have worked to obtain college agriculture credits through the Hutson School of Agriculture, but what is not known is how this experience has impacted those who chose to participate in terms of the rest of their educational career. This study will strive to create a better understanding of how participation in the Racer Academy has impacted the educational pursuits of those involved.

Research Design

Design

The research on the Racer Academy of Agriculture will use an ex post facto design to complete the study. An ex post facto design is quasi-experimental in nature and is used to look at how an independent variable, present prior to the study, can impact dependent variables of interest (Leedy & Ormrod, 2012, p. 242). This is considered quasi-experimental because individuals are not randomly assigned into groups. Rather,

they are split based on whether they participated in the Racer Academy of Agriculture dual credit program while in high school.

Variables

The independent variable in this study is participation in at least one Racer Academy of Agriculture dual credit classes through Murray State University. Individuals who participated in the dual credit program for the 2012-2013 through 2017-2018 school years are being used for evaluation. The 2012-2013 and 2013-2014 school year program participants are being solely used in the determination of graduation metrics. The dependent variables for this study will be what is looked at when trying to determine the overall success of the Racer Academy of Agriculture dual credit program. The first dependent variable to be looked at is enrollment rate of students who have been participants in the program. The second dependent variable to be analyzed will be the Grade Point Average (GPA) of students who were participants in comparison with the GPA of students within the Hutson School of Agriculture and from across the university student body. The third dependent variable is the average length of time to graduation from the time that the individuals become full-time students. The last dependent variable to be evaluated is the graduation rate of the college level students from Murray State University.

Subject Selection

Population

Approximately 1,970 student participants make up the population of students who were enrolled in a Racer Academy dual credit class during the 2012-2013 through 2017-2018 school years. These individuals were in their Junior or Senior year of high school

while enrolled in the Racer Academy class. For graduation related measures, calculations will only be conducted on the high school graduating classes of 2013 and 2014 in order to allow for proper time to graduation. The control population is made up of the entire student body of the university and is made up of individuals from many different backgrounds and experiences.

Sampling Procedure

Due to University policy, it is not possible for the researcher to be aware of the students who enrolled as full-time students versus those who did not, which presents a problem when it comes to the selection of the sample population. A normal random selection of a sample population would be achieved by using a table of random numbers after any identifiable information was redacted from the data set. Each member of the total population would be assigned an identification number based on alphabetical order to aid in the selection process of the individuals. Through the selection process, a sample of participants would be chosen. Because of the nature of these policies, all students who enrolled and participated will be evaluated in aggregate form for their GPA, time to graduation, and graduation rate.

Data Collection Procedure

In concert with the Hutson School of Agriculture and my advisor, I was asked to perform this study to assist faculty and staff research as a Graduate Assistant. Due to the experimental design of this research, all the data needed to make the necessary comparisons has already been collected by various Murray State University offices, namely the Office of the Registrar and the Office of Institutional Research. The Hutson School of Agriculture requested information through the Office of Institutional

Effectiveness through the appropriate channels. Before transferring the necessary data in order to perform the analysis for use by the School, the dataset was de-identified before giving to the researcher. Other data was collected from the Office of Recruitment and the Hutson School of Agriculture as well through the research process. Data from each of these offices were combined in order to conduct this research.

Data Analysis Procedure

Once the data was collected it was analyzed using various statistical tests to compare the results from the two different groups of individuals. The main test to analyze the data will be a descriptive statistics test which will provide information on the groups such as mean, median, range, etc. From these results, conclusions and recommendations will be made.

Budget and Time Schedule

Because of the nature of this study, there were no foreseeable expenses for this research. The only input that was required was the time of those involved in collecting, analyzing, and reporting what has been found. This study will take place over a short time period, with the limiting factor being the transfer of data from the multiple university offices.

