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Higher Education in Native American Communities:

Who Graduates and Why?

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A thesis submitted to the faculty of
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Master of Science

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ABSTRACT

Higher Education in Native American Communities:
Who Graduates and Why?

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In this case study, I examine the graduation patterns of students attending Chief Dull Knife College located on the Northern Cheyenne Reservation in Lame Deer, Montana. While comparing the characteristics of students attending this college with that of two-year colleges nationally and tribal schools throughout the nation, we begin to understand the unique situation that this community faces. With the use of logistic and linear regressions, I explored the characteristics of those who graduate and ask the question, who graduates and what makes them unique? This study found that the credits attempted per semester, the number of credits they earned divided by the number of credits they attempted, and the number of semesters enrolled were the most significant factors. Using the information collected from the literature review, this study then used linear regressions to explore the effects of the initial variables on these three significant variables.

ACKNOWLEDGEMENTS

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INTRODUCTION

Chief Dull Knife of the Northern Cheyenne people said, "We can no longer live the way we used to. There is a new way of life that we are going to know. Let us ask for schools, that way our children can attend them and learn this new way of life" (We, The Northern Cheyenne 2008: 115) Similar to these words from a Native American leader are ideas coming from American politicians that have suggested that the key to prosperity for America is in an educated workforce. While programs like "No Child Left Behind" have been implemented to encourage success in elementary through high school, this legislation does not affect those who have already finished the K-12 program. The students that did not master the basic concepts of math, reading, and science, are at a disadvantage as they were "left behind" by the education system. The college that they choose to attend is now burdened with not only teaching a college curriculum, but also bringing these students to a level where they can begin to fully comprehend the college curriculum being taught.

"The 'Indian problem' raises serious questions about this Nation's most basic concepts of political democracy. It challenges the most precious assumptions about what this country stands for – cultural pluralism, equity and justice, the integrity of the individual, freedom of conscious and action, the pursuit of happiness." These words from the 1969 Kennedy report, *Indian Education: A National Tragedy – a National Challenge* brought to light concerns about what the education system is to do for Native Americans in the United States of America. History is filled with attempts toward "converting the heathen" and "civilizing the savage" because at that time America saw its native people as "dirty, lazy, drunken" or as a "noble savage." These stereotypes still prevail today, forty-two years after the Kennedy report was released; the era of assimilation and stereotypes hasn't ended.

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Education is one of the tools advocated by government and tribal leaders to close the gap between America's native people and descendants of those who immigrated to this land. Yet the drive and focus that was created by the Kennedy report has not created equality of outcome. In 2005, 89.1% of whites over the age of twenty-five had completed high school, yet at that time 75.2% of Native Americans over the age of 25 had completed high school (ACS PUMS 2005). After 21 years the government had not closed the achievement gap. An analysis of bachelor's degree or higher among adults 25 years or older in 2005 shows that 30% of whites had achieved a college degree yet only 14.3% of Native Americans or Alaskan Natives had achieved the same (ACS PUMS 2005).

From the eras of broken treaties, assimilation and termination, a trail of broken promises and unfulfilled dreams has been left for Native Americans by the United States government. If Native Americans are to overcome this inequality, we must understand what has fueled the resolve of Native American communities to grow and for students to increase college enrollment and graduation. Therefore, in this study I will explore what is unique about students who obtain an associate's degree in a reservation community. Chief Dull Knife College (CDKC) on the Northern Cheyenne Nation is a setting that represents well the types of stratification found in many native communities. CDKC students come from the poorest American Indian reservations in Montana (Whiting, Ward, Hiwalker, Davis 2005). Among previous generations, education beyond high school seemed unnecessary because of ranching and farming jobs in the area. However, with the current status of Montana's economy, which ranks at the bottom nationally, there are few jobs in these traditional occupations or in the nearby coal mining and power plants. In Rosebud County where CDKC is located, 18% live in poverty, but 46% of all Northern Cheyenne and 55% of the children live in poverty (Census Bureau 2000). The CDKC Financial

Aid Office determined that 68% of CDKC students are low-income status based on financial need, as shown by the Pell Grant Financial Aid Indicator.

PURPOSE STATEMENT

The objective of this study is to identify characteristics of students who obtain an associate's degree within eight semesters of attendance. Despite being located in a rural, impoverished, and minority community, students attending tribal colleges located on reservations are still progressing in their aspirations towards higher education. Carol Ward's 2005 book, *Native Americans in the School System: Family, Community, and Academic Achievement,* explored reasons for the high dropout rate among high schools serving the Northern Cheyenne Reservation. While Ward's study followed students through high school graduation, this study will continue that work by looking at students who enroll in the tribal college located in the community of Lame Deer, Montana. Chief Dull Knife College is a tribal college that serves the Northern Cheyenne community and has a unique set of difficulties compared to most community colleges throughout the United States.

The purpose of this study is to explore the traits of students that graduate from CDKC on time and those who do not. These two groups will be compared with those who have not graduated to determine which characteristics contribute to completing an associate's degree.

SIGNIFICANCE STATEMENT

The role of the non-traditional student in terms of age and ethnicity has not been explored in depth within the two-year college system. Those who are considered non-traditional students have a unique set of circumstances, which often necessitate a delay in obtaining an education, the need for part-time status, or the need to maintain a full-time job during the college process (Engle and Tinto 2008; Stephan, Rosenbaum and Person 2009) American Indian reservations are

rural locations where poverty is the norm and where Native Americans are not the minority, but the majority. While many two-year colleges may include some of these students with unique characteristics, very few serve populations in which the majority of students meet three criteria indicating lower status - rural, poor and minority.

The extensive non-traditional student population on Native American reservations creates a unique situation for tribal colleges. The significance of this study, first, will be to explore the demographics of this college setting and compare it with both national two-year college data and other tribal colleges throughout the United States. This study will also explore the factors that suggest a higher likelihood of timely graduation, which is typically four years, or eight semesters or less. This study will be given to the administrators at Chief Dull Knife College to suggest areas for improvement to help their student population, as wells as show areas of success within this higher education institution. This study will be used as a measuring device for future analyses of academic achievement at Chief Dull Knife College

LITERATURE REVIEW

Although the Northern Cheyenne Reservation in Montana faces challenges of being a minority community, in a rural location, and being economically impoverished, very little of the current literature accounts for the cumulative effects of American Indian reservation communities on educational attainment. Thus, the literature must be evaluated for the effects of each influence individually in order to determine what the interplay among the different factors might produce. Patricia Hill Collins' (2000) idea of matrix of domination and standpoint epistemology suggests that groups with two or the three disadvantages have unique experiences that shape their educational attainment. This will be followed by an analysis of the current literature on education attainment in two-year colleges nationally, which will provide a national

comparison group. A review of the national trends will then be followed by a review of the literature on the effect of retention rates and the theoretical framework surrounding retention frame works. Next, literature on tribal colleges that serve the Native American communities will be analyzed. This section will finish with a brief description of the Northern Cheyenne community and Chief Dull Knife College.

Minority Communities

Yetman (1998) defines ethnic and racial minorities as groups of people who have an identity, rooted in history, traditions, physical similarities and common ancestry, that provides the basis for unequal treatment related to ascribed characteristics. Minority communities come in many shapes and sizes, from the inner-city ghettos to immigrant enclaves and American Indian reservations. These communities remain on the fringe of mainstream America. Understanding the common threads among these different types of minority communities allows for an understanding of the unique situations that these groups face.

For immigrant enclaves a common theme has been the obstacles that impede their accessing mainstream American society (Handlin 1941, 1951; Wittke 1952; Child 1943; Vecoli 1977). However, empirical studies have found that many immigrant enclave members have found acceptance as they increased knowledge of American culture within the urban location (Warner and Srole 1945; Gordon 1964; Sowell 1981). To find acceptance in the host society, some immigrants shed traditional values and fully embrace the host society's norms and value systems (Eisenstadt 1970). In some enclaves, however, immigrants have gained socioeconomic status while retaining the culture of their community (Portes and Rumbaut 2006). In contrast, American Indians have been seen as an unmeltable ethnic group because of their history with American colonialism (Portes and Manning 1986). While some American Indians, often in urban

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areas, have adapted to the dominant culture, other groups of American Indians, because of their rural location or other factors, have not adapted to the same extent. As a result of location in reservation communities, these populations typically face economic and social isolation (Ward and Snipp1996).

Research on stereotype threat suggests another obstacle that minority groups face, especially in the realm of educational attainment (Steele 2003). Negative stereotypes about educational ability suggest that minority students will not succeed in educational settings. Thus even for minority students who attempt higher education, the challenges associated with a college-level education may inadvertently reinforce the negative stereotypes they have previously encountered and negatively affect their educational performance (Steele 2003).

Additional factors affecting educational attainment are associated with the colleges racial minorities attended. Minority groups, especially Latinos and American Indians, are over-represented in two-year colleges, which are mainly focused on vocational education and have higher dropout rates than more elite colleges (Altbach et al. 1999; Astin and Oseguera 2004; Reisel and Brekke 2010). Also, minorities, especially Blacks and Latinos, are traditionally under-represented in elite colleges that traditionally have lower dropout rates (Altbach et al. 1999; Astin and Oseguera, 2004; Reisel and Brekke 2010). Four-year universities that minorities attend are more likely to be universities with lower rankings, limited funding and resources and generally lower achieving students (Fry 2004).

Another factor in the educational attainment associated with minority communities involves the lack of experience of minority parents with the school system. This lack of experience has a correlation with higher chances of dropping out (Bourdieu 1984; Kneller 1965). Among American Indian students, parents' education is an important factor in school

performance and graduation (Ward 2005). The participation rates of minorities in higher education are also affected by their dropping out of high school at a higher rate (Orfiel, Losen, Wald, Swanson 2004), which results in their being less likely to try any higher education (Reisel and Brekke 2010).

The first hypothesis of this study is that because of these factors, Native Americans will be less likely to graduate with a two-year degree. This will also affect the number of credits attempted as students may choose to leave school before graduation.

Poverty

Poverty is defined typically as the state of one who lacks a usual or socially acceptable amount of money or material possessions (Zweig 2004). Janet Fitchen explains in her book, *Poverty in Rural America,* that poverty is more than just an inability of individuals and families to access financial capital, but also a unique set of shared experiences that create a type of minority-like community. The Economic Research Services of the USDA reported the following in analysis of rural poverty in 2004:

> According to the 2000 Census, racial and ethnic minorities constitute 17 percent
> of the nonmetro population, with nonmetro minority populations growing in all 50
> States. Overall U.S. poverty rates are higher for minorities than for non-Hispanic
> Whites. This racial disparity is even more marked when considering rural poverty
> rates and other dimensions of well-being, such as education and depth of poverty.
> More than one out of every four nonmetro Hispanics, Blacks, and Native
> Americans live in poverty. The nonmetro poverty rates in 2002 for non-Hispanic
> Blacks (33 percent) and Native Americans (35 percent) were more than three
> times the nonmetro poverty rate for non-Hispanic Whites (11 percent). … Fifty-

two percent of nonmetro Native Americans who are poor have incomes that are less than half of the poverty line.

Because college tuition rates have risen dramatically in public four-year colleges since 1996 (Department of Education 2006), limited economic resources have affected lower-income students' ability to attend and receive a college degree. Family income and parental education have been found to have a positive correlation with educational success in the college setting (Adelman 2006; Kao and Thompson 2003). This correlation emphasizes the importance of financial factors for impoverished minority students. The American National Education Longitudinal Study of 1988 found that of the students who graduated from high school in 1992, by the year 1997 82% had attended some higher education. However, among those whose parents had a masters degree or higher, 97% had attended some college, and among students whose parents had not graduated from high school, only 63% had attended college. Thus, students whose parents have fewer resources to contribute to their child's education are less likely to attend (Schoeni and Ross 2005). Relevant factors affecting college enrollment include family income, the individual educational institution, and a student's academic history, which determines the remainder of the financial requirements (Reisel and Brekke 2010).

While a tie exists between minority status and poverty, the single factor of low economic status can also affect a person's goals towards educational attainment and other goals. To begin, poorer communities have fewer resources that may be over taxed in comparison with wealthier neighborhoods. Studies have found that childcare and other services are not as readily available in the communities in which families need a second income to survive (Aber et al. 1997; Pebley and Sastry 2004). Also youth in poverty will either leave their parents' home earlier or later than their non-impoverished counterparts (DeMarco and Berzin 2008).

