GROWING SOCIAL CAPITAL:

AN ANALYSIS OF MINORITY STUDENT

CHOICES OF MAJOR/DISCIPLINE

AND OCCUPATION

By

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CHAPTER I

INTRODUCTION

This study investigates whether disparity exists in the income potential of minority graduates by examining the choice of academic majors by two-year college graduates representing different races/ethnicities, focusing on the socio-economic impact of their degree choices.

Background

In the 20th century, a college diploma, regardless of discipline, has been considered the ticket to a prosperous American lifestyle. College graduates were thought to be prepared and were expected to exercise critical thinking skills as they applied historical concepts, engineering skills, and accounting principles beyond the context of college curriculum. The knowledge and ability to clearly and effectively communicate still depends on one's ability to think and write clearly and effectively (Rosovsky, 1990), so the importance of a college education is as great now as during the previous century. Callen and Finney (2002) wrote, "Approximately 43 million American baby boomers with at least some college education will be over 55 and retired or approaching retirement by 2020. . . . the nation will face a prospective deficit of about 12 million workers with at least some college education" (p. 26). The nation's higher education programs must

graduate a sufficient number of competent citizens to replace the large pool of retirees and to augment the nation's brain trust as the economy reacts to new opportunities in the world.

Education that prepares individuals to assume their roles in society through demonstrated leadership and practical skills must prepare representatives from all segments of society. The information age increases the need for knowledge workers, people who will work in an office rather than the factory floor. Information technology, gathering, processing, or applying information will employ 56 percent of the work force (Francese, 2002). Both the number of college graduates and the quality and type of degrees awarded are critical to maintaining the United States (U.S.) economy and the social fabric. Callen and Finney (2002) noted that when citizens lose trust in the promise of opportunity, the loss affects the social fabric. Society benefits when citizens have the confidence and the analytical skills necessary to address complex public issues that defy simple answers.

Research Problem

Educating all United States citizens is clearly in the public interest. How can U.S. educational institutions more effectively build the expectation and anticipation of benefits from education in its less educated communities and encourage the selection of college majors that lead to higher income? Is there a significant difference in income between graduates from differing academic disciplines? Graduates in history and education lose earning power as their careers progress in contrast to graduates in business, math, and the sciences (Thomas & Zhang, 2005). Is there a difference in selection of academic major

and subsequent income between minority and non-minority students? These questions led to the purpose of this study.

Research Purpose

This study investigated the differences in choice of academic majors and their corresponding income potential among two-year college graduates, using race or majority/minority status as the independent variable. To accomplish this, the study compares the graduates' selection of academic majors/disciplines by race during three academic years at a community college of 21,000 students located in a Midwestern city of 170,000 people. Findings were compared with data from the Employment Security Commission of the state in which the college is located to determine if the racial imbalance in selection of academic discipline had any affect on income potential.

Importance of this Study

The identification of academic disciplines selected by minorities will provide guidance to educational policy planners and advisors in recruitment, counseling, and scholarship programs for minorities. This knowledge will further the community college's efforts to build career expectations in the minority communities. Callen and Finney (2002) concluded that individuals can contribute more to society and the economy with enhanced knowledge, skills, and abilities. The lack of knowledge, skills, and abilities inflicts a penalty on both individuals and the society in which they live. Lattimore and Borgen (1999) tested the validity of a vocational choice instrument measuring personality types. Their findings noted variations within personality type based on racial background. The authors called for further research examining direct and indirect effects on career choice and job satisfaction to add to the knowledge base.

The institution selected for this study considers the entire community when planning its programs. The *Day of Vision Program* conducted annually at the college selected for this study exposes high school students from minority groups to the college in an attempt to raise the expectations of the students. In turn, the college's expectation of increased minority enrollment is based on the community it serves (Million, 2006). The *Day of Vision Program* is largely credited with an increase in minority enrollment to the point that the demographics of the college do reflect the community at large ("TCC Scores," 2006). In the 2005-2006 academic year, the number of Hispanic students at the community college in this study increased 322 percent and the number of Black students by 58 percent (Pere, 2007). With increased enrollment of minority students, the opportunity to guide larger numbers into selected high-income career fields increases.

This study investigates the under representation of minorities in the selection of academic major that lead to high income fields available in the city's Metropolitan Statistical area (MSA) as indicated by specific occupational code.

Research Questions

1. Which majors attracted the largest percentage of racial minority graduates?
2. Which majors attracted the smallest percentage of racial minority graduates?
3. How did selection of majors among graduates of this college compare to the current occupational report of income for the MSA serviced by this college?

Theoretical Framework Used in this Study

Social Capital, as a theory, was brought into modern usage by Coleman's (1988) refinement of human capital theory. Coleman's social capital maintains that people behave differently depending on the social structures. Networks can facilitate goal

attainment by individual members. Coleman contended, "Human capital is created by changes in persons that bring about skills and capabilities that make them able to act in new ways" (p. 100). Putnam (2000) described social capital as a function of bonding and bridging. Bonding establishes the identity of groups and bridging establishes broader social identities. Putnam's definitions describe bonding as creating social capital within a group as members share cultural bonds creating trust and obligation and bridging as creating opportunities to establish social networks beyond the homogeneous groups. The social bonding may foster clannishness and cultural inbreeding as well. Bourdieu and Passeron (1990) wrote, "A scholastic future is of greater or lesser probability for a given individual only insofar as it constitutes the objective and collective future of his class category" (pp. 155-156). These socio-economic and ethnic categories act as anchors, both offering security and limiting movement. Positive applications of the theory permit an individual to grow past the secure social network by bridging beyond the subculture's norms and expectations.

Definition of Terms

Demographic data refers to self-declared data pertaining to race, major/discipline, income, and career.

Ex-Post Facto research, also called causal-comparitive research, "explores relationships among variables that cannot meet the stringent criteria for true experimental research. . . . The independent variable, or cause, has already occurred or cannot be manipulated, so the researcher has no control over it" (Gay & Airasian, 2003, p. 11).

Major or discipline refers to a field of academic study. These two terms will be used interchangeably.

Minority is defined as a "group that is different in some respect (such as race or religious belief) from the majority and that is sometimes treated differently as a result" (Garner, 2004, p. 1017).

Non-minority refers to non-Hispanic Whites.

Socialization is the process by which social capital transacts within and without the community. Socialization is context-dependent because social behavior remains within the bounds established as normal by the community (Arriaza, 2003).

Society is defined as a "community of people, as of a state, nation, or locality, with common cultures, traditions, and interests" (Garner, 2004, p. 1425). In this study, society refers to the nation and its common interests.

Assumptions

The following two assumptions support the framework of this study on the selection of academic disciplines by various race/ethnicities.

1. Distributions of race, the selection of academic major, and their potential earnings are comparable.
2. Graduates will tend to seek employment congruent with their degree's emphasis.

Limitations of this Study

One limitation encountered with this research relates to the understanding of college race/ethnic categories in this study with U.S. Census categories. The college studied here adheres to a classification set including Caucasian and Hispanic, but the U.S. Census Bureau data subdivide these categories in a manner requiring scrutiny before using census data, such as White; White, non-Hispanic; and Hispanic. Information

referring to Whites was drawn from the White, non-Hispanic category. Information referring to Hispanics was drawn from the Hispanic category.

Another limitation of the research concerned the theory of social capital. Social capital, as a construct, merely offers one framework to aid in the understanding of the trends in minority/majority selection of academic discipline. Social capital is not offered as a singular theory or as a singular solution. There is no claim that social forces existing in minority communities cause members of those communities to select particular academic disciplines, but it can function as a framework, fostering understanding of minority selection of major and corresponding occupations to assist college program planners to better serve the minority communities.

A related limitation with the study of a single institution makes it difficult to generalize the results of the study. On the other hand, the method employed can be replicated at other community colleges with similar service areas, improving the clarity of the picture of racial/ethnic representation in each academic discipline. Replication is one way the study of a particular institution can be generalized to the population (Gay & Airasian, 2003).

There were additional limitations when reporting the data. These limitations required the researcher to obtain and analyze the best data available.

1. Self-reported institutional records (applications for admission) may not be reliable.

2. Data on minority classification is not always consistent due to changes in reported categories.

Sample for this Study

The sampling used in this study is called purposive sampling and is criteria based--using the criteria (based on the distribution) of race and ethnicity (Gay & Airasian, 2003). The criteria for selection were based on the diverse ethnicity of both the community and the student body of the college. The sample is comprised of graduates of one community college for the academic years 2004-05, 2005-06, and 2006-07.

1. The student body of the selected community college averaged over 21,000 Full Time Equivalent (FTE) students over the selected academic years. A large number of these students were not actively seeking a terminal degree from the community college.
2. The selected community college graduates approximately 1000 students every academic year.
3. The selected institution offers a full range of academic and applied disciplines.

Summary

This chapter introduced the topic of this study, selection of academic major by race/ethnicity, for the purpose of determining if racial imbalance in academic major affects income potential of graduates. The research questions, conceptual framework of social capital, and significance of this study were then presented. Chapter two presents a review of existing literature concerning social capital's power of community, building social capital and the future, revolutionary emancipation, evolutionary emancipation, defining race and ethnicity, a primer on educational access, the mission of the community college, the importance of academic advising, an illustration of the problem, comparing

income and education in various ethnic groups, race/ethnicity and the selection of academic disciplines, and academic major and future income.

CHAPTER II

REVIEW OF LITERATURE

The philosophical underpinning of my research is that education emancipates by building and using social capital. Formal education increases income and leadership potential that can be invested into the community that produced the graduate. The benefits do not require the graduate to return to his or her original social community: the graduate who returns to the community builds relationships and serves as an example for others; the graduate who invests in the larger society creates a pathway for others to follow. These two forms of contribution are at the heart of social capital, the value of a community being in its members.

Social capital, as a theory, was brought into modern usage by Coleman's (1988) refinement of human capital theory. Coleman's social capital maintains that people behave differently depending on the social structures. Networks can facilitate goal attainment by individual members. Coleman contended, "[Social] capital is created by changes in persons that bring about skills and capabilities that make them able to act in new ways" (p. 100). Putnam (2000) described social capital as a function of bonding and bridging. Bonding establishes the identity of groups and bridging establishes broader social identities. Putnam's definitions follow:

> Bonding creates social capital within a group as individuals within the group share cultural bonds creating trust and obligation.

Bridging creates opportunities to establish social networks beyond the homogeneous groups.

Social capital's social bonding may foster clannishness and cultural inbreeding as well. Bourdieu and Passeron (1990) wrote, "A scholastic future is of greater or lesser probability for a given individual only insofar as it constitutes the objective and collective future of his class category" (pp. 155-156). These class categories act as anchors, both offering security and limiting movement. Positive applications of the theory permit an individual to grow past the secure social network by bridging beyond the subculture's norms and expectations.

Bouchard (2008) stated that education builds knowledge capital and that this capital remains the property of its holder. The author questioned the intrinsic value of the content of education, citing the economic and social benefits of a recognized credential as potentially more important than enhanced knowledge and skills, but the value of a completed course of study is established either way in the author's writings. The fact that the individual is recognized as one who controls knowledge capital increases that person's worth in the nation's progressive tax-based system because greater income potential equals greater tax contribution. Knowledge capital increases the potential economic power of individuals, who, in turn, can invest in themselves, their social networks, or the larger society. Investing leadership and finances within one's social network introduces the aspect of social capital as bonds are strengthened within the group and opportunities for others to build bridges to the larger society are constructed. Putnam (2000) also remarked about aggregate economic growth produced in part by social capital as a benefit to the community by raising levels of cooperation and expectation. This

supports Coleman's (1988) contention that social capital is found in the relationships between people.

Social Capital's Power of Community

Wampold et al. (1995) wrote, "People tend to seek out environments containing people with similar, rather than complementary, characteristics" (p. 366). Lawler (2001) explained that networks are produced by social exchange, but emotion provides the strength of the bond. Stronger minority teacher representation across the disciplines will strengthen the bond and encourage minority students to enter the currently underrepresented disciplines. This will further encourage more participation in the affected field.

