



AN ANALYTICAL INVESTIGATION OF THE  
CHARACTERISTICS OF THE DROPOUT STUDENTS IN  
HIGHER EDUCATION

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**ABSTRACT**

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Aim/Purpose	Student dropout in higher education institutions is a universal problem. This study identifies the characteristics of dropouts.
Methodology	The paper develops a mathematical model to predict students who may drop-out. The sample includes 555 freshmen in a non-profit private university. The study uses both descriptive statistics, such as cross tabulation, and a binary regression model to predict student dropout.
Contribution	There are two major contributions for the paper. First, it identifies the dropout rates of each group, a finding that may be used to better allocate resources at higher education institutions. Second, it develops a predictive model that may be used in order to predict the probability of a student dropping out and take preventive actions.
Findings	This study compared dropout rates of one and a half year of enrollment among Traditional Undergraduate Students. Two major findings are the following: (1) Some of the resources designed to assist student are misallocated, and (2) Predictive models can be used to calculate the probability of a student dropping out.
Recommendations for Practitioners	The study recommends that institutions must create initiatives to assist freshmen students and have annual assessment to measure the success of the initiatives.

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Recommendation for Researchers Two, mathematical models may be used to predict dropout rates, the paper includes a model that predicted with 66.6% accuracy students who will dropout.

Keywords dropouts, attrition, persistence, retention, higher education

## INTRODUCTION

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Institutions of post-secondary higher education usually measure their success by looking at student's persistence, attrition, or dropout rates. When the persistence is high, institutions pat themselves on the back and it is business as usual. Once the dropout rate rises, however, they panic and try to investigate the reasons for the dropouts. The dropout topic is very challenging and painful especially for private non-profit institutions, which have the reputation of being 95 - 99% tuition driven. Their survival depends on keeping the persistence rate as high as possible and the dropout rates as low as possible. Yet, analyzing the reasons for the increase in dropout rates remains an immense task, not only because of the complexity of and correlation between variables, but also because the literature failed to create any consensus on the definition of 'dropout' or define any model institutions can follow. Moreover, institutions do not have a consistent and systematic way of collecting dropout data.

Research reflects inconsistency in defining the "dropout" term. One-definition states, "dropout as referring to those persons who leave the college at which they are registered" (Tinto & Cullen, 1973, p. 1). A second definition of dropout is "dropout as referring only to those persons who never receive a degree from any institution of higher education." (Tinto & Cullen, 1973, p. 1). Addressing this definition is almost an impossible task due to lack of access to reliable data.

For the purpose of this study, the operational definition is as follows: **"Students are considered to have dropped out if they did not register for courses the following semester from the institution."** The definition follows the structure of the USA Department of Education definition of the term "retention", which is defined as "the student who registered for the fall term and did not register for the following fall in the same institution." (National Center for Education Statistics [NCES], 2017) It has its positive and negative factors. Its positive aspect lies primarily in analyzing longitudinal data to predict if the university is using its resources efficiently and effectively. The negative aspect is that it includes students who may have transferred to another institution to earn their degree

This study will examine a cohort of students who joined an institution in Fall 2016 and follow their registration pattern for 3 consecutive semesters: Fall 2016, Spring 2017, and Fall 2017. Students who dropped out are those students who registered in Fall 2016 but failed to register in either Spring 2017 or Fall 2017.

The paper includes a two pronged analysis of first-year traditional-age registered students who continued and who dropped out. The first analysis utilizes descriptive and cross-tabulation statistics of their ethnic background, gender, age, and academic achievement. Financial data analysis will be considered in a following study due to issues in data collection. The analysis considers the use of various academic programs designed to facilitate the students' transition to college, to improve both their academic and social experience, and to reduce the dropout rate. In addition to the descriptive analysis, a predictive model is developed using logistic regression in order to identify students who may be susceptible to dropping out in order to take corrective action.

The paper starts with a literature review where high school dropout statistics is presented followed by higher education dropouts. The design section presents the model. The methodology will follow. The Findings and results section will present the data analysis and testing results of the model followed. The paper concludes by presenting the implications and summary of the study with future recommendations.

## LITERATURE REVIEW

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The problem of increased illiteracy and high school and/or college dropouts is an international problem. In Argentina Zalazar-Jaime, Moretti, Losano, and Medrano (2017) investigated the perceived academic satisfaction among first year freshmen students attending universities because the highest dropout rate in public universities in Argentina occurs during first year freshmen students. In the Open University of Israel, Vilner and Zur (2016) investigated the reasons why there was a high dropout rate in their beginning Computer Science (CS1) course and attempted to design a final exam which reflected the material covered in the course and which contained a proper balance of questions in terms of skill testing. Bennett (2000) reported that the dropout rate in high school in Australia was huge among male students where 50% of those students would end up on welfare. Similarly, countries such as Norway (Hovdhaugen, 2011) and Spain (Rodríguez-Gómez, Feixas, Gairín, & Muñoz, 2015) are struggling with the same problem. Moreover, universities in England even tried to reform their higher education to address the dropout concern (Simpson, 2004).

There are many causes for dropping out, for example, *students are ill prepared for higher education*. Mokoena and Materechera (2012) recognized the dropout rate of first year freshmen students in colleges in South Africa was a trend. They concluded that one of the reasons for the dropout was that the students were underprepared for higher education. They concluded that institutions should identify the strengths and weaknesses of students and develop creative strategies to provide support and assistance to such underprepared students. Bastone (2011) concurred that freshman students entering colleges and universities are ill prepared for higher education. They lack the skills of learning independently, settling into different work patterns compared to high school, time management, intensive study of fewer new subjects. Yet, professors expect the new undergraduates attending college for the first time to possess all these skills.

*Recession.* The trends of the recession and enrollment in 2-year colleges and 4-year public and private (non-profit and for-profit) institutions seem to go hand in hand. There is a close inverse correlation between the economy and college enrollment in higher education; that is, enrollment in higher education tends to rise as the recession worsens. With unemployment at its highest, people started reflecting and assessing their options. They started considering pursuing their education to improve their opportunities for better employment, to provide a better quality of life to their families, to improve their skills, and to investigate career change.

Even though the 2006-07 to 2013-14 recession in the USA caused local governments to significantly reduce grant funding for full time equivalent (FTE) students, that was not the case for public four-year institutions which received approximately 40% of their income from government resources. Nonetheless, private non-profit and private for-profit institutions were effected the most (Mellander, 2016).

*Financial.* The American Association of Community Colleges (2017) reported that the recession had “dramatic and unforeseen impact on enrollment,” which grew from 16.9% in 2007 to 24.1% in 2009. The recession caused students to analyze, assess, and reexamine their options of which college or university to attend; that, in turn, caused public 2-year colleges to become more desirable than 4-year nonprofit institutions. Public 2-year colleges cost averaged US\$6,750 per year compared with US\$9,800 for 4-year public universities and an average of US\$21,240 per year for 4-year private universities (O’Malley, 2012). Private institutions faced the challenge of competing with the public institutions and community colleges.