As the timeline for leaving parents' home varies for impoverished young adults, so does the assumption of adult responsibilities. The rate of marriage is lower for those who live in poverty (Brown and Emig 1999; Haskins and Sawhill 2003; Berzin and DeMarco 2010). Yet the rates of teenage parenthood are higher (Darroch, Frost, Singh, and The Study Team 2001; Maynard 1996 Berzin and DeMarco 2010). This suggests that certain life events may negatively affect college attendance rates (Fox, Connolly, and Snyder 2005).

While the literature has focused on poverty in urban locations, more studies are now addressing the effect of rural location and poverty on educational attainment (DeYoung 1987; Lichter and Eggebeen 1992). Those who live in poverty in rural locations have also seen a need for less education because of the specific opportunities afforded in rural locations (Fitchen 1995; Nord 1998; Nord, Luloff, and Jenon 1995; Farmer and Moon 2009). Young adults in both rural and impoverished communities are less likely to continue in higher education. For those who do continue on, poverty in rural locations has been found to have a negative effect on education outcomes (McLanahan and Sandefur 1994; Thompson, Alexander, and Entwise 1998; Zill 1996).

Rural Communities

There is no one single accepted definition of rurality. Concepts that are common to most definitions include (Hunter, Gaylord, Britnell and Ashford-Works 1998):

- low population size and density,

- distance from urban areas,

- low degree of urbanization,

- types of economic activity.

The US Census Bureau definition includes:

- Towns with population of 2500 or less.

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- Areas of open country- accounts for 23% of US population.

The Office of Management and Budget (OMB) defines rural by exclusion: Any area outside of a Metropolitan Statistical Area (MSA).

Exploration of the effects of rural communities on educational attainment has shown that students in rural communities have a disproportionately large share of high school dropouts (Lichter, Cornwell, and Eggebeen 1995; U.S. Department of Education 1997) as well as lower achievement test scores when compared to those in non-rural communities (College Entrance Examination Board 1995; U.S. Department of Education 1992).

As the perceived need for higher education in the rural community remains low, lower educational attainment continues to plague the rural community (Kohn et al. 1990; Fitchen 1995; Nord 1998; Nord, Luloff, and Jenon 1995; Farmer and Moon 2009). Although participation in the labor market is a goal of most, structural factors limiting opportunities mean that rural residents often find themselves in a cycle that perpetuates additional intergenerational poverty (Fitchen 1995).

Because of the stereotype that higher education is not needed in rural communities, some rural communities have been hesitant to continually invest in education. These communities have not seen the benefits of education due to the brain drain to larger communities that have more economic opportunities (McGranahan 1991; McGranahan and Ghelfi 1998; Swaim and Teixeira 1991). The brain drain also negatively affects familial socioeconomic status as it is measured either through household income or, more importantly, parental income (Alexander, Entwisle and Thompson 1987; Guo 1998; Mehan 1992; Teachman 1987).

While the current literature has focused on family and school factors that affect educational attainment (Hanushek 1996; Orfield 1994; Roscigno 1998), the effects of spatial

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location, i.e. rural location, have recently received more attention (Roscigno, Tomaskovic-Devey and Crowley 2006). Although the literature on educational attainment for minorities and in rural communities is limited, studies show that rural students fall into three groups whose experience in college is limited because of the social capital available to them (McGrath, Swisher, Elder, Conger 2001). The limited resources available to minority and rural communities create severe limitations in higher educational attainment (Roscigno, Tomaskovic-Devey, Crowley 2006). Though stereotypes persist about rural areas as populated by primarily white farmers, many rural and poor areas are homes to ethnic minorities. These areas include African Americans in the Mississippi Delta (Lee and Singelmann 2005; Parisi et al. 2005), Mexican-origin Hispanics in the lower Rio Grande Valley (Saenz 1997; Saenz and Thomas 1991), and Native American Indians on reservations throughout America (O'Hare and Johnson 2004). Because of the unique makeup of these rural communities, discrimination and economic oppression have long been factors within the communities (Albrecht, Albrecht, and Murguia 2005; Duncan 1999; Tomaskovic-Devey and Roscigno 1996).

Variable Interplay

Each of the three structural conditions, minority, poverty and rural location, can affect the educational achievement of an individual. However, a community's cultural and social resources affect how community members react to these conditions. Patricia Hill Collins' (2000) concept of the matrix of domination asserts that to understand the standpoint of this community, it is necessary to clarify the interplay and correlation among multiple types of conditions and disadvantages. Collins' stated, "For individual women, the particular experiences that accrue to living as a Black woman in the United States can stimulate a distinctive consciousness concerning our own experiences and society overall (2000: 23-24)." Among the Northern

Cheyenne, each student has a distinctive consciousness of their own experiences. This consciousness is influenced by the unique culture and history of the Northern Cheyenne and their relationship to schooling.

As each of the variables may affect each other, the second hypothesis is that students who are poor, have a minority status, and live in this rural location will have a lower graduation rate than those who do not fall into each of the these three categories. This will be manifest through lower graduation rates at Chief Dull Knife College than two-year colleges throughout the country that do not have all the disadvantages associated with this group of people.

Two-Year Colleges Nationally

While past research has focused on the attainment of a bachelor's degree as a measure for educational attainment, the associates degree and two-year colleges have become increasingly important. Between 1965 and 2004 enrollment at four-year institutions has increased 126%, yet the two-year colleges have seen an increase in enrollment by 458% over the same period (National Center for Educational Statistics 2005). However, despite the enrollment increase, only half of new college students obtain a degree within eight years (National Center for Educational Statistics 2005). While many studies have focused on the success of the four-year colleges over the two-year colleges, new studies have suggested that the two types of institutions are not as comparable as first thought (Brint 2003). Given the differences in the populations between two and four-year colleges students, this highlights the importance of looking at students who don't match the majority population in a given area. Collins studied the effects on poor black females in urban locations, but understanding the effects of higher education for Native Americans in rural locations also can demonstrate the multi-layered effected of multiple areas of disadvantage (Collins 2000; McIntosh and Rouse 2009).

Between 1982 and 1992, four-year institutions saw a slight decrease in enrollment among students in the lowest quartile of socioeconomic status. However, two-year institutions saw a 6% increase over the same time period (Brint 2003). While higher secondary educational achievement paved the way for college attendance in the past, lower achievement is no longer a barrier to college attendance (Cabrera and La Nasa 2001). During the past 40 years, minority and low-income students attending two-year colleges increased from 20% to 38% (National Center for Educational Statistics 2005). The disadvantage of students who attend two-year institutions is higher, however, compared to those with higher academic preparation and socioeconomic status who attend four-year institutions (Plank and Jordan 2001; Brint 2003).

Although research has focused on the bachelor's degree and the benefits associated with it, the associate degree's importance has been undervalued. The number of associate degrees granted has increased 223%, and the income of those who obtain this degree is 22-35% higher than those with a high school diploma, compared to a bachelor's degree which contributes an additional 11-22% to earnings of persons with an associate's degree (Grub 2002). While the difference in income still exists, many jobs offer the same pension plans and other benefits for workers who have an associates degree and bachelors degree (Baum and Ma 2007).

Forty percent, or 7.6 million, undergraduates attend college at two-year institutions (Horn and Nevill 2006; Phillippe and Sullivan 2005). These colleges serve some of the least-prepared student populations (Grubb 1996), but they also serve more low-income students, non-traditional students, and students who are first in their family to attend college (Cohen and Brawer 2003). Two-year colleges serve a wide range of students, from adults with remedial education needs to students involved in dual-enrollment in college before their high school graduation (Morest 2006). These colleges typically serve diverse populations, and are committed to open access,

something that fewer four-year institutions do (The National Commission on Community Colleges 2008).

The 1995-1996 Beginning Postsecondary study shows that while 47% of all students entering college are first-generation, in two-year institutions 53% are first-generation college students (Choy 2001), which contributes substantially to the non-traditional status of two-year college students. Similarly, 60% of four-year institutions students are 18-24 years old, while only 50% of students are 18-24 at two-year schools, and 40% of students are older than 24 compared to 36% at four-year institutions (McIntosh and Rouse 2009). Gender distributions are similar in two- and four-year institutions. Fifty-nine percent of students are attending part-time at two-year institutions compared to only 26% at four-year colleges (McIntosh and Rouse 2009). Employment also shows a disparity: while over 50% of students attending two-year colleges are employed, only 37% of students at four-year colleges are employed. Two-year colleges also serve more culturally diverse populations as 14% are non-Hispanic Black students at two-year schools, compared to 12% at four-year schools. Finally, the Hispanic student population is 15% at two-year institutions, compared to 8% at four-year schools (McIntosh and Rouse 2009). Another issue that is to be noted is the older age of the students at two-year colleges as seen in the comparison by McIntosh and Rouse. Within the analysis, the third hypothesis expects that students at CDKC will be older than those at four-year colleges more in line with the age groups of those located at two-year colleges.

Finally, two-year colleges are preparatory in nature due to the focus on remedial education. Eighty percent of two-year colleges provide remedial education for their students (McIntosh and Rouse 2009). Due to the extensive remedial education provided by two-year colleges, studies have examined the positive or negative effects of remediation on graduation,

credits earned, and retention. Though remediation has beneficial effects, existing evidence is inconclusive because outcomes may be explained by other factors (McIntosh and Rouse 2009).

In sum, two-year colleges typically serve a non-traditional college community, as students are older, more likely to be minority, are more likely to work while attending classes, and may need additional help to take and pass college level courses. These factors affect the time it takes for students to graduate and will affect the goals and foci of two-year colleges.

Student Retention

The 2006-07 Consortium for Student Retention Data Exchange (CSRDE) Retention Report (2007) indicated that for first-time full-time freshman, the six-year graduation rate ranged from 65.2% for Asians and 59.4% for Whites at the top of the listings, while Native American students had the lowest graduation rate at 38.4%. However, Native American student retention information was inadequate for addressing additional implications in the Consortium's report, as explained by the author. The suggestion to focus on retention comes from Jensen's (2011) summary on retention factors.

While certain colleges are more likely to cater to certain groups of students, the circumstances of those attending two-year colleges are unique because of their effect on retention. Though studies use the terms persistence to describe maintaining enrollment from fall to the spring semesters and retention to describe being enrolled from one fall semester to the following fall semester, the word retention here is being used to explain either idea. Tinto (1975), who developed the theoretical framework for understanding retention in 1975, explained that retention occurs when students have successfully integrated both socially and academically into the college atmosphere. This framework has been the basis for the conceptualization of retention for at-risk populations. In recent research for the Pell Institute, more recent analyses by Tinto and

Engle (2008) expanded the framework. Their recent analyses show that low-income, first-generation students face a number of challenges that make it difficult for them to be successful in college and lower their changes of persisting to graduation. These challenges include (Engle and Tinto 2008, 3):

- They disproportionately come from ethnic and racial minority backgrounds with lower levels of academic preparation.
- They also tend to be older, less likely to receive financial support from parents, and more likely to have multiple obligations outside college, like family and work, that limit their full participation in the college experience.

Engle and Tinto also report that previous research has shown that even after taking their demographic backgrounds, enrollment characteristics, and academic preparation into consideration, low-income and first-generation students are still at greater risk of failure in postsecondary education. They assert that the problem is as much the result of the experiences these students have while they are in college as the experiences they have before they enroll. The college experiences they refer to are related to the students' lower likelihood of being engaged in the academic and social experiences that foster success in college, such as studying in groups, interacting with faculty and other students, participating in extracurricular activities, and using support services. Engle and Tinto (2008, 3) also found that:

- Lower levels of academic and social integration among this population are inextricably linked to finances and financial aid.
- Due largely to a lack of resources, low-income, first-generation students are more likely to live and work off-campus and to take classes part-time while working fulltime, which limits the amount of time they spend on campus.

