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Effect of a Substance Abuse Intervention Program on Student Achievement at a Midwest University

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by

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Declaration of Originality

I do hereby declare and attest to the fact that this is an original study based solely upon my own scholarly work here at Lindenwood University and that I have not submitted it for any other college or university course or degree here or elsewhere.

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Abstract

Through empirical research, this dissertation examined whether a substance abuse intervention program implemented at a Midwest university could prove beneficial in addressing the problem of substance abuse on college campuses. Drawing on multiple resources, including Department of Education, psychologists, scholars, and other professional sources, this dissertation provides information on the importance of intervention and behavioral adjustment. This study covered statistical data over a two-year period on an intervention program including measurements such as: grade point average, attendance, number of months in the program, and degree persistence. A second area of research was directed at determining the effect of the intervention program regarding retention. The methodology used in this study was mixed and included examination of program implementation, through use of qualitative and statistical data. It concluded, based on research and final statistics, that participating in a substance abuse intervention program not only increased the potential for student success and behavioral change, but slightly improved the percentage of retention and graduation persistence. It also identified the need for further study based on availability of resources needed to maintain and sustain a viable program.

Implementation of the intervention program took place during the study. Therefore, adjustments in procedures were made based on feedback received and data gathered. The process for collection of samples was changed to provide secure handling of the sample and subsequent valid test results. Also, as a result of researching discipline measures for substance abuse at universities within the same sports conference,

consequences for NCAA athletes changed from suspension from competition for a year to removal from competition until a clean drug screen was provided.

Studies in the future should include following students who left school prior to graduating to determine the mortality rate of persistence to degree among program participants. Conducting a survey with the fall semester incoming freshmen class would improve study design and provide a better picture of the extent of substance abuse, rather than surveying the spring semester after many freshmen have lived on campus for half of the academic year.

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Chapter One: Introduction

While serving as the Dean of Students for a Midwest suburban private university, it appeared to this researcher that illicit drugs and alcohol had been on the rise over the few years preceding this study. University policy regarding students involved in illicit drug use was to simply expel them from the university. Having been a leader and served in the military, the researcher approached the administration with the prospect of creating an intervention program based on his experiences. After some research into what other universities and colleges offered, and reviewing Army Regulation 600-85 (U.S. Army, 2009) covering substance abuse, a substance abuse intervention program was created to assist students in altering their behaviors and to allow them to continue their studies.

For many years, colleges and universities around the country tried to determine the best course of action to deter illicit drug use among their students. A 2010 *Monitoring the Future* study provided results on adolescent drug use and reported that marijuana use was at its highest rate since 1981 (Johnston, O'Malley, Bachman, & Schulenberg, 2010).

More than one third of students in 8th through 12th grade reported using an illicit drug within a one-year span and one quarter reported they had used in the 30 days previous to survey (Johnston et al., 2010). In the researcher's experience as a Dean of Students, incoming freshmen arrived on the college campus with a sense of freedom and expectation that once away from parental supervision they could choose a path involving alcohol and illicit drugs; viewing this as a youthful rite of passage and a time to experiment. As more young people were entering college looking to further their education, and with the number of high school students reporting an increase in illegal drug use (Johnston et al., 2010), the researcher believed it was important for institutions

of higher learning to find a solution to the illicit drug abuse problem on campus. *Monitoring the Future* (Johnston et al., 2010), a study sponsored by The National Institute on Drug Abuse, was a long-term study of adolescents, college students, and adults through age 50 to determine drug usage in reference to how long and how often use continued. The authors of the 2010 study indicated that one in sixteen college-bound high school seniors were more likely to participate in unlawful drug use, based on information gathered from the survey (Johnston et al., 2010). An alarming statistic revealed that once they graduated high school and entered college, they caught up, and in most cases exceeded, their non-attending peers in drug use (Johnston et al., 2010). In an earlier study, Gledhill-Hoyt, Lee, Strote, and Weschler (2000) reported that between the years 1993 and 1999 the illegal use of marijuana in the 30 days preceding survey increased from 12.9% to 15.7%. Of the 119 colleges and universities selected for this report, 66% reported an increase in marijuana use (Gledhill-Hoyt et al., 2000). In their study of self-reported use, illicit drugs were on the rise in colleges and universities around the country and may have reflected an association with increased use at middle schools and secondary schools. Another fact from the report was nearly one-third of students reported first using marijuana after entering college. Gledhill-Hoyt et al. (2000) concluded that intervention efforts should be directed toward college students, as well as toward secondary school students. There were, however, limitations in each self-reported study, such as: were the subjects honest in their answers, did the fact that decriminalizing use of unlawful drugs in some states made it a less balanced study, or did the fact that legalization of medicinal marijuana in some states seem to decrease the severity of illicit drug use?

An article by Allison (2011) of the *Denver Post*, discussed a Colorado University student who was arrested for possession of medical marijuana and subsequently not charged. The student retained a lawyer because the university was going to suspend the student for violating the substance abuse policy. Due to a pending lawsuit ascertaining that the student had not actually violated a state law, university officials backed off from suspension and allowed the student to reside off-campus and continue his education. Some state officials felt that the legalization of marijuana in Colorado would make it much easier for individuals to traffic the drugs. Twenty other states also passed laws allowing the use of medical marijuana. Many asked about the repercussion on the drug-free school act and how it would impact policies in effect. Public schools were the ones most concerned because of receiving funding from the federal government, even though use of medical marijuana was not yet passed into law at the federal level. Most universities followed their policies and prohibited possession or use of marijuana on campus owned property (Allison, 2011).

Institutions of higher learning held a similar philosophy in drafting policies regarding substance abuse. They all agreed that their primary objective was to educate their students and provide a safe learning environment so their students could become productive and successful citizens upon graduation. Other responsibilities, noted in the limited literature, entailed fostering a climate where students no longer felt as if they could freely engage in illicit drug use without the fear of punishment (Johnston et al., 2011). In a report published by the Office of National Drug Control Policy (2004), at least one-third of students entering college indicated they started using marijuana prior to their 18th birthday. These findings differed from the 2010 study because the surveys

conducted in 2004 primarily targeted 8th through 12th grade students. The 2010 study validated the need for institutions of higher learning to continuously seek methods to deter alcohol and illicit drug use, based on earlier *Monitoring the Future* studies (Johnston et al., 2010).

The Center for Behavioral Health Statistics and Quality (Drug Abuse Warning Network, 2009) conducted a five-year study on the trends of emergency room visits involving illicit drugs between the years 2004 and 2008. Of the 15 different illicit drugs studied, marijuana provided the largest increase in visits from 281,619 in 2004 to 374,435 in 2008, equating to a 32% increase over the five year period of study. The 374,435 reported visits during the 2008 time period for marijuana equated to 37.7% of all reported illicit drug use. A statistic noted was that patients between the ages of 18 and 20 had the highest increase in visits regarding marijuana (467.2) (Drug Abuse Warning Network, 2009).

Background of the Problem

Alcohol and illegal drug use continued to be a problem on university campuses around the country. In a *Monitoring the Future* Survey (Johnston et al., 2011), research indicated that universities and colleges around the country were continuing to develop alcohol and illicit drug prevention programs, with no real mention of intervention. In July of 2002, President Bush signed into law the Safe and Drug-Free Schools and Communities Act, which provided funds for K–12 schools to assist in designing and implementing activities that would support the Act. Specific components of this legislation required schools to provide measurable objective data associated with their program to determine its effectiveness and comply with Title IV funding mandates (*Safe*

and Drug-Free Schools and Communities Act, 2004). Prevention was defined as responsible sanctions for punishment and education, and for the purpose of this law, focused on preventing and reducing drug abuse. Intervention was defined as an action that required professional support and direct involvement with a student who was identified either by local authorities or school administrators as having a problem with substance abuse and refused to seek assistance on their own (*Safe and Drug-Free Schools and Communities Act*, 2004). On-going research indicated that grants from the Department of Education, which targeted at risk K-12 students and used a combination of community based preventive and intervention programs, could provide a balanced approach. This method of substance abuse education provided sound fundamentals and targeted those most needing assistance (*Safe and Drug-Free Schools and Communities Act*, 2004). A review of the current literature on drug prevention and intervention found a limited number of studies on programs targeting intervention.

Parents who send their sons and daughters to a college or university put trust in these institutions and expect they are committed to provide a safe environment by eliminating distracters that would hinder their students from receiving a quality education. Parents assume that universities will promote exploration of ideas and encourage discovery of expression, while providing a safe academic environment encircled not only with learning, but also increasing social interaction and community building (Office of National Drug Control Policy, 2004).

Unfortunately, in this researcher's experience, new-found freedom also brought hazards of alcohol and illicit drug abuse. It has been documented that alcohol and drug abuse occurs on college campuses around the world. In a survey conducted by the

University of Michigan, *Monitoring the Future* (2005), it was reported that as much as 68% of college-age students were alcohol consumers and 37% of college age students used some form of illicit drugs (Office of National Drug Control Policy [ONDCP], 2004).

Previous studies found the casual use of illicit drugs led to long-term dependency, which may affect the student's ability to achieve academic success. In a study conducted by the ONDCP (2004), it was noted that universities and colleges should explore having both preventive and intervention programs in place to facilitate this success. Knowing that alcohol remained the primary drug of choice in colleges and universities, in addition roughly 50% of students tried some form of illicit drug (Johnston, O'Malley, Bachman, & Schulenberg, 2005a).

Retention

Retention, above all else determined the success of a university or college and was considered one of the most important issues in surviving tough economic times (Koenig, Frey, & Detterman, 2008). In a survey conducted by the American College Test (ACT), Inc., in 2008, it was reported that only 43% of college students completed their degrees. In response to these findings, 20% to 25% of a university's national rankings were based specifically on retention rates. In a publication by Habley and McClanahan (2004), a survey was conducted with the contribution of 2,500 to 2,800 four-year universities around the country. It was reported that students attending a four-year institution had three major reasons for leaving school. "Academic stimulation and assistance: challenge in and support for academic performance, Personal future building: the identification and clarification of student goals and directions and Involvement

experiences: student participation/interaction with a wide variety of programs and services on the campus" (Burkum, Habley, McClanahan, & Valiga, 2010, p. 3).

Of the three categories, student participation was considered a strong factor in retention. Academic stimulation was targeted to specific academic classes offered, as not fitting the needs or desires of the student. The social atmosphere also depended on the size of the university, since smaller-sized universities offered fewer social interaction activities than larger ones (Burkum et al., 2010).

Purpose of the Study

While a tremendous amount of research covered the statistical aspects of drug abuse among college students reported by the ONDCP (2004), most colleges and universities primarily focused on prevention methods; there was little information about drug intervention programs. In a research study conducted by Larimer, Kilmer, and Lee (2005), it was noted that extensive research had been conducted on preventive measures relating to alcohol abuse, but very few targeted the abuse of illegal drugs. Part of the research was to determine if the procedures utilized in alcohol abuse prevention could be targeted towards illicit drug use. It was noted that during research in a study conducted by Larimer et al. (2005), and Larimer and Cronce, (2002), programs designed to be non-interactive resulted in very little effect on deterrence of use. These types of preventive measures focused on the educational aspect of drug abuse rather than the needs of the individual. It was also determined that a combination of both preventive and intervention methods, such as those used in alcohol abuse, programs dealing with behavioral therapy and methods used for dealing with addictive tendencies result in a higher percentage of success.

The purpose of this study was to conduct a program evaluation based on two years of data collected by the researcher at a Midwest University to determine if providing an intervention program, based on specific criteria, could determine if there was data to support the theory that providing an intervention program would not only increase student achievement, but also provide the necessary education that would assist in altering student behavior.

Research Questions

This study sought answers to the following research questions:

Research Question # 1. Is there a relationship between providing an alcohol and substance abuse intervention program and the overall success of the student?

Research Question # 2. Does the inclusion of Midwest University's Alcohol and Substance Abuse Program allow the perception that its campus is a safer and more secure environment for post-secondary learning?

Research Question # 3. What are the processes that best support implementation of an alcohol and substance abuse program such as the one at Midwest University, as indicated through phone interviews of parents and student program participants?

Although many high schools took part in national surveys conducted each year by the National Institute on Drug Abuse (2010), literature was limited on description of statistical data related to college students' use of illicit drugs. This study was a mixed study, which included quantitative data contributed from a sample group of students who entered into a substance abuse intervention program. Analysis used measurable data found in the University Consolidated Access Management System (CAMS) and focused

on student achievement. Specific areas of interest studied included grade point average, attendance, number of months in the program, age, and retention.

In a study conducted by Burkum et al. (2010), the authors focused on best practices when surveying community colleges, private four-year colleges and universities, and public four-year universities and colleges. The study focused primarily on academic retention and degree persistence. Within the decade previous to study, colleges and universities experienced increasing difficulty to retain students. Some issues that contributed to this were the economy and cost of education. In a study conducted by Schofield and Dismore (2010), there were a number of reasons given for student failure to complete their educations. Most of these, such as personal issues, lack of motivation, lack of preparedness, and fiscal problems were the main focus of study. There was little information pertaining to retention, based on alcohol or illicit drug use, and the percentage of those leaving college due to these factors varied from study to study.

Rationale

Any university, large or small, rural or urban, residential or commuter, private or public, is committed to providing an experience that gives students the opportunity to reach their full potential. Alcohol and drug abuse continued to be a serious threat to the safety and welfare of university students and needed to be confronted in a manner that led to the university's mission of providing its student's safety, scholastic achievement, and institutional integrity. While conducting this study, it was important to determine whether other universities offered an intervention program for students and to compare those in existence to the program offered at the Midwest University selected for this study. After researching university policies, there seemed to be a consensus that substance abuse was

perceived to be a major concern, but universities were unsure how to address it. Most universities focused on prevention as outlined in the *Safe and Drug-Free Schools and Communities Act* (2004), which provided funding and grants to assist in education and awareness. Some universities simply had a zero tolerance policy. If a student was found to be involved with an illegal substance or had a drug related incident, he or she was immediately expelled from the university. Other research indicates that a vast number of universities use a preventive approach in trying to educate and provide assistance to students that appear to have issues with illegal substances (ONDCP, 2004).

Still, there were some universities that utilized outside sources and rehabilitation clinics to assist students in overcoming substance abuse issues. Universities cannot achieve high levels of retention and success for students with illegal substance abuse issues without implementing some form of program to help those students that are in a high-risk category.

The National Drug Control Strategy, as part of the Office of National Drug Control Policy (2004), emphasized how important it was to prevent drug use before it started. If a student can be prevented from engaging in substance abuse through a university's education program, it sends a message that the university is making an effort to minimize an abuse problem. Drug testing can be a deterrent to drug use, but there are many liabilities associated with testing that discourage universities to engage in this form of prevention (ONDCP, 2004).Universities or colleges under the guidance of the Safe and Drug-Free Schools and Communities Act were mandated to provide programs designed on prevention. In order to receive continued funding, universities and colleges needed to foster a safe and drug-free learning environment that supported academic achievement,

be consistent with the principles of effectiveness, be designed to either prevent or reduce the use, possession and distribution of illegal drugs, and create a well-disciplined environment constructive for learning (ONDCP).

Marijuana has been called a recreational drug, and the perception that it is a harmless substance was far from the truth. In a study conducted in 2011 by the *Monitoring the Future* Survey (Johnston et al., 2011), 62% of individuals tested started using marijuana as their primary drug. In an article published by the *Journal of the American Medical Association* in 2002, marijuana led to memory loss, attention deficit, and an adverse effect on student achievement (Solowij, Stephens, Roffman, & Babor, (2002).

Methodology

The method of research for this study was influenced by the overall concept that students who choose to make poor choices related to substance abuse were not necessarily unable, with the right assistance, to change their behaviors and continue on their path to degree completion. In order to support the rationale behind evaluating an intervention program on one specific college campus, the researcher designed an evaluation program to encompass categories that specifically addressed the substance abuse intervention program, based on information taken from a variety of sources over a specified period of time.

This research study was conducted to determine if a substance abuse intervention program could be implemented at a university and monitored to see what effect, if any, it would have on student achievement. The researcher selected a program outcomes evaluation utilizing a set of variables arranged by categories related to student

achievement. Each category was measurable and provided the researcher with a quantifiable data set. After looking at what was available and accessible, the following categories were selected: gender, age, grade point average before, during, and after, date entering program, date leaving program, number of months in the program, and degree persistence. Gender was selected to determine the percentage of male to female students entering the program, age was selected to determine an average among the participants, and grade point average before, during, and after was used to determine the level of student achievement while enrolled in the program. Date entering and leaving the program was used to determine the average number of months before a student completed the program. Degree persistence was selected to track students' success through continued enrollment after they left the program.