*High School enrollment.* Rouse and Kemple (2009) stated that in 2009, around 16 million students attended approximately 40,000 high schools in the United States. Most of these students attended public school. The U.S. Census Bureau of Labor Statistics started collecting data about the United State enrollment and dropouts from 1948. In 2011 the Bureau reported that only 40% of 16 to 24 year old students were enrolled in colleges or universities. Some of the factors that contributed to the trend

included (1) low rate of employment for this group, only 46.1% of 16 to 24 year old people were employed in 2009, (2) 85% graduated high school in 2008 compared to 75.5% in 1967. In 2009, Dr. Richard Fry, senior research associate at the Pew Hispanic Center, said, “We have the biggest pool of young adults we’ve ever had who’ve finished high school, this means that more youths than ever before were eligible to attend college. Effectively, a record high proportion of youths are in college because the base of young high school completers is at an all-time high, not because college enrollment among high school educated youth has increased.”(Fry & Parker, 2012) In 2005 high school graduation rate was 46.9% compared to 46.7% in 2008. In 2009 the enrollment level for 18-24 year old students attending colleges and universities was a record high, hence, the need for resources to assist high-risk students skyrocketed too (Gilroy, 2011).

Englund, Egeland, and Collins (2008) reported that there was a significant correlation between dropout rate and parental involvement in their children’s schooling. Patterns of parental involvement in school were significantly different between expected dropouts and unexpected graduates in middle childhood. In contrast, expected graduates had higher levels of parent involvement in middle childhood, more supportive parent-child relationships in early adolescence, and higher levels of social competence with adults than unexpected dropouts.

*Legislation.* In the USA, interim legislation was passed to increase degree completion rates for students who were enrolled in colleges and universities. The Obama administration dedicated US\$18 billion to fund educational initiatives to make “world-class” college education affordable (Gilroy, 2008). As a result, community colleges are attempting to reform and restructure their processes. The community colleges created new initiatives of honor programs, collaborating and developing new programs for high school students, and workforce training. These aggressive marketing and advertising campaigns encouraged politicians to advocate and provide extra resources to community colleges and public institutions. As a result, in 2007 approximately 3.1 million students (11.8%) of high school graduates enrolled in community colleges. Oviatt (1997) recommended Congressional support by awarding grants for Hispanic Serving Institutions (HIS).

In 2014, the US National Center for Education Statistics (NCES, 2016) reported that 17.3 million undergraduate students attended 2-year and 4-year institutions in the United States. 10.6 million (61%) attended 4 year universities, while 6.7 million (39%) attended 2 year colleges. Of the private nonprofit universities, 86% of the under 25-years old students attended full time. 34% of the part time students attending nonprofit universities were under 25-years old.

*Blended learning.* Institutions are recognizing the dropout epidemic and have started reforming and restructuring their existing programs. That was the case for the Mechanical Engineering discipline at Universitat Rovira in Spain. The institution reformed its Mechanical Engineering curriculum and its instructional delivery methodologies by including blended learning strategies. The study reported that new approaches have improved students learning outcomes. Most of all, there was a significant impact in performance, as well as reduced dropout rate (López, Ferrando, & Fabregat-Sanjuan, 2016). Alonso, Manrique, Martinez, and Vines (2011) introduced self-efficacy to understand student dropout rate.

*Team work collaboration.* Other institutions and disciplines introduced peer collaboration, tutorial groups, and teamwork/peer collaboration to create student interaction and reduce the dropout rate. That was what Booij, Leuven, and Oosterbeek (2017) did in their Economic class. They manipulated the composition of groups and placed weaker students with better students. The results of their study indicated that their dropout rate was reduced by 12%; their low-ability students had more interactions and improved their skills. However, there was no evidence that high-ability students were unaffected. Moreover, Yadin and Or-Bach (2010) lowered the dropout rate in Information Science and Computer Science disciplines by introducing individual and collaborative learning. Students who were involved in extracurricular activities and utilized the Student Support Systems appeared to be more satisfied which resulted with higher graduation rate (Simpson, 2004).

*Mentoring.* Campbell and Campbell (1997) emphasized the importance of having a mentoring program in an institution to increase student persistence and reduce dropouts. Their study reported that mentored students had higher Grade Point Average (GPA) and completed more units per semester. As a result, the dropout rate was lowered from 26.3% to 14.5%. The study indicated no significant difference due to gender and ethnicity of the mentor versus protégé. Hu and Ma (2010) stated that Asian students liked having college mentors. Moreover, Hispanic students were more likely to consult with their mentors on their sensitive challenges compared to Caucasian students.

Walleri, Stoker, and Stoering (1997) tried to resolve the problem of dropout at Mount Hood Community College in Oregon, USA. They tried to increase retention by developing and implementing a new program focusing on at-risk students. The college gave students at-risk extra attention by providing aggressive academic advising, monitoring the students' progress, and providing a mentoring program. The project was successful. However, there was no significant difference in GPA between program students and other students; students receiving the intensive academic advising had a higher one-year retention rate. Similarly, Museus and Ravello (2010) emphasized the importance of academic advising in the success of minority students, especially African American students. They recommended that institutions must implement a proactive, humanized (e.g., advisor learning more about the student's culture and environment), and holistic (e.g., attempt to understand the student's challenges outside the classroom) academic advising strategies.

Similarly, Fries, Carney, Blackman-Urteaga, and Savas (2012) found that the wraparound support for high-risk youth is very positive. "The purpose of the wraparound process is to identify and then support the high-risk youth's individual strengths and then to encourage personal goal setting." The wraparound process consists of four phases: team preparation, initial plan development, plan implementation, and transition. Many high-risk youth re-join with educational goals once their lives became more stable after receiving wraparound support and that in turn decreased the dropout rate and increased the graduation rate. The challenge was reaching out to high-risk youth and encouraging them to utilize any wraparound support. Moreover, the literature repeatedly emphasized the importance of "sense of belonging" in any institution. The recommendation was having "sense of belonging" as a variable all by itself and using the variable to predict student dropout. They recommended that institutions must continuously measure the sense of belonging even during the students' pre-college period (Hausmann, Schofield, & Woods, 2007; Hurtado et al., 2007).

Some of the other characteristics that are often examined when investigating dropout are ethnicity and gender. The next few paragraphs present an overview of the available arguments in these two categories

## ***ETHNICITY***

The US National Center for Education Statistics (NCES, 2016) ethnicity statistics for nonprofit institutions include, 3% two or more races, 1% American Indian, 6% Asian, 11% Hispanic, 13% African American, and 66% Caucasian.