Similarly, Rendón, Jalomo, and Nora (2004) suggest that it is not just the student who needs to put forth the effort towards integration; part of the effort needs to be exerted by the institution. Kuh and Love (2004) also suggest that cultural integration is necessary. In fact, students should not need to leave their sense of identity at home when pursuing an education (Tierney 2004). While Tierney's model emphasizes the importance of cultural capital of students entering higher education, it also suggests that higher education institutions need to "validate Indigenous capital, epistemologies" (Pidgeon 2008, pg. 353).Tierney also explained that if students are provided with the necessary cultural capital students would overcome the barriers that lead to retention and integration. Additional studies support the ideas about the incorporation of cultural identity and cultural capital (Benham 2006), and developing theoretical frameworks that consider factors that include cultural and social capital and how they affect retention (Wells 2008; Astin 1993; Teranishi et al. 2004; Berger 2004).

Tribal Colleges

The existence of tribal colleges began with the Navajo Community College (now Dine' College) in 1968. These colleges have continued despite challenges facing the community they serve and their purposes are not the same as other two-year colleges in the United States. Tribal colleges and universities (TCUs) were created with three distinct differences from two-year colleges in other communities. First, these institutions were chartered by the tribal governments; second, their focus is on one cultural group; and third, these institutions normally do not receive state funding (Thornton 2006). These colleges, while providing higher education to their community, also have an important role in helping preserve tribal culture and languages (Thornton 2006). Stein (1999) describes tribal colleges as, "small tenacious institutions of higher education that serve the smallest and poorest minority group in the United States (American

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Indians) under difficult and challenging circumstances" while being "under-funded, overworked, and viewed by the rest of American higher education with some wonder at their ability not only to survive, but to survive with panache" (p. 259).

In 1995 the graduation rate for Native Americans was 37% at American colleges and universities (PrettyPaint 2009), yet tribal colleges are helping overcome the disadvantages of geographic isolation, physical disability, and poverty (Sanchez, Stuckey, and Morris 1998). Tribal colleges help students overcome more adversity as Native American students on reservations have higher incidences of substance abuse, lower incomes, and less academic preparation (Martin 1993). Tribal colleges are unique in enrolling one-third of all Native Americans attending college (Ortiz and Boyer 2003); 55% of all American Indian students are enrolled in two-year institutions (Carney 1999).

These colleges also deal with a population that is more likely to skip semesters while continuing their education (American Indian Higher Education Consortium 1999). Persistence rates are 50% lower for Native Americans who live on reservations in comparison to their white counterparts. Because of this and many other disadvantages experienced by Native Americans on reservations, tribal colleges have helped reservation communities to overcome the barriers to obtaining post-secondary education. Iris PrettyPaint's (2009) recent research clarifies some of the elements effective in supporting tribal college student retention and success. Her model, developed from intensive interview data, documented the kinds of resources that American Indian students believe are important to their ability to stay in school and succeed. Similar to other models (e.g., Tierney) this model also identifies such resources as academic advising, faculty support, tutoring, etc. as important resources that support student performance. However, this model also identifies additional resources that are particularly important to American Indian

students: family and community resources–family members, community elders, cultural events and activities, etc. While one study of American Indian student retention at Blackfeet Community College (Thornton 2006) uses individual-level data for one semester, there are no studies that examine tribal college student retention and graduation using longitudinal data. Therefore, this study addresses an important gap in the research about the completion of associates degrees and the types of factors that influence this type of educational achievement.

Chief Dull Knife College

Chief Dull Knife College is a tribally controlled community-based college offering Associate of Arts and Associate of Applied Science programs and certificates in some areas of study. CDKC was originally named Dull Knife Memorial College and was chartered in 1975 by tribal ordinance and opened in 1978 to serve the surrounding communities. The college was accredited by the Northwest Commission on Colleges and Universities in 1995. In 2001 the college was renamed Chief Dull Knife College to emphasize the status of Dull Knife among the Northern Cheyenne people.

The community that Chief Dull Knife College serves is located on the Northern Cheyenne Reservation. Established in 1884, the Northern Cheyenne Reservation has approximately 4,500 residents, of which, nearly forty percent have incomes below the poverty level (U.S. Bureau of Census 2000a). This poverty level is exacerbated by the unemployment rate that fluctuates between 60 and 85% (Ward and Jones 2011).

Though studies have been conducted about tribal colleges in general, research on Chief Dull Knife College has been limited to assessments of its educational programs and services. Ward's book, *Native Americans in the School System*, was an exploration of patterns in Northern Cheyenne student graduation from the high schools that serve the Northern Cheyenne nation.

This study found that community of residence, and the associated traditionality of those communities, had a significant impact on whether or not students would receive a high school diploma. The communities of residence were Lame Deer, Busby, Birney, Muddy Creek, and Ashland. In these communities students were able to develop mentors or other sources of support that contributed to their academic success. This study also found that gender was important, as females were more likely to finish high school than males. Additionally, gender can have different effects at the college level: women may leave college to start families, and both men and women with children may face difficulties with maintaining enrollment due to childcare and family-related needs, including working to support their family (Stephan, Rosenbaum, and Person 2009). Thus, gender and age are important variables included in this study.

Due to the significance of community and gender among Northern Cheyenne students, the fourth hypothesis is that community will affect graduation. The fifth hypothesis is that gender will have a statistically significant impact on graduation.

Northern Cheyenne Reservation Community

Due to the unique challenges that students at Chief Dull Knife College and those in the surrounding communities face, it is useful to look at the occupational opportunities in the area and the potential for graduates with associates degrees to obtain those jobs. The 2007-2008 retention survey at Chief Dull Knife College asked students how much they agreed or disagreed with the statement, "I need a college degree to be successful," in this survey 80% of students marked "strongly agree" and another 15% marked "agree." Given the rural location of the Northern Cheyenne Reservation, this perception is important in light of the sources of local employment. In Whiting, Ward, Hiwalker Villa and Davis' (2005) study of the impact of welfare reform on the Northern Cheyenne community, the unique circumstances surrounding

employment of Lame Deer and the surrounding reservation communities are described. Under

the TANF (welfare) program people were required to work to receive government assistance.

Because of a lack of private sector jobs, forty of the forty-five jobs listed for TANF workers

were with the federal, state, or tribal governments. As the most consistent and stable sources of

employment in the area, jobs available within the public sector do require at least a small amount

of post-high school education.

A recent search of jobs with the federal government at www.usajobs.gov found that the

jobs listed within 100 miles of reservation were for medical technologists with education

requirements including a minimum of 16 hours of biology classes in a post-high school setting.

Other jobs included engineering technician and physical science technician requesting at least

thirty semester hours of college courses with a specific number of hours in their respective fields.

Jobs located in state agencies found on the website www.svc.mt.gov were limited to a civil

engineering technician that preferred but did not require education in engineering and

construction. While in many other areas of the country the private sector may provide more job

opportunities, due to both obstacles for economic development (Ward and Snipp 1996) and the

spatial isolation of the Northern Cheyenne Reservation, public sector jobs provide the most work

opportunities for CDKC graduates who want to stay in the area.

Massey and Denton (1988) described five distinct dimensions of residential segregation

that have some relevance to reservation communities. The Northern Cheyenne Reservation

experiences certain dimensions that lead not only to spatial segregation but also to racial

segregation. Massey and Denton's five dimensions included evenness, exposure, clustering,

centralization, and concentration. Because of the unique circumstances of a reservation

community, the residents of the Northern Cheyenne reservation experience more exposure to

isolation and clustering while the concentration remains very low. Like urban centers, the Northern Cheyenne reservation has a large population of minority group members, which adds to the clustering effect, but the actual isolation associated with the rural location and lack of concentration makes their situation unique.

To give the proper geographic context, the closest town that has more than a handful of privately held businesses is Colstrip Montana. Colstrip Montana, with two motels, a grocery store, and a gas station, is 23.5 miles to the north, and takes approximately 30 minutes to reach from Lame Deer, the largest community on the reservation. The closest community that exceeds 100,000 people is Billings Montana. Billings is located 104 miles west of Lame Deer, and depending on weather conditions, takes approximately an hour and forty five minutes reach by car. For serious medical needs, according to the American College of Surgeons, the closest adult and pediatric Level I Trauma facilities are in Denver Colorado, over 500 miles away, or in Salt Lake City UT, just over 600 miles away.

Expected Research Findings

While the expected cumulative effects of rural location, poverty, and minority status are expected to be negative when attempting higher education, this study's hypotheses address both the cumulative effects and the effects of individual factors related to risks for retention. The effects expected in the following analyses are indicated in the following statements:

- Hypothesis 1 – Native Americans are less likely to graduate than non-Native Americans.

- Hypothesis 2 – The cumulative effect of poverty, minority, and rural location will be demonstrated through a lower graduation rate at CDKC than other two-year colleges nationally.

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- Hypothesis 3 – Students who attend CDKC are more likely to be older than students attending other two-year colleges nationally.

- Hypothesis 4 – The community students grew up in will have an effect on their graduation rates, mainly, the more traditional the community, the more likely students are to graduate.

- Hypothesis 5 – Females will have higher rates of graduation than males.

METHODS

This study included students who began their enrollment between the fall semester of 2001 and the spring semester of 2007 and who are degree-seeking students. This study includes data for all students who meet these criteria. The total number of students included in the study is 507. CDKC Department of Student Affairs records were the primary source of data for this study. However, because placement scores and information on the high school attended were not available for all the students, the total number of cases dropped to 297. To account for the missing data, 50 multiple imputation data sets were created which created the data needed to maintain the total number of 507 cases (Bodner 2008).

Measures

The following variables were chosen because of their relevance based on analyses in previous studies of community college student retention and completion. Gender, ethnicity, and age were identified as relevant to college outcomes in a recent review of two-year colleges (McIntosh and Rouse 2009). Placement scores, according to a recent fact book published by the American Indian Measures for Success, affect graduation time and rates (McIntosh and Rouse 2009). High school attended was included as a result of Ward's study on high school dropout rates on the Northern Cheyenne Reservation (Ward 2005). This variable represents both

differences in the high schools students attended and the communities in which the schools and students were located. Status, indicating part-time to full-time enrollment, was shown to be an important variable in the Department of Education's study on community colleges (Engle, Bermeo, O'Brien 2006). Passing percentage was used instead of Grade Point Average GPA to represent the ability of students to pass the courses attempted. This variable is unique to this study as it does not allow the weight of grades to affect the measure. The number of semesters represents the total amount of time students have spent attending college which has been found to affect graduation (McIntosh and Rouse 2009).

The following is a list of variables, their definitions and sources:

Graduated: The dependent variable uses data from CKDC records for all graduates between the 2002-2003 academic school year through the 2009-2010 school year.

Gender: The gender of each student was taken from records of the Student Affairs Department Data Coordinator.

Ethnicity: Like similar studies on tribal schools, ethnicity is broken into two categories, Native Americans and those who are not Native American.

Age: Age is broken into categories similar to those used in other two-year college studies. Five categories are defined as follows: Less than 18 years old, 18 to 24 years old, 25 to 39 years old, 40 to 64 years old, and 65 years old and older. All age groups are represented in this sample.

Age-squared: Age-squared comes from the categories previously discussed multiplied against itself to test for any non-linear relationships.

Reading: The reading placement scores upon enrollment are used to create this variable; it ranges between 1 and 12 based on the proficiency associated with each grade level.

Language: The language placement score from student enrollment is used and ranges between 1 and 12 based on the abilities in comparison with the corresponding grade level.

Math: The type of placement test varied during the time period being studied, so students were assigned a score of 1-4 depending on the beginning class they were advised to enroll in. Students scores were assigned to the courses as follows: 1 – Introduction to Mathematics, 2 – Introduction to Algebra, 3 – Intermediate Algebra, 4 – College Algebra.

High school attended: This dummy variables represent graduation from any of the following high schools or receiving a GED: Lame Deer High School, Colstrip High School, St. Labre Catholic High School, Northern Cheyenne Tribal School, Other, Unknown or GED.

First semester status: The status is based on the number of credits the student enrolled in during first semester. Those with less than 5 credits received a score of 0.25, 6-8 credits received a 0.5, 9-11 credits received 0.75, and students with credits that exceeded 12 were given a score of 1. This score was then multiplied by 10 to create a more diverse range for the logistic regression.

First semester passing percentage: From the student's first semester the credits earned are divided by the credits attempted. This percentage was then multiplied by 10 due to the logistic nature of the initial regressions in the analysis.

Semesters Attended: This variable is the number of semesters the student attended beginning with the first enrollment. If the total credits attempted was greater than 0, then the semester is counted towards semesters attended.

Semesters Attended Squared: The semesters-squared variable is the previous variable multiplied against itself to test for a non-linear relationship that might exist.