Chapter 4

Results

Introduction

This chapter contains the results obtained by the methods listed in the previous chapter. The results exhibited hereafter will provide the facts and figures used to examine the Murray State University Hutson School of Agriculture Racer Academy dual credit program for its impact on student outcomes in four target areas. As previously mentioned, the results listed below will pertain to the Racer Academy's effectiveness in matriculating high school participants into full-time students at Murray State, how the participating students perform academically after becoming full-time students, the number of terms in which a student enrolls for classes until graduation, and finally the graduation rate of these students. Each of these groups of results are compared with the similar group of students across Murray State university and then students with the Hutson School of Agriculture.

Results for Research Question 1

The first research question of this thesis revolves around one of the biggest directives behind the Racer Academy of Agriculture when it comes to the resources that are dedicated to it from both the Hutson School of Agriculture and Murray State University. This purpose is to drive enrollment in areas across the 18 County Service Region as well as the state of Kentucky. In order to understand how effective the

Racer Academy of Agriculture is in recruiting students and matriculating them into full-time students, the matriculation rate was studied for the high school graduating classes from 2012-2013 through 2017-2018 with the following research question in mind: Are dual enrollment students in the Racer Academy of Agriculture matriculating into degree study at Murray State University after they graduate from high school? The first steps in evaluating this opening research question is to count the original Racer Academy of Agriculture enrollment and participation numbers, as well as the number of students who became full-time students at Murray State University after participation in the program. This dataset can then be used to calculate the matriculation rate by dividing the number of matriculated students by the number of participating students in any given year.

Table 1

Racer Academy Participant Matriculation Data

Graduating Class	Participating Students	Matriculated Students	Matriculation Rate (%)
2012 - 2013	135	27	20.00
2013 - 2014	285	54	18.95
2014 - 2015	360	74	20.56
2015 - 2016	381	80	21.00
2016 - 2017	392	85	21.68
2017 - 2018	404	79	19.55

The Racer Academy of Agriculture had 135 participants in the 2012-2013 high school graduating class, which increased to 404 by the 2017-2018 class. The total number of participants increased right at a 200% over this time period. The participant matriculation rate averages 20.29% from the six years included in this study, and ranges from a minimum of 18.95% from the 2013-2014 graduating class and up to the maximum of 21.68% from the 2016-2017 graduating class.

In order to examine this data further, the students who matriculated into Murray State as a First Time Freshmen were able to be divided into two distinct groups based on the program of study they chose to study. These two groups are defined as students within the Hutson School of Agriculture (Table 2) and students outside the Hutson School of agriculture (Table 3). Within each of these tables, the total number of students that falls into each category is given, as well as the percentage of Racer Academy of Agriculture participants and matriculated students that each group encapsulates. Beginning with the number of students that enrolled into Murray State as a First Time Freshman within the Hutson School of Agriculture, the number of participants which matriculated in has steadily risen year over year.

Table 2

RAA Participant Enrollment Within the Hutson School of Agriculture as a First Time Freshman

Graduating Class	Enrollment as an FTF in the HSOA	Percentage of all RAA Students	Percentage of all RAA Matriculated Students
2012 - 2013	16	11.85	59.26
2013 - 2014	33	11.58	61.11
2014 - 2015	53	14.72	71.62
2015 - 2016	58	15.22	72.50
2016 - 2017	64	16.33	75.29
2017 - 2018	56	13.86	70.89

This number of FTF enrollees increased in percentage share of total RAA students even while the program has seen a 200% increase in participants from the 2013 to 2018 graduating classes. The number of students who matriculate as a First Time Freshman within the Hutson School of Agriculture makes up on average 13.93% of the entire group of Racer Academy of Agriculture participants, with a minimum of 11.58% from the 2013-2014 graduating class and a maximum of 16.33% from the 2016-2017 graduating

class. These First Time Freshman in the HSOA also make up an average of 68.45% of the total RAA participants which matriculated into Murray State as a First Time Freshman.

