

**THE IMPACT OF SUPPLEMENTAL INSTRUCTION ON THE RETENTION AND  
GRADUATION OF STUDENTS OF COLOR AT “MID-WESTERN UNIVERSITY”**

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the requirements for the degree of  
Doctor of Education**

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When I stand before God at the end of my life  
I would hope that I would have not a single bit  
of talent left and could say...  
“I used everything you gave me.”  
~ Erma Bombeck

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This dissertation and degree is dedicated first, and foremost, to my son Dylan Patrick Hand. I owe everything I have achieved in my adult life to you. Being blessed to have you as my son gave my life meaning and the reason to work hard to be a good role model, set and successfully complete goals, and to live my life to the fullest. You have shown me that children truly are “the crowning glory.” Thank you for your continual support and understanding throughout this process. Your positive energy, love, free spirit, intellectual insight, philosophical talks, and optimistic thinking have been an incredible inspiration and strengthened me to keep going! I love you lots! You truly have been the wind beneath *my* wings! Now it is your day in the sun to spread *your* wings and fly... you have already achieved so much and I am very proud of you. I look forward to being there when you get your Air Force pilot wings pinned on. Remember what we have learned *together*... to be “fearless”, willing to “take risks”, and the importance of “integrity”. You have such an amazing future ahead of you... take time to enjoy the journey and remember that there is no rush or only “one right way” to get to the destination. You are a unique and wonderful soul and I know you will have many phenomenal achievements and will experience great success throughout your career and life. But, no matter how far you go in life... remember your roots, your heritage, where you came from, and try to remain “a simple kind of man.” As I look back on my career, educational accomplishments, and life’s journey, I find that my greatest life

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## **ABSTRACT**

### **THE IMPACT OF SUPPLEMENTAL INSTRUCTION ON THE RETENTION AND GRADUATION OF STUDENTS OF COLOR AT “MID-WESTERN UNIVERSITY”**

by Dulcie D. Holek

Understanding how students of color become socially and academically integrated into college is critical to improving their retention. Although a variety of retention programs exist, programs such as Supplemental Instruction (SI) focus on lowering the rate of attrition by promoting academic success through peer instruction, teaching effective learning methods, and study skills training. A recent study demonstrated that SI significantly improved the GPA for students of color that attended SI sessions at MWU. It was important to determine if the SI program also had an impact on the retention and persistence to graduation of students of color at MWU attending SI.

The study site was unique since MWU has the only SI program, nation-wide, administered in an institutional diversity office. This unique location provided in-depth data on students of color that will contribute significantly to current research. Although much research has been conducted in the areas of SI and academic achievement, there has been minimal research performed analyzing the effect SI has on the retention and graduation rates on the population of students of color.

Given this paucity of research, the purpose of this quantitative investigation was to fill this research gap by measuring the extent to which there was a difference between the retention and graduation rates of students of color at MWU who attend SI to students

of color at MWU who do not attend SI. The null hypotheses was that there would be no significant increase in the retention rate and graduation rate within each group of students of color who attend SI in comparison to student of color who do not attend SI.

This quantitative investigation involved a causal-comparative, ex post facto method of research, using the Cochran-Mantel-Haenszel chi-square technique. The population of this investigation included MWU undergraduate students of color. Archival data for the time period beginning in the Fall semester of 2001 through the Fall semester of 2002 was utilized in this investigation. The students' reenrollment and graduation status at the end of the Spring semester of 2007 was analyzed in the comparison, and collected from the MWU Minority Student Services (MSS) records and MWU Office of Institutional Research. The *F* tests were performed on the main effects for the two factors and the interaction between the two factors. In the post hoc analysis, three summary Cochran-Mantel-Haenszel (CMH) correlation statistics were used to test for the hypothesis of no association. Differences were determined to be significant at the associated *p*-value of  $<.0005$ .

This study concluded that SI had a significant impact on the retention and persistence to graduation for African-American, Hispanic/Latino, and Native American students at MWU. However, this study concluded that SI did not have a significant impact on the retention and persistence to graduation for Asian students at MWU.

To decipher the reasons for differences by ethnicity, factors relating to ethnic identity development, learning styles and academic achievement, self-concept of academic ability, and specific social and cultural experiences and needs were reviewed to explain how and why these factors play a role in the academic achievement and retention

of students of color. The literature supports that African-American, Hispanic/Latino, and Native American students often develop networks and support systems when entering college (i.e., cultural organizations), and having strong and active ties to the campus community may play a role in increased SI attendance and the impact on retention and persistence to graduation. Previous research indicated that Asian students are influenced by three key factors that may contribute to SI attendance not having a significant impact on their retention and persistence to graduation: experiences with reverse stereotype threat (i.e., living up to the stereotype that Asian's are academically superior, making it more difficult to ask for assistance, therefore, not attending SI); being influenced by relationships and external forces; and the reaction and focus on social political consciousness identity development in the college years. It is important to note that the Asian students graduated at the same rate as the students from other ethnic groups, indicating they achieved academically through other methods.

This study demonstrated the significance intervention programs such as SI have on retention, and persistence to graduation of students of color. Measurable data attained from studies such as this support the acquisition of funding, institutional understanding and buy-in, and continuation of diversity initiatives and retention programs, such as SI.

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## CHAPTER I

### INTRODUCTION

Understanding how students of color become socially and academically integrated into college is critical to improving their retention (Bean, 1983). Tinto (1986, 1997) and Terenzini (1994) have suggested that academic integration is a particularly important factor for the successful persistence to graduation for students of color. According to Lovitts (1997), academic integration develops through formal interactions between and among students, faculty, and campus staff as they work together toward the achievement of academic goals. Academic integration for students of color may be supported by: diversity in the curriculum, faculty diversity, clear learning expectations, student involvement with faculty through classroom and mentoring activities, honors and scholarship programs, study groups, student study lounges, brown bag lunch seminars, cultural programs, pre-college enrichment programs, summer bridge programs, developmental courses, and campus academic assistance programs.

Although various theories have contributed significantly to the research on student attrition and retention, Cabrera, Casteneda, Nora, and Henstler (1992) promote merging unique and similar premises into a single model, termed a merged model, as a more effective way of explaining persistence rather than by individual models. In the past few years important advances have been made in research addressing students of color and factors that may be more sensitive to their college adjustment experience (i.e., cultural assimilation and academic preparation). Recent attrition and retention studies examining the specific needs of students of color (Cabrera & Nora, 1994; Caplow & Donaldson, 1996; Congos & Schoeps, 1993; O'Hear & Macdonald, 1995; Tinto, 1986,

1997; Tracey & Sedlacek, 1997) have relied on theoretical models that blend the most prominent features of earlier theories (i.e., social and academic integration, commitment, rites of passage, sense of belonging, feelings of isolation, and withdraw). Using a merged model, Nora and Cabrera (1996) examined the influence the student's ethnicity had on the different effects of factors considered in a model of retention and persistence, and found students of color have low retention rates. Additionally, Astin's (1985) talent development model and Steele's (1995, 1997) stereotype threat present new perspectives related to factors influencing the academic success and retention of students of color.

According to Eimers and Pike (1997), students of color are most successful when their academic training is complemented by social, cultural, and artistic development. Furthering this position, Clements (2000) suggests that a strong social, academic, and cultural support structure enhances the retention, persistence, and academic success of students of color. This is especially important at predominantly white universities in which students of color show a tendency to travel to their homes of origin during their time off to be with family and familiar cultural surroundings. It is important to provide social and cultural activities to increase the amount of time the students spend on campus and develop a sense of belonging. Monthly cultural heritage celebrations to encourage all students, faculty, and staff on campus to participate and intermingle promote the existence of a pluralistic campus environment. Research (Loo & Rolinson, 1986; Suen, 1983; Turner, 1994) has shown that students of color who are more likely to leave college before graduating express feelings of isolation, alienation, or not belonging. Therefore, it is important for universities to provide academic, personal, social and cultural support for

students of color, and to enhance a campus environment where diversity is understood and celebrated.

According to Schroeder (1996), retention is highest in a nurturing campus climate, where there exist high expectations and beliefs that all students have the capacity to succeed. Retention programs for students of color may include: multicultural learning communities, student organizations and activities, cultural celebrations and activities, first generation student programs, service learning programs, diversity awareness and sensitivity programs, cultural centers, honors and scholarship programs, pre-college enrichment programs, summer bridge programs, developmental courses, and campus academic assistance programs.

Students of color often express apprehension about being equipped to handle the academic rigors of college and becoming academically integrated (Nora & Cabrera, 1996). To assist students of color in becoming more academically prepared, retention programs such as Supplemental Instruction (SI), Peer Advising, mentoring, and summer bridge programs include an academic assistance component for these students. Through the SI program, for example, students are provided academic assistance with historically difficult courses, as well as receive training on study skills in conjunction with content material of courses. The learned study skills may be transferable to other courses, enhance future academic success, and improve retention and persistence to graduation. At the research site, the Peer Advising program works with students with a GPA of 2.3 or below on a 4.0 scale who receive support from trained peer advisors in an effort to assist the student in raising their grade point average and persisting toward graduation. Formal mentoring programs, such as AMIGOS (Arranged Mentoring for Instructional Guidance

and Organizational Support), are also supportive of the academic success of students of color by providing positive academic role models and a connection to the university (Stromel, 2000). Early recruitment and retention initiatives, such as the College Excellence Enrichment Program (ACE), Gaining Early Awareness and Readiness (GEAR-UP) program, and Upward Bound program, are structured to assist students of color in middle school and high school develop academic skills that will prepare them for college, as well as provide the students with on-site college experiences at an early age. Through the ACE program students of color graduating from high school who do not meet the minimum admission requirements, but show strong academic potential, are provided an opportunity to demonstrate their academic ability through a six-week summer program. SI is incorporated into the summer ACE program to provide the students with academic support. At the research site, students who successfully complete the six-week program are granted admission and participate in mandatory academic enhancement programs (i.e., SI) assisting the students to succeed academically and persist to graduation. Although a variety of retention programs exist, programs such as Supplemental Instruction (SI) focus on promoting academic success by increasing the quality of education and lowering the rate of attrition (Burmeister, 1993).

### Supplemental Instruction

Supplemental Instruction (SI) is a national academic assistance program that focuses on historically difficult courses, in which 30% of the students do not pass the first time taken (Martin & Arendale, 1997). SI is confidential, voluntary, free, offered to all students enrolled in courses where SI is offered, and is not considered remedial in that SI

targets historically difficult courses and not the students' ability levels. Students in courses offering SI are informed of the program during the first class meeting through an oral presentation by the SI Leader and an informational brochure. The SI program offers a series of three weekly review sessions for each course offering SI. At each session, a trained SI Leader guides the students through course material, leads discussions focused on important course concepts, assists students with developing strategies for studying the subject, conducts practice tests, and teaches study skills and techniques that are transferable to other courses.

Supplemental Instruction (SI) was created by Deanna C. Martin, Ph.D., at the University of Missouri-Kansas City in 1973 in response to the need for reducing attrition rates and increasing the emphasis on student retention (Martin & Arendale, 1993). SI was developed to provide an alternative method for teaching transferable study skills in conjunction with content material of courses with demonstrated high attrition rates. In its inception, SI was offered in courses in the health science professions. Due to its overwhelming effectiveness, it was then expanded to other historically difficult courses throughout the institution. Accordingly, students who successfully completed the identified historically difficult courses, and exhibited leadership and effective communication skills, received training in how to administer SI and provide peer instruction.

Faculty and staff from over 1,000 institutions across the nation have received training by the University of Missouri-Kansas City SI staff to implement the SI program at their own institutions. The SI program is active at institutions in 13 countries (Australia, Canada, Denmark, Egypt, Marshall Island, Malaysia, New Zealand, Puerto

Rico, South Africa, Sweden, United Kingdom, United States of American, and West Indies) (Martin & Arendale, 1993).