Status average: This variable shows each student's college enrollment in a range of part-time to full-time. Credit enrollment was used to create the following status assignments: 0-5 credits

equal 0.25, 6-8 credits equal 0.5, 9-11 credits equal 0.75, and 12 or more credits equal 1. Every

semester attended had the status totaled and then divided by the number of semesters attended.

This variable was then multiplied by 10 due to the logistic regression for the initial analysis.

Passing percentage average: Earned credits are divided by attempted credits and then all

semesters are totaled and divided by the number of semesters attended. This variable was then

multiplied by 10 to create a range for the logistic regressions.

(Figure 1 about here)

This model provides an overview of the concepts for the analysis. Two important

variables affecting the likelihood of graduation are time (semesters enrolled) and student school

performance. Students' first semester performance and placement scores (obtained when

students first enroll at CDKC) predict semesters enrolled and students' first semester

performance. Placement scores and students' demographic characteristics affect their first

semester performance. Although student demographic characteristics may influence the

likelihood of graduation, these influences are expected to be mediated by the students'

experiences in college, such school performance and the time enrolled in school.

Data Analysis

The analysis began with general comparisons of Chief Dull Knife College with other four

and two-year colleges and tribal colleges throughout the United States. A comparison of gender,

age, attendance status, and ethnicity shows the unique challenges for Chief Dull Knife College.

This study looks at the percentage of students who received Pell Grants in two-year institutions,

tribal colleges and CDKC. Additional comparisons of students attending Chief Dull Knife

College with other tribal colleges include percentages of high school graduates and those who

received a GED, types of high school attended, marriage and family rates, first-generation

students, percentage of students who were placed in remedial reading, language, and math classes, and the ability of students to speak the Native American language of the institution sponsoring the tribal college.

Logistic regressions were used to determine the likelihood of graduation in five models. The first model shows the effects of demographic characteristics of students and the second model adds to the previous model academic preparation and the high school attended, both of which are expected to influence students' preparation for college. The third model takes into consideration student performance in the first semester and enrollment status. The fourth model excludes the first semester information and includes the status and passing percentage (as an average during their entire enrollment at CDKC) and also includes the time it took to graduate, as measured by semesters and semesters-squared. The final model includes all variables in the models previously discussed.

Because semesters, semesters-squared, status-average, and passing percentage average account for a substantial amount of the variance within the model to predict graduation, these variables are included in linear regressions to determine if other variables mediate the effects. The three variables were predicted by the demographic information in the first model. This was followed by adding high school and placement scores into the model; the last model included the first semester's academics accomplishments. The three variables were predicted largely by the demographic characteristics and student performance in the first semester. To clarify which variables influence students' first semester performance, another regression was computed which includes demographic characteristics, placement scores, and high schools.

For R-squared information on each table, one of the imputed sets at random were chosen and all remaining r-squared information were then used from the same imputed dataset. The 10th imputed dataset was the at-random dataset used.

RESULTS

Comparisons of CDKC with Tribal Colleges, Four-Year, and Two-year Colleges

(Figure 2 about here)

Figure 2 is a comparison of gender ratios for the four groups. While over 40% of students are male at the national four and two-year college level, males comprise 5% less of the students at tribal colleges. For Chief Dull Knife College, the percentage of males is even lower, at 26% of the student population in the 2007-2008 school year. While national studies have found more women obtaining degrees than men, a ratio of 3 to 1 is startlingly different than current national statistics (McIntosh and Rouse 2009).

(Figure 3 about here)

Figure 3 shows that Tribal Colleges and CDKC have enrollment numbers similar to four-year colleges. While approximately 40% of two-year college students attend full-time, the numbers are closer to 60% for tribal colleges and CDKC. These numbers are about 15% less than the numbers for full-time students at four-year colleges nationally. Because of the working habits of two-year college students and the rural location and limited employment opportunities of tribal college students, this difference and similarity with the four-year colleges is expected.

(Figure 4 about here)

To better understand the poverty that exists in this community, we look at the percentage of students who received for Pell Grants. Though nationally two-year colleges have just over 50% of all students receiving Pell Grants that number increases by 5% for students attending

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tribal colleges. This number increases by an additional 3% for students attending CDKC. The majority of students attending Chief Dull Knife College are affected by poverty With just shy of 60% of students receiving federal aid based on financial need, we learn that the situation at CDKC is not like other two-year colleges or tribal colleges in the nation. Yet the proportion at CDKC is closer to that of students attending four-year institutions, where 58% of students receiving Pell Grant assistance.

(Figures 5 & 6 about here)

A direct comparison of ethnic groups across the types of colleges and with CDKC is incomplete, but some comparisons are possible using information that has been reported. At two-year colleges 9.4% of students were included in the "other" category that could include Native Americans, but this group also includes Asians and Pacific Islanders. Four-year colleges reported the "other" category to be approximately 14% but these numbers have the same limitations as two-year colleges. While Native Americans are sharing a portion of only 9.4% and 14.2% portion of the populations at two-year and four-year colleges nationally respectively, this small proportion presents a stark contrast to colleges serving reservation communities. Tribal colleges nationally serve populations that are approximately 86% Native American with all other ethnic accounting for just less than 14% of the population. Chief Dull Knife College serves an even larger Native American population with over 95% of the students in the 2007-08 school year being Native Americans. While studies previously cited suggested the disadvantage associated with minority status in higher education, the proportion of minority students in this tribal college is significant for its contrast even with other tribal colleges and two-year colleges.

(Figures 7 & 8 about here)

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While most students attend college immediately after finishing high school, students attending Chief Dull Knife College do not fit the typical college age range. Figure 7 demonstrates that while students under 25 years-old comprise approximately 60% of the populations at four and two-year colleges and tribal colleges nationally, this same age group is 15% less, or just over 35%, of the population at CDKC. This college has a larger enrollment of non-traditional students, as the numbers show more students are returning to school after an extended time out of high school. Nationally, students between 25 and 39 years old comprise approximately 27% of the population. CDKC's population is 10% higher at this age interval. Chief Dull Knife College also includes a larger proportion of students in the 40-64 year old group, having 10% more of its population being older than the national average of two-year colleges. The percentage of students who are older than 64 is about 1% of the student population at both two-year colleges and Chief Dull Knife College.

For tribal colleges, similar patterns are found. The proportion of students in the age group of 25-34 at CDKC, as illustrated in Figure 8, exceeds that of tribal colleges by approximately 10%. Four percent more students at Chief Dull Knife College fall in the age category of 35-49 compared to tribal colleges nationally. The age group of 50-64 years is 7% lower at tribal colleges nationally compared to CDKC. When adding these groups together, Chief Dull Knife College has 20% more of its population in the 25-64 age groups than tribal colleges and two-year colleges. This difference in the age of the student population suggests that the population at this tribal college is unique in comparison to national statistics for the other types of colleges.

(Figure 9 about here)

Figure 9 demonstrates that the percentages of students obtaining high school diplomas and students obtaining GEDs is not that different when comparing tribal colleges to CDKC. In both college populations, approximately 80% of the students earned a high school diploma.

(Figure 10 about here)

Figure 10 compares the types of high school attended by those who graduated from high school. While tribal colleges report that over 40% of their population attended a public high school off the reservation, because of the tribal schools serving the Northern Cheyenne reservation approximately 18% of their students attended public school off the reservation in the area. Although there is only a 5% difference between public schools on reservations, both groups being near 40%, one contrast is related to BIA school attendance: the Northern Cheyenne reservation is not served by a BIA school. Other differences include that St. Labre, the Catholic school in nearby Ashland, Montana, boosts the number of students to just shy of 28% of students at Chief Dull Knife College who attended an "other" high school, compared to 5% of students at tribal colleges nationally.

(Figure 11 about here)

The proportions of students who are married and the number students who have children are quite different when comparing Chief Dull Knife College and tribal colleges. However, considering the difference in age that was demonstrated in Figures 7 and 6, a larger population that is married and with children should be expected. In fact, while less than 10% of students in tribal colleges nationally were married and with children, over 30% of CDKC students fall into this category. The categories of married without children and single with children are similar,

within 5%, but a more substantial difference can be seen for students who are single without children. Figure 11 demonstrates that just shy of 20% less students at Chief Dull Knife College compared to tribal colleges nationally, are unmarried without children. This is most likely due to the contrast in age distributions between tribal colleges and CDKC.

(Figure 12 about here)

Figure 12 is a comparison of first-generation students. National figures for tribal colleges show that 64% of students are first-generation college students. Chief Dull Knife College is different in that 60%, or just 4% less than tribal colleges, are first-generation students. This information comes from the 2010 survey of CDKC students, while tribal school numbers are reported in the AIHEC 2007 report.

(Figures 13, 14, and 15 about here)

Figures 13, 14, and 15 show comparisons of students who were placed in remedial courses as a result of their placement scores taken upon college entrance. While nationally 47% of tribal college students were placed in remedial reading courses, 57% (or 10% more) of CDKC students were placed in remedial reading courses. In contrast, in Figure 14 we see that a smaller percentage of students at Chief Dull Knife College were placed in remedial language classes. However, the math placement scores shown in Figure 15 reveal that while over 25% of students at tribal colleges were able to start with non-remedial (i.e., college level) courses in mathematics, less than 1% of students at CDKC are able to start with college level math courses. This stark contrast suggests that students entering CDKC have significant academic disadvantages compared to other college students.

(Figure 16 about here)

While the ability to read and do mathematics is pivotal to success in college, students at tribal colleges also learn about the culture and language of their communities and maintaining their cultural heritage. Figure 16 shows the Cheyenne fluency of students entering Chief Dull Knife College in comparison with other tribal colleges and their student's abilities to speak their native language. The students at CDKC are more likely to speak their native language than students at other tribal colleges while 10% more of the students at tribal colleges have no ability to speak or understand their language of their respective tribes. CDKC exceeds the national comparison of students who have an intermediate handle on the language by 8%. The advanced and fluent levels are similar among tribal colleges and CDKC students. The higher percentage of intermediate speakers can possibly be attributed to the older age of the CDKC population. An exploration of this phenomenon is something that can be addressed in future studies.

Graduation Logistic Regression Analysis

(Insert Table 1 about here)

The first model within this analysis is a logistic regression using whether or not they graduated as a dependent variable and the demographic, placement scores, first semester performance and overall performance as the independent variables. Model 1 indicates that females are 69% more likely to graduate from Chief Dull Knife College with an associate's degree than males, which is consistent with the current literature on gender gaps in educational achievement. Age is also significant and has a non-linear association with graduation. This association demonstrates that as students get older they are more likely to graduate; however, that trend begins to reverse once an individual hits the fourth age group of 40-64 years old. Although this effect does decline, the age-squared coefficient does not indicate a dramatic drop,

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similar to the significant increase associated with the first age coefficient. These variables only account for 3% of the variability within the model.

Model 2 expands the previous model by adding information about the students at their first enrollment in Chief Dull Knife College. This information includes their placement scores in reading, language, mathematics, and also the high school they graduated from, if known or whether the student received a GED. When including the additional variables, the p-values associated with age and gender remain significant. Model 2 indicates that, relative to ethnicity, age, placement scores and high school, being female increases the chances of graduation from college by 86% compared to males. The non-linear association with age and graduation remains, and the math placement score is significant in this model. Comparing students whose first math class is Introduction to Mathematics with those placed in Introduction to Algebra, the latter group is 68% more likely to graduate. In contrast, students who test into the College Algebra class when they begin college are 204% more likely to graduate than those who test into the Introduction to Mathematics class. These variables account for 10% of the variability within the model.

The first semester enrollment status and the passing percentage are added to create Model 3. While gender is no longer significant in this model, age and the math placement score remain significant. In addition, both the status and passing percentage are significant with a p-value of less than .001. When considering the math placement test relative to the other variables in the model, for each unit increase in the math score, a student's likelihood of graduation increases by 68%. For approximately each 10% increase in credits attempted, a student is 21% more likely to graduate than students who take fewer credits. Finally, the passing percentage of the student's first semester increases 36% for each 10% increase in credits earned divided by the credits

attempted. The addition of these variables representing students' first semester performance, accounts for 20% of the variability of the model.