Cole (1986) stressed the importance of Black role models to encourage the self-esteem and identity formation of Black students. Cole also stressed the importance of Black role models to non-minority students as authority figures and competent professionals worthy of respect. While teaching is not a high-income profession, seeding each discipline with members of minority groups may encourage minority students to pursue the disciplines currently underrepresented. Students will learn in a more diverse environment that better reflects the diversity of the larger culture and be better able to work within the nation's pluralistic society.

Building Social Capital and the Future

Increasing minority representation may establish an environment where acceptance and respect acts as a recruiting influence, further reducing the imbalance. Heuser (2005) emphasized the importance of trust, a condition necessary to encourage people to combine their resources and abilities into a greater pool of capital. This trust is

created within a community, drawing strength from the established norms and sense of reciprocity that establish and bond the community.

The racial imbalance in academic disciplines also affects the graduate level of education because the imbalance in the undergraduate programs passes on to the higher level. This imbalance has been recognized and studied. Rogers and Molina (2006) identified minority recruitment strategies at 11 university departments seeking to keep up with the need for minority practitioners. A critical component of the recruiting strategies involved networking within the Black community: "One faculty member reported that the connections created a steady stream of minority applicants who applied because they knew someone like themselves who was already enrolled at the school" (Rogers & Molina, 2006, p. 152). Networks lead to team building, and Rogers and Molina's faculty interviews underscored the success of a diverse environment comprised of sufficient senior minority core faculty to create a critical mass of support. Program visibility was higher, and minority students were attracted to the program because of the respect and support offered. Building a social network with professors integrates students into the academic discipline. In addition to this, students who create social networks among themselves achieve more positive outcomes (Fischer, 2007). Correcting the racial imbalance in academic disciplines may be accomplished by seeding the disciplines with nurturing professionals (Umbach, 2006), pursuing active recruitment, and providing incentives to enter the field through scholarships.

The benefits to both students and the larger society support the notion of diversity as a compelling public interest. Role models and mentors can both build and use social capital as they recruit and assimilate minority applicants, thereby increasing

representation in the currently underrepresented disciplines. This increased representation benefits the minority students by providing education in a high income field that may appear closed to them. All students benefit by the increase in cultural awareness and sensitivity. Society benefits as socially responsible graduates of all races attain leadership positions with a better understanding of how to shape policy that both uses the strengths of and enfranchises all of its members, increasing the social sphere and the social capital that bonds the increased social sphere.

Porter and Umbach (2006) suggested that the selection of academic field affects the interaction of students with peers and faculty from those fields: "People of color are not likely to choose a particular major where they are one of the few minorities present" (p. 431). Porter and Umbach set controls for age, gender and race and discovered racial and ethnic differences between minorities and Whites. Blacks selected the social sciences over the lab sciences. Hispanics were inclined to the arts and humanities over the sciences. Heuser (2005) emphasized the importance of trust, a condition necessary to encourage people to combine their resources and abilities into a greater pool of capital. This trust is created within a community, drawing strength from the established norms and sense of reciprocity that establish and bond the community.

A supportive environment across the disciplines increases a student's expectation for success via the effects of bridging. A student's expectations of success in an academic field generate a critical incentive to study in that field (Pike, 2006). The expectation of success in a particular academic discipline is crucial to motivate a student to undertake the lengthy and expensive quest for a college education: "At the most basic level, expectations act to encourage students to select academic majors that they believe

are congruent with their abilities, interests, and personalities" (Pike, 2006, p. 806). Successful minority professionals in the workforce and in the classroom, as instructors, may foster the expectations of success. This may improve minority representation across the academic fields and foster higher expectations, encouraging members of the minority communities to enter the underrepresented disciplines. Minority representation in certain academic fields encourages participation from members of that minority group (Porter & Umbach, 2006). Avoiding the underrepresented disciplines exacerbates the loss of social capital.

Critics may argue that interaction is natural and requires no intervention in recruitment strategy to balance representation in academic disciplines; further, these critics may challenge the notion that diversity within academic fields matters to the students or the larger society. Umbach (2006) wrote, "Diversity is a 'compelling' interest in that it enhances higher education through the benefits it brings to individual students" (p. 318). Society reaps the benefits of culturally educated students as their greater awareness of the needs, wants, and desires of people who are not like them enhances their ability to communicate and serve a larger number of people in the larger society. Gurin, Nagda, and Lopez (2004) advocated that America's colleges and universities must improve the quality of the racial climate on their campuses by providing uplifting interaction that lowers barriers and may enhance democratic outcomes. This improved climate enhances learning as students from different races and backgrounds learn from each other and develop mutual respect as they develop into culturally competent citizens. Simply increasing the numbers of minority students cannot achieve this goal; increasing

representation in career fields identified as underrepresented may improve the democratic outcomes of higher education.

To summarize the authors cited above, the benefits to both students and the larger society support the notion of diversity as a compelling public interest. Role models and mentors can both build and use social capital as they recruit and assimilate minority applicants, thereby increasing representation in the currently underrepresented disciplines. This increased representation benefits the minority students by providing education in a high income field that may appear closed to them. Students benefit by the increase in cultural awareness and sensitivity. Society benefits as socially responsible graduates of all races attain leadership positions with a better understanding of how to shape policy that both uses the strengths of and enfranchises all of its members, increasing the social sphere and the social capital that bonds the increased social sphere.

Hagedorn, Nora, and Pascarella (1996) wrote, "Adequate representation of women and minorities in different professional and occupational fields cannot be attained unless these groups first earn undergraduate degrees within those fields" (p. 435). They continued, "Although the health professions were popular for all groups, an especially large number of African American students (23.2%) declared this major" (p. 433). Despite this positive trend, the higher income fields within medical training reflect the imbalance between race and selected major. Racial minorities comprising 25 percent of the population are underrepresented in the nation's medical schools at a mere 7 percent, and this trend is increasing (Grumbach & Chen, 2006). The lack of minority students in the medical schools could aggravate the lack of medical care available in minority and low-income communities (Cantor, Bergeisen, & Baker, 1998).

The racial imbalance in selection of major affects the Information Technology (IT) field as well (Varma 2006). While lack of access to technology in the home and school is considered a factor, Varma indicated that learning outcomes are improved when technology is introduced in an environment where students interact with peers similar to them. The students "will develop their social identity based on how they fit into relationship with other students" (p. 132). How strong is the aversion to IT as an academic choice? Stockard, Klassen, and Akbari (2004) surveyed 831 Los Angeles area college bound high school students, only 7.8 percent White, and found 64 percent of respondents would not consider computer science as a college major. Other high technology and potential high income fields, including psychology, engineering, and law scored interest percentages of 3.4, 2.9, and 2.9, respectively. The "No Answer" choice scored 57 percent, indicating a lack of career guidance in the lives of these students. The authors indicated parental influence as a factor, but a lack of social capital from the family can be overcome if there is a support network in the academic community acting as a bridge to the various academic disciplines and career paths.

Horvat's (1997) interviews with Black high school students suggested that the community structures built on race created a boundary between their present situation and the situation they hoped to attain. This boundary was created by the experience of the members of this community, which included few role models with advanced education. Breaking the mold was seen as an abandonment of the culture that had shaped their values and limited the willingness to consider choices outside the Black community's norms and expectations. The author stressed the lack of functional choice in college and career for people bound by a community's limited range of modeled options.

To illustrate how the perceived limitations on selection of major both affect and are affected by social capital, let's construct a hypothetical person named Lisa from the pool of Black females interviewed by Horvat. Lisa's peers don't value education and have little confidence in the benefits of a college degree. A disproportionate number of Lisa's successful models earned degrees in necessary but low paying fields such as social work. Lisa's social capital is limited because her social network provides little awareness of the life-changing potential of academic disciplines effectively unknown to her.

If mentors and models in Lisa's community represent a wider range of fields, Lisa can enjoy the greater social capital of the expanded network and weigh a wider range of options for her future. Eventually, she will become a part of the expanding network, whether she remains part of the community's fabric (bonding) or establishes a position in the larger society (bridging).

Race and ethnicity are one factor in the complex struggle for emancipation through education. Power structures, control of resources, and socio-economic resources have comprised the larger picture, but race and ethnicity, however defined, have played a significant part in the social unrest that led to changes in public policy.

Revolutionary Emancipation

Some groups of people have so little social capital due to centuries of oppression and exploitation that revolutionary means are required to start the process of emancipation. Although guided by outsiders, the strength and wisdom to emancipate must come from within the culture. Revolutionary educators applied principles of social capital before the term was invented.

Social capital is a function of bonding, which develops trust, and bridging, which establishes networks. What makes bonding work is a sense of trust within the community. Freire (2003) noted the trust-inhibiting contradiction in oppressed cultures, "Trust is established by dialogue. To glorify democracy and to silence the people is a farce; to discourse on humanism and to negate people is a lie. . . . How can I dialogue if I am afraid of being displaced, the mere possibility causing me torment and weakness?" (p. 90). Freire's dialogue was an educational experience meant to emancipate the participants from oppression by understanding the dichotomy between what was inherited and what was acquired. Humans inherit a sense of freewill and passion, but we acquire a sense of oppression through social and cultural experiences. Dialogue will build leaders and free people who can challenge the oppressive order and mitigate the acquired attributes of oppression (Freire, 1998). A sense of trust allows the free expression critical to effective dialog.

Myles Horton, founder of the Highlander Folk School, understood the principle of people developing social capital through dialog:

> He had learned that the people knew the answers to their own problems. He had learned that the teacher's job was to get them talking about those problems, to raise and sharpen questions, and to trust people to come up with the answers. (Adams, 1998, p. 4)

Social capital builds a sense of community through dialog, a sharing of common burdens and solutions beneficial to all. "People learn about unity by acting in unison. They learn about democracy by acting democratically. Each time they act in democratic unity, as a result of Highlander experiences, they both strengthen their capacity for such action and

demonstrate the process of education" (Adams, 1998, p. 207). Myles Horton (1990) was a revolutionary as indicated by the purpose of the school into which he invested his life, "The job of Highlander was to multiply leadership for radical social change" (p. 115).

This school facilitated by Horton supported grassroots, community-level education fostering a sense of democracy within the affected communities. This emphasis was reflected in the 1950 Statement of Purpose for Highlander:

> We reaffirm our faith in democracy as a goal that will bring dignity and freedom to all; in democracy as an expanding concept encompassing human relations from the smallest community organization to international structure; and permeating all economic, social, and political activities. (Glen, 1996, p. 283)

This expanding work, bridging from small community organizations to increasingly larger ones, was a call to revolution, a call to break the chains fastened to oppressed peoples as they replaced the acquired chains with a newly acquired appreciation of democracy. While it can be argued that oppression and exploitation occur, the radical claims against the particular systems in question need to be balanced against the nature of that particular system. In the twentieth century, the United States needed reform in its racial and socio-economic policies; the continued need for reform exists, but destroying the existing social order is not necessary. The process of revolution gave way to evolution as communities awakened to their potential to grow their individuals and their communal power within the larger society.

Evolutionary Emancipation

Green and Preston (2001) described education's effect on social capital as the strongest influence on democratic outcomes. As members of a defined group expand

their capabilities, thereby increasing their social capital within their community through the process of bonding, they expand their social position in the larger society by bridging, thereby using the increased social capital. The authors also noted education's effect on income disparity, suggesting that income distribution, equal and unequal, correlate with employee skills and qualifications. Green and Preston further postulated that systems that create more equality in job skills benefit from flatter income distribution. Alternately, systems that fail to remediate the disparity in job skills perpetuate the income disparity and the lack of social capital in low-income communities. Weeden (2002) determined that income disparity exists because "positions in the division of labor are differentiated from each other; reward packages of greater or lessor value are attached to these positions" (p. 55). The author further noted, "To motivate people to undergo the necessary training with all its attendant sacrifices and miseries, society must reward these occupations well" (p. 71). Yasso (2005) offered an explanation of social capital as networks of people and community resources that provide individuals the instrumental and emotional support to navigate the social institutions. People of color attained education, justice, and employment through the use of social capital, and they, in turn, invested the information and resources into their social network.