For the future, the trend projected a steady enrollment for full time students and a significant increase in part time enrollment for less than 25-years old students. The Pew Research Center analysis reported the following statistics of young adult students who were 16-24 years of age in the USA:

***African American.*** Even though there was a rising trend of high school dropout among African American students from 2007 to 2008, the college and university enrollment of 18 to 24 year old African American students remained steady at 32% of the population. However, recently the dropout rate of male African American students was increasing not only in predominately-white institutions (PWI), but also in historically Black colleges and universities (HBCU).

The perceptions of students in predominately-white universities vary immensely and contradict each other. African American students were very intimidated by faculty, who were perceived to be aloof

and uncaring, yet Caucasian students' perceptions were just the opposite. African American students observed racism on campus and were uncomfortable in academic interactions and campus environment. On the other hand, Caucasian students enjoyed diverse peer interactions, were comfortable in academic interactions, and felt positive about the environment on campus (Johnson, Wasserman, Yildirim, & Yonai, 2014; Thomas, et al., 2007). Zea, Reisen, Beil, and Caplan (1997) concluded that students decided to dropout when they started perceiving that the college environment was unwelcoming because of their race, ethnic background, or religion.

Hunn (2014) concurred that African American students were underrepresented in 4-year college graduation. Nationwide, only 42% of African American students who attend college graduate in contrast to 62% of Caucasian students. Some of the challenges of retaining African American students included lack of diverse faculty and staff on campuses, culture, lack of sense of belonging, and campus climate. The study recommended establishing a learning community by Team Based Learning (TBL) pedagogy to allow students to collaborate and increase the sense of belonging. Moreover to create mentoring programs for African American students by African American faculty.

The factors that affect the success of African American male students in HBCU included university's racial composition, faculty support, peer support, mentoring program, and academic success (Palmer, Davis, & Maramba, 2010).

***American Indian/ Alaskan Natives.*** Research reflected that this ethnic group was considered to be a minority within the minority, and they were hardly mentioned because they comprised only 0.8% of the student population. However, 75-93% of American Indian/ Alaskan Native students dropout of college and never complete their college degree due to ill health. Moreover, female American Indian students were consistently reported to have more ill health compared to male students (Patterson-Silver Wolf, VanZil-Tamsen, Black, Billiot, & Tovar, 2013).

***Asian.*** According to the 2000 U.S. Census in the Southern United States, even though the African American population was 29.2%, the Asian population was at 0.6%, and the Hispanic population was 5.3%, the flagship university student population consisted of 1.89% Hispanic, 5.14% Asian, and a very small percentage of African American.

***Caucasian.*** The literature reflects that Caucasian students consistently have the lowest dropout rate compared to any other racial ethnic groups among students. The dropout rate among Caucasian high school students was less than 9%, and 46% of Caucasian high school graduate attend colleges and universities. The college enrollment of 16 to 24 year old Caucasian students was at 41%. Moreover, 37% of 25 to 29 year old Caucasian students had at least a Bachelor's degree.

***Hispanic.*** In general the report indicated a record-high high school graduation rate among Hispanic students. Adam (2001, 2010) raised the awareness by stating that in 20 years the overall proportion of Hispanic high school students had increased from 6% to 15%. Sadly, 39% of Hispanic children still lived in poverty; hence, the Hispanic dropout rate was about 30% nationally. The 2011-2012 PEW report (McGlynn, 2011a) reflected a change in the dropout trend; the class of 2012 had record breaking high school graduation rate. In addition, a higher percentage of Hispanic students than Caucasian students joined a post-secondary institution; in 2012, 69% of the students who pursued higher education were Hispanic, surpassing Caucasian students (McGlynn, 2014).

McGlynn (2011b) clarified the misconception of the Hispanic student profile, that is, the stereotype that Hispanics were foreign born, English was their second language, and had the highest high school dropout rate. Rather, a large majority of Hispanic students in the United State was born in America, English was their first language, and they had a much lower dropout rate. However, this fact does not mean that native-born Latino perform better than foreign-born Latino students do. In some cases, they do worse due to their affiliation with gangs (McGlynn, 2011a). On the other hand, the literature reflected that high school dropout rates increased significantly each year for children who immigrated after the age of eight (Beck, Corak, & Tienda, 2012).

There is a difference between Hispanic students who were born in the United States (native-born) and foreign-born Hispanic students. The report (McGlynn, 2011b) indicated that 70% of Hispanic youth either finished high school or earned the GED and were striving to attend colleges and universities. According to Cooper (2011), the dropout rate in Foreign-born Hispanic students (52%) is twice the rate of Caucasians and African American students. 41% of Hispanic 16-20 years old do not possess high school diploma or earned GED compared to 23% for African Americans and 14% Caucasian. 25% of native-born Hispanics do not possess high school degree, yet 21% earned their GED compared to 5% of foreign-born. In 1992, Mellander reported that even though the percentage of Hispanic students completing high school had improved significantly over the years, only 50% of the Hispanic students who graduate high school attend college.

The dropout rate among Hispanic high school students was at 22%. 43% of native-born Hispanic high school graduates attended colleges and universities compared to 29% for foreign-born Hispanics. Furthermore, the dropout rate among native-born Hispanic was at 8.5% and the college enrollment of 18 to 24 year old Hispanic students was at 26%. There is a major gap between native-born Hispanic and Foreign-born Hispanic students. Moreover, only 9% of foreign-born Hispanic students graduated college compared to 14% for native-born Hispanic (Cooper, 2011; Jia, 2009).

The literature shows that some of the reasons for dropouts included early teen marriage (Dahl, 2010; Gest, Mahoney, & Cairns, 1999), early teen motherhood (Driscoll, 2010; Hofferth, Reid, & Mott, 2001), and substance use (Fleming, White, Haggerty, Abbott, & Catalano, 2013; Gfroerer, Greenblatt, & Wright, 1997). The Hispanic college enrollment growth was due to significant improvement in high school graduation rate and overall population growth (Hoogeveen, 2013)

McGlynn (2011a) stated that the second generation Hispanic youth was growing over the last 2 decades and that by 2030 they will be the majority of the workforce while the Caucasian population is aging. McGlynn made the point that “their economic and social integration will depend on educational investments made today: the Hispanic demographic dividend can be harnessed for the benefit not only of future generations of Hispanics but also of the nation.”

In addition, research showed that Hispanic parents strongly believed in the value of higher education. They anticipated their children would receive some scholarship, and they were more reluctant to borrow money to send their children to college compared to Caucasian or African Americans; they were concerned about repayment of the loan and their culture adopted “pay as they go” culture (Gilroy, 2012; McCallister, Evans, & Illich, 2010).