Model 4 was created by adding to Model 2 the following: student's average enrollment status, the student's average passing percentage, and the number of semesters the student has attended. When considering the student's performance over time at Chief Dull Knife College, gender, age, and math placement scores are no longer significant. A student's status, passing percentage, and semesters attended all become significant with a p-value of less than .001. As a student's status increases on average by 10%, his or her likelihood of graduating doubles compared to a student whose average is lower by 10%. For each 10% increase in a student's passing percentage, that student's chances of graduating increases two and a half times. There is a non-linear effect of semesters attended, with the apex of the association sitting between 8 and 9 semesters. This means that after four years of working toward a two-year degree, a student's likelihood of graduating begins to decrease. These variables account for 54% of the variability within the model.

Finally, Model 5 takes all the variables previously discussed into consideration. When including ethnicity, age, reading, language, and math placement scores, the student's high school, their first semester's achievement and their achievement averaged over time with the number of semesters attended, the only variables that significantly influence graduation are status average, passing percentage, and the number of semesters attended. The non-linear effect remains for the semesters attended. As a student attends each additional semester, the likelihood of graduating is four times higher with each additional semester until that effect peaks between 8 and 9 semesters. Students who always attend full-time during their enrollment at Chief Dull Knife College are 235% more likely to graduate than those who attended three-quarters time. For students whose

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passing percentage is 10% higher, their likelihood of graduating increases by 138%. Simply put, for those students who pass all of the credits they attempt versus those who pass 8 out of every 10 credits they attempt, the likelihood of graduating is over two and a half times higher. These variables account for 55% of the variability within the model.

Models six through eight looked at the individual placement scores and their effect on graduation when using demographic information as the control variables. When looking at math placement scores, gender, age and the math scores are statistically significant. In other words, females are 84% more likely to graduate from CDKC when statistically adjusting for the math placement score, ethnicity, and age. Additionally, the math placement score has a significant impact. For each level higher scored on the math placement score, a student will increase his/her likelihood of graduating by 65%. For students who score place them in college algebra, their likelihood of graduating when compared to students who were placed in introductory math increases by almost 200%. The r-squared accounts for approximately 7% of the variability within the model.

In Model 7 we look at the effect of the reading placement score on graduation. Similar to model 6, age and gender are statistically significant along with the reading placement score. When statistically adjusting for gender, ethnicity, and age a student's reading placement score increases the likelihood of graduating by 12%. For students who score in the sixth grade level of reading, their likelihood of graduating is 60% higher than those who score with a first grade level. Students who score at the twelfth grade level in reading have an almost 75% higher chance of graduating than those students who had a sixth grade level score on their reading placement test. The r-squared accounts for approximately 4% of the variability within the model.

In Model 8 we consider the language score. Although age remains statistically significant in this model, as is consistent with models 6 and 7, gender is no longer significant. The language placement score is also not significant in this model. While this model does not appear to offer much new information, comparison of the r-squared sheds additional light on the predictability of some of these placement scores. While model 8's r-squared accounted for 4% of the variability within the model, this number is the same as model 7 that had one additional statistically significant variable. These two models can be compared to model 1 which has just one less percentage point in the r-squared, and yet that model included exclusively background demographic information.

Average School Performance Linear Regressions

(Insert Table 2 about here)

Since enrollment status average, passing percentage average, and semesters attended are the most significant when considering graduation, determining the likelihood of these three variables will help staff and faculty at Chief Dull Knife College focus their efforts on helping students pass the credits they attempt, while maintaining a higher average enrollment status, and graduating within a four-year window. Model 1 looks at status average when considering the demographic information, placement scores, and the high school attended. While gender is not statistically significant in this model, ethnicity, and age are. This is possibly due to Native Americans have additional resources to pay for the additional credits each semester. The significance of age in this model could be related to the additional Pell Grant funding to those who already have families, or to the fact that older students may be pushing to finish their education sooner than their younger counterparts. These two variables are statistically significant

when statistically adjusting for the placement scores and high school attended. This accounts for 15% of the variability within the model as demonstrated by the r-squared.

Model 2 considers the effects of demographic variables, placement score information, and high school attended on the passing percentage. This model did not have any statistically significant variables when statistically adjusting for the other variables within the model. This model accounted for 16% of the variability within the model.

Model 3 considers the effect of the variables on the number of semesters attended. Gender and age are statistically significant, but none of the additional variables are statistically significant in this model. When including ethnicity, age, placement scores, and high school or GED, females at Chief Dull Knife College attend on average .67 more semesters than their male counterparts. The effect of age in this model is that as the student's age group increases the number of semesters attended increase by two and a half additional semesters. This model has an adjusted r-squared of 3%.

Model 4 considers the effect of these variables on the status of the first semester. The model shows that Native Americans on average have a status of 1.20 higher or, on average, about one additional credit each semester, than non-Indian students. Age has a non-linear relationship with the semester status that has an apex on the third age grouping. The model has an adjusted r-squared of 12%.

Model 5 looks at the passing percentage of the first semester when considering demographic information, high school attended, and placement scores. Gender and age are statistically significant within this model. Females are more likely to pass the credits they attempt. When statistically adjusting for the other variables within the model, females pass on average 8% more of the credits that they attempt during their first semester. There is a non-linear

relationship with age and the passing percentage of the first semester. This inverted parabola suggests that the second and third age groups are less likely to pass the credits they attempt than the youngest and oldest groups that attend CDKC.

DISCUSSION

This study is the first of its kind for students at Chief Dull Knife College. With the school becoming accredited in the last ten years and a significant change in the labor market within the last twenty years, a drive towards education is becoming even more important for those in lower income, minority and isolated communities. Although this study is first and foremost a case study of Chief Dull Knife College and exploratory in nature, several hypotheses were tested. While several hypotheses were considered, the comparisons that were made between Chief Dull Knife College, other two-year colleges across the nation, and tribal colleges located throughout the United States, are important when trying to understand the unique experiences of students attending the tribal college on the Northern Cheyenne Reservation. With this new understanding of the types of students attending CDKC and their differences from other schools, CDKC and its staff have the opportunity to address the unique challenges of their students.

The first hypothesis addressed the effect of minority status on education attainment. While the effects of ethnicity were not statistically significant for graduation, the analyses showed that Native Americans scored lower on math placement tests and the percentage of credits earned of those attempted were lower compared to non-Native Americans. A regression predicting math placement had an adjusted r-squared of 22 percent and the only statistically significant variable was ethnicity, when statistically adjusting for age and gender. The coefficient was -1.11, suggesting that the effects of ethnicity on the math placement scores, which was statistically significant in other models, could possibly have been masked because of the effects

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of the math placement scores.. These findings are consistent with other findings regarding minorities in a college setting (Altbach et al. 1999; Astin and Oseguera 2004; Reisel and Brekke 2010). While it is significant that Native Americans at CDKC are less likely to graduate, this also suggests similarities with Collins' (2000) work on the disadvantage of blacks in a rural impoverished setting. This study is limited in its comparison of Native Americans with other ethnic groups because of the lack of other ethnic groups at CDKC.

The second hypothesis addressed the interplay between the variables of ethnicity, rural location, and poverty. While CDKC has a lower graduation rate than other two-year colleges nationally, a direct effect of these variables on graduation rate cannot directly be measured, but the unique circumstances surrounding the students at CDKC could possibly be one explanation for the lower graduation rate. Drawing on Collins' (2000) suggestion about the need to understand the interplay among poverty, rural/urban location, and ethnicity, this study suggests that there is an additional disadvantage related to gender, i.e., for Native American males that attend CDKC. Future studies may look at the effects of gender and ethnicity on the percentage of credits earned, status, and time it takes to finish a two-year degree, since these were the variables that had a statistically significant effect on graduation, but their effect was being mediated by the variables that were more significant.

While it was expected, as stated in the third hypothesis, that the student population at CDKC would be older than four-year colleges, it was not anticipated that their age would be older than those in two-year colleges. This finding does point to the special circumstances that are associated with CDKC. Though tribal colleges and two-year colleges had similar age distributions, a unique feature of CDKC is that a third of students are between the ages of 25 and 40, compared to approximately 10% less for both the tribal colleges and two-year colleges.

The fourth hypothesis was related to the effect of differences in the high school students attended and its community location on graduation. Because some students received a GED and students may attend high schools outside their community of residence, the variable, high school attended, did not accurately represent the concept intended. Future research needs to approach this variable anew, to see if previous findings on the effect of community remain the same when measured in the college atmosphere.

The fifth hypothesis was concerned with the effects of gender. Like the findings in Ward's study (2005), gender was statistically significant when looking at its effects on the number of semesters attended and the passing percentage within the first semester. However, the effect on graduation was mediated by the other variables. The effect of the first semester's passing percentage on the average passing percentage was possibly a mediating variable again, but at the very minimum, this study did show that females on average pass more of the credits that they attempt than males during their first semester. This finding suggests a disadvantage for males who attend CDKC. While Collins' (2000) research suggests that black females are at a disadvantage in an urban setting, in this rural minority setting it is Native American males who might be at a disadvantage.

While this study did not use GPA to represent school performance, the variable passing percentage was used successfully to measure this concept. This variable represented the percentage of credits student passed, not the actual course grade. This was an important measure since students with poor preparation for college often take incompletes, withdraw or fail their courses. Also, as students took more credits each semester, they were more likely to graduate. Future research may consider a variable that would take into consideration both the passing

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percentage and enrollment status to create a hybrid variable that would take both of these measures into consideration.

While time attending college was important, a window of eight years is unfortunately short considering that eight semesters, or four years, is where the apex of lowess line was created between graduation and semesters attended. As additional information is collected at Chief Dull Knife College, this analysis should be repeated to see if this trend continues. Because of the imputations used to account for missing placement scores, the statistically significant effect of unknown high school should be reexamined. Also new analyses should include information on those students who had not reported their high school.

While this analysis ultimately found that a student's ability to graduate was not directly affected by their ethnicity, age, or gender, a closer look of the effects of these variables on school performance should be continued. While this college is unique, with such a large percentage being one minority, an exploration of the effects of such an ethnically non-diverse community may be important for future exploration. Though many suggestions have been given for future exploration, one success story in this study is the effect of age on graduation. Though the effect was mediated by school performance, age had a significant effect on the graduation variable when other demographic characteristics were included. As regression explored the effects of age on the school performance variable, the non-linear relationship was again found and consistent throughout the models.

During a recent visit to the college while I was doing individual and group interviews, I found that students who were older than 25 years old had many stories about traumatic life events. Future research needs to explore such life events of student in college, especially those in stratified communities. A common theme within the stories being told included the deaths of

close family members, going to prison for long periods of time, usually exceeding a year, and single-parent responsibilities. Future qualitative and quantitative research may want to take into consideration these variables.

Ultimately this study found that Chief Dull Knife College is not like other colleges. Whether the comparison is with four and two-year colleges or tribal colleges that also serve Native American communities, the unique experiences of Chief Dull Knife College students calls for additional consideration of the question, who gets what and why? Why are math placement scores so much lower at Chief Dull Knife College? Why do more students take three to four years to obtain a two-year degree than those who obtain it in two years? Although Native Americans are able to take more college credits due to additional funding, why are they passing less of those credits that they attempt? This study is only the beginning of a longer process of understanding student experiences at Chief Dull Knife College which is intended to provide information that may help students realize more successful educational attainment.

As we begin to think about how to increase the productivity at colleges like CDKC one thing must be considered. Placement scores showed that many students are coming in with limited math skills. While math is a building block in so many other classes, we cannot place blame on the instructors for low passing rates. Although blame is quick to be passed to schools, teachers, and students for graduation rates lower than the national average, one must consider the unique circumstances and challenges of CDKC and other colleges in similar situations. With students who have lower placement scores, CDKC staff and faculty should be commended for their ability to educate these students with not only the college curriculum, but also with the basic building blocks so that they can succeed in their college courses and through life.