Defining Race and Ethnicity

Oppression has been viewed in terms of both race and socio-economic status. When viewed in terms of race, categories become more difficult to define because of the differing ethnic classifications within each race. Does race and ethnicity still matter in an egalitarian age? "Race is of consequence to our practice and by omitting the topic we are agreeing that there is a universal race with an accompanying culture replete with values"

(Johnson-Bailey & Cervero, 2000, p. 153). The notion that we are one people denies the differences in acquired cultural values and expectations.

Quintana (2007) stated that definitions dealing with race have been complicated by the alternate term of ethnicity. In the classic sense, race tends to denote biological characteristics (Black) and ethnicity denotes a sense of heritage (African-American). Bennett (2006) described racial socialization as a shaping of an ethnic identity, a sense of identification with a shared racial heritage. Bennett acknowledged that it is "argued that the constructs are inextricably linked to one another" (p. 199). Bennett's research focus was to determine how school engagement among African-American youths is fostered by ethnic identity and racial socialization. Bennett found, "Racial socialization and ethnic identity are not unidimensional constructs. Rather, they are multidimensional and appear malleable over time, development, and setting" (Bennett, 2006, p. 199).

Difficulties arise when governmental agencies classify the demographic categories of race and ethnicity differently:

> The federally mandated racial and ethnic categories, however, are not biomedical in origin. Rather, they derive from the 1997 "Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity" published by the Office of Management and Budget (OMB). These standards set forth 5 minimum categories for data on race: American Indian or Alaska Native, Asian, Black or African, Native Hawaiian or Other Pacific Islander, and White. (Kahn, 2006, p. 1966)

The five categories of race are a minimum that can expand into as many categories as different government agencies require for their reporting needs. This causes confusion

when comparing data from different government databases. "Researchers will need to adopt terminology that is more precise and descriptive" (Hughes, Rodriguez, Smith, Johnson, Stevenson, & Spicer, 2006, p. 749). The subject responding to a questionnaire is limited by the range of choices offered, but regardless of the categorization of the race and ethnic questions, self reporting raises the biggest questions about the data. A subject chooses the category that fits with his or her sense of identity. This affects the research by introducing the risk of error into the data collected, but this is ameliorated by the recognition that the subject aligns himself or herself with a group listed on the questionnaire. This alignment identifies the community from which the subject draws strength and to which the subject contributes. This alignment is of interest to a researcher interested in social capital.

A Primer on Educational Access

Economic and social disparities are nothing new in modern society, but these disparities may affect the economic enfranchisement of minority populations in the United States. Blacks and Hispanics are entering higher education in significant numbers, expecting to improve upon their socio-economic status. Changes in technology and markets increase the importance of a literate workforce, and the need to increase social capital in the minority communities creates an imperative to increase literacy in both the verbal and quantitative areas. Rosovsky (1990) emphasized that education was more than the process of mastering communication skills, indicating the importance of learning the methods and principles of science to complete the student's education**.**

Approximately 60 percent of undergraduate students enroll first in community colleges across America, offering access to many who would not apply at a university

(Bounds, 2005). This enhanced access overcame geographic, economic, and racial barriers in keeping with the goals established during President Harry S. Truman's administration. The Truman Commission of 1947 emphasized two areas to improve education in the United States: provide a general education to more citizens and improve college teaching (Hutcheson, 2007). The 1960's expansion of two-year and community colleges led to the improvement in accessibility that satisfied the goals of the Truman Commission (Bounds). The classic liberal curriculum was supplemented by an alternate general education curriculum which emphasized democratic application of classic principles as well as extra-curricular activities (Hutcheson). The commission report's preface indicated the task was to define the responsibilities and examine the objectives, methods, and facilities of American higher education ("The President's Commission on Higher Education ," 1947). The report further emphasized the lack of minority participation in higher education and indicated the phenomenon as reflecting a history of unequal opportunity. One of the solutions was to make public education available for fourteen years, two past the current system of 12 years. This would alter teaching methods and introduce the human and social needs that educational institutions must meet, but it would also help support democracy and build a central unity as people from all walks of life, races, and economic status learn to live together as a free citizenry. Federal funds are an investment in building such a democracy ("The President's Commission on Higher Education,"). The report's emphasis on the mission and methods employed in educational years 13 and 14 created a need for a two-year college that meets the needs of citizens in the community in which it serves.

Building the social and economic potential of minorities was a dream in 1947, but the two-year college expansion of the 1960s created an opportunity to admit a new type of student. Cross (1971) described the "New" student entering post-secondary education in contrast to the traditional student from an affluent background. These new students frequently failed to achieve academic honors in high school and often came from families classed as low socio-economic status. Cross further noted 81 percent of this group classified themselves as one of the established non-White minorities.

Many of these students from the lower socio-economic classes, regardless of ethnicity, ameliorated their academic deficiencies and completed various degree programs (see table 2). With increasing minority graduates entering the economy, the earning power of minorities should increase proportionately, but only if all academic majors lead to careers of equal income potential. Cross (1971) noted that restrictions, real or perceived, limit the benefits of education by limiting the career options. Students of high academic ability can transcend these limitations, but students with less academic ability tend to enter occupations similar to their parents or pursue education to enter fields such as social work, teaching, and engineering. While "developing individual talent should be the goal of education" (Cross, 1971, p.113), developing talent in the high income potential fields will help individuals rise to a higher socio-economic status.

The Carnegie Commission (1967-73) sought ways to foster social justice and development of high skills as part of its vision of reform with an emphasis on expanding professional degree programs. Funding was to come from federal, state, and local levels of government to support curriculum reform instructing in new technologies. Mastering

new technologies was considered a path to higher income potential and was one way to fulfill the goals of the Truman Commission of 1947.

The Mission of the Community College

Mission statements provide clarity to the leaders and staff of an organization. A college mission statement provides direction for policy planners, administrators, and instructors, enabling them to determine specific requirements and tasks to fulfill the organizational mission. The American Association of Community Colleges (AACC) described the community college as a community builder through education:

> Community colleges are centers of educational opportunity. They are an American invention that put publicly funded higher education at close-to-home facilities, beginning nearly 100 years ago with Joliet Junior College. Since then, they have been inclusive institutions that welcome all who desire to learn, regardless of wealth, heritage, or previous academic experience. (American Association of Community Colleges, 2006, para. 1)

The AACC supports the role of the community college as a force to serve all the members of the community by creating opportunities to learn skills and socialize in ways that permits bridging between all the constituent groups comprising the community, reflecting the ideals of the Truman Commission of 1947. Much of this mission is being accomplished by the community colleges in the nation, but there is still an area that requires further investigation at the local level: the choice of academic discipline by the various minority groups.

The Importance of Academic Advising

College academic advisors contribute to student selection of majors, retention, and success as they direct students towards activities that lead to success after graduation. This expands the vision of a successful outcome beyond the usual emphasis of retention (Campbell & Nutt, 2008).

The community college is frequently an open admissions institution serving a diverse student body, diverse in demographics and assessed academic skills (Elmi, 1998). The emphasis on success beyond retention and graduation goals is a critical step in advising first generation students, students whose parents did not attend college, to gain the greatest benefit from their college education. Roughly half of these first generation students are from minority groups, and many enter college lacking college-level academic skills (Gibbons & Shoffner, 2004; Elmi, 1998).

The unique needs of these students present an opportunity for counselors to assist students in assessment of needs, assessment of educational goals, and assessment of outcome. One such university developed a proactive advisement program. Freshmen at the University of Wisconsin-Oshkosh commonly indicated they are undecided on their academic major while 50 percent of the freshmen who had declared a major would change it in the middle of their sophomore year (Freeman, 2008). This program involved advisors, faculty, and administration to assess abilities, limitations, life goals, and career goals while exploring the academic programs that would help students achieve their life and career goals. This guidance included the selection and scheduling of specific courses (Freeman), so these programs provided the mechanism to guide minority students into high income potential fields

An Illustration of the Problem

The role of the community college is the preparation of learners for the next step in their lives. Whether that step is a job or a university education, the community college is a low cost, high access opportunity to improve one's knowledge and skills. McPhail, McKusic, and Starr (2006) wrote of the community college's celebrated role as gateway to the nation's underserved and underprepared students. The high number of underprepared students seeking college admission offers a unique opportunity for today's community colleges. These students are defined as those who lack college level academic skills. The open door policy allows these students to enroll in remedial classes to become proficient in their previously undeveloped skills and to pursue their college careers.

Robinson (1999) described the community college as a force for developing the disadvantaged by reducing the gap between citizens with abundant financial resources and those who lack sufficient financial resources to pay tuition. The community college serves the community by opening the door to those who were once barred access to higher education and by preparing all of its students to excel in the workplace or at the university. Cejeda and Leist (2006) emphasized the importance of financial aid as the key to student access because it reduces the financial burden by making tuition affordable.

Robinson's view of the community college of the future cast the institution as a major player in the knowledge industry. With the need for an educated workforce possessing critical thinking skills, education is vital to the nation's economic health; the community colleges will build the nation by strengthening the individual members of

supported communities. Cejeda and Leist (2006) emphasized the community college's role in this endeavor: "Meeting the needs of the community has served as the mantra of America's 2-year institutions" (p. 255). Brainpower and technology can multiply individual productivity to compensate for higher wages and help America retain global competitiveness" (McCabe, 2000). Educated citizens will enjoy a more productive life and help sustain a productive economy.

Comparing Income and Education in Various Ethnic Groups

Data from the U.S. Census indicated income are distributed differently among the various ethnic groups. The 2005 mean income figures listed non-Hispanic Whites at $42,963. This is $12,491 greater than the $30,472 mean income listed for Blacks and $15,203 greater than the mean income of $27,760 listed for Hispanics. The category names used matched the U.S. Census designations (United States Census Bureau, 2007, March 15, Table A3).

Is there a disparity of income between minority and non-minority segments of the nation's workforce? Government data indicated education increases pay, regardless of race: "Median weekly earnings for Black high school dropouts were $372, while earnings for Black college graduates were $828. Among Hispanics, median weekly earnings for high school dropouts were $388, while Hispanic college graduates were $866" (U.S. Department of Labor, Bureau of Labor Statistics, 2006, Chart 2-5). Despite the positive effect of education on income, Blacks and Hispanics earn less than Whites. Accounting for similar level colleges, being White in this society still nets an advantage, averaging $125 per week for completing some college and $200 dollars per week for completing a four-year degree (U.S. Department of Labor, Chart 2-5).

Average monthly earnings by race indicate Blacks earn $2,106 with a high school diploma and $2,717 with an associate's degree. Whites earn $2,678 with a high school diploma and $3,256 with an associate's degree. Hispanics earn $2,052 with a high school diploma and $3,028 with an associate's degree. The numbers escalate with further education. Whites earn $4,384 with a bachelor's degree, Blacks earn $3,673 and Hispanics earn $3,549 (United States Census Bureau, 2005, September, Table D). The sources cited above indicate disparity in income between race/ethnicity, but the government supplied data also indicate a financial benefit from education for members of each demographic category.

Horn and Nevill (2006) provided data on all two-year undergraduates for 2003-2004.

Table 1: Proportional Participation of Two-Year Graduates by Ethnicity, Nation-wide

Race/Ethnicity	*Percentage of Ethnic Groups Participating in Community College*	*Percentage of Population 18 Years and Older*
White	59.9	72.0
Black	15.3	11.2
Hispanic	14.4	11.0
Asian/Pacific Islander	6.0	3.7
Native American	1.0	0.7
Other	--	--
Percent	100.0	100.0

Column 2 percentage as reported by National Center for Educational Statistics--Profile of Undergraduates in U.S. Postsecondary Education Institutions: 2003-2004, table 3.2.
Column 3 percentages as reported by U.S. Census Bureau, 2000, table 1.

When compared to the 2000 census, Blacks, Hispanics, and Asians were proportionately over represented in the community colleges of the nation. Whites were underrepresented in the community colleges (United States Census Bureau, 2000, phc-t1).

Horn and Nevill (2006) also provided data on all undergraduates for 2003-2004, including two-year students.