While in college, students are encouraged to enroll and participate in classes across all academic programs and fields of study. Classes are not limited to students who are within the corresponding academic department but are available to any student that meets the eligibility requirements. Likewise, the Racer Academy of Agriculture is not limited to students who plan to pursue a degree in an agriculturally focused program. Any high school student who meets the eligibility requirements of the Racer Academy of Agriculture can enroll in the class or classes of their choosing. This is evident when looking at the following table which exhibits the subset of RAA participants who matriculated into Murray State University in an academic department outside of the Hutson School of Agriculture. These students made the decision to enroll in a Racer Academy of Agriculture course or courses, even though agriculture would not be their first choice for their academic field of study. These students were able to earn college credits, which could be applied to their transcript as electives and help move the student closer to degree completion.

Table 3

RAA Participant Enrollment Outside of the Hutson School of Agriculture as a First Time Freshman

Graduating Class	Enrollment as an FTF outside of the HSOA	Percentage of all RAA Students	Percentage of all RAA Matriculated Students
2012 - 2013	11	8.15	40.74
2013 - 2014	21	7.37	38.89
2014 - 2015	21	5.83	28.38
2015 - 2016	22	5.77	27.50
2016 - 2017	21	5.36	24.71
2017 - 2018	23	5.69	29.11

Over the six high school graduating classes included in this dataset, there was an average of 19.83 participants who matriculated into Murray State as a First Time Freshman outside of the Hutson School of Agriculture each year. This group makes up approximately 6.36% of the total students in the RAA program and 31.55% of matriculated students across this timespan.

Results for Research Question 2

Once a student arrives on campus and begins taking classes one of the biggest indexes that is used to measure their success is the Grade Point Average (GPA) that they have achieved. The GPA of a student can be impacted by many different factors including courses taken, course load, study habits, personal life, etc., but for this study the researcher is going to assume that everything remains constant between the Racer Academy participants and all other University students who are used as the control groups for this study. (Note: All GPAs that are listed below are on a 4.0 scale, with the following grade values: A = 4.0, B = 3.0, C = 2.0, D = 1.0, and E = 0.0) Because the student GPA is used so commonly across higher education to measure student success in various situations, it is the researcher's opinion that it will be a credible measure to use to compare student success across our two groups of students. This comparison inspects how students who are dually enrolled in Racer Academy of Agriculture classes while in high school perform in college compared to their peers within the Hutson School of Agriculture and across Murray State University. The GPA of RAA participants which matriculated into MSU as a first-time freshman is measured in two different approaches. The first approach to examining student GPA is to look at their performance in the first two semesters after the student reached full-time status. This GPA measure is listed in the

below table. One caveat to the comparison in the below table is that the MSU and HSOA GPAs are cumulative GPAs instead of being limited to the first two semesters of a student's collegiate career, due to the amount of the data received by the researcher.

Table 4

RAA Participant GPA after 2 Semesters as MSU Full-Time Student

Graduating Class	Participant GPA	MSU GPA	(+/-)	HSOA GPA	(+/-)
2012 - 2013	2.97	3.02	- 0.05	2.97	0.00
2013 - 2014	3.17	3.05	0.12	2.94	0.22
2014 - 2015	3.24	3.06	0.18	3.00	0.24
2015 - 2016	3.28	3.08	0.20	3.03	0.25
2016 - 2017	3.37	3.12	0.25	3.08	0.29
2017 - 2018	3.29	3.20	0.08	3.15	0.14

Note: The GPA for the MSU and HSOA students are averages of the entire student population for the school years coinciding with the participants and their graduating classes. Therefore, the data sets do not have the same parameters due to the average GPAs not being limited to the students' first two semesters.

The two-semester GPA for RAA participants as first-time freshman students at Murray State averaged 3.22 over the six years in the study, and steadily rose throughout the period to reach the maximum of 3.29 from the 2017-2018 graduating class.