The U.S. Department of Education (1999) designated the SI program as an Exemplary Educational Program, and has validated the effectiveness of SI with the following three claims:

1. Students participating in SI within the targeted, historically difficult courses earn higher mean final course grades than students who do not participate in SI.
2. Students participating in SI within the targeted, historically difficult courses succeed at a high rate (withdraw at a lower rate and receive a lower percentage of D or F final course grades) than those who do not participate in SI.
3. Students participating in SI persist at the institution (reenrolling and graduating) at higher rates than students who do not participate in SI.

The University of Missouri-Kansas City continues to house the international headquarters of the SI program. Its staff conducts research in SI related areas, presents a series of conferences throughout the United States and abroad, conducts formal training workshops for institutions that are new to the SI program, maintains an interactive web page, and publishes a quarterly newsletter.

Previous investigations regarding the academic success through SI for students of color include one by Martin and Arendale (1993) that explored the use of SI in an urban setting with students of a diverse population, and a study by Stockly (1996) that examined the academic performance of Mexican-American women who have attended SI. The study by Martin and Arendale (1993) determined there to be a significant increase in GPA with students of a diverse population in an urban setting, and the study



by Stockly (1996) determined there to be a significant improvement in the academic performance of Mexican-American women who attended SI. Although these two studies have provided information regarding SI and diverse populations, the first study was conducted in a non-traditional academic setting and the second study excluded males.

This research investigation differs from previous research studies since the population included in the sample was comprised of traditional college level students of color from all four main ethnic groups, and included both genders. In addition, the focus of the study was on the retention and persistence to graduation of student of color who attend SI. Although much research has been conducted in the areas of SI and academic achievement, there has been minimal research performed analyzing the effect SI has on the retention and graduation rates on the population of students of color. The unique placement of SI in the Minority Student Services office at the site university provides another point of reference from the previous studies since the SI programs in their studies were housed within academic affairs versus within a diversity department.

### Problem Statement

Recently, a study of one intervention program (Telfer, 2003) demonstrated that SI significantly improved the GPA for students of color that attended SI sessions. While this study indicated improvements on a course basis for a student, it was important to determine if the SI program had an impact on the retention and persistence to graduation of students of color attending SI to better determine the long-range impact of the intervention on persistence and graduation rates.

The purpose of this quantitative investigation was to measure the extent to which there is a difference between the retention and graduation rates of students of color at the site institution, referred throughout by the pseudonym Mid-Western University (MWU), who attend SI to students of color at MWU who do not attend SI. This study used the four ethnic categories utilized by the MWU Office of Institutional Research for identifying students of color at MWU. The population studied included undergraduate students from the following four ethnic groups: African-American, Hispanic/Latino, Asian, and Native American. The study site was unique since it has the only SI program, nation-wide, administered in an institutional diversity office and not in an academic assistance program office. Although research has been conducted in the areas of SI and academic achievement, there has been minimal research performed analyzing the effect SI has on the retention and graduation rates on the population of students of color. This unique location of the SI program ensconced in a diversity office provided a unique opportunity to gather data regarding the longer-range impact of SI on students of color in persistence and graduation rates.

According to Congos and Schoeps (1993), the inability to retain students remains a costly problem for institutions in higher education. This investigation assists administrations with evaluating whether academic assistance programs, such as SI, support students of color to be retained at the university and ultimately graduate. The retention of students saves the institution money by providing consistency with its tuition revenue source and eliminates the need to recruit more students to fill the slots vacated by students who de-matriculate.

## Research Questions and Hypotheses

The purpose of this quantitative investigation was to measure the extent to which there is a difference between the retention and graduation rates of students of color at MWU who attend SI to students of color at MWU who do not attend SI. More specifically, this study investigated the following research questions:

1. Is there a significant increase in the retention rate within each group of students of color who attend SI in comparison to students of color who do not attend SI?
2. Is there a significant increase in the graduation rate within each group of students of color who attend SI in comparison to students of color who do not attend SI?

Based on the research questions, the null hypotheses for this study were:

H01: There will be no significant increase in the retention rate within each group of students of color who attend SI in comparison to student of color who do not attend SI.

H02: There will be no significant increase in the graduation rate within each group of students of color who attend SI in comparison to student of color who do not attend SI.

## Research Design and Context

This quantitative investigation involved a causal-comparative, ex post facto method of research, using the Cochran-Mantel-Haenszel chi-square technique. This research investigation utilized the archival data set from the Telfer (2003) study to further

investigate whether SI attendance had an impact on the graduation and retention rates of students of color at MWU by using the Cochran-Mantel-Haenszel chi-square technique for each research question. The Pearson chi-square was also used in this study as a secondary analysis because it detects any kind of association, especially when using 2 X 2 tables (SAS Institute, 1999). The one-way ANOVA model was not used in this study because the groups were not randomly selected and the comparison involved more than two variables. The two-way analysis of variance (ANOVA) between-subjects technique was not used in this study because the data are categorical variables and not continuous variables. Based on the following criteria (Green & Salkind, 2003), the Cochran-Mantel-Haenszel chi-square technique was used with each of the sub-population variables in this investigation:

1. the studies relate two between-subject factors to a single dependent variable (i.e., Enrollment or Graduation Status);
2. each participant has scores on three variables (i.e., Ethnicity, SI Attendance, Enrollment or Graduation Status); and
3. each factor divides cases into two or more levels while the dependent variable describes cases on a quantitative dimension (i.e., Ethnicity has four levels: African-American, Hispanic/Latino, Asian, and Native American; SI Attendance has two levels: Attended SI, Did Not Attend SI; Enrollment has two levels: Enrolled, Not Enrolled; and Graduation Status has two levels: Not Enrolled and Did Not Graduate, Not Enrolled and Did Graduate).

The *F* test was performed on the main effects for the two factors and the interaction between the two factors. The students' reenrollment status and whether they

did or did not attend SI was analyzed in the comparisons for the first research question. The students' graduation status and whether they did or did not attend SI was analyzed in the comparisons for the second research question.

In the post hoc analysis, three summary Cochran-Mantel-Haenszel (CMH) correlation statistics (i.e., Nonzero Correlation, Row Mean Scores Differ, and General Association) were used to adjust for the effect of Ethnicity in the data to test for the hypothesis of no association to determine the levels of significance between the retention and graduation rates of each group (SAS Institute, 1999). Differences were determined to be significant at the associated  $p$ -value of  $<.05$ .

Archival data for the time period beginning in the Fall semester of 2001 through the Fall semester 2002 was used. Students enrolled in courses offering SI during this three-semester period were the focus of the comparative study. The students' reenrollment status at the end of the Spring semester of 2007 and whether they did or did not attend SI were analyzed in the comparisons for the first research question. The students' graduation status at the end of the Spring semester of 2007 and whether they did or did not attend SI were analyzed in the comparisons for the second research question.

The archival data population included students at the Freshman, Sophomore, Junior, and Senior class levels. The students' enrollment and graduation status at the end of the Spring semester of 2007 was analyzed in the comparison. The rationale for using the Spring 2007 data to measure the enrollment and graduation status of the students included: 1) the premise that all classification of students in the study, including those classified as first semester Freshman during the Fall semester of 2002, would have five

years to achieve graduation by the end of Spring semester 2007; and 2) the MWU Office of Institutional Research would have the student enrollment and graduation data from the end of Spring semester of 2007 analyzed and available by August 2007 to begin the data analysis of this investigation.

### Significance of Study and Contributions

Student retention is of heightened interest to universities given the financial implications involved with the loss of tuition revenues and state support per student at public institutions like MWU (Congos & Schoeps, 1993). Each time an institution loses a student to attrition, the institution loses income until that student is replaced. According to Beal and Noel (1980), research demonstrates institutions lose additional income because it costs more to recruit a student than it does to retain one. In a higher education climate where outcome measurements and cost effectiveness area priority, program evaluation has become essential; data that demonstrates if performance and achievement indicators have been reached can provide concrete program justification (Congos & Schoeps, 1993). Once the impact of a retention program, such as SI, is known, the data can be used to evaluate current expenditures and cost effectiveness.

Ultimately, retention is a result of effective educational, social, and cultural programs and services both inside and outside of the classroom. Noel, Levitz, and Saluri (1985) stress that institutions should focus more on the effectiveness of programs aimed at improving retention. SI is considered a successful program regarding academic improvements by many research experts and has been proven to be effective (Blanc, DeBuhr, & Martin, 1983; Congos & Schoeps, 1993; Congos, Schoeps, & Langsam, 1997;

Kenney, 1989; Lundenberg, 1990; Price & Rust, 1995). Although much research has been conducted in the areas of SI on academic achievement, there has been minimal research performed analyzing the effect SI has on the retention and graduation rates on the population of students of color. The unique placement of SI in the Minority Student Services office at MWU provided an outstanding research opportunity for examining the impact SI has on the retention and graduation rates of students of color in a context of services within a diversity department versus in an academic unit.

With many state legislatures scrutinizing the merit and effectiveness of retention programs for at-risk college students, O'Hear and MacDonald (1995) contended that producing valid, defensible, and reliable statistical verification that a retention program is educationally sound has become increasingly more important. The findings from this study present statistical outcome measurement results in a straightforward format and style that is easily understandable and useful for decision makers and may be replicated by other institutions.

### Definition of Terms

The definition of terms used during this research investigation include:

1. Attrition – The rate at which students fail to reenroll and graduate.
2. Confidentiality – The SI program Supervisor, SI Assistant Supervisor, SI Secretary, and Director of Minority Student Services are the only MWU staff to have access to the SI information for students' in courses offering SI. Individuals who are not on the SI staff are not informed as to which students are or are not attending SI sessions.

3. Diversity – (as defined by MWU) – The range of differences among people, especially in the characteristics covered by MWU’s Affirmative Action Protocol (race, gender, religion, disability, and sexual orientation). An attitude that recognizes the value and contributions of all members of our Community. A commitment to respect and provide equitable treatment for members of our Community, especially those from under-represented groups.
4. Educational benefits – factors attributed to the college experience and include changes in the student in terms of intellectual capacity and skills, values, attitudes, and interests.
5. Enrollment Management – the process of forecasting trends using effective research that will effectively plan for the future and likely affect higher education.
6. Ethnic Identity – ones’ sense of belonging to an ethnic group and the part of one’s thinking, perceptions, feelings, and behavior that is due to ethnic group membership.
7. Existential benefits – factors defined by the quality of the college experience itself, peer contacts, interactions with faculty, extracurricular and academic experiences, and recreational activities.
8. Fringe benefits – outcomes related to the institutional credentials the student receives that provide certain social and occupational advantages (i.e., diploma).
9. GPA – (Grade Point Average) – The final grade a student receives in the course based on a 4.0 scale. For the purpose of this study, the achievement of a grade of D+ (1.3) or higher for a course offering SI is considered a passing grade.



10. Graduation rate – The rate at which students successfully attain graduation at an institution.
11. Historically difficult course – Courses in which 30% of the students receive a final grade of D, F, or W for the course. Courses considered historically difficult at MWU, and included in this study, are: Accounting 201, Accounting 202, Biology 101N, Biology 101P, Biology 101T, Chemistry 131, Chemistry 132, Computer Science 180, Health Professions 214, Health Professions 215, Math 105, Math 107, Math 130, Math 132, Music 114, and Psychology 100.
12. Microaggressions – subtle behaviors or communication of racism.
13. Non-SI Students – Students who choose not to participate in the SI sessions for the course, or have attended only one or two SI sessions for the course during the semester.
14. Passing grade – The achievement of a grade of D+ or higher for a course offering SI.
15. Persistence to graduation – The rate at which students continue to reenroll in courses progressing toward degree completion and graduate.
16. Pluralism – An environment where individuals from diverse backgrounds successfully coexist, and where differences are accepted, appreciated, and celebrated.
17. Predominantly White University – An institution of higher learning where the total student of color enrollment constitutes less than 25% of the total enrollment, which includes full-time and part-time students at the undergraduate and graduate levels.