Table 2: Proportional Participation of College/University Graduates by Ethnicity, Nation-wide

Race/Ethnicity	*Percentage of Ethnic Groups Participating in College/University*	*Percentage of Population 18 Years and Older*
White	69.3	72.0
Black	11.2	11.2
Hispanic	9.8	11.0
Asian/Pacific Islander	5.7	3.8
Native American	.08	0.7

Column 2 percentage as reported by National Center for Educational Statistics--Profile of Undergraduates in U.S. Postsecondary Education Institutions: 2003-2004, table 3.2.
Column 3 percentages as reported by U.S. Census Bureau, 2000, table 1.

The percentage of participation for Whites increased from 69.3 percent to 72 percent at the level above associate degree. This is in stark contrast to the percentage of Black student participation that dropped from 15.3 percent (see table 1) at the two-year level to 11.2 percent (see table 2) for all four-year students. Hispanic student participation percentage also dropped from 14.4 percent (see table 1) at the two-year level to 9.8 percent (see table 2) at the four-year level. It should be noted that the percentage of Black and Hispanic college participation declined as a percentage of total population above the two-year level, indicating greater participation at the two-year level than the four. These numbers suggest that minorities are better represented at the two-year level

programs, increasing the importance of the two-year degree in the social and economic potential of minority graduates.

Cejeda and Leist (2006) noted that the changing demographics of the nation will change the demographics of community colleges. While McCabe (2000) avoided blaming people or institutions for the problems discussed, he also used demographics to illustrate that the problem may grow worse. The first demographic issue raised is that the American workforce is becoming older. The economy needs increased productivity from the younger workers to support an aging population that approaches retirement. Socio-economic factors also affect education because, "one-parent households tend to have lower incomes, and poverty is the primary cause of educational underpreparation" (McCabe, 2000, para. 11). The final demographic factor discussed was race. "Hispanic Americans and African Americans lose ground at each step of the educational ladder, from high school graduation and college enrollment to degrees and certificates earned" (McCabe, 2000, para. 12). The nation must develop its human capital. It will benefit the nation's economy, support the aging population, and create opportunities for people to establish their own sense of purpose and dignity. The underprepared students will, "begin college with poor preparation and academic deficiencies. Colleges will have the responsibility of raising educational attainment for this more diverse and less prepared student population" (McCabe, para. 12). Cejeda and Leist (2006) noted that the early selection of an academic major improved retention in minority students.

Financial aid programs enhance access and retention, and while the states manage the interests of their respective education programs, the scope and effects of these educational programs influence the nation as a whole. Acknowledging this, the federal

government of the United States become a partner with the states in providing financial assistance to broaden access and improve retention ("The President's Commission on Higher Education," 1947).

Today, financial grants to low income students available from the Federal Pell Grant Program improve access to the nation's colleges. Pell grant awards at the community college averaged $2,161 per student over the three year range under consideration in this study (table 3). No category of ethnicity varied more than one hundred dollars from the average loan amount. Grants to Asian and Native American students were slightly above the average at $100 and $95 per student, respectively. Grants to Caucasian and Hispanic students were slightly below the average at $74 and $98 per student, respectively. Grants to African American students were only $24 per student below the average (see table 3).

Table 3: Subject Institution's Pell Grant Data (rounded to the nearest dollar) for Academic Years 2004-05, 2005-06, 2006-07

CATEGORY	*TOTAL $*	*TOTAL GRADUATES*	*$ PER GRADUATE*
African American	636,925.88	298	2,137
Asian	65,577.00	29	2,261
Caucasian	2,579,992.56	1236	2,087
Hispanic	101,101.00	49	2,063
Native American	360,964.00	160	2,256
Average Pell Grant	----	---	2,161

Data provided by the community college's Office of Institutional Research (2008)

Pell grants provide thousands of qualifying students from all ethnicities access to post-secondary education, creating the opportunity to improve their income-generating potential. This opportunity may be enhanced by the selection of academic discipline leading to a high-income occupational field.

Race/Ethnicity and the Selection of Academic Disciplines

Government figures track associate degrees by race. Converting the raw numbers into percentages of participation by race indicated a connection between race and selection of major.

Table 4: National Holders of Associate Degrees by Race and Percentage within Race by Major/Discipline, 2005

RACE	PERCENTAGE OF POPULATION	ENGINEERING	HEALTH	LIBERAL ARTS	SOCIAL SCIENCE.	NATURAL SCIENCE
White	78%	80%	80%	77%	70%	87%
Black	11%	9.9%	11%	9.5%	11%	7.7%
Hispanic	7.1%	6%	6%	9.1%	14.4%	9.2%
Other N/A	--	--	--	--	--	--
Total	100%	100%	100%	100%	100%	100%

Remaining balance includes participants who cross racial categories.
Column percentages as reported by U.S. Census Bureau, 2005, September 13, Table D

The percentages in each academic discipline are a within-race percentage, meaning that 80 percent of the engineering degrees were earned by Whites. This is slightly above the percentage of Whites in the population of graduates.

The data in table 4 indicated that a greater within-race percentage of Whites also held degrees in the health and natural science fields with under representation present in the social science fields. Blacks were underrepresented in the engineering and natural science fields, yet well represented in health and social science. Hispanics were underrepresented in engineering and health, yet well represented in social sciences and natural sciences. Consistently, Whites held associate degrees in the fields that experience stronger wage growth: engineering, health (Thomas & Zhang, 2005), and natural science (U.S. Census Bureau, 2005, September 13, Table D).

Academic Major and Future Income

Today, a college education provides an edge in earning power and effective citizenship, but the soft disciplines that lead to social work and teaching trail the hard disciplines that lead to engineering and technology. Thomas and Zhang (2005) found people with education degrees experienced more of a return on their educational expense than graduates with majors in history, but both experienced a decline in their wages compared to graduates who obtained majors in business, engineering, and computer science. Data from U.S. Census Bureau (2005) corroborate Thomas and Zhang's assessment of the enhanced monthly earning power of workers holding a two-year degree in computer science, $3,407, or engineering, $3,578, as compared to liberal arts, $3,087 (U.S. Census Bureau, "What It's Worth," 2005, Table D).

Regional data reflected the national trends in occupational wages. Data collected and maintained by the Oklahoma Employment Security Commission (n.d.) for the host city's Metropolitan Statistical Area (MSA) reported the annual median wages of various occupations available in the reporting statistical area served by the community college.

Median wage is reported in this study because of the gap between the lowest and highest wage earners and the inability to forecast in which fields the graduates will find employment. Occupational code #25-0000, Education, Training, and Library, averaged $32,099. This median wage was similar to another field in the helping professions: Community and Social Services, occupational code #21-0000, which reported a median income of $30,466. While these occupations pay above the median salary for all occupational codes, $27,446, for this MSA, the median wage for all occupational codes includes unskilled labor and minimum wage jobs. The Health Care Practitioner and Technical Occupations, Code #29-0000, reported a median income of $40,784. Median salaries in the health care field are higher than teaching and social work, but Architecture and Engineering, #17-0000, reported a median income of $53,277; Computer and Mathematical occupations, #15-0000, reported a median income of $51,562; Life, Physical, and Social Sciences, #19-0000, reported a median income of $49,050; and Business and Finance, 13-0000, reported a median income of $44,078. Selection of career field can make a substantial difference in salary. The selection of discipline affects income potential, but do demographic factors affect the selection of discipline by the students?

The income gap between races has been reduced when comparing workers within a particular field. However, Thomas and Zhang (2005) noted little racial disparity in earning power over time, suggesting that one reason for the economic disparity among college graduates is the range of wages between low income and high income generating disciplines. This would not appear to be a problem unless a disproportionate number of

minorities are selecting the low income disciplines, accentuating the economic and social disparity.

Summary

This chapter reviewed existing literature concerning the theory of social capital and emancipation through education, the limitations of demographic categories of race versus ethnicity, the history of the two-year college involvement in educational emancipation, the current status of graduates from various levels of higher education, the current income potential of graduates based on selection of occupation, and the role of academic advisors in the process of assessing students and clarifying their academic and life goals. As education emancipates the citizenry, members of minority communities can build bridges to the larger community and share in the economic opportunities. Education in the fields that lead to high incomes will strengthen minority communities and diversify the larger society. Chapter three presents the chosen methodology for this study: research focus, method of data collection, hypothesis and method of data analysis.

CHAPTER III

METHODOLOGY

The causal-comparative nature of an ex-post facto study examines one concern, post event, studying real situations that provide the opportunity to test ideas and apply methods (Gay & Airasian, 2003). Such a method directs attention to factors that could otherwise be ignored by the field (Evans, 1989).

Gay and Airasian (2003) distinguished experimental research from causal-comparative research. Experimental research requires random selection: The researcher divides the participants into two or more equivalent groups before applying treatments to the experimental group(s). In causal-comparative research, selection of participants is not random and no control group is required. Causal-comparative research is not true scientific research due to the lack of experimental controls on both the sample and the treatment, especially the lack of a control group to establish cause and effect. Causal-comparative research seeks to identify the reason for preexisting differences between groups.

The ability to generalize the sample's results to the population is possible by replication, which increases the certainty to assume the results did not occur by chance by their replication in similar situations (Gay & Airasian, 2003). This design is appropriate for this research problem and the research question because the method used to study the

research problem can be replicated at community colleges with similar characteristics as the community college participating in this study, such as size and demographics.

This study compared minority students (taken as a group and broken down by the supporting academic institution's classifications) to non-minority students in terms of the following dependent variable: selection of major/discipline by the community college's graduating Whites, Blacks, Hispanics, Asian-Americans, and American Indians during the 2004-2005, 2005-2006, 2006-2007 academic years. Those receiving degrees were selected over the general student population to avoid the inclusion of students who were undecided or who had changed majors. This institution graduates an average of 1,000 students each academic year, so three years of data ensure a sample size sufficient to include a relatively large number of associate graduates.

Research Focus

General research questions: Are graduates from minority groups underrepresented in certain majors/disciplines and does this choice of major affect income potential?

To answer these questions, an ex-post facto design was chosen for this study. Ex-post facto research investigates possible causes for behavior by comparing participants exhibiting a specific behavior with those who exhibit alternative behavior. The data comprising the independent variable have already been recorded from standardized college survey questions that were part of the application process. The dependant variable was obtained from the participating community college's data base.

This study compared the independent variable of race/ethnicity with the dependent variable of students' choice of academic discipline. Specifically, the research focus compared minority students (taken as a group and broken down by the supporting

academic institution's classifications) to non-minority students in terms of the following dependent variables:

1. Selection of major/discipline by the community college's graduating Whites, Blacks, Hispanics, Asian-Americans, and American Indians during the 2004-2005, 2005-2006, 2006-2007 academic years.
2. Income listed by comparable occupational code for the College's MSA. This data set permitted comparison between minority and non-minority dominant academic fields and income potential as reported for the geographic area served by the community college.

Method of Data Collection

A construct is an idea that cannot be measured, but effects of that idea can be measured. Social Capital served as the construct for this study. An instrument is a tool to collect data, the information relevant to this study. The data in this study were drawn from the community college's records over a three year period from 2004-2007. These records included the following information:

1. The community college's graduation rates
2. Self-reported data on race and ethnicity from admissions forms
3. Local government records containing census data
4. Department of Commerce statistics on median wages for the college's MSA

One assumption of this research is that the self-reported data are accurate.

There are reliability issues concerning the consistency of the results: One aspect, stability, is affirmed because the ex-post facto data will not change. Another aspect, equivalence, does not apply because there is only one test of the data.

Demographic data pertaining to race and selection of academic discipline will be provided by the supporting college's Office of Institutional Research and Assessment. The demographic data request includes the following identifiers from an established institutional data base:

1. Ethnic breakdown, using categories established by the community college, reporting the numbers and percentages of graduates for the 2004-2005, 2005-2006, 2006-2007 academic years:

    a. Caucasian
    b. African American
    c. Asian
    d. Native American
    e. Hispanic
    f. Native Hawaiian/Pacific Islander
    g. Other

2. Final selection of academic discipline by the graduates of the 2004-2005, 2005-2006, 2006-2007 academic years.

Data was analyzed using the chi-square formula and tables suggested by Shavelson (1996).