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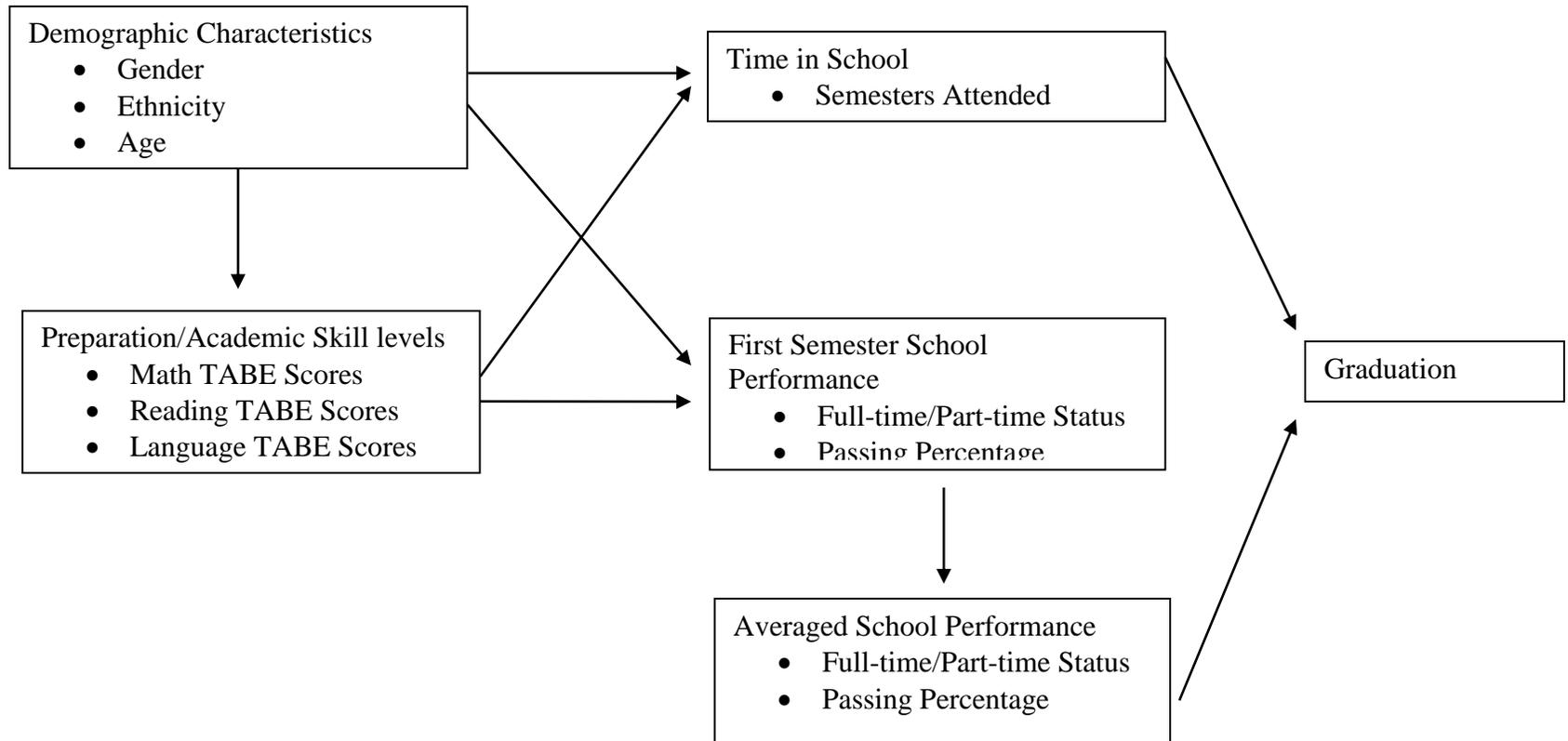
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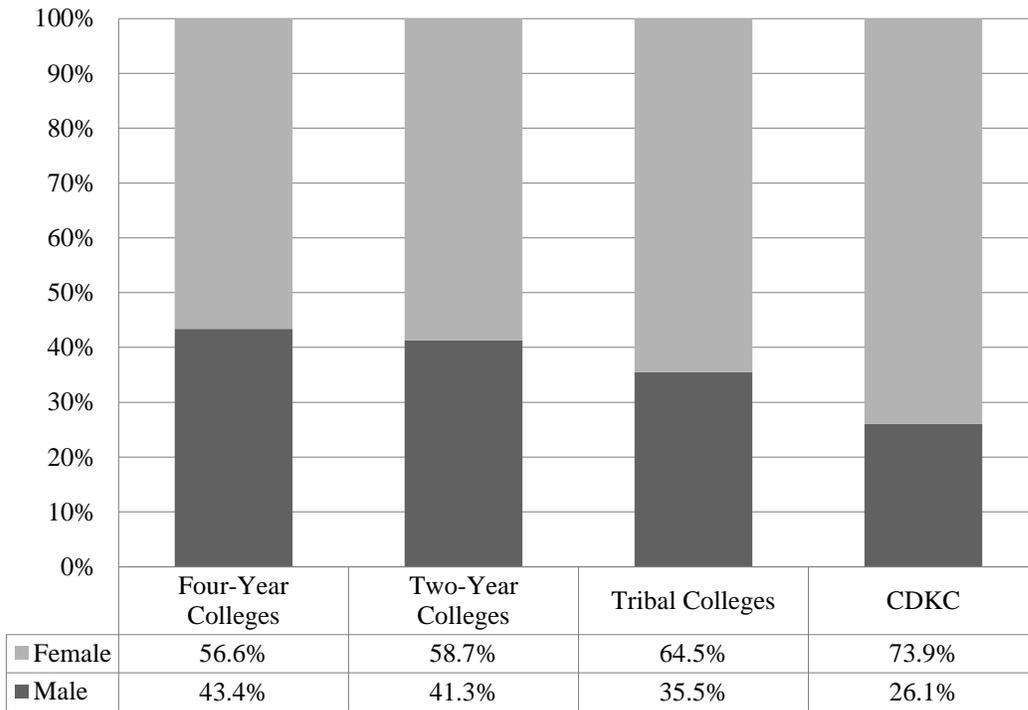-----. 1997. *High School and Beyond (Sophomore Cohort).* Washington, D.C.: National Center for Education Statistics.

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Figure 1: Chief Dull Knife College Graduation Effects Conceptual Model

Demographic Characteristics
- Gender
- Ethnicity
- Age

Time in School
- Semesters Attended

Preparation/Academic Skill levels
- Math TABE Scores
- Reading TABE Scores
- Language TABE Scores

First Semester School Performance
- Full-time/Part-time Status
- Passing Percentage

Graduation

Averaged School Performance
- Full-time/Part-time Status
- Passing Percentage

Figure 2: Gender Comparisons

	Four-Year Colleges	Two-Year Colleges	Tribal Colleges	CDKC
■ Female	56.6%	58.7%	64.5%	73.9%
■ Male	43.4%	41.3%	35.5%	26.1%

Note: Four and Two-Year College information comes from McIntosh and Rouse 2009, Tribal College information came from AIHEC Fact Book 2007, and CDKC statistics come from the 2007 enrollment records.

Figure 3: Status Comparison

	Four-Year Colleges	Two-Year Colleges	Tribal Colleges	CDKC
■Part-Time	25.9%	59.2%	40.6%	39.0%
■Full-Time	74.1%	40.8%	59.4%	61.0%

Note: Four and Two-Year College information comes from McIntosh and Rouse 2009, Tribal College information came from AIHEC Fact Book 2007, and CDKC statistics come from the 2007 enrollment records.

Figure 4: Pell Grant Recipients

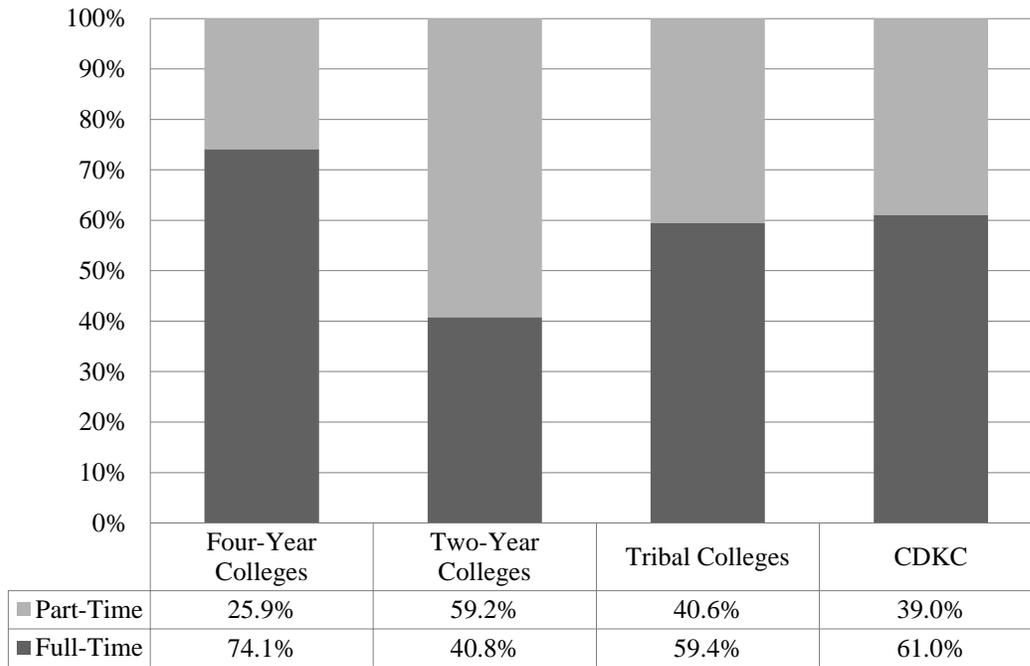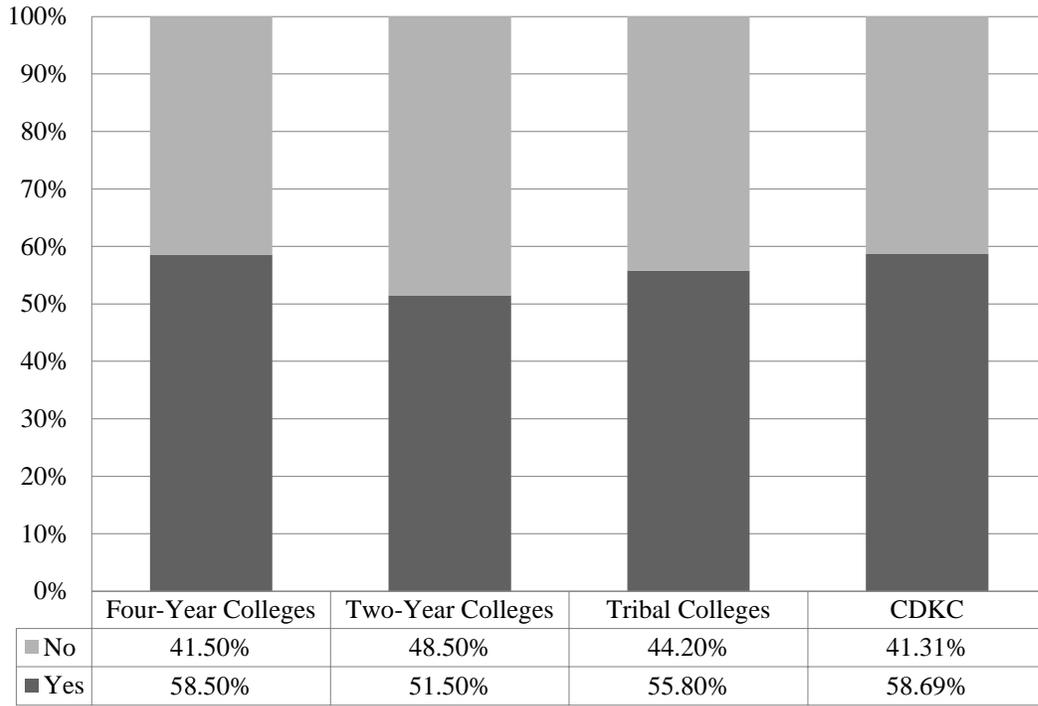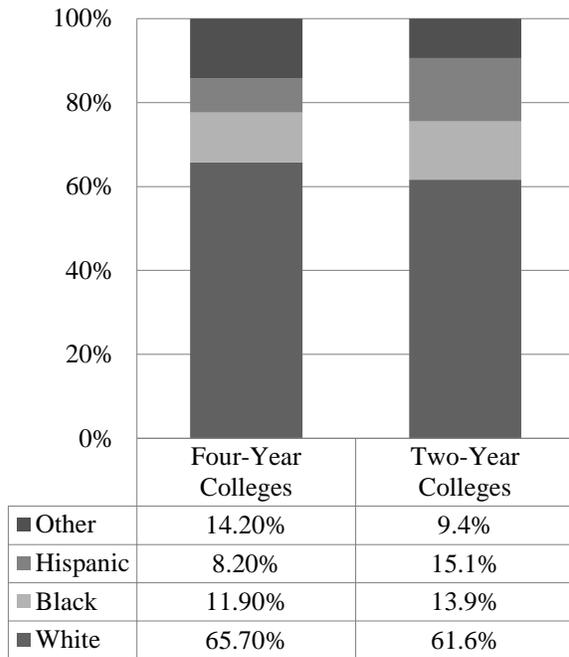|	Four-Year Colleges	Two-Year Colleges	Tribal Colleges	CDKC
No	41.50%	48.50%	44.20%	41.31%
Yes	58.50%	51.50%	55.80%	58.69%

Note: Four and Two-Year College information comes from McIntosh and Rouse 2009, Tribal College information came from AIHEC Fact Book 2007, and CDKC statistics come from the 2007 enrollment records.