## ***GENDER***

The fact is that more women pursue their education compared to men. 42% of students 18 to 24 enrolled in colleges and universities are women. The percentage stayed consistent over the last 3 years. In 2008, 53% of those attending colleges and universities were women. Conway (1989) investigated the trend of female college students from 1889-1989 and reported that more female students majored in Humanities and Fine Arts compared to Science, Technology, Engineering, and Mathematics (STEM). She added, “What is critical for any young person, male or female, in developing a sense of his or her adult self is the internalizing of a strong self-image in his or her chosen field of endeavor. The model for women’s higher education in the 21<sup>st</sup> century must take into account providing what is needed to give women the ability to translate their knowledge into self-directed action, especially women who have not experienced egalitarian family life styles.” (Conway, 1989, 3) Since 1969 the male student enrollment in colleges and universities was the highest because students attempted to defer from the military draft. Hence, it is at 35.2% and record high 37% in 2008 for male students.

Smock (1990) reported that African American women who dropped out had the tendency to remarry within 10 years after separation due to risk of poverty and reluctance of cohabitation without marriage. Despite all the challenges of cultural racism and sexism, female African American students

have doubled their college attendance at a rate 2:1 ratio compared to their male peers. However, it was still behind those of Caucasians and Asian students (Hunn, 2014; Winkle-Wagner, 2015).

McGlynn (1998) stated that the dropout rate among Hispanic females was much higher when compared to males. Research showed that Hispanic female wages were significantly lower compared to Caucasian or African American females.

## **BACKGROUND OF THE UNIVERSITY UNDER INVESTIGATION**

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The study analyzes the dropout rates in a non-profit private university in Southern California, USA. The university's mission states the following. The University offers a distinctive and relevant educational experience to a diverse population of traditional-age, adult, and graduate learners preparing them for successful careers and a commitment to life-long learning across the liberal arts and professional programs. Its Core Values include ethical reasoning, diversity and inclusivity, lifelong learning, and community and civic engagement. **Ethical Reasoning** - The University affirms a value system that actively supports peace with justice, respect of individuals and humanity and the health of the planet and its people. Students are reflective about personal, professional, and societal values that support professional and social responsibility. **Diversity and Inclusivity** - The University supports a diverse and inclusive environment where students recognize and benefit from the life experiences and viewpoints of other students, faculty and staff. **Lifelong Learning** - The University promotes intellectual curiosity and the importance of lifelong learning. It teaches students how to learn, to think critically, to be capable of original research, and to access and integrate information to prepare them for continued personal and professional growth. **Community and Civic Engagement** - The University asserts a commitment to improving and enhancing local, regional and global communities.

In 2016 the University was one of 435 national institutions that hold a federal designation as a Hispanic Serving Institution (HSI). 44% of the student population of the university was Hispanic, a complete breakdown of the university student population is included in a following section.

The university believes in providing the proper resources to serve its mission and students. The university initiated and committed the following services as resources to help the student population: Academic Success Center, Brothers' Forum, Career Services, Disabled Student Services, and First Generation Student Success Program (FGSSP). The sections below present the mission of each department.

### **Academic Success Center:**

The Academic Success Center (ASC) mission is, "The Academic Success Center is committed to helping all students become the most confident, curious, and engaged learners they can be." The program started in 1992. It provides the following services to students: Tutoring services (one-on-one, group tutoring, and online tutoring), Events and Workshops such as Finals Group Study Sessions and Midnight Study Hours, Testing services such as placement testing and proctored testing, Peer academic coaching, Technology coaching, and services for students with disabilities.

### **Brothers' Forum:**

The Brothers' Forum is an organization dedicated to support and assist African American males and broadly support men of color on campus throughout their social and academic endeavors. All students enrolled receive both scholarship support and an assigned faculty or staff mentor. A scholarship is derived from the David and Lucile Packard Foundation and was created to support the academic success of Brothers' Forum members at the institution. To be eligible for the Brothers' Forum Scholarship students must do the following: (1) enroll as a full-time student for Fall and Spring (one semester, if graduating), (2) register for 1 unit of Brothers' Forum education course, (3) preferably have cumulative grade point average 2.4 or more (4) attend and be actively involved in Brothers' Forum events and meetings, (5) meet regularly with assigned mentor, and (6) have financial need.



**Career Services:**

The mission of the Office of Career Services and Professional Development is to provide professional development instruction and career-oriented support to ensure that students graduate with the skills necessary to succeed in their chosen professions.

**Health Center and Disabled Student Services:**

The Disabled Student Services Department (DSSD) has been designated by the University to ensure access for all students with disabilities to all academic programs and University resources. Types of disabilities include medical, physical, psychological, attention-deficit, and/or learning disabilities. Reasonable accommodations are provided to minimize the effects of a student's disability and to maximize their potential for success. Some of the accommodations provided by the DSSD, just to name a few, include priority registration, assistance in scheduling classes in accessible locations, extended testing times, testing in a distraction reduced testing environment, reader and/or transcribers, sign language interpreters and/or caption lists, assistance in obtaining text books in an alternate format, adaptive technology (e.g., for visually impaired, or those students with learning disabilities), and network referral system to outside agencies which may further assist a student with a disability.

**First Generation Student Success Program (FGSSP):**

The First Generation Student Success Program (FGSSP) is a comprehensive program serving first generation college students and their families. The FGSSP is a program under the Office of Multicultural Services, Division of Student Affairs. In 1996 the university established the program and has currently served over 600 students and their families. The FGSSP promotes diversity, educational opportunity, and the academic success of first generation students. By generating a focused sense of academic purpose and confidence among students and family members, the program seeks to increase retention and graduation rates of first generation students. They provide the following services: scholarships, mentoring, programs/ workshops, parental involvements, and research and assessment.

***PROBLEM STATEMENT***

The university took pride in its high persistence rate over the last 7 years. However, in 2017 the dropout rate increased significantly. The dropout rate was at 14.43% over the last 7 years, however, in Fall 2017 the rate increased to 18%, which represents approximately a 25% increase. Simple statistical calculations show that the increase in the dropout rate was significant ( $p=0.0028$ )

***PURPOSE OF THE STUDY***

The purpose of this study is of twofold: first, to investigate the characteristics of students who drop out without completing their degree and, second, to create a predictive model to identify future student dropouts. To accomplish this purpose a quantitative predictive model will be devised. The model will be tested using one and a half years of data. This pilot will only address Traditional Undergraduate (TUG) students, that is, students who were 16-24 years of age. Adult students are not included in this study.

***DESIGN/METHODOLOGY/APPROACH***

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***POPULATION AND SAMPLE***

The University under study had in its main campus, i.e., not including online or non-traditional age students, 2809 registered traditional undergraduate (TUG) students in the Fall 2016, the year of the start of the study. The average TUG student age was 20.2 years. The undergraduate students included 41.8% males, 57.4% females, and .7% unreported. The ethnic background included 3% American

Indian/Alaska Native, 6.1% Black or African American, 20.8% Caucasian. 50.1% Hispanic/Latino, 4.6% Asian, 0.5% Native Hawaiian/Other Pacific Islander, 10.9 Not Reported and the remainder were either International 3.1%, or two or more races 3.6%.