Hypothesis and Method of Data Analysis

Is the choice of academic major at this community college independent of ethnicity? Chi-square analysis was chosen to answer this question because both variables under review are nominal data and measured in frequencies. Chi-square analysis is useful when research calls for data on dichotomous variables such as male or female (Cohen, Manion, & Morrison, 2001). Chapman (1996) selected chi-square analysis as the appropriate test to identify differences in male and female geography graduates in terms of college degree results. Cohen, Manion, and Morrison (2001) expanded the

concept to multiple elements of a variable, a scenario where only one response may be selected from multiple choices. This concept of multiple elements of a variable pertained to this study because the graduates from whom the data are derived selected one academic major from a pool offering many choices and one ethnic designation from a pool of six choices.

Chi-square analysis tests whether one set of proportions is different than another by comparing frequencies. In this study, the independent variables of graduate race/ethnicity should be proportionately distributed, according to the percentage of graduates from each ethnic group represented at the community college, within each of the dependent variables of academic major/discipline available at this institution. The following test hypothesis governs this research:

H0: fo = fe

fo are the observed frequencies of graduates from each ethnic group within selected major/disciplines available at the community college during the 2004-2005, 2005-2006, 2006-2007 academic years.

fe are the expected frequencies of graduates from each ethnic group within major/discipline based on proportion of population reported for each ethnic group by the community college during the 2004-2005, 2005-2006, 2006-2007 academic years.

The following statement of the null hypothesis posits the following: There is no difference in the selection of major by race or ethnicity at this community college.

The dependent variables of specific academic major/discipline tested by chi-square were chosen based on the following criteria: A minimum of 100 graduates in a

grouping of academic disciplines during the test period increased the opportunity for a meaningful proportion using chi-square.

Chi-square analysis was employed because the data were categorical and could only be measured in frequencies. The test employed in this study was a non-parametric test because the data were not interval or ratio. A parametric test establishes a mean and variance in interval or ratio data. In this study, the proportion of selected race/ethnicities within each major academic division was tracked as a category. No mean and standard deviation data applied here

Summary

The data collected and subsequent analysis sought to answer the general research question: Are graduates from minority groups underrepresented in certain majors/disciplines and does this imbalance affect income potential? The study's focus on one particular educational institution and the supported MSA provides a method that any educational institution of comparable size and demographics can employ to audit its contribution to diversity and the social capital of its community. Chapter four presents the findings via an analysis of the data using chi-square to test for significant differences in the proportion of race/ethnicity across the following groupings of academic disciplines: health occupations; business fields; helping professions; general education; and science, engineering and technology.

CHAPTER IV

FINDINGS

The graduates from the participating community college from the 2004-05, 2005-06, and 2006-07 academic years were the sample for this causal-comparative research investigating selection of major/academic discipline and race/ethnicity. Eighty-two academic disciplines were assigned to related fields of study and further reduced to five categories to bolster sample size:

1. Health occupations
2. Business
3. Helping professions
4. General education
5. Science, engineering, and technology

A sixth category, professional services: firefighter, law enforcement, etc., lacked sufficient numbers to determine proportional imbalance of race/ethnicity within the category.

Proportionality was determined by dividing the total number of graduates into the number of graduates from each race/ethnicity and multiplying the result by 100, establishing the proportion of each respective race/ethnicity as a decimal (table 5).

Table 5: Total Graduates and Proportion

Total Graduates	6909	Proportion
African American	625	.091
Asian	149	.022
Caucasian	5214	.755
Hispanic	224	.032
Native American	512	.074
Other	185	.026
		1.0

Each race/ethnicity's proportional decimal was multiplied by the total number of graduates to determine expected frequency. The expected frequency was compared to the observed frequency to determine proportionality in each of the five categories of academic discipline. Shavelson (1996) designed chi square tables that provide the formula and method to determine significance (see tables 6-10). Significance was determined by assigning five degrees of freedom (due to six ethnicities) and a selection of alpha (α) criterion:

α .05 = 11.07

α .01 = 15.09

Test of Proportion for Health Occupations

This category combined fields such as lab technician, nursing, and pre-dentistry to differentiate these academic disciplines from non-health related fields. The breakdown of race/ethnicity follows the divisions established by the community college.

Table 6: Chi-square Analysis of Graduates in the Health Occupations

CATEGORY	*Observed Frequency (O)*	*Expected Proportion*	*Expected Frequency (E)*	*O - E*	$(O - E)^2$	$\frac{(O - E)^2}{E}$
African American	97	.091	134	-38	1444	10.78
Asian	32	.022	33	-1	1	.03
Caucasian	1170	.755	1116	54	2916	2.61
Hispanic	26	.032	47	-21	441	9.38
Native American	111	.074	109	2	4	.03
Other	42	.026	39	3	9	.23
Σ	1478	1.0	1478	Ø		x^2 obs = 23.06
						p≤.01

As shown by table 6, the results do not indicate a good data fit. At $x^2 = 23.06$, the alpha criterion is exceeded at $\alpha = .05$ of 11.07 and $\alpha = .01$ of 15.09, respectively. Note that the African American graduates' expected frequency was 134 compared to the observed frequency of 97, a shortfall of 38 graduates in the health occupations. The observed frequency of Hispanic graduates was 26, which fell short of the expected frequency of 47 by 21 graduates. While Caucasian graduates were over represented in this field with an observed frequency of 1170 compared to the expected frequency of 1116, a difference of 54 graduates in this field of study, the large size of this group prevents the difference from being statistically significant.

Test of Proportion for Business

This category combined fields such as accounting, economics, and management to differentiate these academic disciplines from non-business related fields. The breakdown of race/ethnicity follows the divisions established by the community college.

Table 7: Chi-square Analysis of Graduates in the Business Fields

CATEGORY	*Observed Frequency (O)*	*Expected Proportion*	*Expected Frequency (E)*	*O - E*	$(O - E)^2$	$\frac{(O - E)^2}{E}$
African American	98	.091	100	-2	4	.04
Asian	41	.022	24	17	289	12.04
Caucasian	800	.755	826	-26	676	.82
Hispanic	42	.032	35	7	49	1.40
Native American	84	.074	81	3	9	.11
Other	29	.026	28	1	1	.04
Σ	1094	1.0	1094	Ø		x^2 obs = 14.45
						p≤.05

The results of table 7 do not indicate a good data fit in the business disciplines. At $x^2 = 14.45$, the alpha criterion is exceeded at $\alpha = .05$ of 11.07. However, five of the six ethnicities are proportional. Note that the Asian graduates were over represented in this field with an observed frequency of 41 compared to the expected frequency of 24, a difference of 17 graduates. The disproportional number of Asian graduates in this field of study caused the alpha criterion to be exceeded at .05, but the small number of Asian graduates reduces the importance of this finding in light of the proportionality of the other ethnicities.

Test of Proportion for the Helping Professions

This category combined fields such as social work and teaching to differentiate these academic disciplines from fields emphasizing technology, industry, or profit. The breakdown of race/ethnicity follows the divisions established by the community college.

Table 8: Chi-square Analysis of Graduates in the Helping Professions

CATEGORY	*Observed Frequency (O)*	*Expected Proportion*	*Expected Frequency (E)*	*O - E*	$(O - E)^2$	$\frac{(O - E)^2}{E}$
African American	157	.091	99	58	3364	33.98
Asian	7	.022	24	-17	289	12.04
Caucasian	752	.755	824	-72	5184	6.29
Hispanic	51	.032	35	16	256	7.31
Native American	93	.074	81	12	144	1.78
Other	32	.026	29	3	9	.31
Σ	1092	1.0	1092	Ø		x^2 obs = 61.71
						p≤.01

As shown by table 8, the results do not indicate a good data fit. At $x^2 = 61.71$, the alpha criterion is exceeded at $\alpha = .05$ of 11.07 and $\alpha = .01$ of 15.09, respectively. Note that the African American graduates' expected frequency was 99 compared to the observed frequency of 157, an overage of 58 graduates in the helping professions. The observed frequency of Hispanic graduates was 51 compared to the expected frequency of 35 for an overage of 16 graduates. The expected frequency of Caucasian graduates was 824 compared to the observed frequency of 752, a shortfall of 72 graduates. Asian graduates of the participating institution are also underrepresented in the helping professions, but the small number of Asians attending the participating institution nullifies the impact on proportionality.

Test of Proportion for General Education

This category combined fields such as humanities, theatre, and music, the framework of the classic liberal education. The breakdown of race/ethnicity follows the divisions established by the community college.

Table 9: Chi-square Analysis of Graduates in General Education

CATEGORY	*Observed Frequency (O)*	*Expected Proportion*	*Expected Frequency (E)*	*O - E*	$(O - E)^2$	$\frac{(O - E)^2}{E}$
African American	210	.091	218	-8	64	.29
Asian	48	.022	53	-5	25	.47
Caucasian	1829	.755	1807	22	484	.27
Hispanic	72	.032	77	-5	25	.32
Native American	174	.074	177	-3	9	.05
Other	61	.026	62	-1	1	.02
Σ	2394	1.0	2394	Ø		x^2 obs = 1.42
						p≥.05

As shown by table 9, the results indicate a good data fit. At $x^2 = 1.42$, the alpha criterion is not exceeded at either $\alpha = .05$ of 11.07 or $\alpha = .01$ of 15.09.

Test of Proportion for the Science, Engineering, and Technology

This category combined fields such as biology, architecture, and computer science to differentiate these academic disciplines from fields emphasizing business, social service or medical practice. The breakdown of race/ethnicity follows the divisions established by the community college.

Table 10: Chi-square Analysis of Graduates in Science, Engineering, and Technology

CATEGORY	*Observed Frequency (O)*	*Expected Proportion*	*Expected Frequency (E)*	*O - E*	$(O - E)^2$	$\frac{(O - E)^2}{E}$
African American	32	.091	53	-21	441	8.32
Asian	20	.022	13	7	49	3.77
Caucasian	453	.755	437	16	256	.60
Hispanic	25	.032	18	7	49	2.72
Native American	30	.074	43	-13	169	3.93
Other	19	.026	15	4	16	1.07
Σ	579	1.0	579	Ø		x^2 obs = 20.41
						p≤.01

As shown by table 10, the results do not indicate a good data fit. At $x^2 = 20.41$, the alpha criterion is exceeded at $\alpha = .05$ of 11.07 and $\alpha = .01$ of 15.09, respectively. Note that the African American graduates' expected frequency was 53 compared to the observed frequency of 32, a shortfall of 21 graduates in the science, engineering, and technology disciplines.

Summary

This chapter analyzed the data collected for this study. Various academic disciplines were grouped together by general occupational categories. Chi-square analyses tested proportionality of race/ethnicity in each grouping. Racial/ethnic representation was disproportional in three of the categories listed: health occupations; helping professions; and science, engineering, and technology. In chapter five, conclusions are drawn from the findings and discussed in context of the following issues: ethnic representation and income potential-host MSA, the national picture, building social capital through education, recommendations for practice, and further research recommendations.

CHAPTER V

CONCLUSION

This study set out to establish whether the choice of academic major is independent of race/ethnicity. The purpose was to determine whether disparity exists in the income potential of minority graduates by comparing graduates' selection of academic majors/disciplines by race during the academic years of 2004-05, 2005-06, and 2006-07 at a selected community college. Findings were compared with data from the host State's Employment Security Commission to determine if the racial imbalance in selection of academic discipline affects income potential in the minority communities. This study answers the original research questions:

1. Which majors attract the largest percentage of racial minority graduates? The helping professions of social work and teaching attract a disproportionate amount of African American and Hispanic graduates (see Ethnic Representation and Income Potential—MSA section, this chapter).

2. Which majors attract the smallest percentage of racial minority graduates? Academic majors dealing with math, science, and technology fail to attract a proportionate number of graduates (see Ethnic Representation and Income Potential—MSA section, this chapter).

3. How does graduate selection of majors at this college compare to the current occupational demographics report of income for the MSA serviced by this college? Academic disciplines leading to the helping professions, health

occupations, business, and math, science, and technology had comparable occupational codes. General education had no comparable occupational code (see Ethnic Representation and Income Potential—MSA section, this chapter).