Figure 5: Ethnicity

	Four-Year Colleges	Two-Year Colleges
■ Other	14.20%	9.4%
■ Hispanic	8.20%	15.1%
■ Black	11.90%	13.9%
■ White	65.70%	61.6%

Note: Four and Two-Year College information comes from
McIntosh and Rouse 2009.

Figure 6: Ethnicity

	Tribal Colleges	CDKC
■ Native American	86.2%	95.4%
■ Other	13.8%	4.6%

Note: Tribal College information came from AIHEC Fact Book 2007, and CDKC statistics come from the 2007 enrollment records.

Figure 7: Age Comparisons

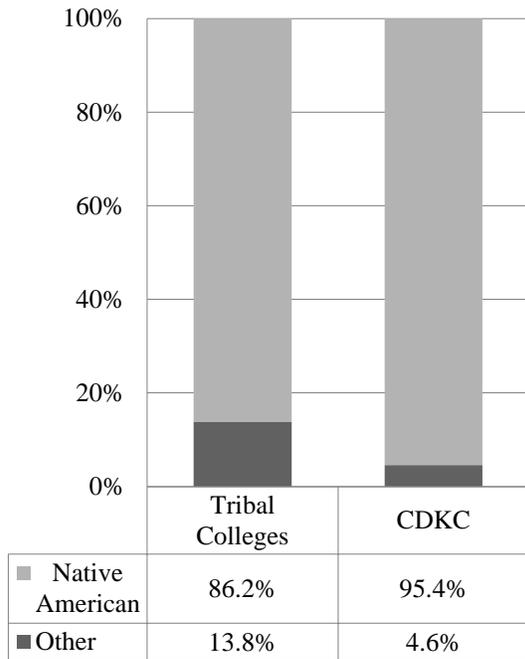|	Four-Year Colleges	Two-Year Colleges	CDKC
■ 65+	0.1%	0.9%	1.4%
■ 40-64	9.3%	13.5%	24.2%
■ 25-39	26.9%	27.5%	37.7%
■ 18-24	61.9%	52.4%	36.1%
■ <18	1.8%	5.8%	0.0%

Note: Four and Two-Year College information comes from McIntosh and Rouse 2009, Tribal College information came from AIHEC Fact Book 2007, and CDKC statistics come from the 2007 enrollment records.
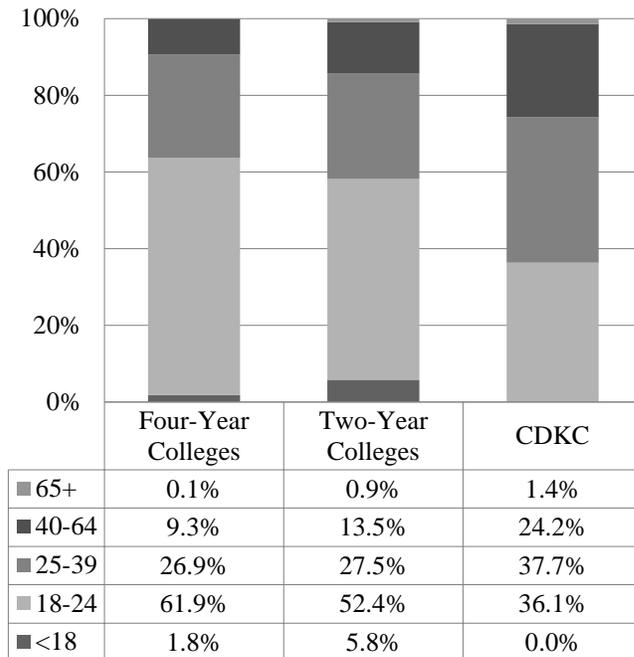
Figure 8: Age Comparisons

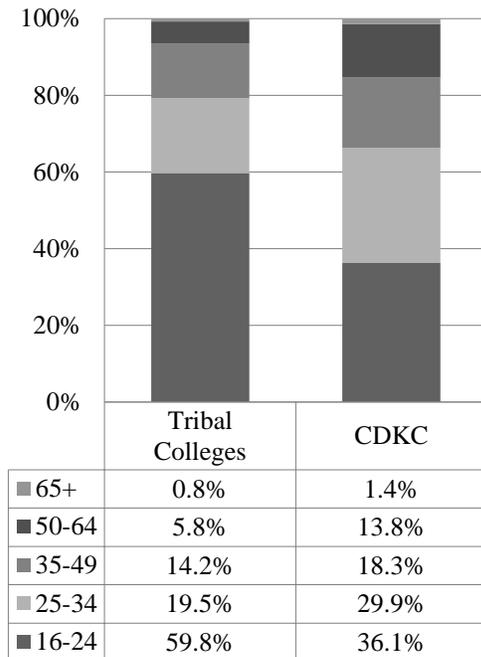|	Tribal Colleges	CDKC
■ 65+	0.8%	1.4%
■ 50-64	5.8%	13.8%
■ 35-49	14.2%	18.3%
■ 25-34	19.5%	29.9%
■ 16-24	59.8%	36.1%

Note: Tribal College information came from
AIHEC Fact Book 2007, and CDKC statistics come
from the 2007 enrollment records.

Figure 9: High School/GED Comparison

	Tribal Colleges	CDKC
GED	20.0%	21.2%
HS	80.0%	78.8%

Note: Tribal College information came from AIHEC Fact Book 2007, and CDKC statistics come from the 2007 enrollment records.

Figure 10: High School by Type Graduates
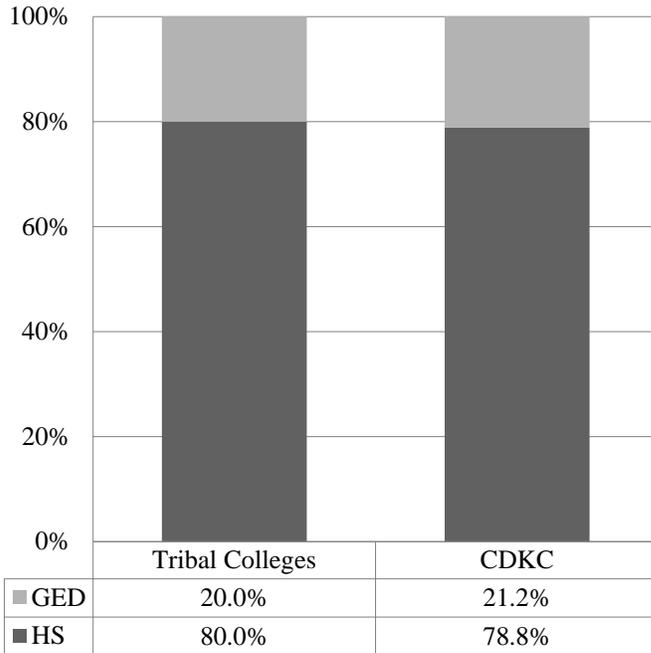
	Tribal Colleges	CDKC
■Other	13.4%	27.5%
■Tribal School	8.0%	12.1%
■Reservation Public HS	35.1%	42.9%
■Public HS	43.5%	17.6%

Note: Tribal College information came from AIHEC Fact Book 2007, and CDKC statistics come from the 2007 enrollment records.

Figure 11: Marriage and Children

	Tribal Colleges	CDKC
■ Married w/ Kids	9.0%	32.7%
■ Married-No Kids	6.9%	5.6%
■ Single w/ Kids	28.4%	23.0%
■ Single-No Kids	55.7%	38.8%

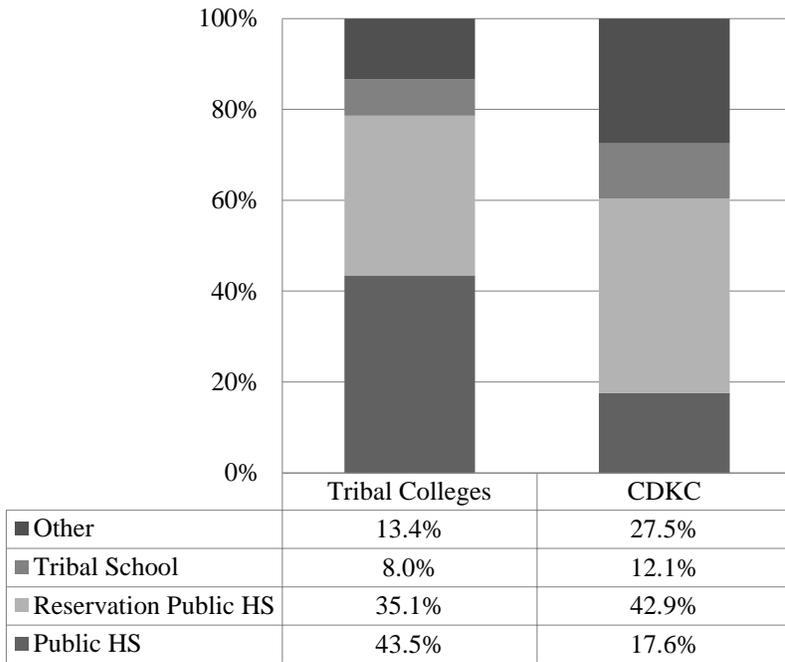Note: Tribal College information came from AIHEC Fact Book 2007, and CDKC statistics come from the 2007 enrollment records.

Figure 12: First Generation Students

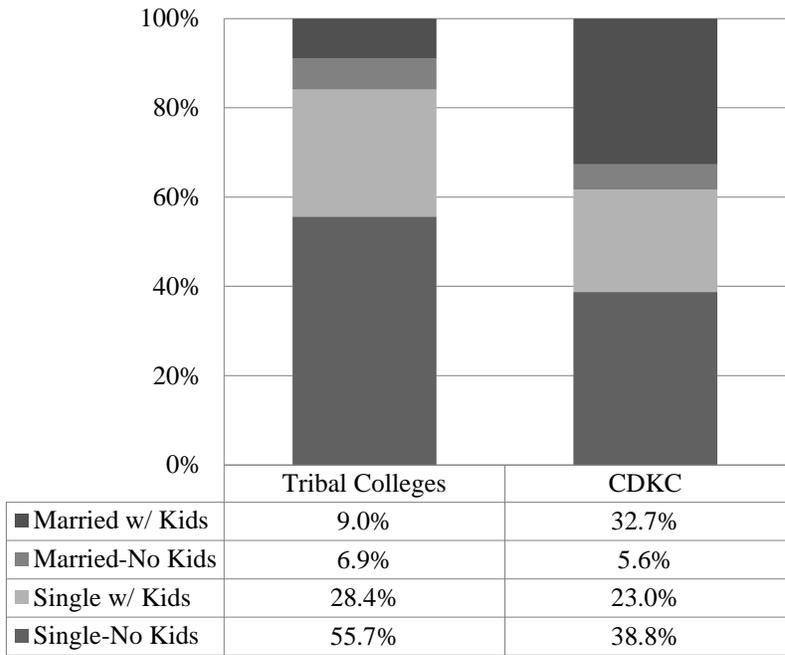|	Tribal Colleges	CDKC
Non-First Generation	36.1%	39.6%
First Generation	63.9%	60.4%

Note: Tribal College information came from AIHEC Fact Book 2007, and CDKC statistics come from the 2010 enrollment records.