Research Hypotheses

Alternate Hypothesis # 1. Following a student's participation in the substance abuse intervention program offered by the university there is a difference in student achievement, as measured by Grade Point Average and Course Attendance before, during, and after participation in the program.

Alternate Hypothesis # 2. When comparing participants in the substance abuse program to nonparticipants, there is a difference in student achievement, as measured by Grade Point Average and Course Attendance.

Alternate Hypothesis # 3. There is a relationship between length of participation in the substance abuse program and student achievement, as measured by Grade Point Average and Course Attendance.

Alternate Hypothesis # 4. There is a relationship between a student's participation in the substance abuse intervention program and graduation persistence, measured by age of student and progression through student enrollment status in college (i.e. first, second, third, or fourth year).

Limitations

The limitations of this study were related to the ability of the researcher to access data and provide enough substantial information that would determine the results of this study. Other limitations were the use of outside sources and facilities that were certified and reputable in providing information on an individual's substance abuse testing history. Each potential threat was evaluated to determine its impact, and adjustments were made to eliminate detrimental effects and provide validity to this study.

The outside sources used for testing were in the same city as the university and provided the best and most accurate reporting available at the time. A student would go to the test site and register, leave a urine sample, and wait for the results. Part of the limitation of this source was the actual sample draw. Questions considered included: Were all employees trained the same when collecting the sample? How was the sample collected? What measures were put in place when shipping the sample to the laboratory?

Definition of Terms

The following terms and their definitions are related to this study and will be found in the context of this dissertation.

CAMS - For the purpose of this study CAMS, Consolidated Access Management System, refers to the operating system used to consolidate and store access to all student pertinent information (Information technology, 2014).

College age – For the purpose of this study, college-aged student refers to college students between the ages of 18 and 25, as indicated in the data.

Hallucinations - Hallucinations involve sensing things that are not there while a person is awake and conscious; a false or mistaken idea or delusion (The American Heritage Medical Dictionary, 2007).

Illicit drugs -Illicit refers to any drug that is contrary or forbidden by law to possess, manufacture, or consume (Licit/Illicit drugs, 2014).

Lysergic Acid Diethylamide (LSD) - Also known as lysergide and colloquially as acid, is a semi synthetic psychedelic drug of the ergoline used to produce hallucinations (Spitz, 2007).

Marijuana – A cannabis plant; preparation made from the dried flower clusters and leaves of the cannabis plant, usually smoked or eaten to induce euphoria (Spitz, 2007).

Resident Advisor – For the purpose of this study, Resident Advisor refers to a number of individuals that assist the Resident Director in performing duties within the residence halls.

Resident Director – For the purpose of this study, Resident Director refers to the individual that is placed in a supervisory position within a residential hall to maintain a safe and orderly atmosphere for students to reside while attending.

Tetrahydrocannabinol (THC) - THC is a compound made from cannabis, or synthetically, that is the primary intoxicant in marijuana and hashish (Spitz 2007).

Title IV – of the Higher Education Act of 1965 covers the administration of the United States federal student financial aid programs (Title IV, n.d).

Conclusion

This research study focused on one institution's effort to determine if a substance abuse intervention program increased not only retention, but to the overall academic success of the participants. The program was designed to identify students who were using marijuana and offer them an opportunity to remain in school and receive professional counseling for their substance abuse.

As research will indicate in Chapter Two, most studies were targeted toward prevention rather than intervention, and few studies were related to specific effects as applied to student retention and academic success. Surveys supplied most of the information in this study's literature review, and with this type of research it became apparent that information taken was subject to the accurate, honest, and open answers provided by the subjects surveyed. This study was based on factual information retrieved from the university Consolidated Access Management System (CAMS).

Retention continued to be considered and was a huge portion of University success. Of the typical reasons for students leaving the University, substance abuse was normally a subcategory of the personal and emotional reasons why students left school. Alcohol was considered as the most used substance for abuse, with marijuana quickly approaching and in some cases surpassing the problems related to alcohol. As the legalization of medical marijuana and recreational use of marijuana continued to rise, it was imperative for universities and institutions of higher learning to design and implement programs focused on student success and behavior.

Chapter Two: Literature Review

Colleges and universities around the country were committed to providing an atmosphere that allows students to be able to reach their full potential. With that, college and university administrators met with obstacles to be monitored in order to promote the positive atmosphere which will result in student success.

Drugs were associated with poor academic achievement and created social barriers that interfered with the normal learning environment. Alcohol and drug abuse in grades 8 through 12 was an issue for years, and research was conducted to find ways of deterring this epidemic (Johnston, O'Malley, Bachman, & Schulenberg, 2011). Most of the research expressed the need for prevention, but also indicated that when students were identified as having abused either alcohol or drugs and normal procedures failed to show improvement, intervention was necessary.

Although alcohol was a major contributing factor on most college campuses, use of marijuana and illicit drugs began to rise and overtake alcohol consumption issues (Johnston et al., 2010). In a table explaining the annual use of an assortment of drugs, (Johnston et al., 2010) indicated that alcohol use had declined by the ratio of 0.9 and marijuana had increased by the ratio of 1.6, during the time period covering 2009 and 2010. The proportional change over a period starting in 2007 and ending in 2010 indicated that alcohol had decreased from 50.2% to 47.4% and marijuana had increased from 21.4% to 24.5% as reported by Johnston et al. (2010, p. 723).

Alcohol and drug abuse has been around college campuses for years and is considered was a normalized acceptable culture among college students. The National Institute on Drug Abuse, the National Institutes of Health, and the U.S.

Department of Health and Human Services presented a yearly report, *Monitoring the Future* (Johnston, O'Malley, Bachman, & Schulenberg, 2013), an ongoing national survey that identified change in the behavioral patterns among young people. In a study conducted in 2012, surveys indicated that there continued to be an upswing of illicit drug use on college campuses (Johnston et al., 2013). This behavior not only affected students in achievement of their maximum potential, but also increased the dropout rate, placing individuals and families in a financial crisis (Johnston et al., 2013). In an article written by Fairris (2012), the author discussed the importance for colleges and universities to utilize program evaluations to determine the effect these programs might have on their population. He went on to discuss that when designing a program evaluation, one must first determine what outcome the researcher looked for, based on specific criteria, and then determine whether or not the program was a success or failure (Fairris, 2012). Most universities based their programs on three main categories: grade point average, retention, and the likelihood of student graduation within four years. When designing a program evaluation utilizing a control group and a like sample group, it was imperative that both groups contained the same demographic information and were evaluated by the same measurement tools, especially when comparing both groups to each other (Fairris).

Background of the Problem

College campuses inadvertently provided an opportunity for alcohol and drug abuse based on the perception that students will have more freedom as they leave home and are removed from the constraints of living with their parents. This new-found freedom allowed students to experiment when confronted with the availability of drugs

on campus (Johnston et al., 2011). Of the drugs identified on college campuses, alcohol and marijuana were the most used. In a tracking study conducted by The Partnership for a Drug-Free America in 2011, sponsored by the MetLife Foundation (Johnston et al., 2011), a survey designed as a questionnaire targeting high school students reported that close to 50% had used marijuana in the past. From the period between 1981 through 1991, the use of marijuana fell from 51% to 27% then continued with a steady rise to 33% in 2011. (Johnston et al., 2011, p 272). With the legalization of recreational marijuana in Colorado and Washington, and an additional 20 states that legalized marijuana for medical use, students seemed to find it less of a legal issue than in the past.

According to the study conducted by The Partnership for a Drug-Free America (Johnston et al., 2011), teens also reported that more of their friends were smoking marijuana on a regular basis. This report was higher than a similar study conducted in 2008. The same 2011 study also indicated that high school students who smoked marijuana were nearly twice as likely to have used pain relievers or harsher drugs within the year previous to the survey, to get high. Since 2008, the perceptions from high school students was that they were less likely lose respect, destroy their lives, or place themselves in danger, as public opinion continued to decrease (Johnston et al., 2011). The decreased perception that marijuana was not as bad as once predicted indicated those predictors pointed to an increase in marijuana usage, and surveys showed an increase, especially among 10th to 12th grade students (Johnston et al., 2011).

Drugs continued to destroy the minds of students and the powerful influence of illegal drugs located on college campuses created an environment not conducive

to student achievement (Johnston et al., 2011). It was also noted that while the use of marijuana had been declining at the secondary school level, it had increased at the college level. It also indicated that high school seniors who decided to attend college were less likely to use an illicit drug than those that did not attend, but after entering college they typically caught up to their non-attending peers (Johnston et al., 2011).

A report filed by The Drug Abuse Warning Network (*The Dawn Report*, 2012), described results of a survey in 2009 that indicated that as many as 375,000 emergency room visits were a direct result of marijuana use that created a factor for cause. Those estimates reflected an age group between 12 and 17 years of age. With this number of young people using the drug, it could be used as an indicator of what colleges and universities would likely be facing in their freshman class recruiting pool.

History of Marijuana in the United States

Marijuana can be traced as far back as the colonial times. Cannabis was a plant associated with Chile, but it was the Spaniards who introduced it to New England residents in the early 1600s. Cannabis was a crop grown by local farmers for its fiber content and eventually became an export crop (Brecher, 1972). In the late 1770s, hemp culture was introduced to many Southern and Western states where plantations were created, and the cannabis crop was cultivated until the mid-1800s (Brecher, 1972).

From the mid-1850s to 1950s, marijuana, also known as Extractum Cannabis, was considered a legitimate medical treatment for the symptoms of gout, hydrophobia, cholera, and convulsions (Brecher, 1972). It was during this time that

experimentation by doctors and other medical professionals resulted in the consumption of cannabis extract, which placed them a euphoric state of well-being (Brecher).

In the late 1880s, the territory of Oregon was the first region within the United States to pass a form of legislation that considered the sale, possession, and consumption of cannabis to be a violation of the law (ProCon, 2011). The only exception to this was if an individual was given a prescription by a licensed physician. It wasn't until 1914 that The Harrison Narcotic Act was enacted by the United States, which created the ability of the government to regulate, tax, and legalize the use of medical marijuana (ProCon). In 1930, marijuana was regulated in every state by the Uniform States Narcotics Act. In 1970, the Control Substance Act eliminated the use of marijuana for medicinal purposes throughout the United States, but in 1996 California passed Proposition 215, which was known as the Compassionate Use Act of 1996 that again legalized the use of marijuana for medical purposes. Again in 2005, the United States Supreme Court handed down a ruling under the Commerce Clause banning the use of cannabis for medicinal purposes (ProCon, 2011).

Trends in Substance Abuse High School and Youth

Looking back 10 years from this writing, in a study conducted by Johnston, O'Malley, Bachman, and Schulenberg (2013), it was reported that a steady decline in marijuana abuse ended, and there was evidence in the study that indicated an increase that started in the mid-to-late 2000s. For daily use the increase for 12th graders, which would be the targeted area for incoming freshman, rose from 5% to 6.5% in the same period. A fact described in a *Monitoring the Future* study

sponsored by The Institute on Drug Abuse and conducted by Johnston et al. (2013), which focused on the two years previous to survey, 12th grade students saw a rise in marijuana use as high as 36.4% (p. 26). This behavior limited students from achieving their maximum potential, and also increased the dropout rate. To determine the overall effect of substance abuse, Johnston et al. (2013) conducted surveys starting in 1975. Just looking at the 12th grade students overall assessment indicated that the use of marijuana had increased by 0.3% from 2012 (Johnston et al., 2013, p. 48). This indicated that incoming freshmen were more likely to participate in substance abuse, based on data retrieved from the *Monitoring the Future* survey (Johnston et al., 2013).

Trends in College Age Students

In a survey conducted by Johnston et al. (2010) covering the years 2002 to 2010, it was estimated that 22.6 million Americans aged 12 or older used some form of illicit drugs during the period prior to their survey interview. Of those surveyed, marijuana numbers were estimated to be at 17.4 million, which was the largest number of any other illicit drug examined in their study (Johnston et al., 2010). When it came to age, the highest rate of drug use was among those individuals aged 18 to 20, at 23.1% followed by those aged 21 to 25, at 20.5% (Johnston et al., 2010). This would be the age at which individuals were either entering the work force or enrolled in institutions of higher learning. It was remarked that once they passed the age of 26, there was a decrease in the use of illicit drugs. One reason given was, as students leave college and enter the workforce, they tended to find that most companies required drug screens prior to employment, and being absent from their

constant peer group from college made the use of drugs less appealing. Another reason was the young adults were more afraid of being arrested and charged, which could result in a permanent entry on their police records (Johnston et al., 2010).

Although alcohol was still a major concern, the largest psychoactive drug used by college students was marijuana, which increased over the few years previous to survey. In a study conducted by Pinchevsky et al. (2012), surveys taken by over 1,200 college students in 2011 indicated that as many as one-third abused marijuana at least once before entering the college scene. Supporting this information, a study conducted by Johnston et al. (2011) for the National Institute on Drug Abuse, titled *Monitoring the Future*, reported alcohol use as decreased between the years 2010 and 2011, while the use of marijuana increased.

In a study conducted by Johnston et al. (2011), trends in substance abuse for marijuana increased to more than 7% for 12th grade students. With 22 million new freshman in 2011, that would equate to roughly one and a half million incoming freshman as current users (Johnston et al., 2011). Research dictated that colleges and universities should plan for the increased use of illegal substances as the policies and regulations continued to change.

In a study conducted by Stewart and Moreno (2013), their research supported the earlier findings of Rimsza and Moses (2005) where trends in substance abuse for marijuana had increased for the following reasons; a sense of freedom from being out from under their parents' supervision, accessibility to marijuana, and the perception that they could blend in to the normal student body without being noticed. Some statistics included in this study identified 15.7% of the students survey had

used marijuana before entering their freshman year, and after their first year of college that number increased to 46.2%. It was found through research that the individuals surveyed believed that marijuana was less dangerous than tobacco and supported the national increase of use by 18 to 25 year olds (Stewart & Moreno, 2013). It appeared that from 1975, just above 40% of those surveyed felt that smoking marijuana was harmful to the user. There was a sharp increase during the 1990s to just below 80%, and in 2011 that number again dropped to just under 40 % (Stewart & Moreno).

In a *Monitoring the Future* survey (Johnston et al., 2013) spanning approximately 25 years of surveys, the trends and annual usage for substance abuse in 8th, 10th, and 12th grades saw an increase in the mid-1970s averaging just above 50%, to a sharp decrease in the early 1990s to just above 20%. There was another sharp increase in the late 1990s to around 40%, and this remained steady within 10 percentage points of this report of data gathered in 2012 (Johnston et al.). Another figure by contrast of the percentage of ‘great risk’ for regular use was the opposite of the percentages for annual use. As the percentages for annual use increased, the percent of perceived risk decreased. This was evident throughout the report (Johnston et al., 2013). Percentages were similar for disapproval of use, but by contrast, the percentage of individuals who needed or had knowledge, access, or knew someone who could secure some form of illegal substance remained high at around 80% (Johnston et al.).

A residential student living in campus housing tended to abuse alcohol or illicit drugs more than a student that commuted to campus for study (Isensee, 2010). In a thesis

written by Isensee (2010), titled *Do High School Environments Predict College Drug Use Patterns,* she contributed that an increase in marijuana use by college students based on the strict curriculum design in high school as regimented was different than in college curriculum, because students in college set their own schedules based on preference (Isensee, 2010). She made this assumption based on research obtained by Fromme, Corbin, and Kruse (2008). However, Fromme et al. (2008) suggested that behavior risks would have little change during the transition from high school to college if behaviors were already established in high school. Research indicated that students leaving high school and going to college had about a one-in-three tendency to gravitate toward an increase in drinking and the use of illicit drugs. The percentage of high school students who pursued some form of higher education increased substantially in the 10 years previous to survey (Snyder & Dillow, 2012).

Traditional Education Approach

Research indicated that most universities and colleges used what was called the traditional educational approach. Universities provided students with information about the hazards of alcohol and drug abuse by posting flyers, and talking about the hazards of alcohol and drug use in First Year Experience classes. According to a research study conducted by Botvin and Griffin (2004), some key factors for use included social, personality, biological, and developmental issues. Over the 20 years of research previous to their writings, concerning preventive measures, it was determined that risk factors for substance abuse started at an earlier age and subsequently drove preventive designs, which started targeting middle-school years. One key element of design was placed on

social development, because research indicated social placement and acceptance was the strongest factor in the use of illicit drugs (Botvin & Griffin, 2004).