The local data supporting this causal-comparative research varied from the national data in terms of African American proportionality in the various academic disciplines. The national data provide a means to assess the nation's educational health, but this data is comprised of thousands of local scenarios. Identifying and resolving imbalance of ethnic representation within each academic discipline at each particular educational institution will add clarity to the national picture and provide direction for policy.

Ethnic Representation and Income Potential—Host MSA

The following commentary provides additional response to the research questions examining specific local data within the context of the national problem.

Finding One—Health Occupations

Disproportionate representation was indicated via chi-square analysis in disciplines leading to the health occupations (see table 6). African American graduates fell short of the expected frequency. Hispanic graduates also fell short of the expected frequency. Two minority groups are proportionally underrepresented at the community college that services a statistical area boasting a median income of $40,784 for the health occupations (Oklahoma Employment Security Commission, n.d.). This median income is $13,338 above the median income for all occupations in the serviced MSA of $27,446.

Data from the U.S. Census (updated in 2005) differ from the selected institution of this study in the academic disciplines leading to the field of health and medicine. Reported data indicate Blacks are proportionate in the field. Hispanics are

underrepresented in the health related disciplines (see table 4). Hagedorn, Nora, and Pascarella (1996) noted that African Americans were well represented in this academic discipline.

Minority graduates may be represented proportionally across the health care field at 25 percent, but they are underrepresented in the nation's medical schools at a mere seven percent (Grumbach & Chen, 2006). The lack of minority medical doctors aggravates the lack of medical care in minority communities and exacerbates the loss of social capital (Cole, 1986) by denying children from minority groups the role models of successful minority healthcare workers from the high income range of the field.

The healthcare field experiences strong wage growth (Thomas & Zhang, 2005). This fosters social capital because society rewards the hard work of its members who train and qualify for high demand, high paying fields (Weeden, 2002). A social capital view of the imbalance of minority graduates from the selected community college posits the imbalance is due to minority healthcare professionals failing to invest information and resources into their local social network (Yasso, 2005) as opposed to a stronger investment across the nation. Pike (2006) noted that a student's expectation of success provided the incentive to study in that field. Porter and Umbach (2006) found that minority representation in various disciplines increased minority participation in those disciplines.

Wampold (1995) noted that people congregate with others of similar characteristics and Lawler (2001) indicated that the emotional strength of the bond strengthened the social exchange. The sense of trust increased the willingness to network. Better representation of minorities in various academic disciplines and

occupational fields will encourage disenfranchised minorities to expand their socio-economic network.

Rogers and Molina (2006) found that networking in the minority community produced strong results in recruiting minorities for graduate schools because the applicants saw instructors who looked like them. Networking (bridging) must follow trust (bonding), but both are necessary to motivate and encourage members of disenfranchised groups to commit to a rigorous and long term education in order to achieve an income higher than the median wage for their area. Active recruitment and networking in the MSA should boost minority enrollment in the health related disciplines, especially the potentially lucrative premedical programs.

Finding Two—Business Fields

While a disproportionate representation was indicated via chi-square in the disciplines leading to the business occupations, five of the six ethnicities were proportionate in this grouping of disciplines. Asian graduates were over represented in this grouping of disciplines (see table 7). The median wage for the business fields is $44,078, or $16,632 above the median wage for all occupations (Oklahoma Employment Security Commission, n.d.).

Pike (2006) found that proportionate representation of ethnicities indicated an expectation of success in that academic field of study. With the only evidence of imbalance being an overage, an expectation of success in the business fields exists in the MSA serviced by the community college as evidenced by proportionally representative ethnicities in majors leading to these high potential income fields.

Bonding and bridging increase the benefit of education as well as the potential contribution of each citizen. This fulfills the social capital growth of the larger community as constituent minority groups add their brainpower and talents to the economy. Other nations now challenge the United States in terms of economic strength, but McCabe (2000) noted that intelligent and technically proficient workers will enhance America's competitive position in the world economy and enjoy a productive life.

Finding Three—Helping Professions

Disproportionate representation was indicated via chi-square in disciplines leading to the helping professions. African Americans and Hispanics were over represented while the Caucasian graduates were underrepresented in this field (see table 8). The serviced MSA's median wage for the helping professions breaks down into two major categories: Education, Training, and Library reports a median income of $32,099 while Social Service occupations report a median wage of $30,466. With the MSA median wage for all occupations at $27,466, the two categories of education and social service are barely above the median wage, $4653 and $3020, respectively (Oklahoma Employment Security Commission, n.d.). African American and Hispanic graduates are over represented in an educational field leading to an income barely above the median income that includes unskilled labor occupations. The higher proportion of minorities in these fields lowers the median income of two-year graduates for their respective ethnic categories and challenges the assumption that a college education is the critical step leading to prosperity.

The helping professions fulfill a need in both the nation's society and economy, but the median wages in these fields are barely above the wages paid to unskilled labor.

The abundance of minority practitioners in these fields inhibits the growth of economic muscle in the minority communities. Further, growth of social capital continues to stagnate due to the negative effect of bonding created when people group around similar traits. Bourdieu and Passeron (1990) warned that clannishness and cultural inbreeding result when no bridging occurs. The cultural inbreeding perpetuates itself as the members of minority groups pursue comfortable work roles supported by familiar mentors. Lawler (2001) emphasized the emotional bonds in the social exchange within communities. Emotional bonds provide a positive influence and a sense of stability of place in the home community, and this sense of assurance or trust can increase the willingness to network.

Increased minority representation in a field or discipline further increases participation by minorities (Porter & Umbach, 2006) by extending the boundaries of the familiar. A strong emphasis on establishing networks in the scientific disciplines and occupations will enhance minority participation in higher-paying fields as potential graduates in that field experience that sense of familiarity. As previously cited, Rogers and Molina (2006) found that networking in the minority community produced strong results in recruiting minorities for graduate schools because the applicants saw instructors who looked like them. Networking must follow trust, but both are necessary to motivate and encourage members of disenfranchised groups to commit to a rigorous and long term education in order to achieve an income higher than the median average for their area.

Finding Four—General Education

General education disciplines indicate a good fit between expected frequency and observed frequency using chi-square analysis (see table 9). There was no precise median

wage data for this range of academic disciplines because the graduates disbursed into diverse occupational fields (see Further Research Recommendations, this chapter).

Pike (2006) and Porter and Umbach (2006) stressed that representation and mentoring enhance the participation of any constituent group. Bonding and bridging build the social capital of all race/ethnicities and enhance all of the nation's industries with generalists who embrace a multi-disciplined approach to planning, innovating, and problem solving.

Finding Five—Science, Engineering, and Technology

A chi-square analysis of graduates in the fields pertaining to science, engineering, and technology indicated that the disciplines of science, technology, and engineering were disproportionate (see table 10). African American graduates were short of the expected frequency. The serviced MSA's median wage for the science, technology, and engineering breaks down into two major categories. Architecture, technology, and engineering reported an annual median income of $53,277, $25,831 above the median income, while mathematical occupations reported an annual median income of $51,562, $24,116 above the median income (Oklahoma Employment Security Commission, n.d.). African American graduates are underrepresented in an educational field that leads to an income potential almost twice as high as the median for all wages in the MSA. Data from the U.S. Census (updated in 2005) report that Blacks were also underrepresented in engineering and natural science at the national level (see table 4).

This is a national problem. Varma (2006) noted the racial/ethnic imbalance in the information technology field and indicated access to technology in the home and in school is enhanced when peers with similar characteristics embrace technology. This

fosters social identity, the bonding of social capital. Stockard, Klassen, and Akbari (2004) noted a low percentage of interest among minority students in Los Angeles to the fields of IT and engineering. Parental influence and a lack of support from the academic community were cited as factors, indicating a deficiency of social capital's factors of bonding (parental support) and bridging (community support). The lack of minority representation in the science, engineering, and technology fields inhibits the growth of social capital (Cole, 1986; Porter & Umbach, 2006) by denying children from minority groups the bonding opportunity from role models of successful, high end minority professionals and practitioners. Wampold (1995) emphasized the sense of trust as a factor in building emotional bonds and indicated the bond is formed between people with similar characteristics. Pike (2006) noted that a student's expectation of success provided the incentive to study in that field. Society must also reward the hard work to train and qualify in a high paying field (Weeden, 2002), and these professions offer wages well above the median wage. The key to improving the nation's competitive position as a technically advanced nation is to focus on particular educational zones, such as the community college's serviced MSA, in order to accurately assess participation levels in scientific and technological fields. Increasing the number of graduates from all ethnicities will strengthen the nation's competitive posture, but increasing the number of minority graduates in these fields will enhance the social capital of the various minority communities as the expanding bonds of trust encourage students to cross the bridge to the larger society.

As previously cited, Rogers and Molina (2006) found that networking in the minority community produced strong results in recruiting minorities for graduate schools

because the applicants saw instructors who looked like them. This phenomenon occurs at the community college level as well. Networking (bridging) must follow trust (bonding), but both are necessary to motivate and encourage members of disenfranchised groups to commit to a rigorous and long term education in order to achieve an income higher than the median average for their area.

The National Picture

The Truman Commission of 1947 noted the lack of minority participation in higher education and placed an emphasis on providing a general education to more citizens as a means of increasing the opportunity of these citizens across the United States. The idea was to invest funds from the federal government to build a society supported by a free and educated citizenry. One way to develop a democratic, educated citizenry was to emphasize the thirteenth and fourteenth years of education ("The President's Commission on Higher Education," 1947). Much has been accomplished since 1947 as graduates from minority groups built the bridges into academia for others to follow.

The community college movement of the 1960s and 1970s brought into the colleges new types of students, learners from minority ethnicities and financially underprivileged families (Cross, 1971). Cross noted that these new students challenged the assumptions of career paths imposed upon them by family and community tradition, the ones with high academic ability achieving high socio-economic status. These students enjoyed interaction with peers having similar characteristics to promote bonding and realized association with mentors having similar characteristics to promote bridging to the larger community.

Today, the local data reporting two-year graduate selection of major/academic discipline differ slightly from national data provided by the U.S. Census Bureau (see table 4). Census data indicate Caucasians are proportionally represented in engineering, health, and general studies and underrepresented in the social sciences. African American graduates are underrepresented in the engineering and natural science fields, but they are proportionally represented in other fields.

Building Social Capital through Education

Education emancipates economically, but there is still inequality of income between race/ethnicities. This income inequality may be reduced by increasing the number of minority students in the fields that enjoy higher income potential, requiring more students from minority groups to enroll in the math and science fields with fewer enrollments in disciplines related to social work or early childhood education.

Social capital's aspect of bonding will establish trust within minority communities as members pursue the whole range of academic disciplines confident of the rewards. A growing presence of minorities in currently underrepresented fields will establish the networks necessary to achieve true parity in employment and wages. These growing networks will realize social capital's role of bridging. The communities served by educational institutions will benefit, as will the state and nation.

A community college's mission and daily practice should indicate a commitment to serve the whole community for the benefit of the whole community by developing a competent citizenry to enhance the well being of the community. The selected community college in this study continues to work toward this goal through its *Day of*

Vision Program and periodic scrutiny of its demographics in regard to recruitment and graduation of its students.

Academic advisement plays a critical role in recruiting and graduating students with particular degrees, especially first generation and minority students. Building the social capital of each racial/ethnic community serviced by the community college will enrich the educational environment and enhance the income-earning potential of minority graduates, potentially easing the inequality through an evolutionary process.

One may suggest that evolutionary emancipation through education should follow its own course, free of interference from governing agencies or policy planners, but it is not interference when an enlightened, progressive society manages and maximizes the cultural and economic benefits of all constituents. Managing diversity to improve democratic and economic outcomes benefits the nation in the following ways:

1. Evolution can be managed; revolution cannot be managed. Government agencies and educational policy planners can continue creating opportunities and measuring the benefits to establish long range plans to meet the challenges of the 21st century economy.

2. Diversity supports democracy. Economic enfranchisement of citizens from alienated groups increases positive participation in the prevailing socio-economic system of the United States.

3. An enhanced brain trust increases the nation's competitive abilities in the international markets. Innovation and efficiency thrive when educated workers from different cultural perspectives unite their knowledge capital to improve the nation's competitive position in the world.