The sample in the research included all five hundred and fifty five students who registered for the Fall 2016, i.e., all students in the first year population. The sample is limited to one year only due to privacy issues and to present the university administrators with supporting evidence that an analytical approach presents a viable method of predicting student dropout. This decision, i.e., limited data set, is supported in Dekker et al. (2009), as mentioned in an earlier section.

Of the five hundred and fifty five students who registered for the Fall 2016, 105 did not register for the Fall 2017. Student records were gathered from the different organizational departments and the following characteristics were collected (other attributes were eliminated because of the lack of completeness across the data set, e.g., religion):

- Student identifiers and personal information including:
  - Record ID
  - Gender
  - Age
  - Ethnic Background
  - First Generation indicator
- Student High School information including:
  - High School
  - SAT or equivalent
- Student Academic Information including:
  - GPA
  - Credit hours
  - College and Major
- Student Financial Information
- Student College Life Information including:
  - Dorm residence indicator
  - Meal Plan Indicator

The data was evaluated for completeness. Of the 505 records, seven were excluded in certain tests because of missing data.

### ***METHODOLOGY/ APPROACH***

This paper includes two approaches to investigate dropout. The first is descriptive statistics and the second is predictive analysis. For the descriptive statistics and cross-tabulation, Pivot tables were used in the MS Excel spreadsheet program. For the predictive analysis and in this round of analysis, financial data were not considered. The main reason for the exclusion is the lack of clarity of the meaning of each characteristic and the incompleteness of many data points. In addition, seven (7) records were excluded for missing SAT results. IBM SPSS ver. 24 was used to perform logistics regression. Checks for collinearity and outliers were performed using a linear model, then logistic regression was used to develop the actual model.

Analytical approaches have been previously used to predict dropout rates. Yukselturk, Ozekes, and Türel (2014) implemented several techniques including K-Nearest Neighbour, Decision Tree, Naïve Bayes and Neural Network classifiers. They found that the Neural Network and the Decision Trees are the most sensitive. However, the study was limited to an online Information Technology course. As such, the students' population is different than the one used in this paper. A second paper, Dekker, Pechenizky, and Vleeshouwers (2009), studied freshmen in an Electrical Engineering program who dropped out after their first term. The study concluded that the Decision Tree is an effective

prediction approach with 75 to 80% accuracy. The strongest predictor of student dropout in this study was the grade in a linear algebra course. An interesting remark is that the researchers determined that having a limited data set, i.e., first semester and pre-university data, maybe more useful than a larger set.

## ***FINDINGS/RESULTS***

### **Descriptive statistics**

The descriptive statistics tables, due to their large number, are included in the Appendix. The tables included in this section of the paper are those that merit special considerations. All tables are constructed with the logic indicated in Table 1.

**Table 1: Demonstration Table**

		Fall 2017			
		Dropped	Registered	% dropped in Spring 17	% dropped in Fall 17
Spring 17	Registered	Cell 1	Cell 2	Cell 5	Cell 6
	Dropped	Cell 3	Cell 4		

% of students who dropped in Spring 2017 (cell 5) is = Students who dropped in Spring of 17 (Cell 1 + Cell 2) / Total Students (Cell 1+Cell 2 + Cell 3+ Cell 4). While % of students who dropped in Fall of 2017 (Cell 6) is = Students who dropped in the Fall of 2017 (cell 1 only) / Total students in the Spring 2017 (Cell 1 + Cell 2 + Cell 4)

Five hundred fifty five students registered in the fall 2016. Of these students, 52 did not register for the spring 2017. Of the 52 who dropped out in the spring, 2 students registered for the fall 2017, and an additional 55 of the students who registered for the spring dropped out in the fall (see Table 2).

**Table 2: Total University Students.**

		Fall 2017			
		Dropped	Registered	% drop in Spr.	% drop in Fall
Spring 2017	Registered	55	448	9.37	10.89
	Dropped	50	2		

Of the 105 students who did not enroll in Spring 2017 and Fall 2017, 54 students (51%) were permanent withdrawals, 12 students (11%) indicated the intention of returning back. Only 14 students (13%) had good standing. 25 students (24%) were on academic warning, academic probation, and academic disqualification [4 students (3.8%) were on academic warning, 15 students (14%) were on academic probation, and 6 students (5.7%) were academically disqualified]. The financial aid to students who had good academic standing was more than the aid given to the students who were placed on probation. This might be a reason why few of the students decided not to enroll.

Based on the above, 97.5% of the students who dropped out had an academic issue. This finding may bring into question (1) the preparedness of high school graduates for college, or (2) the university admission criteria.

Table 3 shows the average SAT for each group. The national average SAT score for 2016 was 1002 – 494 for critical reading and 508 in Math (College Board, 2016)). Table 3 shows that admitted students

SAT score was above average. Hence, further analysis is needed to test the preparedness of high school graduates for college. This finding, i.e., SAT score higher than average, reduces that chances of Mokoena and Materechera (2012) finding that lack of preparedness for higher education is a reason for dropping out. .

**Table 3: Average Admission SAT score**

		Fall 2017	
		Dropped	Registered
Spring 2017	Registered	1030	1055
	Dropped	1012	1010

**Academic Success Center:**

The Academic Success Center was used by 40 students out of 105 who dropped out. 17 of the 40 used ASC during in Fall 2016 with an average of 1.88 hours. 23 of the students who dropped in the Spring 2017 used the ASC for 2.47 hours.

Looking at the raw data, it is clear that some students were motivated to stay at the University, but did not achieve their objective. This is made clear from those few students who utilized the center for 4, 5, 6, and 8 hours of tutoring time, but ended up dropping out from the university. No additional analysis could be performed on those students since there was no additional available data. However, there are two possible recommendations: additional research could be performed to use the number of ASC hours as a predictor of dropout and the institution should attempt to contact those individuals to determine why they decided to drop out.

**Brothers’ Forum:**

None of the members enrolled in the Brothers’ forum dropped out. However, out of 550 TUG students who were enrolled in Fall 2016, Spring 2017, and Fall 2017 one student was a member of the Brothers’ Forum and one student joined in Fall 2017. This indicates that this resource was underutilized.

**Career Services:**

11 out of 105 students who were enrolled in Fall 2016 and did not come back in Fall 2017 visited the Career Services department. Four students dropped out in Spring 2017 and seven students dropped out if Fall 2017. All 11 students visited the Career Services only once except for one. Most students asked help in writing their resumes.

**Health Center and Disabled Student Services:**

34 out of 105 students who were enrolled in Fall 2016 and did not enroll in Fall 2017 visited the Health Services department at least once and one student visited multiple times. A medical provider evaluated all students at least on one occasion.

In addition, three students had formally applied for the Disabled Students Services (DSS) and were approved to utilize the university’s academic accommodations. Two of the students visited the Health center. This does not mean that the students utilized the accommodations. Due to Privacy regulations no further information was provided about these students.