The second approach to measuring and comparing GPA of participants versus the MSU and HSOA student population is to look at the cumulative GPA achieved across a student's entire collegiate career. Within this table the parameters for the data is the same which allows for comparisons between the participants and students across MSU and the HSOA. The data for this second approach is listed in the table below.

Table 5

RAA Participant Cumulative GPA as MSU Full-Time Student

Graduating Class	Participant GPA	MSU GPA	(+/-)	HSOA GPA	(+/-)
2012 - 2013	2.78	3.02	-0.24	2.97	-0.19
2013 - 2014	3.09	3.05	0.04	2.94	0.15
2014 - 2015	3.10	3.06	0.03	3.00	0.09
2015 - 2016	3.17	3.08	0.09	3.03	0.14
2016 - 2017	3.24	3.12	0.11	3.08	0.15
2017 - 2018	3.28	3.20	0.08	3.15	0.13

The cumulative GPA for participants averaged 3.11 over the six-year period while the MSU population averaged 3.09 and the HSOA population averaged 3.03. The Racer Academy participants saw the biggest increase from the beginning to end of the period at 18%, while both MSU and HSOA student GPAs rose 6%.

Results for Research Question 3

The third research question for this study looks deeper into the effectiveness of the Racer Academy of Agriculture to help students get ahead and graduate sooner than when they would otherwise. One of the biggest motivators in many dual credit or AP type programs is to provide college credit to a student in order to give them a head start on their program of study, which in turn will impact the length that it will take a student to complete their collegiate career. In order to fully examine this issue, the researcher kept this research question in mind: What is the length of time to graduation for students who dually enrolled in Racer Academy of Agriculture classes while in high school compared to their peers within the Hutson School of Agriculture and across Murray State University? In order to measure the length of time that it takes a student to reach graduation, Murray State tracks their number of "Enrolled Terms to Graduation". Each Spring, Summer, Fall, and Winter term that a student enrolls in a class from matriculation until graduation is added together to arrive at this value. The values listed in the table below display the average number of enrolled terms to graduation for all students who participated in the Racer Academy and matriculated into Murray State as a first-time freshman, as well as the dataset broken down by students who began in academic program within the Hutson School of Agriculture alongside those who began in another academic unit.

Table 6

Enrolled Terms to Graduation for Matriculated Racer Academy of Ag Participants

Graduating Class	Racer Academy of Ag Participants	RAA Participants who were an FTF in the HSOA	RAA Participants who were an FTF outside of the HSOA
2012 - 2013	8.65	8.70	8.57
2013 - 2014	8.42	8.14	8.92

Racer Academy participants graduated, on average, after taking classes for 8.54 terms. To break this out, students who started as a first-time freshman in the HSOA graduated after 8.42 terms while those who began in another academic department graduated after 8.75 terms. After quantifying the number of enrolled terms to graduation for these groups of students, this data needs to be compared with the entire population of students to have a better understanding of how they match up. In order to make a comparison, the data will be compared against the entire cohort of students that entered MSU alongside these participants, as well as the students who specifically entered a degree program within the HSOA.

Table 7

Enrolled Terms to Graduation for First-Time Freshman Students

Graduating Class	Racer Academy of Ag Participants	MSU Freshmen Cohort	HSOA Freshmen Cohort
2012 - 2013	8.65	9.63	9.72
2013 - 2014	8.42	9.17	9.28

Across the two years of participants from the Racer Academy of Agriculture who came to Murray State as first-time freshman, the average number of terms enrolled from matriculation until graduation is 8.54. The average across the two MSU freshman cohorts is 9.40, while the HSOA specific freshman cohorts averaged 9.50. Within these two

years, a participant in the RAA graduated from Murray State 0.86 terms faster than the overall MSU population, and 0.96 terms faster than the HSOA student population.