18. Remedial – Courses designed for students with lower ability levels. The SI program is not remedial in that it targets historically difficult courses and not student's ability levels.
19. Retention – The rate at which students have continuous enrollment in courses at an institution.
20. Self-concept – a social-psychological construct that addresses how an individual answers the question, “who am I?”
21. Stereotype threat – acts much like a self-fulfilling prophecy, where a student's social identity is attached to a negative stereotype and that student underperforms in a manner consistent with the stereotype.
22. Students of color – Students at MWU from the following ethnic groups: African-American, Hispanic/Latino, Asian, and Native American.
23. Supplemental Instruction (SI) – An academic assistance support program, coordinated by Mid-Western University's (MWU) Minority Student Services (MSS) office. SI focuses on historically difficult courses, in which 30% of the students do not pass the first time taken. It is confidential, voluntary, free, offered to all students enrolled in courses where SI is offered, and is not considered remedial in that it targets historically difficult courses and not the students' ability levels.
24. SI Students – Students who attend three or more SI sessions for the course during the semester.
25. Voluntary Involvement– Students have the choice whether they will attend SI sessions, and the frequency of attendance.

### Limitations and Delimitations of Study

The research investigation was delimited to the SI program at MWU, for students involved during the time period beginning Fall semester of 2001 through the Fall semester of 2002. Further delimiting this research was the unique placement of SI in the MWU MSS office. This program location and the population size and student composition at MWU, and restrictions on which courses are funded to offer SI, may impact some generalizations.

A limitation for this research investigation was the possibility of self-selection bias. According to Congos and Schoeps (1993), because attendance at SI sessions is voluntary, there may be an incorrect assumption that it is mostly the higher achieving students who choose to attend SI. Thereby, postulating that the students who attend SI achieve higher GPAs for the course simply because they are the higher achieving students. The research design for this investigation utilized independent t-tests to address the potential problem of self-selection bias by comparing the means for the independent variables for each of the research questions in this research study.

### Overview of the Complete Document

This dissertation contains five distinct chapters: 1) Chapter I – Introduction; 2) Chapter II – Review of Literature; 3) Chapter III – Methodology; 4) Chapter IV – Presentation of Data; and 5) Chapter V – Summary and Conclusions. Chapter I provided an introductory overview of the research investigation. Chapter II presents an in-depth review of literature and assess theoretical constructs relative to the study that will provide the foundation for the investigation. This will include literature relating to diversity and

retention, retention theories and research, students of color at predominantly white universities, barriers for student retention, retention programs and strategies, evaluation and budgetary issues impacting retention programs, diversity and retention programs at MWU, learning styles and the impact of SI on academic achievement and retention, the evaluation of student outcomes, and components for improving retention and developing a pluralistic culture. Chapter III provides an overview of the specific quantitative research methodology used to investigate the research questions and hypotheses. Based on the findings from the quantitative research conducted, Chapter IV presents the results data of the study. Chapter V presents the conclusions of the research findings and recommendations for further research.

## CHAPTER II

### REVIEW OF LITERATURE

This chapter presents an in-depth review of literature and the theoretical constructs relative to the study. The first section reviews diversity and retention, which includes literature relating to retention theories and research, students of color at predominantly white universities, barriers for student retention, retention programs and strategies, and diversity and retention management at Mid-Western University (MWU). The second section reviews literature relating to learning styles and achievement, and the impact of SI on academic achievement and retention. The final section reviews literature relating to the evaluation of student outcomes.

#### Diversity, Retention, and Persistence to Graduation

As the population of students continues to diversify, a common concern for many colleges and universities is how to go about achieving diversity and improving the retention and persistence to graduation for students from different backgrounds. The following literature review will explore theories, research, barriers, programs and strategies relating to retention and improving the social and learning environments for students of color.

Banks (2002) stated, “individuals who only know the world from their own cultural and ethnic perspectives are denied important parts of the human experience and are culturally and ethnically encapsulated” (p. 1). Emphasizing the importance of diversity and retention of students of color at institutions of higher education, Gurin (2001) postulated that students educated in diverse setting are more motivated and better

able to participate in an increasingly complex multicultural society. Furthermore, students can best develop a capacity to understand the ideas and feelings of others when in an environment where there is: a) a presence of others from diverse cultures, ethnicities, and backgrounds; b) equality among peers; c) an environment where diversity is understood and appreciated through cultural programs, events, and open dialogue; and d) a visible campus-wide support to the commitment of diversity and the retention of students of color.

With the country's population changing rapidly, society needs to understand that the ethnic groups we currently refer to as minorities will become the majority population of the United States within this century. Accordingly, colleges and universities must accept the special challenge and responsibility to develop effective planning models for institutional change necessary to facilitate the blending of culture and become genuinely pluralistic, multicultural communities in the future (Duderstadt, 1999). Undergirding the need for diversity on campuses is a view of accountability. Duderstadt emphasized every individual on campus is accountable, and has a responsibility and role in the transformation of the campus environment climate and culture where diversity is understood and celebrated. The culture created impacts the experiences that students of color have on campus, both within and outside of the classroom.

Colleges and universities are enrolling a more diverse student population in relation to demographic composition, learning styles, and academic preparation than at any other time in American history (Aragon, 2000; Jalomo, 2000; Terenzini, 1996). Yet, the question of retaining students of color persists. The discussion that follows more fully explores factors contributing to retention issues of students of color, strategies to address

retention issues, retention program initiatives at MWU, as well as the impact of learning styles and SI on academic achievement and retention.

### *Retention Theories and Research*

Retention programs, such as Supplemental Instruction (SI), focus on promoting academic success by increasing the quality of education and lowering the rate of attrition (Burmeister, 1993). Several theorists have contributed to the framework to better understand areas of retention and persistence to graduation (Astin, 1968, 1985, 2004; Bean, 1983; Cabrera & Nora, 1994, 1999; Hurtado, 1994, 1999, 2005; Spady, 1970; Steele, 1995, 1997; Tinto, 1986, 1997). Key factors contributing to retention and persistence include students' connections to the campus community. For students of color, this connection is particularly important when they are in a primarily white college. Better understanding the influence of SI on retention may contribute to retention efforts for students of color.

During earlier research on retention, Spady (1970) observed that the behaviors of students who leave college were similar to the behaviors Durkheim (1951) described for individuals who contemplate suicide. According to Durkheim (1951), individuals contemplating suicide choose to withdraw from society because they lack shared values and normative support. Spady compared this to how students either persist or withdraw from college depending on their social and intellectual experiences and support within the college community. If the students' social and intellectual experiences lack shared values with their core personal values they will not feel connected or committed to the institution. If the students do not feel supported within the college community they will

not feel welcome or valued, and will not develop a sense of belonging. In relation to Spady's premises, these feelings of disassociation will lead the students to withdraw from the college.

To more fully explain the process that students go through before leaving college, Tinto (1975) developed a predictive model showing persistence in college was closely related to students' social and academic integration. Tinto found that the student's commitment was the element most likely to lead to persistence, and students having higher levels of social and academic integration were more likely to have commitment to the institution and to obtain a college degree.

Van Gennep's (1960) rites of passage were incorporated in Tinto's (1986, 1997) research exploring the process students go through in leaving their family support system, transitioning and assimilating new values and behaviors, and ultimately integrating their values and behaviors with the core values and behaviors of their family, culture, and new environment at college. It is important for students to go successfully through this process or they will be more likely to leave college. Students of color and first generation students not only need to successfully navigate Van Gennep's rites of passage, quite often they must also overcome cultural shock, entailing assimilating to an unfamiliar culture and developing perseverance and self-reliance in order to succeed and persist to graduation.

Bean's (1982) retention model described how student attrition and retention create a cyclical pattern. Building on this theoretical premise, students' experiences with the college community may influence their beliefs, and these beliefs affect the student's attitude toward the institution and their intentions of whether to stay or leave college. In



addition, findings by Tracey and Sedlacek (1997) have shown the student of color's ability to develop strategies to cope with negative experiences is more important for persistence to graduation than the student's academic ability.

Cabrera, Casteneda, Nora, and Hensler (1992) promoted merging unique and similar premises of retention into a single model as a more effective way of explaining persistence rather than by individual models. By examining specific needs of students of color (Cabrera & Nora, 1994; Caplow & Donaldson, 1996; Congos & Schoeps, 1993; O'Hear & Macdonald, 1995; Tinto, 1986, 1997; Tracey & Sedlacek, 1997), Cabrera et al. relied on theoretical models that blend the most prominent features of earlier theories (i.e., social and academic integration, commitment, rites of passage, sense of belonging, feelings of isolation, and withdraw). Using the merged model, Nora and Cabrera (1996) examined the influence the student's ethnicity had on the different effects of factors considered in a model of retention and persistence, and found students of color have low retention rates. Thus, programs like SI may prove to be critical in aiding in the retention of students of color.

Although earlier theories have contributed significantly to the research on student attrition and retention, recent advances in research addressing students of color and factors highlight factors that may be more sensitive to the college adjustment experience. Astin's (1985) talent development perspective postulates measuring academic excellence by how effectively colleges and universities develop educational talents of students, rather than the level of developed talent students' possess when they enter. Steele and Aronson (1995, 1997) have focused on how students of color are often influenced by the stereotype threat and settle for the status quo on how they perceive they should be treated

and what level they can achieve. Longitudinal studies by Hurtado (1999, 2005) have shown that students of color at colleges and universities with more diverse student populations are more likely to socialize and develop friendships with students from different ethnic groups, and, thereby, develop connections to the institution that increase retention.

### *Students of Color at Predominantly White Universities*

With the exception of Historically Black Colleges and Universities, the majority of higher education institutions, such as Mid-Western University, were originally designed specifically for white students (Benton, 2001). Since racial diversity was virtually absent at the inception of the majority of higher education institutions in the United States (DuBois, 1969), most universities have a social climate and organizational culture that incorporates norms, traditions, and values shared primarily by white students. When faculty and staff at a predominantly white university have an understanding of the campus environment, they are better equipped to assist students of color transition and assimilate to the institution's culture (Cruise, 2002).

The environment at a predominantly white university leaves many students of color feeling like a fish out of water, especially if their home of origin is in an urban setting or on a reservation (Benton, 2001) and the university is in the suburbs or in a rural locale. It is important for predominantly white universities to provide cultural programming and student centers where students of color can go to feel comfortable and that they belong. One of the most significant experiences students of color have at a predominantly white university is that of being the only one (i.e., the one person of their

race when another race is predominant). Many students of color at a predominantly white university similar in size to MWU find they are the only person of color in the classroom, study group, bookstore, residence hall dorm room, waiting line at the financial aid office, and so on. This often leaves the student feeling vulnerable and that they are expected to speak on behalf of their race and culture (Benton, 2001). In addition, students of color are often defined by their racial identity instead of by their qualities as a person (i.e., the intelligent Asian student versus the intelligent student). These experiences often lead students of color to have heightened racial consciousness, feelings of awkwardness, and a sensation of twoness of self (DuBois, 1969). This double consciousness permits a person of color to view themselves through their own racial lens, as well as that of an individual from a different race or culture. Additionally, at an age when many traditional students of color are in transition with their own racial identity, this concept of double consciousness can have emotional consequences for the student at a predominantly white university. The above mentioned issues demonstrate the need for continued existence of multicultural centers, minority student services, multicultural counselors, faculty and staff of color, and organizations and activities specifically designed for students of color at predominantly white universities.