**First Generation program:**

The institution prides itself for serving first generation students and this program presents services to First Generation students. 80 students participated in the program. Seven (7) of these students were members of the cohort under study (TUG who started in Fall 2016 as freshmen). Only one (1) of these students dropped out.

**Special Programs:**

Tinto proposed a three stage “rites of passage” process (Nora, 2001). He suggested that students pass through three stages: Separation, Transition, and Incorporation. Some colleges developed special programs to facilitate the transition through these stages. For example, the Business College in the institution understudy developed a course that introduced the students to (1) Mentors, who were senior students responsible for guiding freshmen through the early years, (2) Advisors who are trained to advise students on courses and instructors, (3) The various university resources, e.g., library, registrar, and others. There was a 10% decrease in dropout rate between students who took the course and those who did not take it.

Tables 4 & 5 show the dropout rate for first generation and non-first generation students for both genders. The difference between the average dropout percentages is small. This suggests that either (1) the effort of the institution, i.e., First Generation Student Success Program – FGSSP, was working or that retention rates do not differ between first and non-first generation students. The latter is not supported by research. For example, Tym, McMillion, Barone, and Webster (2004) stated that dropout rate for first-generation students was more than double that of non-first generation students.

**Table 4: First Generation Performance**

		Fall 2017			
		Dropped	Registered	% drop in Spr.	% drop in Fall
Spring 2017	Registered	24	193	7.26	11.06
	Dropped	17			

**Table 5: Non-First Generation Performance**

		Fall 2017			
		Dropped	Registered	% drop in Spr.	% drop in Fall
Spring 2017	Registered	31	255	10.9	10.76
	Dropped	33	2		

Further analysis investigating the differences between first and non-first generation by gender and ethnic background identified African American first generation (Table 6) as a group that required attention. The dropout rate is approximately three times higher than any other group including non-first generation African American (16.67%). A more detailed look showed that African American First Generation Males’ dropout rate was 66.67%, the highest rate in any group

**Table 6: First Generation African American**

		Fall 2017			
		Dropped	Registered	% drop in Spr.	% drop in Fall
Spring 2017	Registered	6	7	7.14	46.15
	Dropped	1			

Another finding of interest was that males' dropout rate is higher than females' in every ethnicity except for Asian females (see Tables 7 & 8)

**Table 7: Asian Female dropout rate**

		Fall 2017			
		Dropped	Registered	% drop in Spr.	% drop in Fall
Spring 2017	Registered	3	38	10.87	7.32
	Dropped	5			

**Table 8: Asian male dropout rate**

		Fall 2017			
		Dropped	Registered	% drop in Spr.	% drop in Fall
Spring 2017	Registered	1	32	13.16	2.94
	Dropped	4	1		

### Logistic Regression

Prior to discussing the logistic regression model, it is important to share four concerns in using the approach. Hoetker (2007) identified four issues: Interpreting Coefficients, Modeling Interactions, Comparing Coefficients across groups, and Measures of Model fit. Hoetker argues that logistics models differ greatly from regular regression models, and many papers and readers often extend regular regression conclusions to logistics regression findings. As such, care should be taken when considering these issues.

The first step was to check for multicollinearity between the predictor. This was performed using the linear regression module in SPSS. The tolerance value should be greater than 0.1 and the Variance Inflation Factor (VIF) should be less than 10. Table 9 is the output of an SPSS run and it reflects no multicollinearity between the variables.

The next step was to perform a binary logistic regression. Table 10 includes the output from an SPSS run. Several variables (Male, Asian, Caucasian, SAT, First Generation & Housing) show unacceptable level of significance and should not be included. This comment was supported by having many outliers in the model using the Mahalanobis distance

**Table 9: SPSS output for Multicollinearity**

Predictor	Tolerance	VIF
ASC hours	.934	1.071
Male	.915	1.093
Hispanic	.645	1.551
Asian	.719	1.391
African American	.835	1.198
Caucasian	.803	1.246
First Generation	.897	1.115
GPA	.883	1.133
SAT	.857	1.167
Housing Indicator	.894	1.118

**Table 10: SPSS output for variables and coefficients****Variables in the Equation**

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
ASC hours	.427	.142	8.998	1	.003	1.532	1.159	2.025
GPA	-1.026	.179	32.723	1	.000	.359	.252	.509
Male	-.069	.359	.037	1	.847	.933	.461	1.887
HISPANIC	-1.126	.427	6.970	1	.008	.324	.140	.748
Asian	-.516	.581	.787	1	.375	.597	.191	1.865
African American	-1.079	.603	3.203	1	.074	.340	.104	1.108
Caucasian	-.362	.388	.871	1	.351	.696	.325	1.490
SAT	-.003	.002	2.793	1	.095	.997	.994	1.000
First Generation	-.555	.370	2.244	1	.134	.574	.278	1.187
Housing	.335	.362	.857	1	.355	1.398	.688	2.844
Constant	4.139	1.692	5.983	1	.014	62.722		

In order to resolve the outlier status, the analysis was repeated using records for each ethnic group. This approach reduced the outliers and resulted in better models. The following tables show the result for the African American students only. Table 11 displays the results of the multicollinearity tests and shows that there is no multicollinearity (Tolerance for all the variables is greater than .1, while the

VIF values are less than 10). Table 12 is the Omnibus test, and the Hosmer and Lemeshow test, shown in Table 13, further supports that the model fits. Table 14 shows the classification table. It shows that the model accurately predicts 66.6% of those who dropout. Table 15 shows the pseudo R<sup>2</sup> tests, i.e., Cox & Smell R square and Nagelkerke R square. In this case, it can be stated that Pseudo R<sup>2</sup> ranges from 0.35 to 0.66. Another method for calculating R<sup>2</sup> recommended by Crowson (2015) is to calculate the r between the actual and predicted group memberships. This results in an R<sup>2</sup> = .466. Table 16 shows the variables, their Beta and significance. Whilst the variable GPA is a significant variable, the others are not.

**Table 11: SPSS output for Collinearity statistics**

Model	Coefficients					Collinearity Statistics	
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Tolerance	VIF
	B	Std. Error	Beta				
(Constant)	.939	.427		2.198	.034		
ASC hours	-.030	.028	-.150	-1.074	.289	.878	1.139
GPA	-.179	.067	-.485	-2.685	.010	.521	1.920
Male	-.056	.110	-.084	-.504	.617	.613	1.631
SAT	.000	.000	-.049	-.280	.781	.547	1.827
First Generation	-.096	.106	-.132	-.906	.370	.803	1.245
Housing	-.132	.107	-.168	-1.230	.226	.916	1.092

**Table 12: SPSS output for Omnibus test.**

**Omnibus Tests of Model Coefficients**

		Chi-square	df	Sig.
Step 1	Step	20.678	5	.001
	Block	20.678	5	.001
	Model	20.678	5	.001

**Table 13: Hosmer and Lemeshow Test**

**Hosmer and Lemeshow Test**

Step	Chi-square	df	Sig.
1	2.692	8	.952



Table 14: Classification table

		Predicted			
		Dropped_Spring17	0	1	Percentage Correct
Step 1	Dropped_Spring17	0	42	0	100.0
		1	2	4	66.7
Overall Percentage					95.8

a. The cut value is .500

Table 15: Pseudo R2

Step	-2 Log likelihood	Cox & Snell R	Nagelkerke R
		Square	Square
1	15.492 <sup>a</sup>	.350	.661

a. Estimation terminated at iteration number 20 because maximum iterations has been reached. Final solution cannot be found.