The majority of schools that used the educational approach focused primarily on areas which consisted of distributing literature, conducting special speaker series with subject matter expertise, and having their incoming freshmen class watch short films (Botvin & Griffin, 2004). Some universities brought in law enforcement personnel to discuss the legal issues surrounding the use of drugs and the penalties students could face for distributing or possessing an illegal substance. This approach to prevention targeted those that might fall into the category of students who portrayed poor social or limited personal skills (Botvin & Griffin, 2004).

Drug Abuse Prevention in Higher Education

Included in the study by Botvin and Griffin (2004), the Life Skills Training Program (LST) consisted of a multi-dimensional approach to prevention and was considered the best program in use at the time. Research indicated that students who received the LST program showed a 50% decrease in the use of drugs, and the demographics as to where a student went to school or what geographical or ethnic background they had was of little relevance (Botvin & Griffin, 2004). Researchers indicated that by knowing the statistics of this study, colleges and universities could design their preventive education programs in a more targeted manner and be able to better provide services to students who were in need (Botvin & Griffin, 2004).

Retention Philosophies

Retention in higher education was an ongoing issue for universities for many years (Williams & Butler, 2010). In a study conducted by Hanover Research (2011), 13

universities were evaluated on a number of techniques used to improve retention. This report was presented in two parts; one was to address the literature regarding retention best practices, and the second was to determine the most effective programs, based on a national survey. All universities evaluated were public universities with similar demographics and student structure.

As with most colleges and universities, private or public, in the business of being profitable and educating young minds, there seemed to always be the persistent struggle for retention. Komives and Woodard (2003), in a book titled *Student Services, A Handbook for the Profession*, discussed the importance of understanding what the demographics or makeup of a specific student body presented. There were a number of reasons mentioned in an article written by Lotkowski, Robbins, and Noeth, (2004) that supported only two categories to observe.

Most universities incorporated the philosophy of focusing on retention of students and providing positive influences to keep them engaged in moving towards degree progression. In an article written by Alarcon and Edwards (2013), the researchers tried to assess individual factors that might indicate predictors that would determine university retention. As with most universities, students provided revenue in order to maintain operational and academic progress. One hypothesis in their research indicated that they would be positively associated with retention. Within this hypothesis, they indicated that conscientiousness played a major role in academic success when students were asked to cope with taking tests, handing in assignments, and determining grades (Barrick, Mount, & Judge, 2001). It indicated that students who displayed more responsibility and self-discipline were more likely to stay in school and be successful. This study had a sample

of over 580 freshmen students that were 65% female and an average age of 19. The ability of each student was assessed by the ACT standardized test score. They used a typical five point Likert–type scale with reliability of 0.76 grades (Barrick, Mount, & Judge, 2001). Retention was simply determined by whether a student enrolled for academic credit in each term. The overall consensus for the study indicated that the two most relevant factors in retention were motivation and ability grades (Barrick, Mount, & Judge, 2001). This was in contrast to a study conducted by Zyphur, Bradley, Landis, and Thoresen (2007), as their research predicted motivation was the most important element in retention.

Soria and Stebleton (2012) conducted a study in relation to the different social and economic background between the first–generation and non–first–generation undergraduate students. In this study the researchers wanted to establish that the non-first-generation student typically had parents who attended college and the first-generation students were less likely to attend college, and the first-generation students were typically identified as minority, working-class, low income in demographics. Areas of analysis in determining the hypothesis that first-generation students had a lower retention rate included race, gender, grade point average, social class, a sense of belonging, and campus climate. There was evidence in the report that indicated a substantial difference between first-generation and non-first-generation students in almost every academic measure in the study. As with the researchers' first inclination, the first-generation students tended to score lower than their non-first-generation peers within that first year. Within these results it became apparent that universities needed to develop

enhanced support services targeting learning and developmental success first generation students (Erisman & Looney, 2007).

"The success of any college depends on its ability to retain its students" (Archer & Cooper, 1999, p. 13). In an article written by Thompson and Prieto (2013), advising was a major factor in retention, as university advisors were targeted as individuals that could influence students and provide direction for success. Students who were dissatisfied with their advisors typically disengaged because of the non-interpersonal relationships between the student and advisor (Schlosser, Knox, Moskovitz, & Hill, 2003). In a survey conducted by Ableman and Molina (2001), it was determined that advisors needed to provide the time to engage their advisees and bring them into the fold as feeling they were important.

In an article written by Siegel (2011), he discussed the efforts that universities must put forth in best practices was an ongoing and ever-moving target. He remarked that retention was a campus effort and must be designed to include all elements of college life, to include administration, faculty, staff, and athletic programs. Those universities that seemed to be successful took this approach. Another item discussed was the ability to record and assess why students left the university. Those reasons included financial, social, and curriculum factors. He continued to say that no matter the efforts, some students were going to leave, and in some cases that could be a good thing (Siegel, 2011).

An article written by Smith and Zagurski (2013) explored an area that some colleges might not feel was one to focus on retention. Each university had a different standard as to who was invited into the honors program. Those variables include ACT scores, assessment on writing, and reference letters. As with the study, there were no

single factors that related to student retention for incoming students regarding the honors admission process. It was noted that by increasing the requirements, such as moving the high school GPA from 3.25 to 3.5 and placing more weight on that rather than the ACT score for admission into the honors program, students were more successful and increased the rate of retention (Smith & Zagurski, 2013). Within each category there were specific elements addressed as contributing factors. Within the academic category, it was mentioned that most universities or colleges modeled their efforts to improving grade point averages and encouraged social engagement, modeled after Tinto's (1975) Theory of Student Departure.

In a study by Tinto (1975) the researcher defined the term 'dropout' in two specific categories. The first being a student that was registered for classes and dropped out of a designated college or university prior to degree completion. This student was also what most admissions departments reported on their statistics. The second category of dropouts were those students who never go back to school to earn a degree. This research led Tinto to look at the more specific reasons a student would drop out of school, such as socialization, peer pressure, and institution fulfillment (Tinto, 1975).

Tinto's 1988 research was directed at determining whether students who received pre-college education or higher education integration were more successful than those who did not. Tinto (1988) suggested the more involved students were in engaging institutional commitment, the more successful they were at staying in school. Universities that adopted programs such as First Year Programs and Supplemental Instruction techniques reported an increase in retention. A study by Ishitani and DesJardins (2002) supported this process.

The Capital Hanover Research Project (Hanover Research, 2011) spent most of its research dedicated on what academic programs each University or college had to offer. A large percentage of the universities in this study used the following programs as a form of retention, including initiatives that might enhance graduation persistence. Most universities targeted their first year students and introduced services that could be used throughout their academic career.

One program of particular interest encouraged new students to enter a summer program designed to help them develop skills and tools necessary to become successful prior to officially starting the freshman year (Hanover Research, 2011). This study noted there were five specific categories identified as affecting student retention. These categories included: personal, social, academic, life issues, and institutional issues.

In the personal category, students felt lost, stressed, developed unrealistic expectations, or the institution did not fit their needs. The social category was easily identified by students feeling alienated, isolated, withdrawn, and very little interaction with staff or faculty (Hanover Research, 2011). The academic category was identified when students displayed weak study skills, very rarely met timetable for assignments, received a low grade point average, and exhibited a lack the self-discipline to pursue a specific goal. Life issues were probably the easiest to determine because they dealt with financial circumstances, balancing time between job in school, personal issues, health issues, and the institution not necessarily offering the academic path to meet student career goals (Hanover Research, 2011). The last covers institutional issues indicating no assistance for the student, negative feedback regarding assistance from faculty or

administrative offices, inexperienced professors, and technology that was outdated (Hanover Research, 2011).

According to reported statistics, one would assume that one in four college students were frequent users of marijuana (Simons & Carey, 2006). In a study conducted by the National Institute on Drug Abuse called *Monitoring the Future* (Johnston, Bachman, O'Malley, & Schulenberg, 2012), students from high schools around the country were given a survey on marijuana use in categories of use for the year previous to survey, use for the past month, and use for the week previous to survey. This survey targeted students from the 8th, 10th, and 12th grades respectively. It should be noted that the results were driven by a trend in increased use of marijuana reported to the Department of Education. In respect for other studies conducted during this same period, *Monitoring the Future* provided statistics over a specified change that happened over time, while others concentrated on a specific data set that only covered a shorter period. Some statistics mentioned in the study were the increase in self-reported use among 10th-grade students. Numbers indicated that this group of participants reported during the previous 30-day use of marijuana had doubled, and for 12th grade students the number had tripled. Marijuana studies had been conducted since the 1970s on college campuses around the country. Most studies concluded the same results that in the mid-1980s the use of marijuana had leveled off. In a study reported by the National Institute on Drug Abuse, there had been an increase in the use of Marijuana by 12th grade students from 32.6% in 1992 to 42.6% in 2008 (Johnston, O'Malley, Bachman, & Schulenberg, 2009, p. 37). Some reasons for the increase were likely due to the social acceptance of marijuana and the perceived thought that it did not harm one physically. It could also be said that

entering college for the first time and not being under parental control was another important factor, as students began to experiment and participate in prohibitive behavioral actions (Johnston, et al, 2009). The study also mentioned there are 12 million students who attended colleges and universities around the country, and if we looked at the 18% increase in the use of marijuana over the 10 year study beginning in 1990, that result indicated over 256,000 students were entering their college years having abused the drug sometime in the year previous to college entry.

Testing the Norm Perceptions

Numerous studies were conducted to determine the impact of perceived social norms of excessive alcohol consumption on college aged students (Pollard, Freeman, Ziegler, Hersman, & Goss, 2000). However, little research was conducted within this vein to determine relationship between marijuana and other such gateway drug use on the perceived impact on social norms. In a study conducted by Perkins, Meilman, Leichliter, Cashin, and Presley (1999), over 100 college students completed a questionnaire that asked what they perceived the frequency in which the ‘average college student’ used drugs and alcohol and another questionnaire to describe themselves. The results of the study showed that the participating students perceived the volume of drug and alcohol use among their peers to be much higher than their own self-described use. This led to the assumption that using drugs and alcohol was acceptable and normalized within a college campus. Thus, Perkins et al. (1999) suggested that prevention programs, such as drug awareness and educational training were key in combating this perception of norm.

To address the gap in the perceived impact of marijuana usage on a college campus, Page and Roland (2004) conducted a study of “a higher prevalence of current

marijuana use than is reported nation-wide" (p. 72). As with Perkins et al. (1999), college-aged students, both male and female non-athletes, completed a questionnaire defining their perceptions of self-use, along with indicating what they perceived as the norm among other college aged peers. Findings provided the assumption that drug use was higher than self-reported use and those that felt use of marijuana was within the normalized campus culture were more likely to use marijuana, as well (Perkins et al., 1999).

Student Athletes

Athletes had for years been subject to studies in trying to determine a trend in alcohol and illicit drug use. A recent study conducted by the National Collegiate Athletic Association (NJ1) (2010) reported that they had reached out to 991 Division I, II, and III institutions to conduct a survey on eight different categories of substances. Of the 991 institutions asked to participate 64.3%, or 637 schools participated. The study covered a wide range of variables, including each division, team, ethnicity, and the reasons for use. Of the eight substances queried in the study, alcohol was still the most abused substance. It stated athletes tended to stay away from recreational drugs and were tempted to use the substances that could enhance performance. It was significant that the largest percentage of athletes reporting substance abuse were identified as Caucasian.

An issue discovered in the study conducted by the NCAA (2010) was the testing agency only tested at Division championship events and randomly tested Division I and II football and track and field during their seasons. Division III was only tested during Championship events. This left the institutions with the responsibility to randomly test their athletes during season. The percentages of Division I, II, and III institutions that

provided a substance abuse survey were Division I at 75%, Division II at 50%, and Division III and 41%. Schools that did not provide either testing or education about the abuse of drugs needed to examine their policies in order to determine what level of use was on campus. The punishment for testing positive for a NCAA-banned substance could have a harsh effect on institutions as individuals were suspended for 365 days, and if law enforcement officials were involved financial aid could be suspended.

According to researchers Johnston et al. (2013), in a *Monitoring the Future* Survey sponsored by the National Institute on Drug Abuse (2010), in a period from 1993 to 2013, 12th grade students showed an increase in substance abuse starting in 1997, specifically related to marijuana use. Shortly after, there was a steady decline until 2007 when use started to rise again and continued to rise to the time of Johnston et al.'s writing. When asked about the risk of using, these same seniors indicated that over the previous ten years the perception of risk involved with substance abuse declined. Several reasons factored in this response: Marijuana had over the previous few years become decriminalized in a number of states, making the penalty for possession for use a lesser offense, medical marijuana was approved in over 20 states, and marijuana use for recreational purposes was legalized in two states. So, the climate was changing and the acceptance of marijuana was becoming widespread (Johnston et al., 2013).

When seniors were asked about the availability of marijuana, greater than 80% indicated that marijuana was 'fairly easy' or 'very easy' to obtain (Johnston et al., 2013). Marijuana seemed to be the drug of choice since the beginning of the *Monitoring the Future* Surveys began in 1975. With the new laws starting to decriminalize its use, it was likely to be more of an issue for colleges and universities to deter its use.

Marijuana use rose over the two decades previous to Johnston et al.'s study among high school students and was considered the second most abused substance among college students (Johnston et al., 2013). According to research conducted by Gledhill-Hoyt et al. (2000), one-third of college-aged students reported using marijuana while attending college. It was also noted that of those, one in three became habitual users during the same period.

In a study conducted by Johnston, O'Malley, Bachman, and Schulenberg (2008), during the period of their study covering a span of 21 years, it appeared there was an increase of illicit drug use among students ranging from the eighth grade to college. It also stated that the sharpest increase during the five years previous could be specifically attributed to college age students. The findings indicated that illicit drug use among students in grades 8 through 12 enjoyed a steady decline, but college student use held stable since 2004 (Johnston et al., 2008).

For students entering their college years, it was a time for experimentation, postponing adult responsibilities, and wandering through a sense of new-found freedom. Substance use during this phase of life could be contributed to a number of issues, such as transitioning from high school to college, facing new academic and societal demands, or as a way to just cope with everyday college life (Schulenburg & Maggs, 2002). This report validated the perception that marijuana was widely used among college students. Out of 119 colleges used in this study conducted by (Gledhill-Hoyt et al., 2000), two-thirds reported an increase in drug use during the period from 1993 to 1999.

Problems Associated with Substance Abuse

In a report by Chen and Kandel (1995), the authors reported the age for the most abuse was from individuals between the ages of 19 and 22, which were the typical college years for students. Due to these results, it was essential that universities and colleges develop strong preventive and intervention programs. In a study conducted by Rogers (1995), there were four processes the researcher discussed which were considered an important factor for success. The first process was dissemination, which covered the media awareness. Handouts, flyers, and other awareness programs were designed to get information to the students about the hazards of illicit drug use and the consequences that might occur (Rogers, 1995).

The second process explained how colleges needed to adopt a program, both prevention and intervention, and be fully committed to the process of allowing the program to be assessed over a period of time, regardless of what critics or outside forces had to say. Notifying administrators, staff, and faculty would diminish most of the resistance if the plan was sound (Rogers, 1995).

The third process was proper implementation. If a college decided to create an intervention program, there were key factors that must be considered. Legal issues in the design of the program to insure students required to participate were protected under the privacy act, testing conducted in a reliable and verifiable facility, and the data recorded must be maintained in a secure location within the college facilities (Stokols, Allen, & Bellingham, 1996). Surveys conducted by *Monitoring the Future* (Johnston et al., 2012) were used to determine if there was a significant difference between college and non-and college individuals use of illicit drugs. In nearly all categories of drug use, college

students displayed a lower rate of use than their same-aged non-students. A key component of this survey indicated that college students' rate of use using inhalant forms of illicit drugs, such as marijuana, heroin, and hallucinogens was similar to high school graduates their age. Another peculiar statistic was that high school seniors going on to college who were somewhat equal in use to their same-aged non-student quickly exceeded their counterpart after arriving at college. Rationale dictated that once in college, students remained in a status of freedom and could experiment with illicit drugs. As with non-students, after graduation, they went on to get married, join the military, or found jobs, thus eliminating the freedom to participate in alcohol or drug abuse (Johnston et al., 2012).

Most students that graduated from high school and moved on to college were normally at the age of 18. This seemed to be the age where students first tried marijuana, with the highest use occurring between the ages of 19 and 22 (Chen & Kandel, 1995; Wagner & Anthony, 2002). Forty percent of students offered the opportunity to use marijuana during the first year started using within that first year while 65% of that same group at least experimented with the drug.