A study by Fleming (1984) has shown that students of color often experience problems with finances, support services faculty and staff, other students, and the curriculum at predominantly white campuses. Numerous offices on campus share the responsibility for addressing these issues, as well as the student development and retention of students of color. It is beneficial when offices, such as Academic Advising, Scholarships and Financial Aid, Residence Life, Counseling Services, and Academic

Assistance Programs, receive in-depth diversity training to assist the staff in working with the specific needs of students of color (Cruise, 2002). It is important that the goals of a predominantly white university encourage the practice of diversity pertaining to staff professionalism, including: a) the concern for the welfare of humanity; b) an awareness of the social issues confronting a diverse global society; and c) providing educational experiences and programs for people from all backgrounds and cultures to ensure an international and global perspective.

Although it is important for universities to eliminate as many potential problems and obstacles to retention before students of color arrive on campus (i.e., financial aid, housing placement, and harassing or discriminatory behavior by students and staff), it is just as important to structure the institution's environment so more diversely prepared students can succeed (Richardson, 1991). This initiative requires an institutional wide effort. As incidents of racial and other forms of harassment on college campuses rise, many institutions have taken measures to develop and adopt codes of conduct prohibiting discriminatory harassment (Weinstein, 1990).

According to Eimers and Pike (1997), students of color are most successful when their academic training is complemented by social, cultural, and artistic development. Clements (2000) suggested that a strong social, academic, and cultural support structure enhances the retention, persistence, and academic success of students of color. Therefore, it is important for universities to support activities, programs, events, organizations, clubs, fraternities and sororities, that offer a wide range of opportunities for students of color to participate, meet others, and develop a sense of belonging and connectedness to the university. At predominantly white campuses, such as MWU, students of color stay

on campus less and opt to spend free or leisure time traveling to their homes of origin during their time off to be with family and cultural surroundings (Minority Student Services Peer Advisor Manual, n.d.). University sponsored social and cultural activities may increase the amount of time the students spend on campus and develop a sense of belonging.

Retention programs that have an outreach component (i.e., proactive telephone calls) are most effective with students of color, especially first generation students who have not yet learned when to seek academic assistance services (Cruise, 2002). For example, at MWU to encourage students to seek academic assistance for courses offering SI, the SI leaders provide the students in class verbal reminders, information postcards, and bookmarks with the dates, times, and locations of SI sessions.

In addition, faculty members have the responsibility, and play a key role, for the retention of students of color within each academic department. The amount and quality of informal interaction students have with faculty outside the classroom has been shown to increase retention and persistence to graduation (Suen, 1983). This support structure can include: annual orientation to the department, faculty mentoring, fellowship support, general academic support, advising, workshops, and the availability of written policies and guidelines. Palma-Rivas (2002) suggested faculty can utilize technology to facilitate their efforts of making instruction more responsive to the diverse backgrounds of their students, as well as integrate differing learning styles. Faculty must also be aware how their action in the classroom (i.e., singling out a student of color to speak for an entire race) may affect the student's perception of prejudice and discrimination and have a negative impact on retention.

Students of color often find it easier to confide in peers regarding their concerns, fears, and daily tribulations (Boen, 1989; Dalton, 1991; Hayes & Heng-Rue, 1994). This is attributed to many peers having experienced similar issues, being able to provide cultural support, and relating positive solutions for handling issues students of color face at predominantly white institutions (i.e., racial discrimination) (Boen, 1989; Dalton, 1991; Hayes & Heng-Rue, 1994). Mentoring programs can also be supportive to the academic success of students of color (Stromel, 2000).

According to Hendricks, Smith, Caplow and Donaldson (1996), students of color who have developed strategies to depersonalize and cope with negative experiences, such as racial prejudice, are more likely to persist to graduation. University programming, such as Diversity Awareness Training and the Multicultural Counseling program, offer specific strategies and techniques to assist students of color develop coping skills to handle negative experiences.

The separation from family support systems is especially difficult for students of color (Tracey & Sedlacek, 1985). When moving away from home to a community that is predominantly white, these students often have a difficult time locating basic living essentials, such as hair products, food products, hair dressers, culturally oriented churches, and other cultural accommodations to which they are accustomed. For some students of color who come from lower socio-economic status backgrounds, or are first generation college students, the lack of family support is common and may also be a factor for leaving college (Donovan, 1984). Terenzini (1994) proposed that first generation college students are often viewed by their families as breaking from tradition when they leave the family unit to go away to college. This is in direct contrast to how

families with prior college graduates view the students' rite of passage to college as an extension of tradition. Therefore, students of color and first generation students not only need to successfully go through Van Gennep's (1960) rites of passage, quite often they must also overcome family resistance, assimilate to an unfamiliar culture, and develop perseverance and self-reliance in order to succeed and persist to graduation.

Through Sedlacek's (1999) recent review of literature relating to the quality of life for students of color at predominantly white institutions, several important findings pointed out the fact that these students had difficulties with self-concept, racism, working with white faculty, and developing a cultural community on campus. Students of color still find the environment at predominantly white institutions to be racist (Feagin, 2000; Feagin, Vera, & Imani, 2006). Many students of color view the campus challenging and hostile, increasing their stress levels and leading to dissatisfaction and attrition (D'Augelli & Hershberger, 1993). Higher levels of social support, more comfort in the university environment, and positive self-beliefs are associated with more positive academic persistence decisions of undergraduate students of color at predominately white institutions (Gloria, Robinson, Hamilton, & Wilson, 1999). Being cognizant of these issues students of color at MWU experience, the Office of Institutional Diversity and Minority Student Services established policies and strategic plans to address campus-wide issues of racism and hostility, attend meetings and give presentations to educate faculty and staff on issues of diversity, and have obtained support and funding from campus leadership to develop cultural and academic programs and events that provide students of color at MWU the social, cultural, and academic support identified as needing to be in place to create a more positive campus climate.

In support of the critical role social connectedness plays with retention, the SI program maintains a holistic view of student learning. During SI sessions the SI Leaders discuss with the students how life stressors can affect the concentration necessary for studying, test taking, reading, and so forth. Techniques for managing life stressors while maintaining academic demands are also taught in SI sessions. Knowing more about the impact of SI for students of color may provide a key strategy for retention efforts.

### *Barriers for Student Retention*

This literature review examined a broad spectrum of research that offers colleges and universities a better understanding of the barriers students of color encounter and must be addressed in the development of diversity and retention programs. Through examining recent studies involving barriers to the retention of students of color (Aragon, 2000; Astin, Chang, & Kim, 2004; Bean, 1983; Dennis, 1998; Ford & Lang, 2002; Gurin, Lehman, & Lewis, 2004; Hurtado, Lindholm, Kohn, Mahoney, & Sax, 2005; Misra & McMahon, 2006; Nora and Cabrera, 1996; Steele & Aronson, 1995, 1997; Swail, Redd, & Perna, 2003; Terenzini, 1994; Terrell & Wright, 1998; Thompson, 2007; Tinto, 1986, 1997), five common themes have emerged that present barriers for students of color:

1. academic preparedness – poor pre-college academic preparation and achievement;
2. campus climate/environment – stereotype threat, racism;
3. commitment to educational goals and the institution – faculty expectations and attitudes, faculty and staff perceptions of students of color and their ability to succeed, lack of ethnic faculty and staff role models, the educational goals of students of color;



4. social, cultural, and academic integration – socialization, social and cultural isolation, role of the family, lack of cultural, social, and academic assistance programs; and
5. financial aid – inadequate financial aid support.

### ***Academic Preparedness***

A majority of students entering college know very little about how to learn or how to study (Stone & Jacobs, 2006), which causes them to have difficulty succeeding in courses that require critical thinking. Other factors that impede the ability for college students to learn include the lack of awareness of the need to spend time studying outside of class and the need to be prepared prior to class in order to participate in class discussion (Stone & Jacobs, 2006). In 2003, the Higher Education Research Institute (HERI) reported 66% of first-year college students spent fewer than six hours per week studying and completing homework in their senior year of high school. It was also reported that 48% of these students graduated from high school with an A grade point average. Additionally, 70% of these students believed their academic ability to be above average, or in the upper 10% of students in their same grade level (Hurtado, Lindholm, Kohn, Mahoney, & Sax, 2005). Given the pre-college learning and studying experience of the majority of students entering college, it is important for today's students to be taught how to learn and provided with specific learning tools to be successful in college-level learning tasks (Swail, Redd, & Perna, 2003). As described in this study, the design of the Supplemental Instruction program provides an environment in which to introduce students to the learning and studying tools they need to achieve academic success, as well

as to assist students in recognizing and developing their learning-style preference and academic development. An intervening factor that presents another barrier for students already engaged in collegiate learning is being unable to register into course sections where SI is offered (i.e., due to having full classroom capacity, or being in the last group of students eligible to register).

The need to reform K-12 education to more appropriately and successfully prepare students of color for college is becoming an increasingly more prevalent issue for education throughout the United States. Evidence shows that the only reasonable prospect for increasing minority participation in higher education is increasing the supply of college-ready minority graduates (Greene, 2005). This cannot be achieved strictly through policies implemented at the college level; it must also come through improvement in the education students of color receive from their K-12 schools (Moxley, Najor-Durack, & Dumbrigue, 2001). In support of K-12 educational reform, further research has been suggested to develop a modified SI model to implement at the high school level to serve as a proactive approach to teach students the learning and study skills needed prior to entering college to improve academic success and retention.

### ***Campus Climate/Environment***

Steele and Aronson (1995, 1997) suggested that many students of color are influenced by the stereotype threat and are still accepting that less than equal treatments are commonplace occurrences in college, and settling for the status quo on how they perceive they should be treated and what level they can achieve. The stereotype threat acts much like a self-fulfilling prophecy, in which a student's social identity is attached to

a negative stereotype and that student underperforms in a manner consistent with the stereotype. This lack of identification with the education environment can lead to poor academic performance, isolation from the academic environment, and ultimately leaving college. According to Steele and Aronson, although great progress has occurred, racism still exists and must be taken in to account when making decisions and establishing policies.

Similarly, Solorzano and Villalpando (1998) studied how subtle behaviors or communication of racism (i.e., microaggressions) and the campus climate affect the educational experience of students of color. It is important to recognize microaggressions that may occur in the campus environment, policies, and curriculum (Solorzano & Villalpando) and how these microaggressions can have a negative impact on the academic success and retention of students of color. Additionally, Duderstadt (1999) stressed that every individual on campus has a responsibility and role in the transformation of the campus environment climate and culture to address these issues.

### ***Commitment to Educational Goals and the Institution***

Tinto (1986, 1997) postulated that the more congruence between the goals of students of color and the institutional mission and commitment, the more likely the student will persist to graduation. Therefore, the support of the institution in providing a campus environment conducive to achievement of academic goals, and the tools the student needs to achieve their goals, the greater the likelihood that those goals will be realized.

According to Terrell and Wright (1998), there continues to be a prevailing attitude among faculty that students of color do not measure up intellectually, with the exception of Asian students. Asian students are faced with a different stereotype that they are all intelligent and are expected to perform academically at much higher levels. Students of color have reported that these types of attitudes are expressed by faculty through microaggressions (Solorzano & Villalpando, 1998). The attitude of lowered academic ability is internalized by the students of color and often produces a self-fulfilling prophecy. Additionally, students of color are sensitive to faculty perceptions that they are not expected to succeed academically, which causes some students of color to not perform to their full potential. These negative perceptions of a student can also affect faculty subjectivity when grading assignments and test. There are many examples of students of color having papers or coursework identical to those of their white peers graded much lower (Thompson, 2007).

There still exist on college campuses faculty members who immediately assume that a student of color is enrolled only because of a special admissions program with lower standards for students of color (Terrell & Wright, 1998). With many faculty members having limited experience in interacting or understanding cultural difference of students of color, it is important for colleges and universities to make concerted efforts to dispel the attitudes, perceptions, and myths that students of color achieve academically at lower levels. If not addressed, these faculty behaviors will continue to have a devastating effect on the academic success of students of color.