Results for Research Question 4

The goal for every student who enrolls at a college or university is to gain knowledge and skills in order to graduate and ultimately enter a profession which they will succeed in and receive satisfaction from. While a college or university such as Murray State does not have the ability to automatically place students into a profession of their choosing, they can make an impact on the achievement that a student has while enrolled in order to help them progress towards graduation. The student graduation rate is one of the biggest benchmarks that is used in when comparisons across the broad spectrum of higher education. It is used when comparing the performance of athletic departments, campus organizations, academic units, and even to compare one college or university to another. The final research question of this research project uses the graduation rate to compare performance across our different segments of students. For this segment of the research conducted, the graduation rate of students who participated in Racer Academy of Agriculture classes will be compared with students across Murray State University and within the Hutson School of Agriculture. Listed in the table below are the graduation rates for students who were participants in the Racer Academy of Agriculture program alongside the graduation rates for students across MSU and the HSOA who entered the university as first-time freshman during the same academic period.

Table 8

Graduation Rate for First-Time Freshman Students

Graduating Class	Racer Academy of Ag Participants (%)	MSU Freshmen Cohort (%)	HSOA Freshmen Cohort (%)
2012 - 2013	62.96	53.76	62.80
2013 - 2014	61.11	48.28	53.93

The average graduation rate for Racer Academy of Agriculture participants across the two-year time period in this study is 62.04%. The average across the two MSU freshman cohorts is 51.02%, while the HSOA specific freshman cohorts averaged 58.36%. During this time, 11.02% more RAA participants graduated from Murray State more than the overall MSU student population, and 3.67% more than HSOA specific students.

Conclusion

This chapter served to display the results obtained through the four separate research questions. Through the research, several key findings were observed in each research area. First, it was found that the matriculation rate of participating students to become full time-students has remained constant at right over 20% even while the number of students participating in the RAA has increased by 200%. Second, it was found that over the six-year time span included in the research 68.45% of students who matriculated into full-time student status began in the HSOA, while 31.55% began outside of the HSOA. Next, it was found that the cumulative GPA for RAA participants who began at MSU as an FTF averaged 3.11 over the six-year period while the MSU and HSOA populations averaged 3.09 and 3.03, respectively. The first graduation related metric discussed was the number of enrolled terms to gradation, in which it was found that a participant in the RAA graduated from Murray State 0.86 terms faster than the overall MSU population, and 0.96 terms faster than the HSOA student population.

Lastly, it was found that 62.04% of participants in the RAA who matriculated to Murray State graduated, which was 11.02% more than the MSU student population and 3.67% more than the HSOA population.

Chapter 5

Conclusions and Recommendations

Introduction

This chapter serves to provide conclusions and recommendations based from the research conducted throughout the evaluation of the Racer Academy of Agriculture for the 4 key research questions. Through the research, these conclusions and recommendations, if implemented into the planning and decision-making process of the University, have the possibility to make an impact on many different aspects of the Huston School of Agriculture and Murray State University.

Conclusions for Research Question 1

The first research question studied is directly tied to one of the greatest objectives of the Racer Academy of Agriculture. The purpose of this initial question is to identify whether dual enrollment students in the Racer Academy of Agriculture are matriculating into degree study at Murray State University after they graduate from high school, or if they are following a different course of study. To begin studying the dataset, the total number of students who participated each year of the study had to be calculated. Students had to be separated by high school graduating class and then added together to create the study populations. The Racer Academy of Agriculture had 135 participants in the 2012-2013 high school graduating class, which increased to 404 by the 2017-2018 class, a

200% increase in students. After combing through the data, a matriculation rate was able to be calculated to understand how many of these dual-credit students enrolled at Murray State as a full-time degree seeking student. The matriculation rate remained around 20% over the 6 years, averaging 20.29% in this time, even while the program saw a 200% increase in overall student participation. Overall, approximately 400 students matriculated into Murray State University in the time period relevant to this study after participating in the Racer Academy of Agriculture, with the high of 85 occurring from the 2016-2017 graduating class. To take it one step further, the students that enrolled in classes at MSU as a full-time student were segregated based on their desired degree program when they enrolled. Over the six graduating classes, 68.45% of all students that enrolled as a First-Time Freshman began in the Hutson School of Agriculture, while 31.55% of students began their academic pursuits in another academic department.