Table 16: Beta and Significance of variables

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
ASC hours	-12.318	3786.061	.000	1	.997	.000	.000	.
GPA	-3.030	1.375	4.854	1	.028	.048	.003	.716
SAT	-.005	.007	.511	1	.475	.995	.981	1.009
First Generation	-3.859	3.680	1.099	1	.294	.021	.000	28.628
Housing	-1.395	1.688	.683	1	.409	.248	.009	6.774
Constant	12.224	7.625	2.570	1	.109	203616.07		

Note: Variable(s) entered on step 1: ASC hours, OVERALL\_LGPA\_GPA, MaxOfSAT, FirstGen\_IND, Housing\_IND.

### ***PRACTICAL IMPLICATIONS***

It is clear that careful attention should be paid to First Generation African American students and Asian Females to reduce dropout rates. First generation African American students have a dropout rate of 46.15%, as shown in Table 6. Asian Females has double the dropout rate of Asian Males, while in all other ethnic groups, female had less dropout rate than male students, as shown in the Appendix tables 1-3-2, 1-3-3, 1-4-1, 1-4-2, 1-5-1 & 1-5-2. Researchers suggest approaches such as mentoring programs and others are helpful in increasing retention. However, many implementations of these approaches are passive, i.e., students initiate membership. It may be more effective if membership is initiated by the program, i.e., students are invited, or required, to join. Moreover, institutions must have annual assessment of initiatives.

Recommendations from this report were that institutions should establish mentoring programs for Asian Female students, invite successful Asian women to give college-wide lectures, and develop special programs to retain Asian Female students.

The logistic regression approach predicts dropout with fair accuracy. However, the model was limited by ethnic group and showed that only one of the variables was significant. Other approaches, such as neural networks, should also be investigated to determine which approach is best.

There is a need to operationalize the concepts using other variables. For example, SAT is often used to measure preparedness for college. However, SAT did not show as a significant variable in this regression model. Further work is needed to improve the operationalization of concepts and variables.

### ***LIMITATIONS***

First, this study addresses only the Traditional Undergraduate students who are 18-24 years of age. The study does not address adult student who are over 25 years of age.

Second, the operational definition of the study has a flaw since the university policy states that students may take one year leave of absence. And since participants have not registered for the Spring 2017 yet. It is not clear, if they will return. However, participants did not formally apply for a leave of absence.

Third, there is a limit of number of variables that can be used because of the sample size.

Fourth, the sample concentrated on one university and one academic year. Additional research should be carried out in order to generalize the results to other types of universities or other years. Furthermore, additional investigation is needed prior to generalizing the results internationally. There are many important characteristics that may affect the results. For example, cultural factors that may shape the interest, either encourage or restrain, in acquiring a college degree. Another is the cost of higher education as a percent of per capita income that may influence high school graduates.

### **CONCLUSIONS**

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The paper has identified the need to look at many of the assumptions regarding the dropout rates and causes that are often stated without supporting evidence. For example, the descriptive statistics portion of this paper showed that there was no difference in dropouts between Hispanic and Caucasian students, and contradicted Tym et al.'s (2004) assertion regarding the dropout rate of first generation students as compared to the non-first generation ethnic group. It also showed that African American-Male-First Generation has the highest dropout percentage. Institutions should be data driven in their allocation of funds as well as how programs are administered, e.g., passive or active membership recruitment.

Another interesting conclusion that is related to the first is the need to conduct an in-depth analysis to investigate the effectiveness of the programs implemented in the University. For example, the difference between some of the research findings and previous research, e.g., Tym et al. (2004), maybe due to the success of an intervention program or due to societal changes that make the earlier assertions obsolete.

Data mining approaches may be a useful tool in predicting behavior and may be used to prevent drop out by identifying potential dropout students prior to actually dropping out. Furthermore, regression analysis is just one approach. Other analytical approaches may be as, if not more, accurate. As such, it is our hope that others will continue to develop better approaches.

Future research will extend the data set to include private and public universities and additional years as well as other students since the current set was limited to Traditional Undergraduate Students. As suggested by one of the reviewers, an additional student characteristic that should be considered is

the student perception, after spending time in a college, of how important is the college degree to their pursuit of goals.

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## APPENDIX

### Descriptive Statistics Tables

The descriptive statistics tables are constructed with the following logic:

		Fall 2017			
		Dropped	Registered	% dropped in Spring 17	% dropped in Fall 17
Spring 17	Registered	Cell 1	Cell 2	Cell 5	Cell 6
	Dropped	Cell 3	Cell 4		

% of students who dropped in Spring 2017 (cell 5) is = Students who dropped in Spring of 17 (Cell 1 + Cell 2) / Total Students (Cell 1+Cell 2 + Cell 3+ Cell 4). While % of students who dropped in Fall of 2017 (Cell 6) is = Students who dropped in the Fall of 2017 (cell 1 only) / Total students in the Spring 2017 (Cell 1 + Cell 2 + Cell 4)

The tables are listed in the following order:

- 1- Total for University
- 2- Ethnic group (in alphabetical order), and within each group, by gender then first generation
- 3- First generation then Gender

**Table: 1-1 Total for the University**

		Fall 2017			
		Drop	Reg.	%drop in Spr	%drop in Fall
Spring 2017	Reg.	55	448	9.37	10.93
	Drop	50	2		

**Table: 1-2 Asian Students**

		Fall 2017			
		Drop	Reg.	%drop in Spr	%drop in Fall
Spring 2017	Reg.	4	70	11.90	5.41
	Drop	9	1		

**Table 1-2-1 Asian Male Students**

		Fall 2017			
		Drop	Reg.	%drop in Spr	%drop in Fall
Spring 2017	Reg.	1	32	13.16	3.03
	Drop	4	1		

**Table 1-2-2 Asian Female Students**

		Fall 2017			
		Drop	Reg.	%drop in Spr	%drop in Fall
Spring 2017	Reg.	3	38	10.87	7.32
	Drop	5			

**Table 1-2-3 Asian-Male-1<sup>st</sup> Generation**

		Fall 2017			
		Drop	Reg.	%drop in Spr	%drop in Fall
Spring 2017	Reg.	0	8	0.00	0.00
	Drop	0	0		

**Table 1-2-4 Asian Male Not 1<sup>st</sup> Generation**

		Fall 2017			
		Drop	Reg.	%drop in Spr	%drop in Fall
Spring 2017	Reg.	1	24	16.67	4.00
	Drop	4	1		