4. Higher incomes raise prosperity and the tax base. More disposable income results in greater spending, which stimulates the retail and manufacturing sector of the economy, and results in greater savings, which stimulates the banking and investment sectors of the economy. Increased economic activity generates more taxable income for the various levels of government.

5. Higher incomes provide a better return on the national investment in Pell grants. Government funding decisions can be more easily cost justified.

Managing the progress of evolutionary emancipation is both possible and beneficial to the nation by offering socially constructive avenues for advancement to all citizens.

Recommendations for Practice

The Truman Commission empowered emancipation through education by improving access and retention of minority students in the two-year colleges. The next wave of evolutionary emancipation is to identify and remediate disproportionate representation in the various academic fields with an emphasis on assisting students from minority groups to select academic disciplines leading to occupations with high income potential. The following steps propose how to identify and remediate any imbalance in minority representation in the high-potential income fields, primarily, and all fields, secondarily.

1. Use this model of proportion testing at every educational institution with diverse demographics to assess income potential of minority graduates. The model used in this study can identify areas to improve by providing an objective measure of proportionality in each respective discipline and a comparison to the local occupational code data congruent with each discipline.

2. Develop plans to achieve proportional representation in all fields of study. Once disproportionate fields of study are identified, educators and policy planners must isolate causes for the racial/ethnic imbalance and develop cost-effective solutions. Isolating causes would consider factors from socio-economic opportunities to the effectiveness of the nation's public school systems in preparing students for high income occupations, regardless of academic deficiencies and lack of educational expectation (Johnson, 2000). Once exact causes are known (see Research Recommendations, this chapter), specific remedies can be employed to expand the genuine range of choices in academic discipline. Academic advisors can place more students in the critically short disciplines to develop and expand student networking opportunities and placement staff can assist in the transition to full time employment or to a university to complete the education and preparation for employment in a professional field.

This will continue the process of evolutionary emancipation by improving the national condition of low-income potential graduates, one institution at a time.

Further Research Recommendations

This study is an early step in the long journey of evolutionary emancipation. There are several areas of research that will assist in the process of evolutionary emancipation through education. The following areas provide a start in this new phase of the process:

1. This causal-comparative study opens the door to further research possibilities. Further research should include all state funded post-secondary institutions within

a given state to establish a statewide profile of proportional representation. Replicating this study at other two-year colleges serving metropolitan areas with similar population characteristics would assist in the creation of a national data base. Further work should be conducted to track two-year college graduates to determine how many follow through on their declaration of major/academic discipline at the four-year or university level. Tracking graduates into the workplace would yield valuable data to support recruitment, counseling, and placement programs.

2. A special focus using the information obtained from this study would benefit the selected community college. Action research would seek ways to recruit and retain minority students in the disciplines leading to greater income potential.

3. Further investigation into the causes of racial/ethnic imbalance in degree programs and careers offers insights into the problem that would generate ideas and solutions to ameliorate the problem. Social capital in communities, socio-economic status of ethnicities, quality of education in the public schools servicing multi-ethnic communities, and personal motivational issues are areas ripe for research.

4. Tracking occupational choice of general education graduates would supplement the body of knowledge pertaining to income potential. This would permit academic advisors to recommend course offerings to enhance the income potential of general education graduates.

A strong body of research in these areas should provide the data to effectively manage the emancipatory effects of education and fulfill the goals of the Truman Commission

of 1947, the “Open Door” movement of the 1960s and 1970s, and the Carnegie Commission of 1967-73.

Summary

As one cannot hit a target when one is unaware of precisely what the target is, the leaders in the education community need a clear picture of which disciplines are disproportionate in terms of race/ethnicity. Once the imbalance problem has been identified in a particular institution, causes for the problem can be investigated and solutions offered. The researcher’s hope is that this comparison of chi-square analysis of choice of academic major by ethnic groups with local occupational income data provides a useful tool to further the emancipation and unleash the possibilities for the nation’s disenfranchised citizens.

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APPENDIX A

INSTITUTIONAL DEMOGRAPHIC DATA

ON GRADUATES OF SELECTED INSTITUTION

TABLE A1: GRADUATE CODE GROUPS 2004-05, 2005-06, 2006-07

Code: AA – African American CA – Caucasian NA – Native American
AS – Asian HS – Hispanic OT – Other

TOTAL 3 YEARS

MAJOR CODE	*CODE NAME*	*AA*	*AS*	*CA*	*HS*	*NA*	*OT*	*MAJOR CODE TOTAL*
Group # 1 - HEALTH OCCUPATIONS								
050	DENTISTRY	0	1	2	0	0	0	3
589	DENTAL ASSIST-AA	2	0	4	0	2	1	9
592	DENTAL HYGIENIST	0	0	31	0	5	1	37
641	HEALTH CARE ADMIN - AA	0	0	1	0	0	0	1
643A	HEALTH INFORMATION TECHNOLOGY	4	0	46	3	7	0	60
741	MED LAB TECHNOLOGY	2	2	15	1	3	2	25
741A	MED LAB TECHNOLOGY CERTIFICATE	10	1	42	2	2	1	58
750A	MEDICAL ADMIN ASST CERTIFICATE	6	0	35	1	6	1	49
130	MEDICINE	2	2	30	2	2	4	42
791	NURSING	20	9	257	9	25	12	332
685	OCCUPATIONAL THERAPY ASSIST-AA	1	0	31	1	1	1	35
160	OPTOMETRY	0	0	2	0	0	0	2
828	PATIENT CARE TECHNICIAN - CERTIFICATE	17	7	212	3	16	10	265
165	PRE-PHARMACY & PHARMACY TECHNICIAN	1	3	60	1	8	5	78
831	PHYSICAL THERAPY ASSIST	3	3	61	0	6	0	73
195	PSYCHOLOGY	22	1	163	2	11	3	202
870	RADIOGRAPHY	3	3	75	1	8	1	91
701	RESPIRATORY CARE	4	0	50	0	5	0	59
919	SURGICAL TECH	0	0	14	0	0	0	14
240 & 955	PRE-VETERINARY MEDICINE & VETERINARY TECHNOLOGY	0	0	39	0	4	0	43
	TOTAL HEALTH OCCUPATIONS	97	32	1170	26	111	42	1478

TABLE A2: GRADUATE CODE GROUPS 2004-05, 2005-06, 2006-07

Code: AA – African American CA – Caucasian NA – Native American
AS – Asian HS – Hispanic OT – Other

TOTAL 3 YEARS

MAJOR CODE	*CODE NAME*	*AA*	*AS*	*CA*	*HS*	*NA*	*OT*	*MAJOR CODE TOTAL*
Group # 2 – BUSINESS FIELDS								
005	ACCOUNTING	18	8	149	7	17	2	201
096A	ACCOUNTING ASSISTANT-AA	0	0	6	0	0	0	6
096C & 530	ACCTG ASSISTANT-CERTIFICATE	0	0	8	1	1	0	10
035	BUSINESS ADMINISTRATION	58	28	475	23	52	20	656
052	ECONOMICS	1	0	4	0	0	0	5
646 & 646A	HOSPITALITY & GAMING OPERATIONS-CERTIFICATE	0	0	3	0	0	0	3
795	HUMAN RESOURCES-CERT	4	2	16	1	0	1	24
086	INTERNATIONAL BUSINESS	7	1	54	9	1	2	74
086	INTERNATIONAL BUSINESS - CERTIFICATE	0	1	2	0	0	0	3
123	MANAGEMENT	2	1	22	1	3	3	32
124, 124A	MARKETING and APPAREL & MERCHANDIZING	1	0	38	0	6	1	46
100	JOURNALISM & MASS COMMUNICATIONS	3	0	10	0	0	0	13
100B	PUBLIC RELATIONS - ADVERTISING	3	0	10	0	2	0	15
100D	PUBLIC RELATIONS – TV BROADCASTING	1	0	3	0	2	0	6
	TOTAL BUSINESS FIELDS	98	41	800	42	84	29	1094

TABLE A3: GRADUATE CODE GROUPS 2004-05, 2005-06, 2006-07

Code: AA – African American CA – Caucasian NA – Native American
AS – Asian HS – Hispanic OT – Other

TOTAL 3 YEARS

MAJOR CODE	*CODE NAME*	*AA*	*AS*	*CA*	*HS*	*NA*	*OT*	*MAJOR CODE TOTAL*
Group # 3 – HELPING PROFESSIONS								
044A	CHILD DEVELOPMENT	74	0	216	12	33	8	343
054	PRE-EDUCATION	5	1	99	4	7	3	119
055	ELEMENTARY EDUCATION	17	2	188	8	25	5	245
060	SECONDARY EDUCATION	8	0	72	2	6	1	89
089	HEALTH & HUMAN PERFORMANCE	4	0	10	0	0	2	16
091	HUMAN SERVICES	32	0	70	2	11	1	116
104	INTERPRETER EDUCATION	2	0	22	0	2	1	27
099, 232, 673A-I	ALL LANGUAGES	10	4	68	23	7	10	122
223	SOCIOLOGY	5	0	7	0	2	1	15
TOTAL HELPING PROFESSIONS		157	7	752	51	93	32	1092

TABLE A4: GRADUATE CODE GROUPS 2004-05, 2005-06, 2006-07

Code: AA – African American CA – Caucasian NA – Native American
AS – Asian HS – Hispanic OT – Other

TOTAL 3 YEARS

MAJOR CODE	*CODE NAME*	*AA*	*AS*	*CA*	*HS*	*NA*	*OT*	*MAJOR CODE TOTAL*
Group # 4 – GENERAL EDUCATION								
013	AMERICAN STUDIES	0	0	1	0	0	0	1
020	ART	2	0	24	0	3	1	30
070	ENGLISH	0	0	32	2	1	0	35
047	THEATRE	1	0	1	0	0	2	4
095	HISTORY	1	1	43	0	1	0	46
097	HUMANITIES	0	0	14	0	0	0	14
115	LIBERAL ARTS	204	46	1668	70	167	58	2213
145	MUSIC	1	1	15	0	0	0	17
166	PHILOSOPHY	0	0	1	0	1	0	2
190	POLITICAL SCIENCE	0	0	14	0	1	0	15
215	RELIGIOUS STUDIES	1	0	1	0	0	0	2
927	STAGE PRODUCTION TECHNOLOGY-CERTIFICATE	0	0	15	0	0	0	15
TOTAL GENERAL EDUCATION		210	48	1829	72	174	61	2394

TABLE A5: GRADUATE CODE GROUPS 2004-05, 2005-06, 2006-07

Code: AA – African American CA – Caucasian NA – Native American
AS – Asian HS – Hispanic OT – Other

TOTAL 3 YEARS

MAJOR CODE	*CODE NAME*	*AA*	*AS*	*CA*	*HS*	*NA*	*OT*	*MAJOR CODE TOTAL*
Group # 5 – SCIENCE, ENGINEERING, AND TECHNOLOGY								
030	BIOLOGY	5	2	77	4	7	5	100
045	CHEMISTRY	1	2	32	4	3	3	45
542	CHEMICAL LAB TECH-AA	0	0	2	0	1	0	3
082	GEOLOGY	0	0	2	0	0	0	2
125	MATHEMATICS	5	4	36	1	2	0	48
185	PHYSICS	0	2	11	0	1	0	14
193A	COMPUTER INFO SYS	6	3	78	4	6	5	102
585E	COMPUTER INFO SYS	2	0	24	2	0	0	28
065, 657	ENGINEERING	1	1	39	1	3	1	46
064	ELECTRONICS TECHNOLOGY	0	0	4	0	0	0	4
065A	ELECTRICAL & COMPUTER	3	2	16	1	0	0	22
650	ELECTRONICS ENGINEERING TECHNOLOGY	1	0	21	0	0	0	22
093	HORTICULTURE TECHNOLOGY	0	0	18	0	1	1	20
065B	MECHANICAL	0	4	25	1	2	2	34
046 A, B,C,D	MGMT INFORMATION SYSTEMS	1	0	14	1	1	1	18
849	QUALITY CONTROL TECHNOLOGY	2	0	9	1	0	0	12
921	SURVEY TECHNOLOGY	0	0	9	0	2	0	11
939 & 940	TELECOMMUNICATIONS TECHNOLOGY	2	0	22	2	1	1	28
941	TELECOMMUNICATIONS MANAGEMENT	1	0	2	2	0	0	5
931	TRANSPORTATION MANAGEMENT	0	0	5	0	0	0	5
593A	DIGITAL MEDIA	1	0	3	0	0	0	4
593B	DIGITAL MEDIAL-AA	1	0	1	0	0	0	2
631	GRAPHICS & IMAGING TECHNOLOGY -AA	0	0	3	1	0	0	4
	TOTAL SCIENCE, ENGINEERING & TECHNOLOGY	32	20	453	25	30	19	579