Possible Administrative Barriers

One of the main factors in the success of any preventive or intervention program was the support from the administration. Research indicated that alcohol was the leading substance abused most frequently on college campuses, with illicit drugs coming in second. The struggle was to find balance in the approach when designing a prevention and intervention policy for the university. Financial and human resource factors needed

to be taken into consideration and must be a component during the design phase (Stokols et al., 1996).

In a study regarding the effects of smoking marijuana on brain perfusion and cognition by O'Leary et al. (2002), using imagery tomography, it was noted that there was a 12% increase in correlation with the ratings of intoxication. A second study was conducted using an independent list of 12 individuals who stated they were recreational smokers of marijuana. Unlike the initial study by O'Leary et al. (2000), a placebo marijuana cigarette with THC removed was added to the research. The study used 12 individuals, six male and six female, each indicating that they did not smoke marijuana more than 10 times per month (O'Leary, 2012). Individuals were then given either an actual marijuana cigarette containing THC or a placebo prior to being placed in the PET and MRI processing machine. Test results indicated an increased heart rate and blood pressure and showed some change in the cerebral affect in the brain. Heart rates increased roughly 40.6 beats per minute immediately following ingestion of the marijuana (O'Leary, 2012). One difference in the findings was that the increase in blood pressure when the subject was in the supine position and increased to hypotension when standing (O'Leary, 2012).

Aberson and Beeney (2007) conducted a test using the Implicit Association Test to determine affect reliabilities of substance abuse. It was noted that the effects of marijuana use were widely disputed in research literature (Hart, Van Gorp, Haney, Folton, & Fischman, 2001). An interesting fact determined during the research was the effect marijuana had when the participant was conducting mechanical tasks. It was noted that even though the substance might slow reactions, it did not necessarily affect

accuracy. It was also noted that this particular measure could have been a flaw in a design of the Implicit Association test. The effectiveness of this test was important to determine accuracy in light of the report that marijuana was still the most widely used drug in America. Johnston et al. (2005a) reported in a 2003 study that 4.7% of U.S. college students smoked marijuana on a daily basis (p. 239).

This particular study included 581 college students from a university in the Western United States (Johnston et al., 2005a). All students provided consent forms for their participation. Of those initial 581, due to self- reporting issues and other irregularities, the final number of participants dropped to 567: 67.9% were women and 32.1% were men. There was no reliable difference in age between users and nonusers (Johnston et al., 2005a). Some findings were problematic in the design because subjects were asked to start at a specific task, which would require more cognitive resources than on to easier tasks. As an example, subjects who were exposed to harder tasks had difficulty in completing those tasks and scored much better as the tasks got easier (Klauer & Mierke, 2005). An additional finding or recommendation was that future research involving the use of the implicit association test be altered either by design or by sample selection.

As with all illicit substances, marijuana continued to be the most popular drug and continued to be the most used drug in America (Johnston, O'Malley, Bachman, & Schulenberg, 2006; Network, 2009). Numerous studies were conducted to determine the effect of Tetrahydrocannabinol (THC) in reference to cognitive thought and memory loss. Smoking marijuana created an intoxicated effect, as did a number of other intoxicants.

Some symptoms related to smoking marijuana included euphoria, altered time sense, drowsiness, confusion, and anxiety (Hall & Solowij, 1998).

Researchers indicated that smoking marijuana could change the path in which sensory information was received and translated. Findings also indicated the use of marijuana in the long-term could produce changes in an individual's brain that would relate to long-term use of other major drugs. In a study of college students, it was discovered that some skills referencing attention, memory, and comprehension were impaired among students to indicate heavy marijuana use. It appeared there was still some diminished capacity, even after being evaluated 24 hours later. In this study, students were given several tests measuring the aspects mentioned. When comparing heavy to light users, heavy users made the most mistakes and had more trouble with attention. These findings suggested that heavy users would be more likely to have some alteration in brain activity (Hall & Solowij, 1998).

There were several studies that tried to determine if there was a direct or indirect effect between drug abuse and educational attainment. These studies specifically concentrated on an individual's ability to concentrate and the measurement of cognitive thought. One major obstacle remained in identifying causal effect due to most studies concentrating on students who they knew for fact abused drugs. There were other factors that related to these studies that included demographics, family income, parental involvement in furthering children's education, and the specific character of each individual. It has been said there is a correlation that is measurable when trying to determine an individual's academic success and drug abuse. In a study titled "The effect of alcohol and drug consumption on academic performance: A treatment effect

evaluation" conducted by Di Pietro, Page, and Silva Goncalves (2012), a systematic approach was used, starting with survey questions about the abuse of different drug substances in the respondent's lifetime, in the previous 12 months, and in the previous 30 days. The survey was designed to measure student achievement on standardized tests containing the following disciplines: Sciences, Math, History, and Reading (Di Pietro, Page, and Silva Goncalves, 2012). The results of these tests were somewhat biased due to the selected random draw from the population that provided a like sample for those identified as drug abusers. It appeared that this particular study, after using the specific variables that the data obtained were not supporting statistically significant results (Di Pietro, Page, and Silva Goncalves, 2012). The study indicated that according to its measures, it could not be determined that substance abuse had a measurable impact on academic performance.

In an article from *Livestrong* by Ray (2013), nearly 30% of all U.S. citizens above the age of 12 smoked marijuana sometime in their lives. In the category of grades, she indicated citing a report by the Higher Education Center for Alcohol and Other Drug Prevention, that students who smoked marijuana were less likely to spend the required time studying in order to achieve good grades. She continued to say that these students spent most of their time socializing at parties and spent little time concerned about their future (Ray, 2013). She also indicated that 90% of college students who smoked marijuana also drank and/or smoked cigarettes. As with any addictive substance, the virtual high attained by students smoking marijuana often experienced difficulty speaking and listening which made it substantially harder for them to be able to comprehend the material necessary to be successful in class (Ray, 2013).

In a research report conducted by Bell, Wechsler, and Johnston (1997), binge drinking considered high-risk behavior in college students suggested that similar factors in relationship to behavior were found in those that used illicit drugs. This study used a large sample of students that attended four-year colleges around the country. Students studied were undergraduate and included both male and female subjects. Both public and private schools were represented along with and suburban areas. Each school was presented with a 20-page survey inquiring students about their illicit drug abuse (Bell et al., 1997). Questions on the survey were primarily alcohol-related, but a number of questions referred to illicit drug use. The response rate varied from school to school and averaged around 59% total. As with typical questionnaires, information requested was primarily focused on the last 12 months (Bell et al., 1997). An interesting fact reported in the research was that students in schools that had an enrollment of more than 10,000 students were 1.30 more likely to engage in marijuana use. Colleges that were coeducational were 1.55 more likely to use marijuana, especially at all-female schools (Bell et al., 1997 p. 574). One item of interest in this survey was the finding that students who maintained a 3.0 GPA or higher were less likely to use marijuana than those who could not maintain a 3.0 GPA. Part of this would relate to the fact that students who had more than two sex partners in the past month were more likely to use marijuana than those who did not and those associated with marijuana spent less time studying (Bell et al., 1997). This study used 11 characteristics to try and determine if there was significant behavior that would relate to marijuana use. One that was predictable was in students who felt that parties were important to socializing was promoted; the percentage of students who used in this category was relatively high. The second, which most studies

neglected to examine was religion, where most students reported that after partying, religion was an afterthought.

Drug Abuse Prevention

In a study conducted by the Bureau of Labor Statistics (2003), students who had decided not to attend college abused marijuana more than those who were planning to attend. Marijuana use among college students between 18 and 22 years of age tended to increase somewhat faster than for those who did not attend (Johnston, O'Malley, Bachman, & Schulenberg, 2000). It appeared that rates started to level out between the two groups after three or four years of college (Bachman, Wadsworth, O'Malley, Johnston, & Schulenberg, 1997). This could put any college at an advantage if they could provide services to prevent or intervene student substance abuse.

Students who attended college rarely acted as adults, and normally postponed any real challenge of being responsible. Most students were involved with making new friends, getting their academic patterns in place, and trying to fit in the new social scene. With these demands, the opportunity for substance abuse could prove to be constructive and destructive at the same time, as students tried to find their place (Schulenberg & Maggs, 2002). Substance abuse, or experimentation, was considered the norm once students got to college, but in the transition after graduation where many sought full-time employment, the abuse did decrease somewhat (Bachman, O'Malley, Schulenberg, Johnston, Bryant, & Merline, 2002). Studies conducted by researchers Gledhill-Hoyt et al. (2000) and Johnston et al. (2005a) reported that college aged students over the course of the study that 28% to 34% used marijuana and 13% to 34% used some form of illicit drug other than marijuana. The use of marijuana increased over the few years previous to

study as the perception of marijuana was more acceptable and states were looking to legalize its use for other than medical purposes. College students and college-aged individuals were also at risk for the development of substance use disorders and negative consequences related to drug use. Approximately 8% of 18-year olds met criteria for marijuana dependence and 3% met dependence criteria for illicit drugs other than marijuana (Young et al., 2002). Marijuana use was related to increased risk for accidents and injuries, a leading cause of death in this age group (U.S. Department of Health and Human Services, (2002). Similarly, marijuana was the most frequently reported substance in drug-related emergency room visits among young adults, and this rate was increasing for both youth and young adults (*Overview of Findings*, 2003). Additionally, in 2001, young adults were disproportionately represented in visits involving club drugs (i.e., MDMA/ecstasy, GHB, LSD, and methamphetamines), and visits involving LSD and MDMA tended to be highest among those 18 and 19-years of age (*Results From the 2001 National Household Survey*, 2002).

Unfortunately, a more serious concern could be raised for those who used substances daily. In 2003, 4.7% of college students used marijuana daily (30-day prevalence rates), and that rate was higher for males (6.3%) than for females (3.7%) (Johnston et al., 2005a, p. 53). Research indicated risk for initiation of marijuana use peaked around the age of 18, when most students are transitioning into college (Chen & Kandel, 1995; Wagner & Anthony, 2002), and highest use occurred between the ages of 19 and 22 (Chen & Kandel, 1995), during the traditional college years. It was estimated that of 18-year-olds given their first opportunity to use marijuana, over 40% began using within one year, and over 65% would eventually try marijuana (Van Etten, Neumark, &

Anthony, 1997). The time from first use of marijuana to regular use occurred typically within one year for adolescents and young adults (Crowley, Macdonald, Whitmore, & Mikulich, 1998; Van Etten et al., 1997). The median age of first opportunity for drug use for hallucinogens and heroin was 18 for males and 17 for females, while for cocaine it was 20 for males and 19 for females. Fifty percent of individuals with their first opportunity to use hallucinogens (36% for cocaine, and 17% for heroin) would make the transition to first use within one year (Van Etten & Anthony, 1999). As these data suggest, first year college students appeared to be at particular risk for initiation and escalation of marijuana and illicit drug use and consequences. Gledhill-Hoyt et al. (2000) found more than 18% of first year college students reported marijuana use (i.e., using in the past 30 days), and first-year students had the highest prevalence of past 30-day use compared to other college students. Students who used marijuana were also more likely to use other illicit drugs, smoke cigarettes, and drink heavily (Gledhill-Hoyt et al, 2000).

In addition, although non-college bound 12th grade students were inclined to use marijuana more than their college-bound peers, marijuana use for college students between 18 and 22 increased faster than for non-college students the same age (Johnston et al., 2000), and rates became equal within three-to-four years of high school graduation (Bachman et al., 2002), suggesting college may have been a unique opportunity to prevent or intervene with substance use. College represented a period where students typically postponed adult roles and responsibilities (e.g., full-time work, marriage, parenting) while working on normative developmental tasks (e.g., making new friends, developing autonomy). College students were faced with many new interpersonal, academic, and societal demands and expectations, and substance use may have served

both constructive, as well as destructive, functions for students (Schulenberg & Maggs, 2002). Substance use may have provided students with an opportunity to facilitate the transition to college e.g., facilitating interpersonal relations or feelings of maturity, or helping to cope with new demands and expectations. Often viewed as a rite of passage for college students, drug experimentation was seen as normative by many students (Kilmer, Walker, Lee, Palmer, Mallett, Fabiano, Klauer, & Mierke, 2005); Perkins et al., 1999). Many students who experimented with substance use during college ceased or reduced use once they left college and took on full-time adult roles (Bachman et al., 2002). However, substance use could have many negative consequences for the college student, which may have inhibited the successful transition through college and young adulthood and possibly created lasting consequences on the individual and society. Marijuana was one of the most widely used and abused illicit substances by adolescents, young adults, and college students in the United States (Johnston et al., 2005a; U.S. Department of Health and Human Services, 2002); however 34% of college students and young adults (19 to 28-years old) used an illicit drug other than marijuana at least once in their lifetime (Johnston et al., 2005a, p. 230). In several studies, 29.2% of young adults reported using marijuana in the past year and between and 18% used illicit drugs other than marijuana in the past year (Gledhill-Hoyt et al., 2000; Johnston et al., 2004, p. 42). Based on the *Monitoring the Future* study (Johnston et al., 2005a), prevalence of illicit drugs for college students decreased from the 1980s to the early to mid-1990s, but this trend then reversed until a leveling off in 2002. Similarly, Gledhill-Hoyt et al. (2000) reported that rates of marijuana use in the 30 days previous to survey increased by 22% between 1993 and 1999 and that marijuana use increased in two thirds of a sample of 119 colleges. A

2005 survey of college students indicated that the most prevalent drugs used in the prior year (other than marijuana) were amphetamines (12.3%), hallucinogens (11.0%), cocaine (8.8%), and MDMA or ecstasy (8.3%) (Johnston et al., 2005b, p 232).

Effects of Cannabis on Neuropsychological Awareness

In a study conducted by the University of Duke (1972, 1973) following individuals from birth until the age of 38 with periodic interviews conducted during this period starting at the age of 18, individuals within the sample reported having more cognitive problems with persistent cannabis use. Of those that reported persistent cannabis use, cessation from cannabis did not restore neuropsychological functions. Most of the study was used to highlight how important prevention would be if targeting adolescents shortly before the age of 18 (Meier et al., 2012).

This editor of this study, Posner, wanted to know whether research indicated that the more persistent the cannabis use, the bigger decline in IQ. There was very little significance in persistent regular cannabis use and persistent dependence. Posner went on to identify that statistics showed a greater decrease in IQ among the sample that was dependent on cannabis, rather than those that used cannabis regularly. Posner continued to discuss limitations of the study, stating that survey questionnaires primarily targeted past year cannabis use which was self-reported, but had no external validation. Part of the issue was subjects within the sample were said to have underreported because of issues targeting illegal substance use. He went on to say that more research was needed in order to prove neuropsychological impairment was evident. He also determined that more research would be needed in order to test the theory that cessation from cannabis could reverse the effects of neuropsychological impairment (Meier et.al, 2012).

An article in the *Journal of Child and Adolescent Substance Abuse* by Page and Roland (2004) targeted misconceptions and prevalence of drug abuse. The researchers' survey was conducted at the University of Idaho where questionnaires were given to incoming freshmen, and in order to determine the first subject group they selected the English 101 and English 102 spring semester classes. The second subject group was identified as intercollegiate athletes made of a sample of 258 athletes representing 11 intercollegiate teams. Again, these items that assessed self-reporting marijuana abuse came directly from the Core Alcohol and Drug Survey. The same perceptions were used earlier in a study conducted by (Page & Scanlan, 1999). In this study the non-athletes reported prevalence of use within the past month for marijuana at 27.7% for males and 19.0% for females. Student athletes reported 17.1% for male and 13.5% for females. Of the student athletes reporting, basketball recorded the highest at 28.6% followed by football at 21.2% (Page & Roland, 2004, p. 66).

Retention Trends

When trying to find information on retention rates based on social, academic, and motivational integration, there was little information and very little research based on this specific criteria. In a study conducted by Allen, Robbins, Casillas, and Oh (2008), the research was based on sampling over 6,000 students representing more than 24, four-year universities. The specific target was third year retention and/or transfers. Criteria for the research included college persistence, retention, transfer, academic motivation, and social connectedness. Research conducted by Allen et al. (2008) was enlightening because of the findings that turned social acceptance into a key factor determining college persistence. Using a specific database from the National Student Clearinghouse, the

researchers were able to track students to determine whether or not they actually transferred to another university or whether not they had dropped out completely. Of the sample of students gradually surveyed, roughly 64% were still at the school of original enrollment, 14% had transferred to other universities, and approximately 22% had dropped out altogether. The difficulty in this study remained that information determining the reason for students either staying, transferring, or dropping out was limited.