Although faculty, more than any other group on campus, are in the position to affect the greatest amount of change and impact on the academic success of diverse

students, they continue to have a difficult time modifying their teaching techniques, classroom material, and curriculum to be more inclusive for diverse populations. Faculty must keep in mind that they have the responsibility of teaching and nurturing all students by allowing them a place where they can come to dialogue, seek, and share knowledge without fear of biases, hindrances, and impediments (Feagin, 2000; Feagin Vera, & Imani, 1996). It is important for faculty to take an active role in making this shift in paradigm, develop a more comprehensive understanding of the identity development of students of color, and how to design and implement teaching strategies that may enhance the learning environments for students. Maintaining contact with all students is very important in the creation of a culturally responsive environment. According to Terrell and Wright (1998), how students of color interact with and relate to faculty and staff appears to be an important factor in students' academic success.

### ***Social, Cultural, and Academic Integration***

The socialization of students of color is important for colleges and universities to understand and support because it has a direct contribution to their retention. Students of color are often faced with the dilemma of feeling pressure to reject their ethnic identity (i.e., one's sense of belonging to an ethnic group and the part of one's thinking, perceptions, feelings, and behavior that is due to ethnic group membership) in order to fit in and succeed in the campus environment, especially at predominantly white institutions. Furthering this dilemma is the lack of understanding by family or friends from their home environment that may not have experienced this type of conflict. The students of color are often placed in a situation where they receive pressure from home to be true to their

ethnic identity and culture, and at the same time receive pressure from peers and others in the campus environment to assimilate to the standards of the dominant culture to effectively achieve social and academic integration. When students of color fail to connect socially with the campus environment they often travel home on weekends to maintain the social interactions with individuals from their own culture.

Support programs for students facing these conflicts are geared toward helping them realize and understand that they do not have to reject their cultural values in order to accomplish social and academic integration with the campus environment. The establishment of relations with peers and the development of role models and mentors also have a significant impact on both academic and social integration. Research (Terrell & Wright, 1998) indicates that it is the individual's perceptions of social and academic integration that are most directly associated with persistence and retention. Additionally, a study by Torres, Howard-Hamilton, and Cooper (2003) found that having a positive self-concept in relation to ethnic identity contributed significantly to the success of students of color in educational settings.

### ***Financial Aid***

With the rising cost of college attendance, it is becoming harder for students of color to attain a bachelor's degree without financial aid assistance in the form of grants and loans (Swail, Redd, & Perna, 2003). For many low-income students of color, the decisions to enroll or remain in college are driven by the availability of financial aid. A recent study found that low-income students of color who receive grants generally are

more likely to persist to graduation than those students who receive loans (Swail, Redd, & Perna).

Further complicating the matter, when faced with recent budgetary cuts from state funding, many colleges and universities chose to recapture those dollars by increasing the student fees, placing caps on scholarship funding, and cutting retention programs such as SI. Many scholarships are designed to assist students with the payment of tuition and books, but do not cover the payment of fees, therefore, placing the financial burden directly on the students. In cutting academic retention programs, such as SI, students experiencing academic difficulty with coursework must then pay for tutoring services, if this is even an option. Students from lower socio-economic backgrounds have indicated they have difficulty obtaining adequate financial aid, cannot pay the fees on their own, and leave college due to financial reasons (Gregory, 2000). To avoid extending the problematic historical trend of lower retention rates of students of color, colleges and universities must examine past and current practices of how retention programs are supported and funded, and how decision making impacts barriers for students that may inhibit progress towards a more supportive environment for students of color to succeed academically, culturally, and socially (Gregory, 2000).

### *Retention Programs and Strategies*

The development of a campus-wide retention program requires supportive leadership, the willingness to evoke change on campus, and a careful planning effort (Swail, Redd, & Perna, 2003). If any of these factors are missing, the chances for success are limited.

It is important to develop an institutional approach to retention that is viewed as having an integral role on the educational outcomes of all students (Beal & Noel, 1980). Research on the retention of students of color indicates that many variables affect whether the student decides to stay or leave (Tinto, 1985, 1997). According to Terrell and Wright (1988), the following assumptions emerged as variables that apply to all retention programs: students who feel a part of the institution are less likely to drop out; families play an important role in determining a student's persistence in college; freshman students are more likely to withdraw than upperclassmen; it is important that retention strategies be implemented in the freshman year; interactions between students and faculty are important factor for retention; student affairs departments should become involved in the minority student retention effort; and it is important for the entire college community participate in retention efforts.

### ***Premises of Effective Enrollment and Retention Management***

Retention in higher education has been defined as the “degree to which students meet self-determine educational goals” (Lang & Ford, 1992, p. 126). Enrollment and retention management is one of the most difficult and least understood functions on college campuses today. The primary mission for an enrollment management program is to enroll students who fulfill the stated mission and objectives of the university and to help these students succeed in reaching their educational and career goals. Efficient and responsive enrollment and retention management programs can help to solve a school's enrollment problems, but not even the best enrollment and retention management program can save a university that cannot or will not meet the needs of its student



customers (Dennis, 1998). To understand retention management one must also understand enrollment management, as you cannot have one without the other and these two programs cannot act in isolation. Dennis (1998) described enrollment management as the process of forecasting trends using effective research that will effectively plan for the future and likely affect higher education. Enrollment management involves examining what makes students enroll at the institution, understanding the relationship of the student who enrolls with the student who withdraws and the student who persists, knowing how students pay for their education, strategically preparing to meet the future enrollment and financial needs of an institution, and linking enrollment management with retention management. The ten basic premises (Dennis, 1998) regarding enrollment and retention management include: 1) there can be no successful enrollment management program without a successful retention management program; 2) there can be no successful enrollment management program without faculty involvement; 3) an enrollment management program can market only what the institution has to offer; 4) perception must match reality (i.e., misrepresenting the composition of students of color by strategically having pictures taken that have members from all ethnic group represented); 5) a school's financial aid program will significantly affect its enrollment and retention management program; 6) focus on accountability and have established goals and measurable outcomes; 7) there is no one perfect program; 8) it takes time to design and implement a successful enrollment and retention management program, and fine tuning is expected and essential; 9) the program must match the culture and personality of the campus; and 10) retention is the responsibility of all campus administrators, staff, and

faculty, and an atmosphere of educational partnership with the student must be developed.

Dennis (1998) discussed the need to take a more simplistic approach to develop and implement enrollment and retention management programs. With numerous sophisticated and complicated enrollment and retention management models and theories, one can lose focus of what the intentions and goals of the program are supposed to accomplish, which is to attract, enroll, and retain students (Terrell & Wright, 1998). Dennis further proposes that projection models and retention theories alone cannot change an institutions enrollment and retention problems, this must be accomplished though listening to the needs of the students the colleges and universities serve and having the courage to change what needs to be changed in order to meet those needs. In other words, getting back to the basics and then taking action. To do so, the functions of enrollment management, retention management, admissions, financial aid, registration, research and public relations, publications and advertising, and institutional diversity offices need to be integrated (Lang & Ford, 1992). A basic and simple approach that combines these processes has been successful at many colleges and universities (Dennis), but it is also recognized that there is no one right approach that fits all colleges and universities. The one basic underlying premise with any enrollment and retention management program is that it will be a work in progress and will continue to evolve and change as the composition and needs of the students change.

To effectively develop enrollment and retention management at an institution a coordinated system needs to be put in place. Developing a strategy that involves all components of the institution will strengthen the chances for a successful and strong

program that will meet the needs of the students, as well as achieve the enrollment and retention mission of the institution (Terrell & Wright, 1998). The reporting structure and level of presidential and senior administration support will also influence how effective the enrollment and retention program is organized and implemented. In order to have a successful program, the individual leading the mission must be dynamic, confident, creative, and a risk-taker who understands and appreciates that the success of meeting the goals and objectives of the institution can only come through the people implementing the program. Additionally, since enrollment and retention management is influenced by many components of the campus environment, no one person can or should be responsible for the entire enrollment success or failure (Dennis, 1998).

There are many ways to structure enrollment and retention management programs (Dennis, 1998; Ford, 1992; Terrell & Wright, 1998). In an effort to synthesize and streamline the premises of various models, following are the key elements for establishing an effective enrollment and retention management program:

1. Presidential commitment and support is a must.
2. One senior level administrator should lead the retention management program, have the authority to implement the necessary changes across the campus, and have the full support of the president.
3. Understanding that retention management is actually *more* important than enrollment management, since enrollment in college is just the first step toward fulfilling academic objectives. Retaining the students is a much more complex and long-term mission for the institution. Retention is responsible for approximately 75% of an institutions population and tuition revenues.

4. Colleges and universities spend a great deal of money recruiting and enrolling approximately 25 % of their total student population, and little money on keeping the remaining 75 % of their population. The fiscal problems many colleges and universities currently face could be alleviated if more students were retained. The fiscal problems many colleges and universities currently face could be alleviated if more students were retained. The following example illustrates the financial impact retaining students has on an institution. If the annual tuition is \$10,000 and one freshman student stays for all four years, the fiscal return on that student could be as much as \$40,000. For every student who transfers or drops out after the first year, the net income loss could be as much as \$30,000. When this is multiplied by the number of students who withdraw, the net revenue loss can be substantial.
5. The retention program should be practical, accountable, and flexible. Also to be assessed, evaluated, and changed as needed.
6. Faculty input, advising, and participation is crucial.
7. The social life of the campus, student activities, and cultural events and organizations are important components of increasing student satisfaction, which can translate in to the retention of students.
8. Retention management is about assisting each student with reaching his or her educational goals. Therefore, every component of the campus becomes involved in providing the assistance, services, and academic learning to support the attainment of these goals. This study determined SI has a significant impact on the

retention and graduation of students of color who attend SI. Therefore, SI is has been shown to be an important retention program to assist students of color

9. Attain their academic goals.
10. Retention must begin with solid research on which students are withdrawing and the reasons for their leaving, as well as a profile of which students persist and why. Leadership needs to understand their student population base and how this impacts enrollment and retention.
11. Research indicates that the first six weeks of the semester are the most critical for retaining first year students as they struggle to adapt to a new environment and academic challenges. Implementing programs that offer students support during this critical time is very significant to increased retention.
12. There must be a partnership between the director of enrollment management, the director of retention management, and other campus leadership (i.e., the director of institutional diversity).
13. Understand that there is no one right retention management program. It will depend upon the composition of the student body and the reasons why students leave. It is important to have a clear understanding of the population demographics.
14. Matching the enrollment and retention management design with the personality or culture of the institution, and giving the program enough time to develop.
15. Articulate the strategy behind the program to the appropriate campus constituencies, including the right staff people in designing the program, and

providing staff development to prepare and educate them on their role in the enrollment and retention process.

16. Just as there are different recruitment strategies based on market cohorts, there should also be specific retention strategies for different categories of enrolled students.

17. Most importantly, to develop and exhibit a caring attitude of faculty and staff, and to treat students as valued customers.

Supplemental Instruction programs address several of these factors for retention, namely: faculty input, advising, and participation; assisting each student with reaching their educational goals by providing assistance and services that support academic learning; providing academic and social support for students during the first six weeks of the semester; and faculty and staff exhibiting a caring attitude.

### ***Evaluation and Budgetary Issues Impacting Retention Programs***

With many state legislatures scrutinizing the merit and effectiveness of retention programs for at-risk college students, O'Hear and Macdonald (1995) contend that producing valid, defensible, and reliable statistical verification that a retention program is educationally sound has become increasingly more important. The SI research model developed by O'Hear and Macdonald (1995) presents statistical outcome measurement results in a straightforward format and style that is easily understandable and useful for decision makers, and affirmed the SI program is effective and improves retention.

In a higher education climate in which outcome measurements and cost effectiveness are a priority, program evaluation has become essential (Congos &

Schoeps, 1999). Once the impact of a retention program is known, the data can be used to justify current expenditures, demonstrate cost effectiveness, or support expansion and additional financial support. An institutional financial crisis often reveals the dichotomy that exists in higher education institutions regarding the importance of retention programs. While retention programs, such as SI, show increases in student retention and have a positive impact on cost effectiveness of the institution, retention programs are often viewed by institutional and state decision makers as being non-essential programs to be eliminated during a budget crisis. Thus, evaluation data from research such as that outlined in this study can be used to justify current expenditures, support program expansion, and additional financial support, as well as support continuation of retention programs during austere financial conditions.