TABLE A6: GRADUATE CODE GROUPS 2004-05, 2005-06, 2006-07

Code: AA – African American CA – Caucasian NA – Native American
AS – Asian HS – Hispanic OT – Other

TOTAL 3 YEARS

MAJOR CODE	*CODE NAME*	*AA*	*AS*	*CA*	*HS*	*NA*	*OT*	*MAJOR CODE TOTAL*
Group # 6 – PROFESSIONAL SERVICES								
528A	AVIATION	5	0	19	3	1	1	29
110	CRIMINAL JUSTICE	15	1	80	1	9	0	106
071	FIRE & EMERGENCY SERVICES	1	0	56	1	5	0	63
654	INTERIOR DESIGN	1	0	21	2	2	0	26
106	PARA-LEGAL	9	0	34	1	3	1	48
TOTAL PROFESSIONAL SERVICES		31	1	210	8	20	2	272

APPENDIX B

INSTITUTIONAL REVIEW BOARD

APPROVAL FORM

Oklahoma State University Institutional Review Board

Request for Determination of Non-Human Subject or Non-Research

Federal regulations and OSU policy require IRB review of all research involving human subjects. Some categories of research are difficult to discern as to whether they qualify as human subject research. Therefore, the IRB has established policies and procedures to assist in this determination.

1. Principal Investigator Information

First Name: Ernest	Middle Initial: R.	Last Name: Raynor
Department/Division: School of Educational Studies		College: Education
Campus Address:		Zip+4:
Campus Phone:	Fax:	Email:
Complete if PI does not have campus address:		
Address: 117 E. 39th St.		City: Tulsa
State: OK	Zip: 74105	Phone: (918) 747-5991

2. Faculty Advisor (complete if PI is a student, resident, or fellow) ☐ **NA**

Faculty Advisor's name: Robert E. Nolan		Title: Professor
Department/Division: School of Educational Studies		College: Education
Campus Address: 307 Willard Hall Oklahoma State University Stillwater, OK		Zip+4: 74078-4045
Campus Phone: (405) 744-9190	Fax: 744-7758	Email: bob.nolan@okstate.edu

3. Study Information:

A. Title
Growing Social Capital: An analysis of minority student choices of major/discipline

B. Give a brief summary of the project. (See instructions for guidance)
Compare minority students (as a whole and in constituent groups) to non-minority students in terms of the following organismic variables:
1. Number graduated Tulsa Community College, Tulsa, OK, during The following academic years: 2004-05, 2005-06, and 2006-07.
2. Demographic breakdown of graduates
3. Selection of major/discipline by demographics of race/ethnicity
4. Selection of major/discipline by financial aid status
5. Selection of financial aid by race/ethnicity.

This study investigates whether the choice of academic major is independent of race/ethnicity to determine whether disparity exists in the income potential of minority graduates in order to explain income disparity between differing races/ethnicities. Additional data pertaining to financial aid status will be used in the dissertation's literature review section.

Is the choice of academic major at TCC independent of ethnicity? Chi-square was chosen to answer this question because both variables under review are measured at a nominal level. Chi-square tests whether one set of proportions is different than another by comparing frequencies. In this study, the independent

variables of graduate race/ethnicity should be equally distributed, according to the percentage of graduates from each ethnic group represented at TCC, within each of the dependent variables of academic major/discipline available at TCC.
Test hypothesis
H0: fo = fe
fo are the observed frequencies of graduates from each ethnic group within selected major/disciplines available at TCC during the 2004-2005, 2005-2006, 2006-2007 academic years.
fe are the expected frequencies of graduates from each ethnic group within major/discipline based on a mean percentage of population reported for that ethnic group by TCC during the 2004-2005, 2005-2006, 2006-2007 academic years.
Statement of null hypothesis: There is no difference in the selection of major by race or ethnicity at TCC.
The dependent variables of specific academic major/discipline tested by chi-square will be chosen based on the following criteria: A minimum of 100 graduates in an academic discipline during the test period increases the opportunity for a meaningful proportion in chi-square.

This study compares minority students (taken as a group and broken down by the supporting academic institution's classifications) to non-minority students in terms of the following dependent variable: Selection of major/discipline by TCC's graduating Whites, Blacks, Hispanics, Asian-Americans, and American Indians during the 2004-2005, 2005-2006, 2006-2007 academic years. Graduates were selected over the general student population for the pool to reduce the number of undecided or changed majors. TCC graduates an average of 1,000 students each academic year, so three years of data ensure a sufficient sample size to determine racial imbalance in selection of academic major.
Method of Data Collection
Demographic data pertaining to race and selection of academic discipline will be provided by the supporting college's Office of Institutional Research and Assessment.

Office of Institutional Research and Assessment
Tulsa Community College—Conference Center
6111 East Skelly Drive
Tulsa, OK 74135-6198
(918) 595-7924

The demographic data request will include the following identifiers from an established TCC data base:
1. Ethnic breakdown, as established by TCC's categories, reporting the numbers and percentages of TCC graduates for the 2004-2005, 2005-2006, 2006-2007 academic years:
   a. Caucasian
   b. African American
   c. Asian
   d. Native American
   e. Hispanic
   f. Native Hawaiian/Pacific Islander
   g. Other
2. Final selection of academic discipline by the TCC graduates--2004-2005, 2005-2006, 2006- 2007 academic years.

Data will be tabulated using the Statistical Package for the Social Sciences program. Once the specific frequencies for ethnicity and academic major are input into the data view, the test for chi-square will be conducted. Chi-square is employed because the data is categorical. This is a non-parametric test because the data is not interval or ratio, but is nominal. The independent variable is race and the dependent variable is selection of academic major.

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C. Describe the subject population/type of data/specimens to be studied. (See instructions for guidance) Demographic data relating to graduation, financial aid, and selection of major/discipline of students will be analyzed to determine trends in selection of major. No experimentaion on live subjects will occur. No personal or identifying data will be collected. Data will be stored in printed and electronic form with minimal security as no personal information is involved.

4. Determination of "Research".

45 CFR 46.102(d): *Research* means a systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalizable knowledge. Activities which meet this definition constitute research for purposes of this policy whether or not they are conducted or supported under a program which is considered research for other purposes.

One of the following must be "no" to qualify as "non-research":

A. Will the data/specimen(s) be obtained in a systematic manner?
☐ No ☒ Yes

B. Will the intent of the data/specimen collection be for the purpose of contributing to generalizable knowledge (disseminating the knowledge obtained outside of Oklahoma State University, e.g., presentation or publication)?
☐ No ☒ Yes

5. Determination of "Human Subject".

45 CFR 46.102(f): *Human subject* means a living individual about whom an investigator (whether professional or student) conducting research obtains: (1) data through intervention or interaction with the individual or (2) identifiable private information. Intervention includes both physical procedures by which data are gathered (for example venipuncture) and manipulations of the subject or the subject's environment that are performed for research purposes. Interaction includes communication or interpersonal contact between investigator and subject. Private information includes information about behavior that occurs in a context in which an individual can reasonably expect that no observation or recording is taking place, and information which has been provided for specific purposes by an individual and which the individual can reasonably expect will not be made public (for example, a medical record). Private information must be individually identifiable (i.e., the identity of the subject is or may be ascertained by the investigator or associated with the information) in order for obtaining the information to constitute research involving human subjects.

A. Does the research involve obtaining information about living individuals?
☐ No ☒ Yes
If no, then research does not involve human subjects, <u>no other information is required</u>.
If yes, proceed to the following questions.

All of the following must be "no" to qualify as "non-human subject":

B. Does the study involve intervention or interaction with a "human subject"?
☒ No ☐ Yes

C. Does the study involve access to identifiable private information?
☒ No ☐ Yes

D. Are data/specimens <u>received</u> by the Investigator with identifiable private information?

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☒ No ☐ Yes

E. Are the data/specimen(s) coded such that a link exists that could allow the data/specimen(s) to be re-identified?
☒ No ☐ Yes
If "*Yes*," is there a written agreement that prohibits the PI and his/her staff access to the link?
☐ No ☐ Yes

6. Signatures

Signature of PI [signature] **Date** 9 Oct. 2007

Signature of Faculty Advisor (If PI is a student) Robert E. Nolan **Date** 31 Oct. 2007

☒ Based on the information provided, the OSU-Stillwater IRB has determined that this research **does not** qualify a human subject research as defined in 45 CFR 46.102(d) and (f) and **is not subject to oversight by the OSU IRB.**

☐ Based on the information provided, the OSU-Stillwater IRB has determined that this research **does** qualify as human subject research and **submission of an application for review by the IRB is required.**

Sue C Jacobs
Dr. Sue C. Jacobs, IRB Chair

11/21/07
Date

VITA

Ernest Ray Raynor III

Candidate for the Degree of

Doctor of Education

Thesis: GROWING SOCIAL CAPITAL: AN ANALYSIS OF MINORITY STUDENT CHOICES OF MAJOR/DISCIPLINE AND OCCUPATION

Major Field: Occupational and Adult Education

Biographical:

Education: Graduated from Timberline high School, Lacey, Washington, in 1978; received Associate in Arts degree in Humane Studies from Saint Martin's College, Lacey, Washington, in 1980; received Bachelor of Arts degree in Humanities from the Evergreen State College, Olympia, Washington, in 1982; received Master of Science in Human Resource Management and Development from Chapman University, Orange, California, in 1992; completed the requirements for the Doctor of Education degree in Occupational and Adult Education at Oklahoma State University, Stillwater, Oklahoma, in December 2008.

Experience: Served in the United States Air Force as a personnel officer from 1985-1990; freelanced as a business consultant and writer of advertising copy from 1992 to the present; Employed by Tulsa Community College as an adjunct instructor of English Composition.

Professional Memberships: The Honor Society of Phi Kappa Phi (PKP) since 2004; Toastmasters International since 2007.

ABSTRACT

Name: Ernest Ray Raynor III Date of Degree: December 2008

Institution: Oklahoma State University Location: Tulsa, Oklahoma

Title of Study: GROWING SOCIAL CAPITAL: AN ANALYSIS OF MINORITY STUDENT CHOICES OF MAJOR/DISCIPLINE AND OCCUPATION

Pages in Study: 86 Candidate for the Degree of Doctor of Education

Major Field: Occupational and Adult Education

Scope and Method of Study:

The purpose of this study was to use a causal-comparative study to explore the relation of race/ethnicity to the selection of academic major/discipline. Demographic data on three academic years (2004-05, 2005-06, and 2006-07) was collected from a community college of 21,000 students located in a Midwestern city of 170,000 people to determine if minority groups are underrepresented as graduates in higher income fields as indicated by occupational wage data pertinent to the community college's metropolitan statistical area. Chi square was used to analyze significant differences in racial/ethnic proportionality within the various academic areas.

Findings and Conclusions:

Disproportionate representation of minority graduates was indicated in the selection of academic disciplines. In the disciplines leading to higher income occupations, such as science, technology, and engineering, African American graduates were underrepresented. In the disciplines leading to lower income occupations, such as social work and teaching, African American and Hispanic graduates were over represented. Disparity of income between race/ethnicities may be ameliorated by promoting the science and technology fields within the minority communities. Social capital's aspects of bonding and bridging may strengthen the relationship between the nation's educational institutions and the minority communities: bonding to strengthen confidence in the benefits of education and bridging to integrate lower income minority students into the economic mainstream.

ADVISER'S APPROVAL: Dr. Robert E. Nolan