Conclusion

In this chapter, it was evident to the researcher that information could be retrieved regarding substance abuse. The large majority of information in this study was extracted from the *Monitoring the Future* surveys conducted by The University of Michigan. These studies were conducted using a survey questionnaire targeting students, starting in the eighth grade and ending with 12th grade that covered a span of approximately 35 years.

Additionally, several studies regarding retention offered insight into the importance of providing programming for college students to encourage them to continue to work toward graduation. A number of areas were discussed including supporting students in developing a sense of responsibility and self-discipline, considering the specific needs of first generational students, and viewing the unique demographics of a particular university. Other emphasis areas for retention focused on including all departments of the institution of higher learning, such as administrators, faculty, staff, and athletic programs.

Trends in substance abuse have continued to vary during this timeframe, and as material in this chapter described, finding solutions can be difficult and time-consuming. Most universities that were partners in the Safe Free Drug Schools Act and receiving

federal funding used the educational approach when dealing with substance abuse. This approach was primarily used as an awareness tool with very little personal interaction. University and colleges were used in the maturation and social advancement of students and paralleled their academic requirements. Most universities did not have a real feel of how many students abused some forms of illicit drugs.

There were a number of issues that provided motives for college students for use or abuse a particular substance, and being away from home and not under the constant supervision of their parents provided little resistance to peer pressure and relief from early college stress-related issues. Studies that particularly targeted college students indicated a rise in substance abuse, especially related to marijuana. This period began as students started entering their first year of college, which offered them a time of experimentation, socialization, and new-found freedom. It became apparent that the first year in college was the most crucial year in the awareness process when designing substance abuse preventive measures. Research indicated that substance abuse did have an effect on student achievement, but due to the lack of specifically targeted studies, the amount of information available was limited.

Chapter Three: Methodology

Introduction

While serving as the Dean of Students for a Midwest suburban private university, it appeared to the researcher that illicit drugs and alcohol had been on the rise over the previous few years. The policy when students were involved in illicit drug use was to simply expel them from the university. Having been a leader and having served in the military, the researcher approached the university administration with the prospect of creating an intervention program, based on his experience in the military. After some research into what other universities and colleges offered, a specific design was created to assist students in altering their behaviors and allow them to continue their studies at the university.

The purpose of this study was to determine if a substance abuse intervention program designed and administered at a four-year university would be beneficial to the students enrolled in the program and promote academic success through achievement of a higher grade point average and increased attendance, as well as contribute to an increase in retention among this category of students. Information from review of existing research indicated there continued to be substance abuse-related problems in U.S. universities and colleges. There was little information in the research that indicated a reference to substance abuse intervention rather than prevention. This study was designed to identify if there was a relationship between an intervention program and student success, based on categories of measurement identified by grade point average and attendance before, during, and after placement in the program. This study discusses the findings related to a substance abuse intervention program implemented at a private

university located in a suburban setting. The hypotheses tested allowed analysis of whether a program could influence behavior and contribute to a positive campus atmosphere by allowing students to remain in classes while being placed in a rigid substance abuse intervention program. This study was focused on the results obtained through data collected on the abuse of illicit drugs.

This study indicated, through research, the ongoing problems with substance abuse on college campuses, which programs were currently available to students, and whether there was a relationship between participation in a substance abuse program and student achievement, measured by grade point average and attendance rate. Demographic information gathered included gender, athlete or non-athlete status, age, number of months in the intervention program, and degree persistence. Participants were taken from a sample of students placed in an intervention program, and a like sample was taken from the general enrollment population through use of a database of student information based on the program-participant demographic descriptors.

The claim of the researcher in this study was that there would be a correlation between student achievements and student behaviors when placed in a university-sponsored substance abuse intervention program, while allowed to continue their education.

The Intervention

Philosophy and Mission

The university's mission was to offer values-centered programs leading to the development of the whole person, and to educate responsible citizens of the global community (University website). As part of the student development team, the researcher

determined that in order to support the mission it was imperative to design a program that would help in the development and behavior of students who used illegal substances. Policies relating to the use of illegal substances at the university supported the Drug Free Schools Act and assisted in promoting student conduct that supported the University mission.

The program evaluated in this research was designed and presented to the Vice-Present for Student Development and the President of the university. The researcher considered three years of information prior to the study to determine if there was an alternative to simply expelling university students for illegal substance abuse. As part of the university's mission to educate the whole person, the researcher designed a program that would allow students who fell into this category the opportunity to continue their education and receive counseling.

Initially, it had to be determined who would be offered the opportunity to participate in the program and which criteria would determine success. The other challenge was to design the research in such a way to allow little or no limitation in the results used to evaluate the program.

University Counselors

The university had three state-certified counselors trained in conducting intake sessions with students who were placed in the intervention program. Their responsibility was to determine if students recommended for counseling had any underlying issues related to substance abuse and to determine how many sessions of counseling may be required. This was considered an important piece to the program, as the counselors' feedback to the researcher helped in determining the length of time students would be

active in the program. Information collected by the counselors included name, who the student was referred by, assigned counselor, date of initial visit, number of visits, gender, age, and a simple diagnostic template used in determining factors related to substance abuse.

Students who were suspected of substance abuse were identified by several methods. Those methods included report by Resident Directors or other officials who conducted routine room inspections and during those inspections uncovered items that were used in illegal substance abuse, reports from local law enforcement officials in which a student was cited for possession of marijuana or drug paraphernalia, or through student self-referrals. Those students identified were sent to the Dean of Students' office, and a determination was made whether there was enough evidence to warrant a drug test.

Having students tested for potential levels of substance abuse was critical in placing students in the program. The researcher, in his role as Dean of Students interviewed personnel at test sites near the university and eventually chose a state-certified facility that met specific requirements, such as visual observation during testing and controlled, regulated results. Following student and/or parent/guardian consent, each tested student provided a urine sample at the test facility for analysis. Each sample had to meet certain pre-evaluation measures, such as the temperature of the sample and dilution, for eligibility for a valid test result. The test sample was then logged into the facility and prepared for transport to an out-of-state laboratory, where the sample was tested for alcohol, amphetamines, barbiturates, benzodiazepines, cocaine, opiates, and marijuana (personal communication, Test Site Director, July, 2009). Once the sample was

analyzed, the result would be sent to the original testing facility and logged in to records. The results were then sent to the university Dean of Students for processing.

Once the test results were returned to the Dean of Students, he would meet with the student, go over the results, and discuss a plan of action. If the student was positive for drug use, the student was required to complete an intake interview with the university counselors, be tested for substance abuse every three weeks, and sign a contract outlining the requirements which would allow the student to remain actively enrolled in the university. The program was designed through consideration of the researcher's experience in the military, where he was involved in complying with military policy by randomly testing 10% of the soldiers in his unit each month.

Success of the substance abuse intervention program at this university was determined by whether the student completed all the steps outlined in the contract. The contents of the contract are located in Table 1. Since even the youngest enrolled college students were considered as adults, the researcher designed the program to place responsibility on the participating students themselves. The students paid for the initial and subsequent follow-up tests. When they provided two negative drug screens, the Dean of Students could make the decision to take them off of the periodic testing regimen, place them on a no-notice policy, or continue regular testing. This decision was based on a collective effort between the Dean of Students and the university counselors. The no-notice policy was used to randomly select students for testing who were active in the program, as a way to ensure they remained in compliance with the program's directives.

Students placed on the no-notice test policy were randomly selected using a pair of dice and the student's last number of the university student identification number. The

Dean of Student selected a witness from the Student Development office, then conducted the procedure of rolling the dice. If the number on the dice matched an ending number from a student's university-issued identification number, the student was notified to complete the required test at the testing facility. Once the random test results were identified and returned to the university, the student would then meet with the Dean of Students to follow up. If the test results were negative, the university would reimburse the student for the cost of the test. If the result was positive, the student would be considered a program failure and released from the university immediately.

Data Collection and Instrumentation

Once a student was identified by the administration as found with an illegal substance or was suspected of substance abuse, with just cause, the student was required to take a urinalysis at the preselected accredited substance abuse testing facility. During this procedure, the student was asked to deposit a urine sample while visually observed. The sample was then sent to an out-of-state certified testing laboratory and analyzed for the presence of illegal substances, as previously listed. Results from this procedure were available after approximately four-to-seven days. Once the sample reading was returned to the test site, it was recorded and forwarded to the Dean of Students office through secure transmission. If the test was negative, there were a number of disciplinary options that could be administered, based on the severity of the originally-reported offense, up to and including dismissal from the university. If the test was positive for alcohol, amphetamines, barbiturates, benzodiazepines, cocaine, opiates, or marijuana, the Dean of Students covered the specific intervention program procedures outline in the success contract and asked the student if he or she was willing to be enrolled in the rehabilitation

program and go to the university's licensed counselors for an initial intake interview. The counselors then determined the length of time for counseling and the number of visits, based on their professional experiences. The time period a student was retained in the program was determined by the results of periodic testing levels and recommendation made by the university counseling staff.

Academic data was collected from the university main data storage program, Campus Access Management System (CAMS). The selection of data retrieved from this program met validity criteria, such as being verifiable, accurate, accessible, and a source of provision of required demographics. The criteria chosen for use in this study were grade point average, attendance, gender, athlete or non-athlete status, and grade level when placed in the program. Looking at a timeframe for collecting data, it was determined that information on the subjects should be taken before placement in the program, during participation, and after release from the program. All data from this study was used in analysis to assist in the success evaluation of the intervention program and to determine if there was a correlation between student achievement and participation in the substance abuse intervention program.

A survey was used to collect data from incoming freshmen within the first week of spring semester classes. This information was used to determine the level of the possible amount of use to be expected from future incoming freshmen classes. Data retrieved from campus incident reports and the number of calls-to-service from the local law enforcement agencies were also used as a way of measuring levels of drug use.

During the initial survey conducted with the incoming freshmen class, an introduction to the drug intervention process was discussed. During this introduction, it

was noted that the survey was strictly voluntary and that all information received in the survey would remain anonymous, with no person, other than the researcher, to view the results of the survey.

Part of the process in evaluating the overall impact of a substance abuse program was whether the data collected was sufficient in providing valuable quantifiable results. The researcher decided to use criteria accessible and factual, in order to provide validity to the study. The researcher selected grade point average, attendance, gender, age, number of months in the intervention program, and level of degree persistence. Information from each category was taken from the university CAMS for the semesters before, during, and after placement in the program. Data collected was then placed into an excel spreadsheet for future analysis.

In an article written by Gonzalez and Clement (1994), one key factor when gathering data on this topic was lack of availability, with regard to substance abuse information provided by universities and colleges. The authors attributed this to a lack of requirements mandated from leadership at universities. Not to say they felt it was unimportant, but had not directed that data be collected to determine levels of substance abuse, because gathering data did not usually lead to results.

Documentation

Table 1 displays a contract between the student and the university. It was specific in nature and provided a clear and concise binding agreement between the student and the university, which placed the responsibility of behaviors on the student.

The counseling department at the university conducted the initial intake interview to determine if any follow-up treatment or counseling was required. When consulting

with the experts in the testing for illicit drugs, it was determined that testing every three weeks would insure compliance from the student and provide cumulative data for record. It also was clear to the student the penalty for failing to follow any of the directives covered in the contract.

Table 1.

Success Contract

Success Contract

I, _____, agree to the following terms set forth by Midwest University as a stipulation of being allowed to remain enrolled. These terms are as follows.

a) Initial drug/alcohol screening and evaluation by a licensed professional.
b) Participate in any (if any) treatment or counseling program recommended by a licensed professional in a timely manner.
c) Periodic screening for illegal substance/chemicals and alcohol if under the legal age for alcohol consumption. (Every three weeks) or as designated.
d) Provide Midwest University with all related documentation and /or results in a timely manner. (Within 7 days of test being conducted)

The detection of any illegal substance/chemicals or any masking agents may result in immediate dismissal from Midwest University.

The delay of any recommended treatment and/or supply of requested documentation may result in immediate dismissal from Midwest University.

Student's Name (print) _____

Student's Signature _____

Midwest University Official _____ Date_____

Certified testing forms from the testing agency were used to validate the outcome of each specific urinalysis. This form included the normalized and elevated levels of specific drugs tested, in accordance with the testing agency's standard operating procedures, as certified by its Chief Toxicologist. One key component of this process was

to insure to the student that complete confidentiality would be enforced throughout the entire intervention process.

All related documents were kept in a locked container under control of the research administrator. At no time did any of the information place a student in jeopardy of being identified as a participant in the study.

The Researcher's Role

The initial role of the Researcher who contributed to the design of this research study was Dean of Students, followed by responsibility for the design and implementation of the university Substance Abuse Intervention Program. This included maintenance of records of students enrolled in the program and the role of authority in the program. All disciplinary consequences discussed with the student participants were with the Researcher in his role as Dean of Students. This study was designed with potential replication through use of the same variables and conditions in mind, with hopes that this study methodology carried out at other institutions would provide similar results.

Research Design

Having knowledge and experience in the enforcement of substance abuse intervention programs within the United States Military, the researcher made the decision to model the university program after the military program because of its effectiveness and fairness. Under Army Regulation 600 – 85, covering the Army Substance Abuse Program (United States Army, 2012), several components made sense with regard to the university setting, and the program seemed easy to incorporate with students (U.S. Army, 2009). The military philosophy was that substance abuse not only affected the soldier, but also the overall mission.

Secondly, military commanders determined it was an important factor to intervene quickly and place soldiers in a substance abuse program. The same situation applies with college students; once identified as having an issue with substance abuse, the student was offered the opportunity to enroll in the university substance abuse intervention program. This program was mandated and was designed to allow the student to get help while still in school. Those who refused to be enrolled in the substance abuse program were subsequently dismissed from the university.

Once a student successfully completed and was released from the university substance abuse program, he or she was placed on a no-notice test list, from which the student was subject to random testing for the remaining time at the university. Once the program was design and implemented at the university, it was important to determine if the program produced the desired results beyond program participation.

This study was designed using a qualitative and quantitative methodology to identify data taken from a Midwest University substance abuse intervention program to determine if there were relationships among program participants' use of illicit substances and student achievement. The researcher used this methodology to determine relationships among variables measured by grade point average, course attendance, and persistence toward degree, before, during, and after placement in the program. This information was used to draw conclusions and provided information that would assist in determining if a substance abuse intervention program designed by the university met the needs of the students and the university as a whole. These needs were identified as counseling, periodic testing, academic mentoring, and social redirection.

The overall design of the substance abuse intervention program needed to provide data that could be used as a measurable instrument in determining the validity of the program. The research questions mentioned in this chapter were used as an assessment to determine whether the program contributed to a notable change.

Research Question # 1. Is there a relationship between providing an alcohol and substance abuse intervention program and the overall success of the student?

Research Question # 2. Does the inclusion of Midwest University's Alcohol and Substance Abuse Program allow the perception that its campus is a safer and more secure environment for post-secondary learning?

Research Question # 3. What are the processes that best support implementation of an alcohol and substance abuse program such as the one at Midwest University, as indicated through phone interviews of parents and student program participants?

Null Hypothesis # 1. Following a student's participation in the substance abuse intervention program offered by the university there is no difference in student achievement, as measured by Grade Point Average and Course Attendance before, during, and after participation in the program.

The following tests were conducted to determine if there was a difference in means between the subgroups, measured by GPA and attendance rates. The subgroups analyzed included comparison of athletes to non-athletes and males to females.

An ANOVA single factor analysis was applied to GPA before, during, and after program participation, followed by individual z-test for difference in means, if necessary. An ANOVA was also applied to course attendance rates before, during, and after program participation, followed by individual z-test for difference in means, if necessary.

A t-test for difference in means provided analysis for comparison of GPA for athletes to non-athletes before participation in the program, as well as for participant attendance rates for athletes vs. non-athletes.

A t-test for difference in means provided analysis for comparison of GPA for males to females before participation in the program, as well as course attendance data for participant attendance rates for males vs. females.

Null Hypothesis # 2. When comparing participants in the substance abuse program to nonparticipants, there is no difference in student achievement, as measured by Grade Point Average and Course Attendance.

The following tests were conducted to determine if there was a comparison between the subset groups that covered GPA and attendance. Those subset groups included participants and non-participants.

A z-test for difference in means provided analysis for comparison of GPA for participants to non-participants both before and after participation in the program.

A z-test for difference in means provided analysis for comparison of course attendance rates for participants to non-participants both before and after participation in the program.

Null Hypothesis # 3. There is no relationship between length of participation in the substance abuse program and student achievement, as measured by Grade Point Average and Course Attendance.