**Table 1-2-5 Asian Female 1<sup>st</sup> Generation**

		Fall 2017			
		Drop	Reg.	%drop in Spr	%drop in Fall
Spring 2017	Reg.	1	6	0.00	14.29
	Drop				

**Table 1-2-6 Asian Female Not 1<sup>st</sup> Generation**

		Fall 2017			
		Drop	Reg.	%drop in Spr	%drop in Fall
Spring 2017	Reg.	2	32	12.82	5.88
	Drop	5			

**Table 1-3-1 Black Students**

		Fall 2017			
		Drop	Reg.	%drop in Spr	%drop in Fall
Spring 2017	Reg.	11	31	12.50	26.19
	Drop	5	1		



**Table 1-3-2 Black Male Students**

		Fall 2017			
		Drop	Reg.	%drop in Spr	%drop in Fall
Spring 2017	Reg.	7	14	16.00	33.33
	Drop	4			

**Table 1-3-3 Black Female Students**

		Fall 2017			
		Drop	Reg.	%drop in Spr	%drop in Fall
Spring 2017	Reg.	4	17	8.70	19.05
	Drop	1	1		

**Table 1-3-4 Black Male 1<sup>st</sup> Generation**

		Fall 2017			
		Drop	Reg.	%drop in Spr	%drop in Fall
Spring 2017	Reg.	4	2	14.29	66.67
	Drop	1			

**Table 1-3-5 Black Male Not 1<sup>st</sup> Generation**

		Fall 2017			
		Drop	Reg.	%drop in Spr	%drop in Fall
Spring 2017	Reg.	3	12	16.67	20.00
	Drop	3			

**Table 1-3-5 Black Female 1<sup>st</sup> Generation**

		Fall 2017			
		Drop	Reg.	%drop in Spr	%drop in Fall
Spring 2017	Reg.	2	5	0.00	28.57
	Drop	0	0		

**Table 1-3-6 Black Female Not 1<sup>st</sup> Generation**

		Fall 2017			
		Drop	Reg.	%drop in Spr	%drop in Fall
Spring 2017	Reg.	2	12	12.50	14.29
	Drop	1	1		

**Table 1-4 Hispanic**

		Fall 2017			
		Drop	Reg.	%drop in Spr	%drop in Fall
Spring 2017	Reg.	31	260	6.73	10.65
	Drop	21			

**Table 1-4-1 Hispanic Male**

		Fall 2017			
		Drop	Reg.	%drop in Spr	%drop in Fall
Spring 2017	Reg.	16	86	6.42	15.69
	Drop	7			

**Table 1-4-2 Hispanic Female**

		Fall 2017			
		Drop	Reg.	%drop in Spr	%drop in Fall
Spring 2017	Reg.	15	174	6.90	7.94
	Drop	14			

**Table 1-4-3 Hispanic Male 1<sup>st</sup> Generation**

		Fall 2017			
		Drop	Reg.	%drop in Spr	%drop in Fall
Spring 2017	Reg.	4	46	10.71	8.00
	Drop	6			

**Table 1-4-4 Hispanic Male Not 1<sup>st</sup> Generation**

		Fall 2017			
		Drop	Reg.	%drop in Spr	%drop in Fall
Spring 2017	Reg.	12	40	1.89	23.08
	Drop	1			

**Table 1-4-5 Hispanic Female 1<sup>st</sup> Generation**

		Fall 2017			
		Drop	Reg.	%drop in Spr	%drop in Fall
Spring 2017	Reg.	8	98	6.19	7.55
	Drop	7			

**Table 1-4-6 Hispanic Female Not 1<sup>st</sup> Generation**

		Fall 2017			
		Drop	Reg.	%drop in Spr	%drop in Fall
Spring 2017	Reg.	7	76	7.78	8.43
	Drop	7			

**Table 1-5 White**

		Fall 2017			
		Drop	Reg.	%drop in Spr	%drop in Fall
Spring 2017	Reg.	28	201	9.13	12.23
	Drop	22	1		

**Table 1-5-1 White Male**

		Fall 2017			
		Drop	Reg.	%drop in Spr	%drop in Fall
Spring 2017	Reg.	18	88	10.92	16.98
	Drop	13			

**Table 1-5-2 White Female**

		Fall 2017			
		Drop	Reg.	%drop in Spr	%drop in Fall
Spring 2017	Reg.	10	113	7.52	8.13
	Drop	9	1		

**Table 1-5-3 White Male 1<sup>st</sup> Generation**

		Fall 2017			
		Drop	Reg.	%drop in Spr	%drop in Fall
Spring 2017	Reg.	6	29	10.26	17.14
	Drop	4			

**Table 1-5-4 White Male Not First Generation**

		Fall 2017			
		Drop	Reg.	%drop in Spr	%drop in Fall
Spring 2017	Reg.	12	59	11.25	16.90
	Drop	9			

**Table 1-5-5 White Female 1<sup>st</sup> Generation**

		Fall 2017			
		Drop	Reg.	%drop in Spr	%drop in Fall
Spring 2017	Reg.	5	57	3.13	8.06
	Drop	2			

**Table 1-5-6 White Female Not 1<sup>st</sup> Generation**

		Fall 2017			
		Drop	Reg.	%drop in Spr	%drop in Fall
Spring 2017	Reg.	5	56	11.59	8.20
	Drop	7	1		

**Table 1-6 1<sup>st</sup> Generation**

		Fall 2017			
		Drop	Reg.	%drop in Spr	%drop in Fall
Spring 2017	Reg.	24	193	7.26	11.06
	Drop	17			

**Table 1-6-2 Not 1<sup>st</sup> Generation**

		Fall 2017			
		Drop	Reg.	%drop in Spr	%drop in Fall
Spring 2017	Reg.	31	255	10.90	10.84
	Drop	33	2		

**Table 1-6-3 1<sup>st</sup> Generation Male**

		Fall 2017			
		Drop	Reg.	%drop in Spr	%drop in Fall
Spring 2017	Reg.	10	66	9.52	13.16
	Drop	8			

**Table 1-6-4 1<sup>st</sup> Generation Female**

		Fall 2017			
		Drop	Reg.	%drop in Spr	%drop in Fall
Spring 2017	Reg.	14	127	6.00	9.93
	Drop	9			

**Table 1-6-5 Not 1<sup>st</sup> Generation Male**

		Fall 2017			
		Drop	Reg.	%drop in Spr	%drop in Fall
Spring 2017	Reg.	17	111	11.72	13.28
	Drop	16	1		

**Table 1-6-6 Not 1<sup>st</sup> Generation Female**

		Fall 2017			
		Drop	Reg.	%drop in Spr	%drop in Fall
Spring 2017	Reg.	14	144	10.23	8.86
	Drop	17	1		

## BIOGRAPHIES

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