The following example demonstrates the potential increase in institutional cost effectiveness resulting from the SI program. On average, an institution of higher education receives approximately \$5,000 in income (student tuition and state support) per student annually. Congos and Schoeps (1993) have indicated approximately a 10% greater reenrollment for students attending SI. Approximately 2,000 students attend MWU SI sessions annually, if 10%, or 200, of those students were retained, the institution would realize a total of \$1,000,000 annually in retained income. This yields considerable more income than the \$54,000 cost to administer a SI program at MWU for one year (Minority Student Services Annual Report, 2003). If the numbers hold true, this indicates SI is an effective and cost effective retention program.

According to Fowler (2000), it is important to use innovative decision-making through the evaluation of alternative policies in order to arrive at the best decision in

accordance with given goals, constraints, and conditions. At MWU, President Ewing (all names are pseudonyms) implemented three policy-planning committees to evaluate the financial conditions at MWU, to evaluate the program and financial restructuring plan, and to communicate the proposed action. President Ewing's actions follow Lowi's (1969) redistributive policy framework theory, in that he delegated decision-making power to the three policy-planning committees. The three committees include the Budget Review Advisory Council (BRAC), the Budget Restructuring Review Committee, and the Senior Staff Budget Advisory Group (SSBAG). During austere financial conditions, it is vital to the longevity of retention programs, such as SI, to effectively communicate with the planning committees the impact these programs have on the significant amount of retained income of the institution, as well as the academic success and retention of the students (Levin, 1992). The outcomes of these policy committees resulted in approval of the budgetary recommendation to provide on-going institutional funding to support the continuation and expansion of the SI program.

#### *Diversity and Retention Management at Mid-Western University*

The primary goal of Minority Student Services (MSS) is to provide services and support for students of color to remain in college and to persist to graduation (Minority Student Services Annual Report, 2003). To achieve this mission, MSS has instituted several programs to assist students succeed, such as: pre-college enrichment programs, GEAR-UP, ACE bridge program, mentoring, peer advising, scholarships, cultural organizations, cultural education, and SI. Each of these programs plays a significant role in the recruitment, growth, and retention of students of color at MWU.



Programs, such as SI, are important in that they teach students effective learning methods and study skills that are transferable to other courses and situations, and assist in achieving positive student outcomes. When coupled with other retention and support programs, the SI program can be a very powerful catalyst in helping students of color remain in college, successfully persist towards graduation, and attain higher levels of academic achievement.

According to Schroeder (1996), retention is highest in a nurturing campus climate, where there exist high expectations and beliefs that students of color have the capacity to succeed. At MWU this notion has been expressed through academic initiatives such as the increase in academic scholarships for students of color.

As noted in Mid-Western University's Strategic Plan for Achieving Diversity (2005), MWU's pursuit of excellence recognizes that an institutional culture of empowerment and inclusion has a positive impact on institutional performance and student learning. This is evidenced through early recruitment and retention initiatives, such as the College Excellence Enrichment Program (ACE) administered by MSS. Through this program, students of color graduating from high school who do not meet the minimum admission requirements, but show strong academic potential, are provided an opportunity to demonstrate their academic ability through a six-week summer program. SI is incorporated into the ACE program to provide the students with academic support. Students who successfully complete the six-week program are granted admission to MWU and participate in mandatory academic enhancement programs (i.e., SI) that assist the students with succeeding academically and persisting to graduation. MWU also sponsors two early recruitment and retention initiatives that target middle school and high

school students of color. The program initiatives include the Gaining Early Awareness and Readiness (GEAR-UP) program and the Upward Bound program. The programs are structured to develop excellent skills and provide college experiences at an earlier age, thereby, developing an early relationship with future MWU students.

MWU provides academic and cultural support for students by implementing many programs to support its mission to successfully retain and graduate students of color. The MSS office at MWU plays an integral role in implementing the majority of the institution's diversity and retention initiatives. In response to retention issues, Supplemental Instruction was first implemented at MWU in 1995 as part of a federally funded TRIO grant aimed at improving the academic success of students of color. At its inception at MWU, SI was offered for six courses and was administered by Minority Student Services. The SI program was adopted as a university funded academic assistance program in 1997, continues to be administered by Minority Student Services, serves over 2,000 students each academic year, and now offers SI in 20 courses.

MWU has an overall undergraduate population of approximately 18,000 students, with 9% being students of color. The MWU SI program is one of the largest in the state, and the only SI program, nation-wide, administered in an institutional diversity office and not in an academic assistance program office. The MWU SI program is cited, by name, in Mid-Western University's Strategic Plan for Achieving Diversity (2005) as a program to achieve the institution's objective of retaining students from under-represented groups.

The Peer Advising program reinforces the academic assistance programs by providing a humanistic student-oriented component where students explore variables in their lives that have positive and negative influences on their academic success. Students

of color often find it easier to confide in peers regarding their concerns, fears, and daily tribulations (Boen, 1989; Dalton, 1991; Hayes & Heng-Rue, 1994). This is attributed to many of the peer advisors having experienced similar issues, being able to provide cultural support, and relating positive solutions for handling issues students of color face at predominantly white institutions (i.e., racial discrimination) (Boen, 1989; Dalton, 1991; Hayes & Heng-Rue, 1994 ).

Formal mentoring programs, such as AMIGOS (Arranged Mentoring for Instructional Guidance and Organizational Support), can also be supportive to the academic success of students of color (Stromel, 2000). In addition to academic assistance, this type of mentoring program can provide the student with coaching, protection, role modeling, acceptance, counseling, and friendship. It is important for faculty and staff to be involved in mentoring students of color to provide encouragement, serve as the students advocate, and develop a professional connection to the institution. The Office of Graduate Studies and the Office of International Education have also implemented initiatives to respond to the MWU goals, such as the King-Chavez-Parks (KCP) Future Faculty Initiative, International Student Graduate Studies, and the McNair Scholarship program.

The question of why ethnic identity can be a resource and at other times an obstacle to academic achievement for students of color has been addressed by two explanations, blocked opportunities and cultural differences. In his cultural ecological theory, Ogbu (1992, 1995) asserts that the students' recognition of their ethnic group's social status affects their educational endeavors. The cultural ecological model identifies the following types of minority groups: 1) autonomous minorities – minority groups that

have educational parity with whites (i.e., Jews); 2) immigrant minorities – groups that have become part of the society voluntarily to enhance their economic and political well-being, and may excel in school due to motivation and self-selection (i.e., Asians); and 3) voluntary minorities – individuals who have chosen to become part of the United States society and are described as having optimism regarding education as a key to success in the United States (i.e., Hispanic/Latinos); and 4) involuntary minorities - groups that have become part of a society through slavery and conquest, and view education as an inefficient means for economic success (i.e., African-Americans and Native Americans).

To explain academic success among minority students Trueba and Zou (1994) developed a theory based on cultural differences of social identification and achievement motivation. This theory consists of three propositions: 1) the knowledge of home languages and cultures allows students of color to retain a strong self-concepts and affiliation to the larger ethnic group and draw on this affiliation for increased motivation to achieve academically; 2) possessing strong ethnic identities empower students of color to acquire the social skills necessary to successfully navigate and thrive in new learning environments; and 3) having a sense of obligation and responsibility to achieve academically in higher education to serve their respective ethnic groups is a phenomenon that proves empowerment for students of color and their families, as well. For educators to view the academic achievement of students of color separate from their culture and social context is to misunderstand them. At the same time, it is important for educators to also understand that each ethnic group learns and achieves differently from each other, and that individuals within each ethnic group also learn differently from each other. Therefore, students of color need to be viewed not only as a student of color associated

with specific ethnic group, but also as an individual with their own specific identity and academic strengths and weaknesses.

According to Eimers and Pike (1997), students of color are most successful when their academic training is complemented by social, cultural, and artistic development. Furthering this position, Clements (2000) suggests that a strong social, academic, and cultural support structure enhances the retention, persistence, and academic success of students of color. This concept is supported and expressed in Mid-Western University's Minority Student Services Mission Statement (2005). MSS provides cultural and social support for students of color at MWU by sponsoring activities, programs, events, organizations, clubs, fraternities and sororities, to offer a wide range of opportunities for students to participate, meet others, and develop a sense of belonging and connectedness to the university. This is especially important at predominantly white campuses, such as MWU, in which students of color show a tendency to travel to their homes of origin during their time off to be with family and cultural surroundings (Minority Student Services Peer Advisor Manual, n.d.). It is important to provide social and cultural activities to increase the amount of time the students spend on campus in order to develop a sense of belonging. To promote the existence of a pluralistic campus environment, MSS coordinates monthly cultural heritage celebrations to encourage all students, faculty, and staff on campus to participate and intermingle.

As incidents of racial and other forms of harassment on college campuses rise, many institutions have taken measures to develop and adopt codes of conduct prohibiting discriminatory harassment (Weinstein, 1990). Mid-Western University's core values (2005) stress the importance for respect and civility in the treatment of others, and

creating a community that values diversity. The MWU Office for Institutional Diversity (2005) actively promotes an institutional culture that fosters and values human diversity. In response to reducing incidents of discriminatory harassment on campus, the Office of Residence Life and MSS collaborated to develop the Multicultural Advisor Program to assist with policing prejudice in the residence halls. The multicultural advisors provide training on diversity issues, and serve as mediators whenever discriminatory conflicts arise in the residence halls. The Affirmative Actions Office, Office for Institutional Diversity, MSS, and Multicultural Center have staff employed to provide training and mediation with a multitude of diversity issues, and serve as advocates for students experiencing discriminatory harassment.

Mid-Western University's Strategic Plan for Achieving Diversity (2005) provides a comprehensive document that is proactive and aggressive. Although the Office for Institutional Diversity serves a leading role in promoting the concept of an institutional culture that fosters and values human diversity, MWU's Strategic Plan for Achieving Diversity (2005) calls for collaboration across campus to strengthen existing activities and initiate new programs that facilitate meeting MWU's diversity goals. The document outlines the responsibilities, expectations, and accountability of each division and office within the institution in providing proactive management of diversity.

Swail, Redd, and Perna (2003) argued there are four critical junctures that need to be addressed in order to institute effective retention programs for students of color. The first is with the K-12 educational system and its effectiveness in preparing students for college. It has been indicated that completing a rigorous curricular program during high school is a more important predictor for college persistence than test scores, such as

yielded by the ACT or SAT. The second juncture is graduating from high school.

According to Swail, Redd, and Perna, in 2000 43% of Hispanic/Latino students, 21% of African-American students, 20% of Native American Students, and 14% of Asian students had not completed high school. MWU supports summer pre-college enrichment programs and parent programs that focus on providing students of color information, tools, and skills to assist with academic preparation for college and graduating from high school.

The third juncture is enrollment in college. Annual college enrollment rates for students of color have generally increased among high school graduates, however, the graduates enrolled in a degree-granting institution remains low (Swail, Redd, & Perna, 2003). MWU recruiting, admissions standards, summer pre-college enrichment programs, bridge programs, orientation programs, and parent programs address enrollment issues.

The final juncture is persistence in college to degree completion. According to Swail, Redd, and Perna (2003), only 30% of Native American students, 46% of African-American students, and 47% of Hispanic/Latino students who first enrolled in a four-year institution in 2000 actually completed a bachelor's degree within six years. However, 72% of Asian students completed a bachelor's degree within six years. The following MWU retention programs address the issues of persistence in college to degree completion: developmental courses, first generation student programs, parent programs, multicultural learning communities, student organizations and activities, cultural celebrations and activities, service learning programs, diversity awareness and sensitivity programs, cultural centers, faculty and staff involvement, honors and scholarship programs, and campus academic assistance programs.