The following tests were conducted to determine if there was a relationship between variables in the study, with regard to the timeframes of before, during, and after program participation.

A Pearson Product Moment Correlation Coefficient was calculated to allow identification of the potential relationship between length of participation in the program and each of the following variables: Grade Point Average before participation, Grade Point Average after participation, change in Grade Point Average, and course attendance rate after participation.

Null Hypothesis # 4. There is no relationship between a student's participation in the substance abuse intervention program and graduation persistence, measured by age of student and progression through student enrollment status in college (i.e. first, second, third, or fourth year).

The following tests were conducted to determine if there was a relationship between the variables analyzed in the study.

A Pearson Product Moment Correlation Coefficient was calculated to allow comparison of the potential relationship between participation in the program and college enrollment status after participation and age of the student after participation.

A Chi Square test for Independence was applied to support results of the Pearson Product Moment Correlation Coefficient analysis to allow identification of the potential relationship between status of enrollment in college and Grade Point Average after participation and between status of enrollment in college and course attendance rate after participation.

Phone interviews were conducted with program participants and parents to gather data on perceptions of the program and its effectiveness. The questions asked were broad to allow open comments during discussion.

Interview Question # 1: What is your overall perception of the program?

Interview Question # 2: What has been the most significant impact of the program?

Interview Question # 3: Are there any changes you would make to the program?

Population and Sample

This study was conducted at a private, liberal arts university located in the Midwest with an approximate enrollment of 17,000. Located on approximately 435 acres in a medium-sized city, this private university consisted of approximately 3,800 residential students, with a population divide between men and women relatively equal. It should also be noted that approximately 25% of the students residing on campus were international. The university was consistent in its liberal arts education curriculum, based on the Presbyterian values on which it was founded (University Catalog, 2012.)

The sample groups for this study consisted of randomly selected students (N = 40) from a pool of approximately 160 participants in the university-designed substance abuse intervention program, based on a drawing from the 160 files targeted located in the Dean of Student's office, over a two-year period. Data on each subject was collected through the university CAMS. Information collected was grade point average, attendance, gender, age, grade level, and athlete or non-athlete status before, during, and after entrance into the program. This information extracted from the records of program participants was given to the admissions and registrar personnel, and a second like sample (N = 40) from the general student population was developed in order to compare those in the program with those who were not. Each randomly sampled group from the population for this study was given an alphabetic and numeric identifier. The timeframe for this study covered the semesters before, during, and after initial entry into the substance abuse intervention program for the academic years 2009 and 2010. Information derived from

the general student population of students identified by the administration were assumed as not involved with the abuse of illegal substances. The same information was extracted for this sample, to replicate the information of those who had entered the program. The sample size was determined by randomly selecting 25% of the students who participated in the program over the years identified from implementation.

Table A1, located in Appendix A, describes the raw data used in this research, taken from the sample of participating subjects enrolled in the substance intervention program. Those categories included are: gender, age, college level, athlete or non-athlete status, and GPA before, during, and after program participation, as well as attendance before, during, and after program participation, date of entry, date of exit, number of months in the program, and degree persistence.

Table B1, located in Appendix B, describes the raw data used in this research for non-participants, which provided a like sample of data for a sample that mirrored the information provided for the participants in Table A1. Table B1 includes the same categories as Table A1, with the exclusion of date of entry, date of exit, number of months in the program, and degree persistence.

The items listed in both tables were used to provide an analysis for statistical comparisons, difference in means, and identification of relationships reported in this study.

Demographics

Once students were identified, the researcher considered the demographics that pertained to the study and identified gender, athlete or non-athlete status, level of school based on credits, number of months in the program, and age. Twenty-five percent of the

population was identified as female, with 75% identified as male, 75% of the population was identified as non-athlete, with 25% identified as either NCAA athlete or student life sport athlete. Of all categories mentioned, 15% were identified as freshmen, 37% were identified as sophomores, 17% were identified as juniors, and 31% were identified as seniors. The average number of months enrolled in the program was 20.82 months. The average age of participants enrolled in the program was 19.5.

The research university had a day population of around 7,000 students, which included 3,800 residents at the undergraduate and graduate levels, and approximately 7,000 undergraduate and graduate commuters in various programs in the evening.

The research university's population indicated that approximately 90% of the undergraduate student population received some form of financial aid and roughly 90% of the college freshmen resided in on-campus residential housing, which included dormitories, single family housing for females, and apartment style housing for males (University Catalog).

Survey

A survey of 60 incoming freshmen at the research university yielded 51 responses. Questions on the survey identifying demographics were gender, current grade level, age, and ethnicity. The general questions asked related to alcohol and marijuana use prior to arriving at college. When asked 'Have you ever used alcohol?' 82% responded yes and 10% responded no. When asked how many times they used alcohol within the past 30 days, the response was 47% none, 22% 1-to-2 times, 16% 3-to-9 times, 6% 10-to-19 times, and 2% 20 or more times. When asked the same question of marijuana, 84% said none, 6% said 1-to-2 times, and 2% said 20 or more times. When

asked if they had ever discussed alcohol or substance abuse with their parents, 61% responded yes and 31% responded no. One issue regarding this survey was that 57% of the respondents were international students, 25% were White, 4% were African-American, and 3% were Spanish-American.

Fifty-one percent of the respondents indicated they felt that even using alcohol or marijuana, they could still be successful in school. Forty-one percent indicated they felt the use of alcohol or marijuana affected their ability to be successful in their studies.

Limitations

Potential limitation to study included the following:

Access to data. Being able to determine which categories were needed to evaluate the program and provide measurable data for student success came from a limited data base provided by the university. It was determined by the researcher that the information retrieved from this data base provided sufficient data in the areas that were used to measure student success.

Mortality. Mortality was defined by anyone who left the university by choice or by being dismissed from the university as a program failure. There was a limited amount of information on students once they left, but it was determined that more research should be conducted for degree persistence analysis.

Sample representation of student populations. A large percent of respondents to the survey of the general student population was represented by international students. Cultural differences could have affected the nature of responses and provided a variance from the true status of the student body population.

Validity of test results. A limitation that was considered was the percentage of false negatives that could result from the actual analyzing agency responsible for reviewing the urinalysis samples. Upon further communication with agency administration, it was determined that the percentage was less than one percent and the procedure for providing such data was approved by the state in which the agency was licensed, and the court system regulations on substance abuse at the time of study.

Variation in sample collection. The retrieving of samples were conducted by different agency personnel, and after observing the testing agency's procedures, it was determined that all personnel followed the procedures as directed by the agency, which provided accurate information used in this study.

Honesty of response of Non-Participants. The like-sample of non-participants' information on substance abuse was not addressed. It was assumed that this group was not associated with substance abuse and still provided accurate comparable data.

Instrumentation

The researcher chose GPA and attendance as critical evaluation categories based on research gathered in the literature review discussed in Chapter Two, relative to cognitive thought and behavior associated with the abuse of marijuana. The GPA gave statistical data that could be queried into a table and tested using statistical analysis to verify the level of student success or failure during the period enrolled in the university substance abuse intervention program. Attendance also gave the researcher the ability to cross-reference and determine the level of engagement the student portrayed. The number of months within the program and the number of counseling sessions required by the

student resource center was determined by the student's progress as it related to both GPA and attendance findings.

Trying to determine persistence to graduation was difficult, based on the exit information provided when a student left the university. Several reasons for not being able to track those students who left the University were based on the inability to determine if they had just transferred to another university or if they left school altogether. Therefore, it was determined through CAMS that 18 of the original 40 students who participated in the substance abuse intervention program had either left school or transferred to another institution.

The attendance rate during the period of this study would validate the numbers provided in the data set for both participants and nonparticipants. Shortly after this study concluded, the university administration made the decision only to track attendance through the first two weeks of the semester. The study could still be replicated at the same university, but would need support from faculty members to provide data on each student individually, when requested by the researcher. This information was kept at the instructor level, but not entered into CAMS.

Conclusion

The study itself and the research design provided valuable, accessible, and reliable information to assess the intervention program in its then-current state and determine what changes, if any, were needed, as well as to determine if the program provided a service to the students and to the university. Military background provided a valuable level of experience and assisted in the design of this program. Grade point average, attendance, and other demographic information assisted in determining the

validity of this intervention program. The population samples used in this study provided an adequate number of participants and like samples with which to compare relative data within this study.

The design of the student was specific and at the same time held each participant responsible for his or her individual success, based on measurable outcomes while enrolled in the program. Research questions targeted in this chapter were designed to determine overall success, based on quantifiable data and with an end determination of the validity of the program.

Sample groups selected for inclusion in this program evaluation were randomly selected, based on 25% of the number of participants during a two-year period which included both fall and spring semesters of the selected years. A like sample was taken from the entire residential student body to mirror the demographics used in identifying participants.

A survey was conducted based on 20 questions, which involved incoming freshmen during the spring semester. It was determined that information received from the survey was somewhat reliable, based on the number of participants and their demographic makeup. More than 50% of the freshman who took the survey were international, and in the researcher's opinion did not provide much information and was a poor representation of the entire attending student body.

University licensed counselors provided a valuable resource necessary for the implementation of this program. The feedback from their intakes proved to be a valuable asset in determining the amount of time each student remained on the program.

Chapter Four: Results

Introduction

In realizing how many students are lost each year from higher education institutions due to alcohol and substance abuse, the leadership at the study university implemented an intervention program that allowed students to remain in school and continue their studies based on their abilities to successfully follow a strict program designed to alter their behaviors. The results reported in this chapter will provide research to help the university determine if the program is viable and whether there is a need to adjust its design.

After involvement with setting up an intervention program and overseeing its development and implementation, the researcher felt the controversy surrounding marijuana use provided motivation to review this specific intervention program, based on the two years of data available. Data was selected related to and substantial enough to provide a valid study on the program's design. The Null Hypotheses deemed essential to the study are listed in this chapter, and results are reported.

Data and Results

The data collected for this study primarily focused on program participation and student achievement. The sample data collected was generated from the 2009-2010 and 2010-2011 participants, with a like sample taken from the general student body (Appendices A and B). The data was organized into tables to provide for specific analysis and comparisons. Data that was measurable and significant included grade point averages, attendance rates, number of months in the program, and success in completion

of degree. Comparisons can be found in the tables and in discussion of results of testing the null hypotheses.

Null Hypothesis # 1

Following a student's participation in the substance abuse intervention program offered by the university, there is no difference in student achievement, as measured by Grade Point Average and Course Attendance before, during, and after participation in the program.

Grade Point Average

Null Hypothesis 1a. Following participation in the substance abuse intervention program there is no difference in student achievement, as measured by Grade Point Average before, during, and after participation in the program.

An ANOVA (Table 2) single factor analysis of GPA before, during, and after program participation yielded a test value of 0.434. When compared to the critical value of 3.07, the null hypothesis was not rejected. The data did not support a significant difference in grade point average when comparing any of the time frames represented in the null hypothesis.

Table 2.

ANOVA: Participant GPA Before, During, and After Program

Groups	*Count*	*Sum*	*Average*	*Variance*
GPA Before	40	96.02	2.400	0.605
GPA During	40	93.02	2.325	0.617
GPA After	40	99.31	2.482	0.485

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	0.4949	2	0.247	0.434	0.648	3.073
Within Groups	66.6018	117	0.569			
Total	67.0967	119				

Grade Point Average: Athletes vs. Non-Athletes

Null Hypothesis 1b. Following participation in the substance abuse intervention program there is no difference in student achievement, as measured by Grade Point Average before the program, when comparing athletes to non-athletes.

Table 3.

GPA Comparison: Athletes and Non-Athlete Participants

	Athletes	*Non-Athletes*
Mean	0.068	0.087
Variance	0.855	0.661
Observations	10	30
Pooled Variance	0.707	
Hypothesized Mean Difference	0	
Df	38	
t Stat	0.061	
P(T<=t) two-tail	0.950	
t Critical two-tail	2.024	

When comparing athlete GPA to non-athlete GPA, the resulting t-test value was 0.06186 and the $p = 0.95099$. Since the *p*- value was greater than the level of significance (0.05), the null was not rejected. There was no significant difference in GPA for athletes compared to non-athletes before program participation.

Grade Point Average: Males vs. Females

Null Hypothesis 1c. Following participation in the substance abuse intervention program there is no difference in student achievement, as measured by Grade Point Average before when comparing males to females.

Data relating to the Grade Point Average of students involved in the university substance abuse intervention program (Table 4) showed a marginal, observable increase in GPA for the male population when identifying the before, during, and after data and a slightly larger, observable increase for the female population over the course of the study.

Table 4.

Male/Female GPA Before, During, and After Program

Core Group	GPA Before	GPA During	GPA After
Male	2.51	2.40	2.55
Female	2.00	2.07	2.23

Table 5.

GPA Comparison: Male and Female Participants

	Males	*Females*
Mean	0.041	0.222
Variance	0.613	1.030
Observations	31	9
Pooled Variance	0.701	
Hypothesized Mean Difference	0	
Df	38	
t Stat	0.569	
P(T<=t) two-tail	0.572	
t Critical two-tail	2.024	

The *t*-test results comparing the overall GPA of males to females for a three semester period beginning in the fall 2010 academic year are displayed in Table 5.

The resulting t-test value was 0.5694 and the $p = 0.5723$. Since the *p*- value was greater than the level of significance (0.05), the null hypothesis was not rejected. There was not a significant difference in male GPA compared to female GPA for program participants, before the program began.

Course Attendance

Null Hypothesis 1d. Following participation in the substance abuse intervention program there is no difference in student achievement, as measured by Course Attendance before, during, and after participation in the program.

Table 6.

Participant Attendance Rate Before, During, and After Program

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Attendance in % Before	40	33.55	0.838	0.008
Attendance % During	40	33.37	0.834	0.009
Attendance % After	40	32.71	0.817	0.014

ANOVA

Source of Variation	*SS*	*Df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	0.009	2	0.004	0.452	0.637	3.073
Within Groups	1.265	117	0.0108			
Total	1.275	119				

Table 6 represents the results of an ANOVA statistical analysis determining the difference between attendance rates before, during, and after entering the program.

The ANOVA single factor for difference in means analysis yielded a test value of 0.452. When compared to the critical value of 3.07, the null hypothesis was not rejected. The data did not support the hypothesis, which indicated an expected significant change in rate of attendance when comparing the timeframes before, during, or after entering the program.

Course Attendance: Males vs. Females

Data relating to the attendance of students involved in the university substance abuse program (Table 7) showed a marginal, observable decrease (1%) in attendance for the male population and a larger, observable decrease (5%) for the female population. It is noted that even with a decrease in the attendance rate for both male and female, the overall grade point average rose slightly.

Table 7.

Male/Female Average Attendance Before, During, and After Program

Core Group	Attendance % Before	Attendance % During	Attendance % After
Male	84%	84%	83%
Female	83%	82%	78%

Null Hypothesis 1e. Following participation in the substance abuse intervention program there is no difference in student achievement, as measured by Course Attendance before, during, and after participation in the program, when comparing males to females.

A t-test for difference in means (Table 8) was conducted to compare data for participant attendance rates for males vs. females.

Table 8.

Participant Attendance Rates for Males vs. Females

	Males	*Females*
Mean	0.827	0.783
Variance	0.012	0.019
Observations	31	9
Pooled Variance	0.014	
Hypothesized Mean Difference	0	
Df	38	
t Stat	0.979	
P(T<=t) two-tail	0.333	
t Critical two-tail	2.024	

The t-test for difference in means analysis yielded a test value of 0.333. When compared to the critical value of 2.02, the null hypothesis was not rejected. The data did not support a significant change in rate of attendance when comparing males to female participants.

Course Attendance: Athletes vs. Non-Athletes

Null Hypothesis 1f. Following participation in the substance abuse intervention program there is no difference in student achievement, as measured by Course Attendance before, during, and after participation in the program, when comparing athletes to non-athletes.

A t-test (Table 9) was conducted to compare data for participant attendance rates of athletes vs. non-athletes.

Table 9.

Participant Attendance Rates for Athletes vs. Non-Athletes

	Athletes	*Non-Athletes*
Mean	0.779	0.830
Variance	0.018	0.012
Observations	10	30
Pooled Variance	0.014	
Hypothesized Mean Difference	0	
Df	38	
t Stat	1.189	
P(T<=t) two-tail	0.241	
t Critical two-tail	2.024	

The t-test for difference in means analysis (Table 10) yielded a test value of 0.241. When compared to the critical value of 2.02, the null hypothesis was not rejected. The data did not support a significant change in rate of attendance when comparing athletes and non-athletes.