After evaluating the results from this research question, the Racer Academy of Agriculture is succeeding in its mission to recruit and enroll students as a full-time student at Murray State University after participating in the Racer Academy of Agriculture dual credit program. The efforts to recruit new students into the program both inside and out of the Eighteen Country Service Region are proving to be beneficial to not only the Hutson School of Agriculture, but to the University as a whole. This is shown by the number of students who matriculate into the University outside of the agriculture department, who otherwise might not have chosen Murray State as their institution of higher learning. In order to grow participation, increased recruitment efforts should be directed to schools with low participation rates, as well as those with students who might not consider Murray State without this level of exposure to the program.

Conclusions for Research Question 2

The second research question of this thesis research allows for quantifying of the student success measures laid out in the research. Through this aspect of the study, students who dually enrolled in Racer Academy of Agriculture classes while in high school are compared to their peers within the Hutson School of Agriculture and across Murray State University to understand how they performed once they became a full-time student. To begin, the Grade Point Average (GPA) was aggregated for all participants of the Racer Academy of Agriculture by graduating class to get a clear understanding of the performance of each group, and in order to make a comparison with other groups of students across campus. The program participants achieved a two-semester GPA of 3.22 over the six years in the study, and steadily rose throughout the period to reach the maximum of 3.29 from the 2017-2018 graduating class. Because of the limitations of the data received by the researcher, a fair comparison based on the first two semester GPA cannot be achieved between this group and the other groups across campus due to the dataset having different parameters. Nonetheless, the data is presented in order to showcase the success that these students are having soon after entering college as a full-time student.

After looking at the GPA of the participating students after their first two semesters as a full-time student, the next comparison made is based off of the cumulative GPA of each student which covers all classes that they received grades in while being a student of Murray State University. The cumulative GPA for Racer Academy participants averaged 3.11 over the six-year study period while the MSU population averaged 3.09 and the HSOA population averaged 3.03. The Racer Academy participants also saw the

largest percentage increase from the beginning to end of the period at 18%, while both MSU and HSOA student GPAs rose approximately 6%. While it cannot be proven that students achieved higher GPAs because of their participation in the Racer Academy of Agriculture, the data does exhibit that over this period participants realized a higher level of student success in all but one of the graduating classes.

Conclusions for Research Question 3

The third research question of this thesis is to better understand the impact that participation in the Racer Academy of Agriculture has on a student regarding the time that it takes for the completion of their undergraduate degree program. To better understand the influence that participation in the program has on a student's ability to complete their degree in a certain period of time, the number of enrolled terms to graduation was used to quantify the period of time that was required for degree completion. Racer Academy of Agriculture participants from the 2013 and 2014 high school graduating class required an average of 8.54 enrolled terms to reach graduation for their undergraduate program. Once the length of time that it took RAA participants to graduate was established, that value was compared to the same graduating class which entered Murray State as a cohort the following year. Over the same time period, the MSU freshman cohort required 9.40 terms to reach graduation while the freshman cohort who began in the HSOA required 9.50 terms to reach completion of their undergraduate degree programs. In comparison, within the two graduating classes included in this aspect of the research, a participant in the RAA graduated from Murray State 0.86 terms faster than the overall MSU population, and 0.96 terms faster than the HSOA student population.

The data shows during this time period that students who participated in the Racer Academy of Agriculture dual credit program are completing their degree program faster than their peers within the HSOA as well as those across the entire campus. For students who are trying to complete their course of study in a quicker and more efficient manner in order to move into the next season of their life, this data exhibits that through participation in the Racer Academy of Agriculture they can achieve those desired results. These results are also important to the administration of the HSOA and the University because of the increase of the use of performance funding matrixes. Many of these matrixes include metrics which revolve around retention, degree progression, and graduation. If a student is able to move along faster throughout their degree programs, the performance of their academic department and ultimately the University will benefit.