Terrell and Wright (1988) have recommended several components for the successful enrollment and retention of students of color, many of which the MWU Minority Student Services office has incorporated to meet the needs of the students they serve, and to attain their mission of enrolling and retaining students of color at MWU. Following are examples of specific programs MWU Minority Student Services has implemented:

1. Preadmission to graduation – summer pre-college enrichment programs, GEAR-UP, ACE bridge program, orientation programs, and parent programs
2. New student orientation programs – summer orientation programs, parent programs, beginning of semester Get Acquainted Day cultural event
3. Bridge programs – summer pre-college enrichment programs, GEAR-UP, ACE bridge program, orientation programs, and parent programs
4. Parent programs – each of the following programs have a parent component: summer pre-college enrichment programs, GEAR-UP, ACE bridge program, orientation programs, and individual parent programs
5. Mentor programs – formal faculty, staff, and student mentor programs are offered
6. Peer counseling programs – trained peer counselors program
7. Leadership and organizational development – cultural and student organization with leadership development components, formal scholarship and leadership programs for students of color, leadership seminars, educational workshops, and conferences



8. Promotion of cultural diversity – cultural events, celebrations, seminars, workshops, individual education and training programs for faculty, staff, and students

Thompson (2007) describes three categories of benefits students gain from participating in academic assistance and retention programs: educational, fringe, and existential. Educational benefits can be attributed to the college experience and include changes in the student in terms of intellectual capacity and skills, values, attitudes, and interests. Fringe benefits are described as outcomes related to the institutional credentials the student receives that provide certain social and occupational advantages (i.e., the sheepskin affect). The existential benefits are defined by the quality of the college experience itself, peer contacts, interactions with faculty, extracurricular and academic experiences, and recreational activities. In terms of the overarching focus of this study, the SI program provides benefits in all three categories in terms of enhancing the students' intellectual capacity and skills, retention and persistence to graduation, and providing an engaging environment for peer contact, interactions with faculty, and expanding their academic experiences.

#### Learning, Academic Achievement, and the Impact of SI

According to Thompson (2007), despite the continued growth in the nation's minority population, little progress has been made in increasing enrollment and retention of students of color in colleges and universities. Additionally, educational attainment levels continue to be substantially lower for African-American, Hispanic/Latino, and Native American students than that for white and Asian students (Swail, Redd, & Perna,

2003). To address these issues, colleges and universities must develop recruitment and retention programs that have a particular emphasis on attracting and retaining students of color. Benefits students of color acquire through retention programs include: the development of their ethnic identity, increased self-concept of academic ability, opportunities for academic and personal success, and the engagement of social support (Moxley, Najor-Durack, & Dumbrigue, 2001). When students utilize programs, such as SI, the academic achievement they obtain helps develop their confidence and self-concept of academic ability, pride in academic and personal success, motivation to continue to achieve in many different areas, and an overall development of their academic identity (Benton, 2006; Torres, Howard-Hamilton, & Cooper, 2003).

### *Learning Styles and Academic Achievement*

Academic achievement has been defined as “a measure of one’s success within a formal educational system, as evaluated by some universally recognized hierarchy of common indicators (like grade point average, IQ, and math and reading achievement test scores)” (Benton, 2006, p. 15). Academic achievement is influenced by factors external and internal to the individual, and is also sometimes judged by the volume of an individual’s accomplishments (i.e., by the number of academic awards received).

Taking the notion of academic achievement further, Kohn (2004) challenges the views and definitions of what it means to be “well-educated” and redefines “intelligence.” His analysis of these concepts presents overarching inquiries, whose answers could reshape the delivery and assessment of education across the country. Kohn posited that the true purpose of education may be that the qualities of the school are likely

to offer a good education versus a good education based on a student attaining a bachelor's degree without having the job skills necessary for the occupation of choice. Are we teaching students to think for themselves or simply do what they are told? Likewise, colleges and universities have transformed from being teacher-centered to learner-centered, which has shifted the focus from the quality of teaching to the quality of the learning (Barr & Tagg, 1995). By looking at the intellectual debates regarding these philosophical questions and changes, educational practitioners can gain a better understanding of student learning, teaching methodology, educational needs of students, and how these issues can impact the academic achievement and retention of students of color.

Furthering these views on educational delivery, Astin (1971, 1982, 1985) argued there is a conflict between equity and excellence in higher education caused by a continuing reliance on the reputation and resource conceptions of excellence. Many colleges and universities continue to perpetuate the view that students with good grades and high test scores are seen as an important resource that enhances the institution's reputation. While students with lower grades and test scores are viewed as a liability that detracts from institutional excellence. Many colleges and universities continue to take the stance that the fundamental reason for selective admissions (i.e., high school GPAs and standardized test scores) is to establish and maintain academic standards. According to Astin (1971, 1982, 1985), academic standards represent the level of performance the student must demonstrate in order to be awarded particular grades or to earn a bachelor's degree. Astin (1971, 1982, 1985) challenges the traditional definitions of academic standards and the argument that lowered admissions standards erodes academic

standards. In his view, changing admissions standards upon entrance to college does not lead to changed final exit performance standards.

To explain this concept, Astin (1985) provides an analogy. For example, if a patient is admitted in to the hospital more seriously ill than a typical patient at the hospital, the hospital does not automatically set lower exit performance standards for that patient. It is presumed that through medical intervention, rehabilitation, and support that all patients will eventually get over their illnesses and be healthy, productive citizens when they leave the hospital. The same is true for students of color entering the college or university at different levels of academic preparation and ability. The college may need to provide more support (i.e., bridge programs), intervention (i.e., remedial courses), and academic assistance (i.e., SI) for students with lower levels of academic preparation and ability, but ultimately all students must achieve academically and meet the expected exit performance standards for attaining a degree. This puts the ownership and responsibility for student outcomes back on to the colleges and universities for ensuring the quality of education being delivered meets the needs of all students and results in academic achievement and degree attainment (Thompson, 2007). From Astin's (1971, 1982, 1985) talent development perspective, excellence of a college or university depends less on who is admitted and more on what the institutions do for the students once they are admitted. In other words, excellence is measured in terms of how effectively colleges and universities develop educational talents of students, rather than the level of developed talent students' possess when they enter.

According to Dunn and Griggs (1995), how individuals prefer to learn is called their learning-style preference, and involves the way an individual concentrates on,

processes, and retains new and difficult information. Since students in elementary and secondary schools have historically been taught in the same way, without differentiating between the ways individual students process information and prefer to learn, many students entering college have not developed their learning-style preference (Goodlad, 1984). This can often account for lower high school grade point averages and standardized test scores for students that have been attempting to learn using a style that is not natural for them. This is especially true for students of color whose learning-style preferences often do not conform to mainstream teaching methods (Sullivan, 1996).

Studies have shown that students taught through their learning-style preference received higher test scores and grade point averages (Andrews, 1990; Stone, 1992; Turner, 1994). To assist college students realize and develop their learning-style preferences, it is necessary to use a comprehensive model with a related instrument designed to reveal individual styles (DeBello, 1990). One prevalent model widely used is the Dunn and Dunn (1992, 1993) learning-style model. This cognitive-style theory suggests that individuals process information differently based on either learned or inherent traits. Since some traits are not observable, instructors often misinterpret student behavior and misunderstand their traits and preferences. This model explores the individual's traits and preferences in holistic terms relating to whether the individual is an auditory, visual, oral, or kinesthetic style of learner (Dunn & Dunn). Following are examples of these different learning-style preference: 1) auditory – many students require quiet while concentrating, while other learn better listening to music; 2) visual – many students concentrate better in brightly illuminated rooms, while others think better in soft lighting, also often prefer to be seated in the front of the classroom so they are not

distracted by the movements of others; 3) oral – often ask questions, prefer group discussion scenarios, learn through tutoring or explaining course material to others; and 4) kinesthetic – participate in note-taking during lectures, may have a preference for seating arrangements and the temperature of the room.

One method that can be used to unobtrusively obtain clues regarding a student's learning-style preference is observing them when they are given verbal travel directions. The individual is utilizing the auditory style if they simply listen to the directions, an individual with a visual style will need to look at a map, the oral style learner will repeat the directions back to the person providing the verbal instructions, and the kinesthetic learner will either move their hands or body to walk through the directions in a physical manner. It is important to remember that there is no one right learning-style preference or way to learn. The key concept for educators is to be perceptive and to use the individual's learning-style preference when teaching them difficult material and in developing their strengths. When multicultural and learning-style preferences are respected and accommodated instructionally and socially, students perform better academically (Sullivan, 1993).

With the shift to a more learner-centered focus, colleges and universities now must document that student learning outcomes are being met. These student learning outcomes will not be realized unless colleges and universities teach specific learning strategies to students who enter college with little or no understanding of the learning process (Barr & Tagg, 1995). To perform well in college requires higher-level thinking skills (i.e., analysis, synthesis, and evaluation). Introducing students to the benefits and importance of different levels of learning will become more crucial with the growth and

shifts in demographic composition in student populations. Bloom's Taxonomy model (Stone, 2006) presents the different levels of learning necessary for lasting learning to occur: knowledge, comprehension, application, analysis, synthesis, and evaluation.

The theoretical foundation for the SI model emphasizes information processing and student-centered learning activities, involving the behaviorism, cognitivism, and constructivism (Stone, 2006). The basic tenet of the behaviorism learning theory is that learning is represented by a change in behavior, and that this change can be brought about by training the learner to respond appropriately to stimuli. From the behaviorist point of view, the learner is seen as passive, and learning occurs when the correct response is provided the majority of the time (Stone, 2006). The basic tenet of the cognitivism theory of learning is the importance of understanding what is happening in the mind of the learner (Bates & Poole, 2003; Donovan, Bransford, & Pellegrino, 1999). Cognitivists view learners much like computers, in that learners are active information processors who receive information, process it, store it, and retrieve it for use in problem solving and other learning tasks. The basic tenet of the constructivism learning theory is that learning is viewed as a process where learners integrate information they are receiving with information they already know to construct their own understanding of a concept (Vygotsky, 1986). The constructivists emphasize the ultimate goal is for the learner to develop their own conceptual framework.

### *Impact of SI on Academic Achievement and Retention*

Supplemental Instruction (SI) has proven to be effective in teaching students how to learn and in motivating them to want to learn (Stone, 2006). SI is an important

mechanism for introducing students to the learning process, engaging them in collaborative learning activities, and providing a collegial environment that increases motivation to engage in learning (Stone, 2006). The SI program addresses both the academic achievement and retention issues of students of color, as well as instructs students how to develop higher-level thinking skills, as described earlier through Blooms' Taxonomy model (Stone, 2006). SI is based on several different learning principles (i.e., behavioral, cognitive, social interdependence, and interpretive-critical), which strive to break the cycle of learned helplessness (University of Missouri-Kansas City, 2005). Multiculturalism and learning styles of students of color, by individual ethnicity, have also been examined (Dunn & Griggs, 1995). The correlation of these differing theories in relation to the instructional methods of the SI program, provide a theoretical background contributing to the manner in which the SI program is implemented and conducted for students of color.

In accordance with changes of teaching practices and the measurement of student academic success proposed through recent literature, the SI program provides several benefits to colleges and universities in supporting the achievement of these new responsibilities. The SI program also address Astin's (1971, 1982, 1985) notion of talent development by focusing on assisting students in developing educational talents and learning skills that they did not possess when they were first admitted to the university. In relation to Trueba and Zoe's (1994) premise of the need to understand how ethnic groups learn similarly and differently among and with the groups, the SI program provides both group and individual peer-instruction. According to Goodlad (1984), many students entering college have not developed their learning-style preference. The SI program



addresses this issue and trains the SI leaders in methods to assist students in understanding and developing their individual learning-style preferences. Finally, the modalities of learning (i.e., auditory, visual, oral, and kinesthetic) presented in Dunn and Dunn's (1992 & 1993) learning-style model are also explored with the students attending SI sessions in the development of their learning-style preferences.