Null Hypothesis # 2

When comparing participants in the substance abuse program to nonparticipants, there is no difference in student achievement, as measured by Grade Point Average and Course Attendance.

Grade Point Average

Null Hypothesis 2a. When comparing participants in the substance abuse program to nonparticipants, there is no difference in student achievement, as measured by Grade Point Average.

The z-test for difference in means results comparing the GPA overall average before participation in the program for an academic year are displayed in Table 10. The null hypothesis stated that there was not a difference in the GPA when comparing before program intervention.

Table 10.

GPA: Participants vs. Non-Participants Before Program

	Non-Participants	Participants
	GPA Before	*GPA Before*
Mean	2.819	2.400
Known Variance	0.691	0.599
Observations	40	40
Hypothesized Mean Difference	0	
Z	2.331	
P(Z<=z) two-tail	0.019	
z Critical two-tail	1.959	

The resulting z-test value was 0.019, and when compared to the critical value of 1.95, the null was not rejected. There was not a significant difference in GPA before program participation when comparing participants to a like-sample of non-participants.

The z-test results comparing the overall GPA average after participation in the program for an academic year are displayed in Table 11. The null hypothesis stated that there was not a significant difference in the GPA when comparing after program intervention.

Table 11.

GPA: Participants and Non-Participants After Program

	Non-Participants	Participants
	GPA After	*GPA After*
Mean	2.604	2.482
Known Variance	1.377	0.49
Observations	40	40
Hypothesized Mean Difference	0	
Z	0.564	
P(Z<=z) two-tail	0.572	
z Critical two-tail	1.959	

The resulting z-test value was 0.57, and when compared to the critical value of 1.95 *t*he null was not rejected. There was not a significant difference between the average GPA of participants compared to a like-sample of non-participants, after program participation.

Course Attendance

Null Hypothesis 2b. When comparing participants in the substance abuse program to nonparticipants, there is no difference in student achievement, as measured by Course Attendance.

The z-test for difference in means results comparing the rate of attendance before participation in the program for an academic year are displayed in Table 12. The null hypothesis stated that there was not a difference between participants and non-participants in student achievement as measured by course attendance.

Table 12.

Attendance: Participants vs. Non-Participants Before Program

	Non-Participants	Participants
	Attendance Before %	*Attendance Before %*
Mean	85.275	83.850
Known Variance	81.178	84.028
Observations	40	40
Hypothesized Mean Difference	0	
Z	0.701	
P(Z<=z) two-tail	0.483	
z Critical two-tail	1.959	

The resulting z-test value was 0.483, and when compared to the critical value of 1.95 the null was not rejected. There was no difference in course attendance rates when comparing participants to non-participants before program participation.

The z-test for difference in mean results comparing the rate of attendance after participation in the program for an academic year are displayed in Table 13. The null hypothesis stated that there was not a difference between participants and non-participants in student achievement as measured by course attendance.

Table 13.

Attendance: Participants vs. Non-Participants After Program

	Non-Participants	Participants
	Attendance After %	*Attendance After %*
Mean	82.875	81.900
Known Variance	238.570	142.750
Observations	40	40
Hypothesized Mean Difference	0	
Z	0.315	
P(Z<=z) two-tail	0.752	
z Critical two-tail	1.959	

The resulting z-test value was 0.752, and when compared to the critical value of 1.95 the null was not rejected. There was no difference in course attendance rates when comparing participants to non-participants.

Null Hypothesis # 3

There is no relationship between length of participation in the substance abuse program and student achievement, as measured by Grade Point Average and Course Attendance.

Grade Point Average

Null Hypothesis 3a. There is no relationship between length of participation in the substance abuse program and student achievement, as measured by Grade Point Average.

Table 14 represents the statistical data for a Pearson Product Moment Correlation Coefficient comparing the GPA to student achievement as measured by the number of months in the program.

Table 14.

Number of Months vs. GPA After Program

Regression Statistics	
Multiple R	0.232
R Square	0.053
Adjusted R Square	0.028
Standard Error	0.686
Observations	40

Note: Critical Value = 0.308

When comparing the data for the Pearson Product Moment Correlation Coefficient analysis in Table 14, Correlation Coefficient is 0.232, and since this number falls below 0.308, the correlation is weak and not significant.

Null Hypothesis 3b. There is no relationship between length of participation in the substance abuse program and student achievement, as measured by change in Grade Point Average.

Table 15 represents the results of a Pearson Product Moment Correlation Coefficient analysis when comparing a change in GPA to student achievement, as measured by the number of months in the program.

Table 15.

Number of Months vs. Change in GPA After Program	
Multiple R	0.249
R Square	0.062
Adjusted R Square	0.037
Standard Error	6.349
Observations	40

Note: Critical Value = 0.308

Comparison of the PPMCC value of 0.249 to the critical value of 0.308 allowed non-rejection of the null hypothesis. There was no significant relationship between

student participation in the substance abuse intervention program and change in Grade Point Average. There is an observable, non-significant weak relationship.

Null Hypothesis 3c. Student achievement, as measured by Grade Point Average, is independent of the length of participation in the substance abuse program.

Table 16 represents data used in a Chi Square test for Independence statistical analysis in comparing the length of participation to the student's GPA.

Table 16.

Length of Participation vs. GPA

Number of Months	8-13	14-19	20-25	26-30
GPA	2.27	2.24	2.81	2.64
number of students	9	11	8	12

A Chi-Square test for Independence was applied to data. The Chi-Square test value of 0.791 compared to the critical value of 7.815 supported non-rejection of the null hypothesis. Therefore, student achievement measured by Grade Point Average was independent of the number of months of participation in the substance abuse intervention program. This supported the results found for Null Hypotheses 3a and 3b.

Course Attendance

Null Hypothesis 3d. There is no relationship between length of participation in the substance abuse program and student achievement, as measured by Course Attendance.

Table 17 represents results of a Pearson Product Moment Correlation Coefficient analysis in comparing the length of participation to the student's attendance rate after leaving the program.

Table 17.

Number of Months vs. Attendance Rate After Participation

Regression Statistics	
Multiple R	0.018
R Square	0.000
Adjusted R Square	-0.025
Standard Error	0.092
Observations	40

Note: Critical Value = 0.308

Comparison of the PPMCC value of 0.018 to the critical value of 0.308 allowed non-rejection of the null hypothesis. There was no significant relationship between student participation in the substance abuse intervention program and course attendance rate.

Null Hypothesis 3e. Student achievement, as measured by Course Attendance, is independent on the length of participation in the substance abuse program.

Table 18 represents the results of a Chi Square test for Independence statistical analysis in comparing the length of participation to the student's attendance rate while in the substance abuse program.

Table 18.

Length of Participation vs. Attendance Rate

Number of Months	8-13	14-19	20-25	26-30
Attendance Rate	79	79	85	83
number of students	9	11	8	12

The Chi-Square test value of 1.746 compared to the critical value of 7.815 supported non-rejection of the null hypothesis. Therefore, student achievement measured by Course Attendance rate is independent of the number of months of participation in the

substance abuse intervention program. This result supports the findings of Null Hypothesis 3d.

Null Hypothesis # 4

There is no relationship between a student's participation in the substance abuse intervention program and graduation persistence, measured by age of student and progression through student enrollment status in college (i.e. first, second, third, or fourth year).

Graduation Persistence:

Null Hypothesis 4a. There is no relationship between a student's participation in the substance abuse intervention program and graduation persistence, measured by progression through student enrollment status in college, i.e. first, second, third, or fourth year.

Table 19 represents the statistical data for a Pearson Product Moment Correlation Coefficient comparing the number of months in the substance abuse program as related to the level of education as defined by the completed number of academic credits.

Table 19.

Number of Months vs. College Level	
Multiple R	0.385
R Square	0.148
Adjusted R Square	0.126
Standard Error	6.050
Observations	40

Note: Critical Value = 0.308

Comparison of the PPMCC value of 0.385 to the critical value of 0.308 allowed rejection of the null hypothesis. There was a significant relationship between student

participation in the substance abuse intervention program and College Level. There was a significant weak relationship. Participation in the program could possibly account for 14% of the variation in progression through College Level.

Null Hypothesis 4b. Student achievement, as measured by Grade Point Average is independent of the year of college attendance (first year, second year, or third year).

Table 20 represents results of a Chi Square test for Independence statistical analysis in comparing the GPA to the student's college level as defined by the number of academic credits completed while in the substance abuse program.

Table 20.

GPA vs. College Level

College Level	1	2	3	4
GPA	2.65	2.6	2.35	2.31
number of students	7	15	7	11

The Chi-Square test value of 1.355 compared to the critical value of 7.815 supported non-rejection of the null hypothesis. Therefore, student achievement measured by Grade Point Average is independent of the year of college attendance.

Null Hypothesis 4c. Student achievement, as measured by Course Attendance, is independent of the year of college attendance (first year, second year, or third year).

Table 21 represents the results of a Chi Square test for Independence and statistical analysis in comparing the student's attendance rate to the student's college level as defined by the number of academic credits completed while in the substance abuse program.

Table 21.

Attendance Rate vs. Attendance Rate

College Level	1	2	3	4

Attendance Rate	85	84	88	72
number of students	7	15	7	11

The Chi-Square test value of 2.535 compared to the critical value of 7.815 supported non-rejection of the null hypothesis. Therefore, student achievement measured by Course Attendance rate is independent of the year of college attendance.

Null Hypothesis 4d. There is no relationship between a student's participation in the substance abuse intervention program and graduation persistence, measured by age of student.

Table 22 represents the statistical data for a Pearson Product Moment Correlation Coefficient comparing the number of months in the substance abuse program as related to the age of the student.

Table 22.

Age Compared to Number of Months in the Program	
Multiple R	0.402
R Square	0.161
Adjusted R Square	0.139
Standard Error	2.067
Observations	40

Note: Critical Value = 0.308

Comparison of the PPMCC value of 0.402 to the critical value of 0.308 allowed rejection of the null hypothesis. There was a significant relationship between student participation in the substance abuse intervention program and age. There was a significant mild relationship. Student age could possibly account for 16% of the variation in the number of months of participation in the program.

Phone Interviews. Data gathered to assess the perceptions of the drug and substance abuse intervention program was gathered through phone interviews with

parents and student participants. Three questions guided the comments received about the program and its strengths and weaknesses:

(1) What is your overall perception of the program?

(2) What is your overall perception of the program?

(3) What is your overall perception of the program?

Parent responses included:

- *I believe the program has provided a positive impact on my child offering him the chance to finish school and get the required counseling which has assisted him in understanding the serious consequences from drugs.*
- *The biggest impact is how he looks at the use of illegal drugs and how it can affect his future.*
- *The only issues I would question is the cost of the test and the frequency in which they are required.*
- *It works if he stays in school, but if he doesn't stay, then he will go back to smoking.*
- *I am only concerned about the privacy of my daughter's information being released to someone who doesn't need to know.*
- *Great program, what a difference in my son's attitude toward school.*

Participant responses included:

- *The program has made me look at my drug use and how it effects my choices moving forward.*
- *The most impact for me is that I have been forced to stop using where I might not have been able to do it on my own.*

- *Cost is a concern because I am a college student. The other is being transferred to an intern after my initial appointment with a counselor.*
- *Waste of time, I'll start smoking again when I finish school.*
- *I think the university should pay for the tests.*
- *Not happy about my parents knowing my business. I am over 18.*

Continued College Enrollment

Table 23 provides descriptive information for the 40 participating students and the percentage of their degree persistence. The 22 indicated the number of students who continued their degree persistence following completion of the substance abuse program. The 18 indicated the number who did not. Of the 18 that stopped attending, there was no follow-up that indicated whether they stopped attending college altogether or transferred to another institution.

Table 23.

School Attendance Following Program

Attending	Not Attending
22	18
55%	45%

Note: n = 40

Conclusion

The statistical data in this chapter did not provide specific overall proof that students entering into a substance abuse intervention program were substantially more successful than those that did not. Part of the analysis determined that there were outliers within the study that provided support as indicated in research question number one in the Chapter Five discussion. When taking all measurable data in context and looking at the overall results, there was not enough substantial evidence to reject the null hypotheses.

Moreover, there was a factual increase in student achievement based on the data. It was not statistically significant, but the observable results supported the motivation for further study of intervention programs, such as the one generating the data reported in this document.

Retention was considered a major factor in program implementation and design, and after looking at all the data there was a notable number of students who were retained by using the substance abuse program as designed.

Chapter Five: Discussion and Reflection

Introduction

This study was formulated to determine whether a substance abuse intervention program could be designed and successfully implemented at a rural Midwest University where the foundation of the university was built on Judeo Christian values, self-reflecting attitudes, and the desire to place well-educated, moral, and productive citizens into society. The purpose of this study was to determine if a substance abuse program could contribute to altering the behavior of college students and promote academic achievement and progression towards receiving a degree. It was also designed in order to assist in developing a strong retention-based initiative, which would provide students the solid foundation to remain in familiar surroundings and continue their education.

This study was based on a program evaluation over a two-year period and identification of students who were either self-referrals or violated the law in the abuse of marijuana. The program was designed by the researcher based on his experience in the military and his contact with students while serving as the Dean of Students responsible for providing a safe and structured environment in which students could learn and grow.

As research indicated (Johnston et al., 2010; 2011; 2013; Pinchevsky et al., 2012; Stewart & Moreno, 2013), the overall opinion regarding the medical and recreational use of marijuana increased in the decade previous to this study, and with most states decriminalizing its use, universities will struggle and discuss policy changes based on what is best for the University, using a moral code of ethics.

Discussion

Research Question # 1. Is there a relationship between providing an alcohol and substance abuse intervention program and the overall success of the student? When looking at the concepts of Grade Point Average, Attendance, and Degree Persistence, the research provided mixed observations when comparing before, during, and after program participation. Hypotheses were not rejected based on collected data, with the exception of sub-hypotheses 4a and 4b, which examined the relationship between participation in the intervention program and progression of credit status at the university from freshmen to sophomore to junior to senior year. Calculation of a Pearson Product Moment Correlation Coefficient, supported by a Chi Square for Independence analysis, indicated a significant, weak relationship between participation in the program and movement through the credit-level ranks of freshman year through senior year of academic standing at college. However, this does not mean that participation in the program was not relevant to student success. It simply indicated that in this study, with this data set, there was not enough supporting evidence to indicate a significant relationship. There were definite outliers within the sample set used for this study that ranged from a notable, observable increase in GPA and attendance to no substantial difference at all. The researcher recommends that further studies include a more comprehensive tracking system to reach an accurate rate of program success when looking at degree persistence.

Research Question # 2. Does the inclusion of Midwest University's Alcohol and Substance Abuse Program allow the perception that its campus is a safer and more secure environment for post-secondary learning? When reviewing responses from phone conversations with program participants, students indicated that they felt campus was

safe and that adding the substance abuse program reinforced the overall campus atmosphere as one that was being tough on drugs.

Research Question # 3. What are the processes that best support implementation of an alcohol and substance abuse program such as the one at Midwest University, as indicated through phone interviews of parents and student program participants? Phone conversations taken by the researcher had mixed reviews about the effectiveness of the program. Some students felt the program was beneficial and provided a needed service on campus while other students felt it was an intrusion on their privacy. Parents who were interviewed by phone supported the program and had very little to say in reference to its design and implementation.

Grade Point Average. When analyzing the data for Grade Point Average for participating students in the substance abuse intervention program, which included statistics covering before, during, and after the program, it was determined that there was not enough evidence to support the alternate hypotheses. There was no significant difference in Grade Point Average.

Course Attendance. When analyzing the data from the attendance records for participating students in the substance abuse intervention program, which included statistics covering before, during, and after the program, it was determined that there was not enough evidence to support the alternate hypotheses. There was no significant difference in Attendance Rates.

Persistence to Graduation. Although the study did not follow the students after they left the university, it was determined that 22 of the 40 original subjects in the study

did complete their degree. The 18-student mortality could be attributed to transferring or simply dropping out of college.

Triangulation of Results

The use of multiple measures, all related to the same variable comparisons provided triangulation for results in the study. Student achievement was measured by GPA, Attendance, and Retention. Comparisons of student achievement were analyzed between males and females, athletes and non-athletes, and participants and non-participants. The program consisted of three major components: Success Contract, Counseling, and Periodic testing. The contract was an agreement between the university and the student specifically detailing with what was required by the student while enrolled in the program. The Counseling was mandatory for each student enrolled in the program to determine if there are any underlying issues related to the abuse of marijuana. The periodic testing is used as a measure of the student's actual urine test numbers and as a deterrence for the possibility of future use.