Conclusions for Research Question 4

The fourth and final research question examines the impact seen in terms of graduation rates of those participating in the Racer Academy of Agriculture dual credit in comparison to the student body as a whole. The average graduation rate for Racer Academy of Agriculture participants across the two-year time period in this study is 62.04% of students which matriculated into degree study at Murray State University. The average across the two MSU freshman cohorts from the same high school graduating class is 51.02%, while the HSOA specific freshman cohorts averaged 58.36%. RAA participants graduated at a rate of 11.02% more than the general Murray State student population, and 3.67% more than HSOA specific students. As evident by this data, during this time period students who were participants in the program graduated at a higher rate than their peers. While it cannot be proven that participation in the program caused this

effect to happen due to the experimental design of the research, the finding can be taken and applied to recruitment efforts across the board. Students who participate in the program have a higher likelihood to reach degree completion and can move into the search for their first step in their desired career path.

Recommendations for Murray State University

Murray State University and the Hutson School of Agriculture should continue to implement the Racer Academy and Racer Academy of Agriculture programs. Additional effort should be coordinated to increase the matriculation rate of the RAA students to enroll in and progress through Murray State. Potential scholarships or related incentives should be made available to encourage enrollment. Data from this research, including that students who enroll tend to graduate faster, at less cost, and with a higher GPA, should be summarized and used throughout the recruiting process.

Recommendations for Future Research

Through various research projects, dual credit programs have shown to be beneficial to its participants. These students were able to push themselves to obtain university credits while still in high school, and more importantly prepare themselves for what was to come once they became a full-time college student. This evaluation of the Racer Academy of Agriculture proved to show much of the same based on the analyzation of the participant data used for this research study. For future research endeavors, I recommend the researchers to implement an approach which allows for observance of RAA participants from numerous high school graduating classes in real-time over a longer time period which would allow for a more thorough research study to be conducted. I would also recommend identifying students from the same schools who

did not participate in a RAA class and are peers of the participants which can be used as the control groups for the research study. By doing this, the comparison becomes stronger and allows for the effects of the dual-credit participation to be considered more causation instead of correlation. By following these recommendations, future research can be more thorough in nature, which allows for more in-depth findings and recommendations for the program.

Conclusions

Through the Racer Academy of Agriculture, high-achieving and highly motivated students are being introduced to Murray State University through dual credit classes. A larger number of students each year are given the opportunity to earn Murray State credits while still being a high school student as a participant of the Racer Academy of Agriculture. Each year, more of these students are deciding to choose Murray State as their university of choice, whether it be as a student in the Hutson School of Agriculture or through one of our many outstanding other outstanding academic colleges. Because of their exposure to college curriculum in advance of becoming a full-time student, they are prepared for the classes need to progress along their undergraduate degree program. Due to this early exposure, students are achieving higher student success in the classroom than their peers, both in their first two semesters and over the entire course of their degree program. This success allows the students to regularly progress through their classes and reach the end goal of their time at Murray State by obtaining a diploma in their desired course of study. Not only are Racer Academy participants achieving this goal, they are graduating at a higher rate when compared to their peers and are reaching this goal almost one whole term faster as well.

The benefits of participating in a dual credit program while in high school have been proven over various studies described within chapter 2, the results of chapter 4 have shown that participants achieve a higher success rate in various aspects of their collegiate careers, and the conclusions of chapter 5 exemplify the positive impact that the Racer Academy of Agriculture can have on those who participate. The last, and most important step in this process is to showcase these results to the next generation of students who have the capability to be just as or even more successful than those students involved with this research study. Through focused efforts, the Racer Academy of Agriculture has the ability to prepare students to excel in not only the collegiate atmosphere, but beyond.

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