Figure 13: Reading Placement Scores

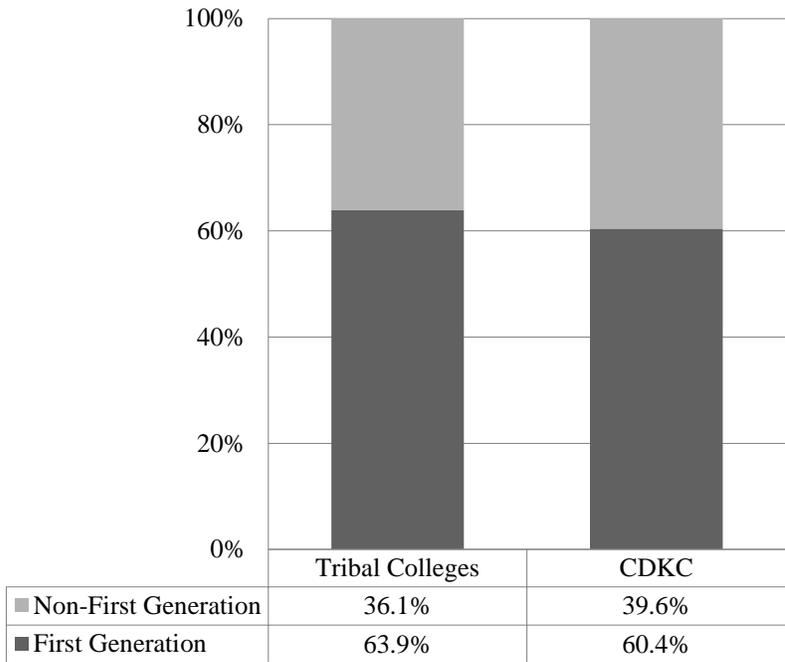|	Tribal[1]	CDKC[2]
▪ Reading Remedial	47.9%	57.1%
▪ Reading Non-Remedial	52.1%	42.9%

Note: Tribal College information came from AIHEC Fact Book 2007, and CDKC statistics come from the 2007 enrollment records.

Figure 14: Language Placement Scores

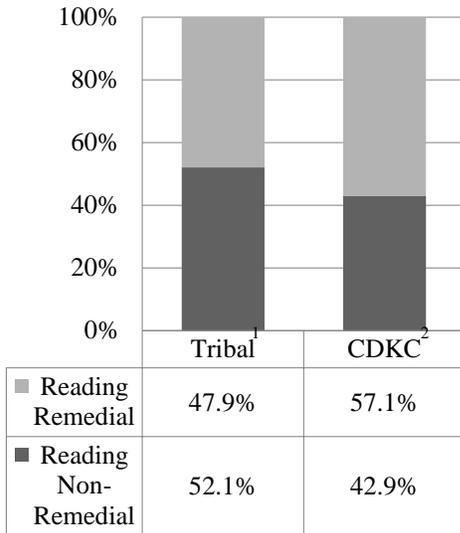|	Tribal	CDKC
▨ Langauge Remedial	57.2%	48.6%
▨ Language Non-Remedial	42.8%	51.4%

Note: Tribal College information came from AIHEC Fact Book 2007, and CDKC statistics come from the 2007 enrollment records.

**Figure 15: Math Placement
Scores**

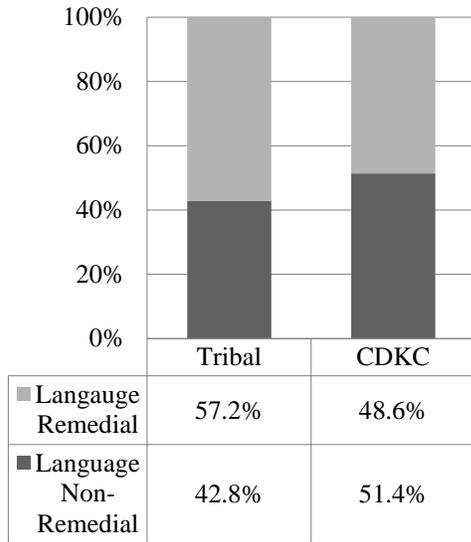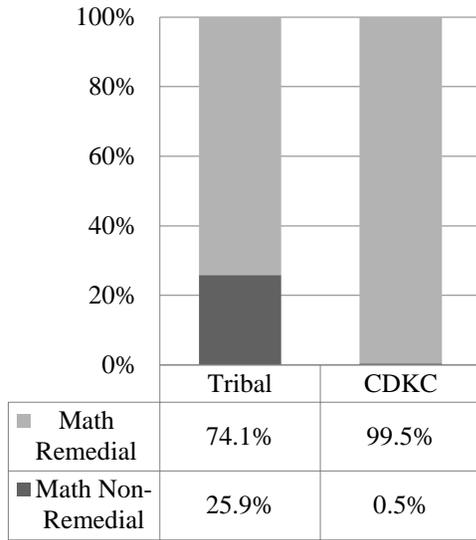|	Tribal	CDKC
▪ Math Remedial	74.1%	99.5%
▪ Math Non-Remedial	25.9%	0.5%

Note: Tribal College information came from
AIHEC Fact Book 2007, and CDKC statistics come
from the 2007 enrollment records.

Figure 16: Native Language Speaking Abilities

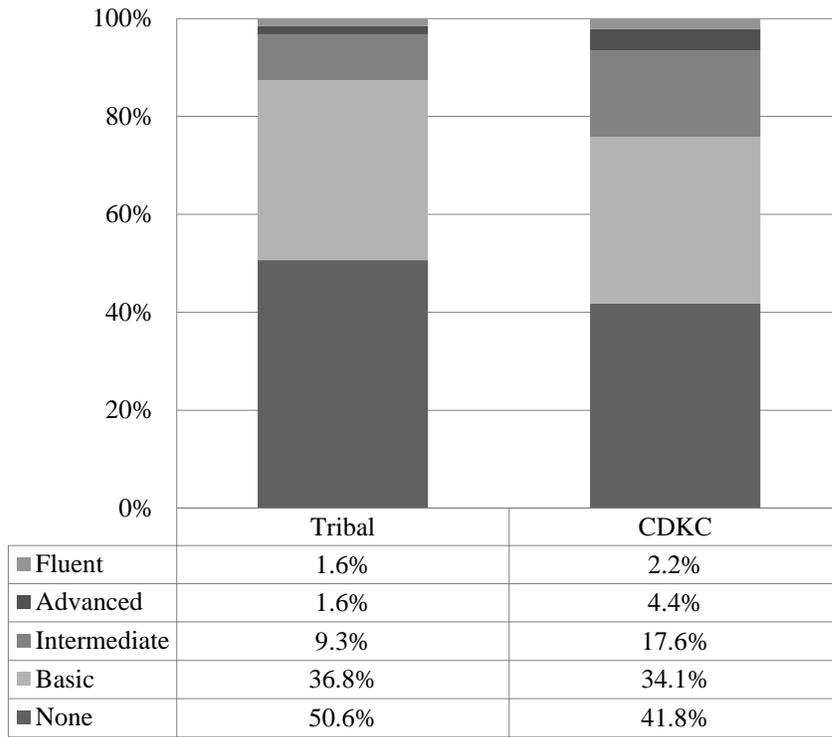|	Tribal	CDKC
■Fluent	1.6%	2.2%
■Advanced	1.6%	4.4%
■Intermediate	9.3%	17.6%
■Basic	36.8%	34.1%
■None	50.6%	41.8%

Note: Tribal College information came from AIHEC Fact Book 2007, and CDKC statistics come from the 2007 enrollment records.

Table 1: Graduation Logistic Regression

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Female[1]	.53(1.69)*	.62(1.86)*	.53(1.69)	.57(1.77)	.42(1.52)	.61(1.84)*	.55(1.73)*	.48(1.62)
Native American[2]	-.34(0.71)	.13(1.14)	.16(1.17)	.62(1.86)	.63(1.88)	.04(1.04)	-.14(0.87)	-.15(0.86)
Age	3.59(36.23)**	3.88(48.42)**	4.36(78.26)**	3.23(25.28)	3.38(29.37)	3.76(42.95)**	3.73(41.68)**	3.72(41.26)**
Age-Squared	-.54(0.58)**	-.58(0.56)**	-.66(0.52)**	-.49(0.61)	-.51(0.60)	-.55(0.58)*	.57(1.77)**	-.56(0.57)**
				`				
Reading		.07(1.07)	.08(1.08)	.15(1.16)	.16(1.17)		.11(1.12)*	
Language		-.03(0.97)	-.04(0.96)	-.10(0.90)	-.10(0.90)			.07(1.07)
Math		.52(1.68)**	.52(1.68)*	.45(1.57)	.44(1.55)	.50(1.65)**		
Lame Deer[3]		1.07(2.92)	.97(2.64)	.49(1.65)	.50(1.65)			
Colstrip[3]		.58(1.78)	.51(1.67)	.94(2.56)	.94(2.56)			
St Labre[3]		.45(1.57)	.20(1.22)	.20(1.22)	.04(1.04)			
Other[3]		.98(2.65)	.88(2.41)	1.16(3.19)	1.12(3.06)			
GED[3]		.90(2.46)	1.01(2.72)	.43(1.54)	.41(1.51)			
Unknown High School[3]		1.04(2.84)	.97(2.64)	.87(2.39)	.78(2.18)			
First Semester Status			.19(1.21)***		.07(1.07)			
First Semester Passing Percentage			.31(1.36)***		.09(1.09)			
Status Average				.75(2.12)***	.67(1.95)***			
Passing Percentage Average				.92(2.51)***	.87(2.39)***			
Semesters Attended				1.69(5.42)***	1.66(5.26)***			
Semesters Attended Squared				-.07(0.93)***	-.06(0.94)***			
Constant	-7.01	-10.18	-14.62	-29.01	-29.45	-8.69	-8.46	-8.01
Pseudo R-Squared	.03	.10	.20	.54	.55	.07	.04	.04
N	507	507	507	507	507	507	507	507

*p <.05, **p <.01, ***p <.001 –Note: Odds Ratio in parenthesis
[1]Male is the reference category
[2]Non-native American is the reference category
[3]Northern Cheyenne Tribal School is the reference group

Table 2: Average School Performance

	Model 1 – Status Average	Model 2 – Passing Percent	Model 3 – Semesters Attended	Model 4 – First Semester Status	Model 5 – First Semester Passing
Female[1]	.06	.36	.67*	.12	.81*
	(.225)	(.297)	(.272)	(.330)	(.387)
Native American[2]	.92*	-.72	.74	1.20*	.02
	(.386)	(.497)	(.463)	(.560)	(.643)
Age	2.85**	-1.42	2.45*	5.01***	-3.37*
	(1.017)	(1.352)	(1.244)	(1.501)	(1.757)
Age-Squared	-.55***	.38	-.34	-.92***	.71*
	(.168)	(.224)	(.206)	(.249)	(.291)
Reading	.02	.02	.01	-.01	-.01
	(.080)	(.096)	(.090)	(.112)	(.126)
Language	-.01	.11	-.00	-.05	.09
	(.066)	(.081)	(.072)	(.092)	(.107)
Math	.15	.24	.51*	.31	.13
	(.189)	(.214)	(.218)	(.260)	(.283)
Lame Deer[3]	.16	.50	.42	.81	1.15
	(.463)	(.610)	(.561)	(.682)	(.796)
Colstrip[3]	.60	-.06	-.27	.81	.81
	(.519)	(.683)	(.629)	(.764)	(.893)
St Labre[3]	.30	-.16	-.27	1.37	.51
	(.503)	(.663)	(.609)	(.740)	(.866)
Other[3]	.21	-.21	-.05	1.44	.16
	(.506)	(.667)	(.614)	(.745)	(.871)
GED[3]	.08	.22	.05	.59	.25
	(.473)	(.623)	(.573)	(.696)	(.814)
Unknown High School[3]	-.82	1.14	.14	.52	1.03
	(.497)	(.664)	(.624)	(.726)	(.846)
Constant	2.40	5.90	-2.00	-1.84	8.25
	(1.73)	(2.221)	(2.056)	(2.50)	(2.889)
R-Squared	.15	.16	.03	.12	.08

*p <.05, **p <.01, ***p <.001- Note: Standard Errors in parenthesis
[1]Male is the reference category
[2]Non-native American is the reference category
[3]Northern Cheyenne Tribal School is the reference group