Personal Reflections

Design of the program and the data it provided was informative and useful. There were some limitations, as discussed in Chapter Three that needed to be addressed, but did not alter the outcome of the study. Gaining access to the university CAMS database was instrumental in gathering the information provided in the study. The program itself was easy to design, and with the assets readily available the researcher was able to provide a service in line with the University's mission and focused on altering the behaviors of those students who were entered into the program. The University's Student Resource Center was an integral part of the program's success, as related to behavior and retention.

As counselors provided initial intake assessment conferences with each student enrolled, they provided immediate feedback and designed personalized programs for each student to follow while enrolled in the substance abuse intervention program. Each student was initially interviewed by a licensed counselor, and depending on his or her progress was assigned to an intern for follow-up counseling.

Changes Made During Implementation

There were a few changes implemented during the period of this study that were necessary to validate the data. The test center used for the substance abuse intervention program and the reliability of the test results were scrutinized for policy, procedure, and confidentiality. Some issues pertaining to the test center regarding actual sample collection were altered so that each sample collected was verified, protected, and transported under strict confidential guidelines. This included the addition of an actual same-sex person visually observing the collection of the sample.

Making a Difference

The substance abuse intervention program was and, at the time of this writing, continues to be a valuable program in altering student behavior with regard to substance abuse. The ability to provide counseling, test facilities, and assist students in moving forward in their educational goals involved more than just retention. The program contributed to an atmosphere where even poor choices could be a source of self-reflection and reenergize the student's desire to be successful. Each student that did not finish the semester and complete the college education specifically due to substance abuse, placed a financial hardship on the family and decreased the ability to reach full potential

Program Participant Views

Speaking to students and parents about the program and its design brought to light mostly positive comments related to the program. Students placed on the program talked about the opportunity the program provided and how it allowed them to continue their education, to self-reflect their level of maturity, and refocus on the responsibilities to become educated, productive citizens within society. There were a few students who considered the program intrusive and a violation of their rights, but realized after leaving the program that given the opportunity to finish their degrees helped them to be better qualified when entering the workforce. Parents, were overall more supportive of the program because it allowed their sons or daughters to continue their studies and provided counseling.

Recent Changes to the Program: Post-Study

Recent changes to the program post-study included a policy revision that encompassed the NCAA and Student Life Sport athletes. While looking at the country's more lenient enforcement of marijuana, with Colorado and Washington State legalizing recreational use of the drug, it has become clear that the climate toward marijuana is changing, at the time of this writing. This includes how the NCAA commission looks at substance abuse. Initially, the no-notice test policy included a random sampling once a month, however as the numbers grow and the laws continue to change, it might be determined that once every six weeks would be sufficient in determining whether the students were complying within the guidelines of the program while still representing the interest of the University.

NCAA

As the NCAA commission meets to determine the criteria for the discipline outcomes of marijuana use, it was assumed that because marijuana was not a performance enhancing drug and more states have either legalized marijuana for medical use or recreational use, that the penalty for abuse would be decreased. Regarding policies relating to substance abuse, specifically in the category of illicit drug use, the researcher believes that universities will still continue to enforce policies prohibiting either possession and/or consumption of these illicit drugs on university property. Universities still have the responsibility to provide a safe environment for students learning and to transition high school students through college into the workforce.

Recommendations to the Program

Recommendations for the program are as follows. First, continue to work issues related to the counseling portion of the program. At the end of this study, the counselors determined how many sessions a student would attend, and that number varied from 1 visit to more than 10. The researcher feels there is a necessity to mandate a specific number of counseling sessions to make sure the student has all the help needed to make the transition to stop substance abuse. Second, possibly, assign peer mentors for those students that have recently entered the program with those that have been in the program for more than a year. And third, provide continued awareness throughout the University community on the effects and legal issues related to the use of it illegal drugs.

University Response

Through an examination of the results of the information from this study, other universities could replicate this intervention and should achieve the same success as this

program, with little or no additional personnel or cost. This program contributed to increased retention figures at the research institution, even though the numbers were minor compared to the entire student body. The support from the university administration and executive office proved to be a vital link, especially in support of its mission.

Impact on the Region

With the realization that more states were legalizing medical marijuana, it became apparent that universities would have to deal with the adverse effect these decisions may have on students who used this and other drugs. The University of Colorado already had to deal with the effects of medical marijuana in 2011, and then had to face reality that with the legalization of recreational marijuana, policies will have to be reviewed and adjusted in line with moral values and that reputation as an institution of higher learning will be continuously challenged.

Local and National Political Policy-Makers

At the time of this writing, more states have started to see an increase in revenue and the opportunity for entrepreneurship, as it related to the legalization of recreational marijuana in Colorado and Washington. The researcher believes that more states will take a hard look at marijuana as a crop that can be taxed and provide revenue that may provide funds for infrastructure. This makes it more difficult for political policymakers to reach their constituents, especially in the middle of a recession. As the push for legalizing marijuana increases and the punishment for possession and/or consumption decreases, the researcher’s opinion is that the federal government will relax its laws against marijuana, thus opening up a new debate within this country.

NCAA Regulations and Impact on Students

Until recently, the NCAA regulating body considered marijuana a banned substance under competitive play in athletic sports. It did not consider marijuana a performance-enhancing drug and were looking at reducing the one-year suspension from athletic sports to six months. It appeared that most universities conducting internal urinalysis had different views on punishment, ranging from no suspension to being banned from the sport for one semester. The study university reviewed its policy on internal urinalysis tests and determined the student, if testing positive for marijuana, would not be allowed to participate in any team activities, including practice or playing in sanctioned games, until the student provided a clean drug screen.

Recommendations for Future Research

This research really only touched a sample of 25% of the roughly 160 students placed in this program in the last five years. Future research, based on the simple criteria that was used in this study, should be designed to follow the students who were enrolled in the program after graduation. A survey that would encompass the entire incoming freshmen class could be designed to get a more accurate picture of their current freshman-year marijuana use, as indicated in monitoring of future studies targeting college freshmen.

Conclusion

Colleges and universities continued to struggle with substance abuse for years. Marijuana was around as long as the United States was officially a country. It was legal to grow as a crop, it was legal to use as a medicinal product, and with legislation was deemed harmful. Laws were passed to make it illegal to grow, sell, or possess. Research

has been conducted on the effects of marijuana and its direct effect on cognitive thinking and long-term health effects for many years. Studies conducted by the Department of Education through the *Monitoring the Future* surveys (Johnston et al., 2005a; 2005b; 2006; 2008; 2010; 2011; 2012; 2013) since 1975 targeting eighth through 12th-grade-students proved over the 40 years previous to this writing that marijuana continued to be at the forefront of most discussions concerning substance abuse. As more states decriminalized its position and their perception was that marijuana was less harmful to the user, many states were legalizing it for medicinal purposes and recreational use. This makes it much more difficult for colleges and universities to be able to enforce strict policies, especially in the area of possession and consumption.

This specific program evaluation of 40 student participants yielded 22 graduates, and 18 students that either transferred or left school after being released from the substance abuse intervention program.

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Appendix A

Table A1.

Participants Quantitative Data Information Set

Participant ID	Gender	Age	College Level	Athlete	GPA Before	GPA During	GPA After	Attendance Before (%)	Attendance During (%)	Attendance After (%)	Date of Entry	Date of Exit	Months in Program	Degree Persistance	Persistance
A01	2	19	2	2	2.83	3.13	1.81	87	88	78	9/3/2009	12/9/2011	28		2
A02	1	18	4	2	2.50	2.33	3.33	79	81	86	1/29/2010	12/9/2011	24	yes	2
A03	2	18	1	2	2.47	2.75	2.76	82	85	87	1/26/2010	12/9/2011	24		2
A04	1	20	2	2	1.93	2.80	3.10	91	93	93	2/11/2010	12/9/2011	23		2
A05	1	19	2	2	2.50	1.17	2.40	86	84	87	10/8/2009	12/9/2011	27		2
A06	2	20	3	2	0.50	1.87	2.15	88	90	90	9/3/2009	12/9/2011	28		2
A07	1	18	1	1	2.08	0.75	3.02	78	64	90	1/26/2010	12/9/2011	24	yes	2
A08	2	19	4	2	2.23	2.00	2.71	89	86	87	9/23/2009	12/9/2011	28	yes	2
A09	2	19	2	2	3.61	2.50	3.01	91	90	91	1/26/2010	12/9/2011	24		1
A10	1	23	4	2	1.75	2.40	1.80	84	85	86	11/20/2009	12/9/2011	25	yes	2
A11	1	19	2	2	2.45	2.52	2.47	85	81	79	10/23/2009	12/9/2011	26		2
A12	1	19	1	2	3.50	3.45	2.58	89	89	93	10/19/2009	12/9/2011	26		1
A13	1	18	1	2	1.40	1.75	2.62	70	70	59	11/8/2009	12/9/2011	25		1
A14	1	20	2	2	3.23	3.00	3.13	87	87	88	10/23/2009	12/9/2011	26		1
A15	1	19	1	2	3.63	4.00	3.81	92	92	93	10/19/2009	12/9/2011	26		1
A16	1	20	3	1	2.75	1.69	2.86	97	89	90	11/20/2009	12/9/2011	25		2
A17	1	26	4	2	2.00	2.50	2.40	54	69	60	10/23/2009	12/9/2011	26	yes	2
A18	1	24	4	2	2.40	2.80	3.00	82	77	69	10/8/2009	12/9/2011	26	yes	2
A19	1	20	2	2	3.20	3.17	3.24	90	91	83	10/23/2009	12/9/2011	26		1
A20	1	19	2	2	0.83	1.06	2.00	80	94	94	10/31/2009	12/9/2011	26		1

Participant ID	Gender	Age	College Level	Athlete	GPA Before	GPA During	GPA After	Attendance Before (%)	Attendance During (%)	Attendance After (%)	Date of Entry	Date of Exit	Months in Program	Degree Persistance	Persistance
A21	1	21	2	2	2.42	2.00	1.80	67	83	63	11/16/2010	12/9/2011	13		1
A22	1	23	4	2	2.00	0.80	1.50	74	48	69	11/1/2010	12/9/2011	13		1
A23	1	28	3	2	3.70	3.18	2.00	93	85	80	2/9/2011	12/9/2011	11		1
A24	1	21	4	2	1.50	2.75	2.25	82	83	63	1/31/2011	12/9/2011	11		1
A25	1	22	3	1	3.20	3.14	2.75	99	90	93	10/24/2010	12/9/2011	14		1
A26	1	21	2	2	3.40	2.75	1.60	90	85	75	10/24/2010	12/9/2011	14		1
A27	1	21	2	2	3.00	3.17	3.40	79	93	87	10/22/2010	12/9/2011	14		2
A28	2	23	4	1	1.86	1.86	0.64	84	80	56	8/26/2010	12/9/2011	16		1
A29	1	20	3	2	3.20	2.75	3.80	96	97	100	11/17/2010	12/9/2011	13		1
A30	1	24	4	2	2.20	2.75	2.20	90	90	94	10/29/2010	12/9/2011	14	yes	2
A31	1	22	3	1	2.15	1.40	1.25	79	74	70	11/15/2010	12/9/2011	13		2
A32	2	21	3	2	2.00	2.31	2.25	88	87	90	9/3/2010	12/9/2011	15		1
A33	1	22	4	2	2.20	2.20	1.80	89	88	84	11/11/2010	12/9/2011	13		1
A34	1	19	2	1	1.86	1.77	2.62	90	90	90	3/16/2011	12/9/2011	9		1
A35	1	21	2	1	2.50	2.75	2.77	75	82	81	8/26/2010	12/9/2011	16		2
A36	1	21	2	2	2.75	2.94	3.40	83	93	95	2/8/2011	12/9/2011	8		1
A37	2	22	4	1	1.08	0.50	1.75	69	70	63	8/26/2010	12/9/2011	16		2
A38	1	19	2	1	3.33	2.54	2.33	90	87	83	10/1/2010	12/9/2011	14		1
A39	1	23	4	2	2.38	2.07	2.00	88	83	89	9/10/2010	12/9/2011	15	yes	2
A40	2	22	4	1	1.50	1.75	3.00	69	64	63	8/26/2010	12/9/2011	16		1
	Gender: 1- male, 2- female														
	Athlete: 1-athlete, 2-non-athlete														
	College Level: 1- freshman, 2- sophomore, 3- junior, 4- ser														
	Persistence: 1- still in school, 2- not in school														

Appendix B

Table B1.

Non-Participants Quantitative Data Information Set

Participant ID	Gender	Age	College Level	Athlete	GPA Before	GPA During	GPA After	Attendance Before (%)	Attendance During (%)	Attendance After (%)
B01	1	26	4	2	2.56	2.50	3.29	78	76	82
B02	1	25	4	2	2.38	4.00	3.50	95	97	95
B03	1	23	3	2	3.45	4.00	1.00	66	78	55
B04	1	26	4	2	3.75	4.00	4.00	95	94	97
B05	1	23	2	2	3.83	3.29	3.20	92	90	91
B06	1	24	3	2	3.67	3.33	3.50	94	90	91
B07	1	23	2	2	3.20	2.80	2.60	88	84	83
B08	1	24	1	2	2.67	3.01	3.24	86	79	82
B09	1	24	2	2	2.72	1.00	2.11	80	70	79
B10	1	21	1	2	3.12	2.60	3.00	82	83	86
B11	1	21	1	2	3.67	3.80	4.00	79	82	86
B12	1	25	3	1	1.64	1.81	2.20	82	84	86
B13	2	24	4	2	4.00	3.82	4.00	96	94	97
B14	2	22	1	2	0.50	1.38	1.00	62	74	71
B15	2	22	2	2	3.20	2.33	3.20	87	88	88
B16	2	23	2	2	2.75	2.29	3.25	96	92	94
B17	1	30	4	2	3.84	4.00	4.00	92	93	90
B18	1	27	3	2	4.00	4.00	3.67	96	95	90
B19	1	28	2	2	2.81	2.21	2.71	79	77	81
B20	1	34	4	2	3.83	3.20	3.20	92	94	10

Participant ID	Gender	Age	College Level	Athlete	GPA Before	GPA During	GPA After	Attendance Before (%)	Attendance During (%)	Attendance After (%)
B21	1	23	2	2	3.08	2.75	2.00	99	80	94
B22	1	30	1	2	2.75	1.61	2.72	89	90	92
B23	1	33	1	2	2.35	2.65	3.00	88	86	79
B24	1	26	3	2	3.20	2.93	3.21	92	94	95
B25	1	26	4	1	2.75	1.00	1.80	84	72	77
B26	1	23	3	1	1.92	2.80	2.69	84	88	86
B27	1	22	2	1	1.50	2.14	1.50	70	80	76
B28	1	25	2	1	1.46	1.71	1.71	78	84	8
B29	2	22	2	2	2.96	2.72	2.76	90	92	92
B30	2	24	3	1	1.75	2.28	0.60	62	67	48
B31	2	23	2	1	4.00	3.70	4.00	89	90	91
B32	2	20	1	1	3.36	3.00	3.23	91	91	88
B33	1	31	2	2	2.28	3.24	2.60	79	84	80
B34	1	34	4	2	3.83	3.20	3.20	90	91	2
B35	1	22	2	1	3.00	2.25	3.25	86	85	88
B36	2	22	2	2	3.00	2.80	3.40	90	87	91
B37	1	23	3	2	3.00	3.25	3.50	88	84	89
B38	1	26	4	2	2.00	1.83	3.00	80	81	84
B39	1	21	2	2	2.07	2.57	1.00	79	83	77
B40	1	21	2	1	0.92	2.20	2.46	86	88	91
	Gender: 1- male, 2- female									
	Athlete: 1-athlete, 2-non-athlete									
	College Level: 1- freshman, 2- sophomore, 3- junior, 4- se									
	Persistence: 1- still in school, 2- not in school									

Vitae

Terry Russell was born in Vincennes, Indiana on September 23, 1954. After graduating from South Knox high school in 1972, he joined the U.S. Army and served until 2000. He entered a job at Midwest University located in St. Charles, Missouri as the Director of the newly acquired Army Reserve Officer Training Candidate Program. He received his Bachelor's degree in Business Administration and his Master's Degree in Non-Profit from Midwest University in 2006. His assignments at the University included Director of Residential Operations, Dean of Students, and Director of Military Affairs. His responsibilities included overseeing the Residential Life office, Veterans Affairs Office, The Army ROTC program, and Public Safety and Security. He was instrumental in developing the Student Veteran's Organization as well as the Substance Abuse Intervention Program