### Evaluation of Student Outcomes

As noted, the accountability movement requires assessment of student learning. Specifically, student outcomes are interrelated to the following SI program goals: a) course completion, b) study skills development, c) ownership for academic success and progress, and c) retention and persistence to graduation. The course completion is met if the student remains enrolled throughout the semester and passes the course with a grade of D+ or higher. Strategies and techniques taught during SI sessions to develop the students' study skills include how to prepare for class, note taking, terminology flash cards, test taking strategies, practice tests, reading comprehension, organizational skills, class participation, and meeting with the professor. Since attendance for SI sessions is voluntary, the student's motivation to succeed academically drives their participation, thereby, promoting ownership for academic success and progress. The student's academic progress is tracked throughout the semester by the SI leader and discussed with the student at individual private meetings.

The student's retention and persistence to graduation is the ultimate goal of the SI Program, as well as the main focus of this research investigation. The student's reenrollment status is tracked to determine whether the goal is being met. For the purpose

of this research investigation, the extent to which there is a difference between the retention and graduation rates of students of color at MWU who attend SI to students of color at MWU who do not attend SI will be measured.

### Summary

With colleges and universities enrolling a more diverse student population than at any other time in American history (Aragon, 2000; Jalomo, 2000; Terenzini, 1996), emphasis on the importance of diversity and retention of students of color has come to the forefront of higher education. Accordingly, with state legislatures scrutinizing the merit and effectiveness of retention programs for at-risk college students, O'Hear and Macdonald (1995) contended that producing valid, defensible, and reliable statistical verification that a retention program is educationally sound has become increasingly more important. The SI research model presents statistical outcome measurement results in a straightforward format and style that is easily understandable and useful for decision makers. Once the impact of a retention program is known, the data can be used in making programming decisions, such as justifying current expenditures, demonstrating cost effectiveness, or supporting expansion and additional financial support.

In response to retention issues, Supplemental Instruction was first implemented at MWU in 1995 as part of a federally funded TRIO grant aimed at improving the academic success of students of color. At its inception at MWU, SI was offered for six courses and was administered by Minority Student Services. The SI program was adopted as a university funded academic assistance program in 1997 and continues to be administered by Minority Student Services.

Mid-Western University's goals and institutional priorities (2005) promote diversity and multiculturalism by creating and nurturing an environment that attracts and retains students, faculty, and staff who embody and promote cultural, racial and global diversity. MWU has exemplified Richardson's (1991) six ways universities can maintain quality and diversity:

1. Help students of color graduate by increasing student retention initiatives and promoting academic success,
2. Plan strategically,
3. Encourage perception of comfort,
4. Expect support from faculty,
5. Present reflective curricula, and
6. Promote diversity (p. 3).

Since racial diversity was virtually absent at the inception of the majority of higher education institutions in the United States (DuBois, 1969), most universities have a social climate and organizational culture that incorporates norms, traditions, and values shared primarily by white students. Issues students of color face at predominantly white universities (i.e., feeling like a fish out of water, the only, twoness double consciousness, and racial identity development) demonstrate the need for continued existence of multicultural centers, minority student services, multicultural counselors, faculty and staff of color, and organizations and activities specifically designed for students of color. Five common themes have emerged that present as barriers for students of color: 1) academic preparedness; 2) campus climate/environment; 3) commitment to educational goals and

the institution; 4) social, cultural, and academic integration; and 5) financial aid (Swail, Redd, & Perna, 2003).

Bean (1983) postulated that understanding how students of color become socially and academically integrated into college is critical to improving their retention. Students of color attending predominantly white universities with minimal cultural diversity also have a cultural dimension to integrate in addition to the social and academic integration faced by all students (Tinto, 1986, 1997). When multicultural and learning-style preferences are respected and accommodated instructionally and socially, students perform better academically (Sullivan, 1993). Therefore, it is important to structure the institution's environment so more diversely prepared students can succeed (Richardson, 1991). Since students of color often express apprehension about being equipped to handle the academic rigors of college and becoming academically integrated (Nora & Cabrera, 1996), academic integration is a particularly important factor on the successful persistence to graduation for students of color (Tinto, 1986, 1997; Terenzini, 1994). Retention programs, such as Supplemental Instruction (SI), focus on promoting academic success by increasing the quality of education and lowering the rate of attrition (Burmeister, 1993). A recent study of the SI program (Telfer, 2003) demonstrated that SI significantly improved the GPA for students of color that attended SI sessions at Mid-Western University (MWU). The purpose of this quantitative investigation is to measure the extent to which there is a difference between the retention and graduation rates of students of color at MWU who attend SI to students of color at MWU who do not attend SI.

The conceptual model in Figure 2.1 outlines the main concepts of the study. The overarching theoretical constructs of the study include the principles of Supplemental Instruction, theories of retention and persistence to graduation, and ideology of diversity and students of color. MWU provides academic and cultural support for students through diversity and retention initiatives. The MSS office at MWU plays an integral role in implementing the majority of the institution's diversity and retention initiatives. The implementation of these initiatives is influenced by political and budgetary issues, as well as retention theories and research. The initiatives include retention programs, such as the Supplemental Instruction program. The experiences of students of color at MWU are influenced by: social and academic integration; the students' level of commitment, academic preparedness, learning style, and sense of belonging; the campus and community culture at a predominantly white university; personal life issues; and retention programs, such as SI. The student outcomes include successful course completion, development of study skills, students' ownership for academic success and progress, and the students' retention and persistence to graduation. These outcomes are instrumental in evaluating if the SI program goals were met, and whether there was an increase in the retention and graduation rates of students of color attending courses offering SI.

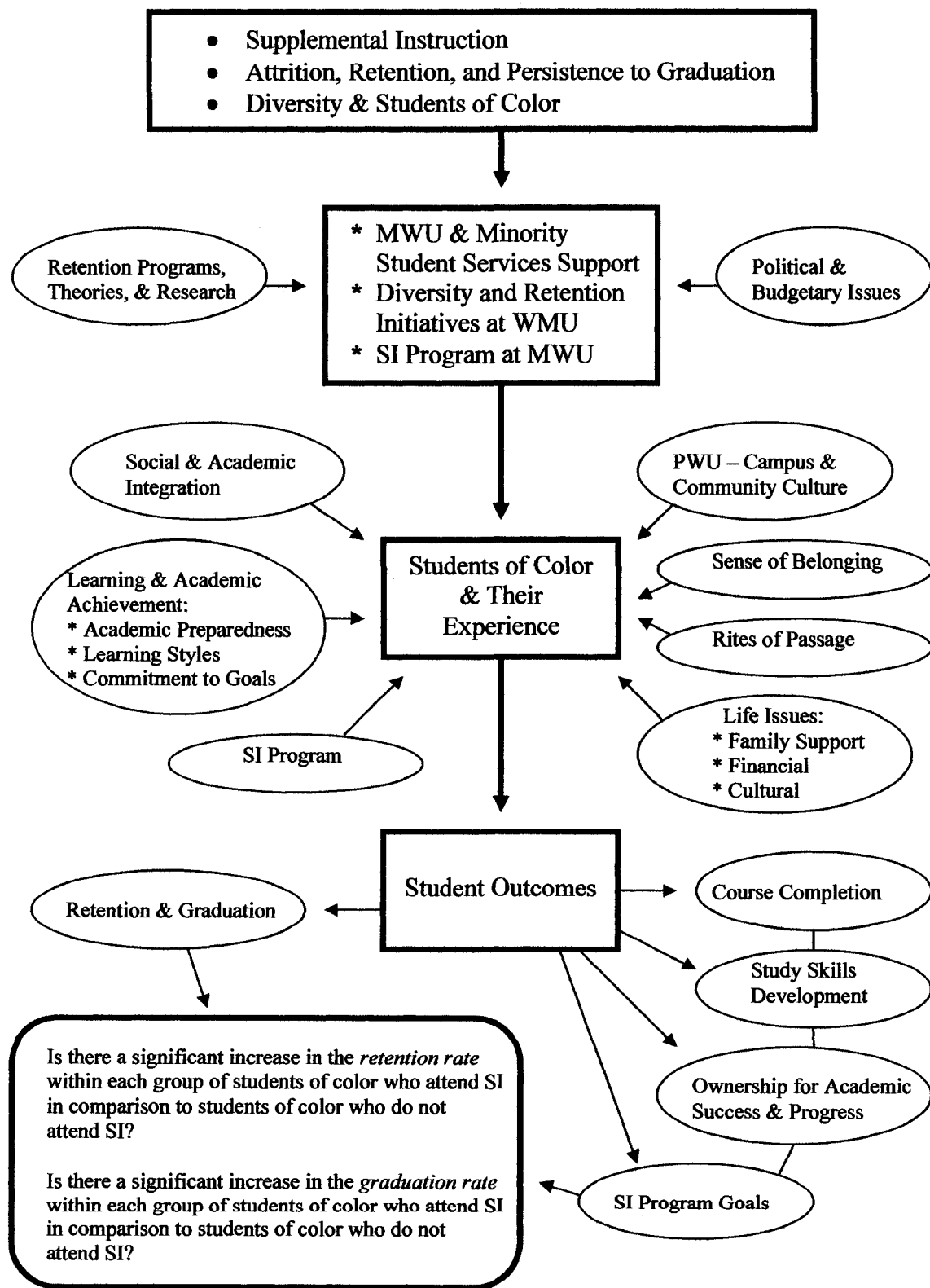


Figure 2.1. Conceptual Model of SI and the Retention and Graduation of Students of Color

## CHAPTER III

### METHODOLOGY

The research questions at the heart of this study were: 1) is there a significant increase in the retention rate within each group of students of color who attend SI in comparison to students of color who do not attend SI; and 2) is there a significant increase in the graduation rate within each group of students of color who attend SI in comparison to students of color who do not attend Supplemental Instruction (SI). A quantitative methodology was employed for this research. According to Green and Salkind (2003), the goal of multivariate descriptive statistics is to portray accurately and succinctly data from multiple variables. Thus, a quantitative approach best serves this investigation because each participant has scores on three variables (two factors – Ethnicity & SI Attendance; and one dependent variable – Enrollment or Graduation Status). In addition, this study was non-experimental in nature, utilized ex post facto data, and involved the testing of hypotheses. Based on the research questions, the hypotheses for this study were:

HØ1: There will be no significant increase in the retention rate within each group of students of color who attend SI in comparison to student of color who do not attend SI.

HØ2: There will be no significant increase in the graduation rate within each group of students of color who attend SI in comparison to student of color who do not attend SI.

The purpose of this chapter is to provide an overview of the quantitative research methodology and rationale, research design, population and sample, data collection,

instrumentation, data analysis, and the SAS FREQ procedure formula statement design. This quantitative investigation involved a causal-comparative, ex post facto method of research, using the Cochran-Mantel-Haenszel chi-square technique. The population of this investigation was Mid-Western University (MWU) undergraduate students of color. Archival data for the time period beginning in the Fall semester of 2001 through the Fall semester of 2002 was utilized in this investigation. The students' enrollment and graduation status at the end of the Spring semester of 2007 was analyzed in the comparison. The rationale for using the Spring 2007 data to measure the enrollment and graduation status of the students included: 1) the premise that all classification of students in the study, including those classified as first semester Freshman during the Fall semester of 2002, would have five years to achieve graduation by the end of Spring semester 2007; and 2) the MWU Office of Institutional Research would have the student enrollment and graduation data from the end of Spring semester of 2007 analyzed and available by August 2007 to begin the data analysis of this investigation.

The unique placement of SI in the Minority Student Services office at MWU provided an outstanding research opportunity for examining the impact SI has on the retention and graduation rates of students of color. This setting is unique given the location of services for minority students within a diversity department versus in an academic unit. A goal of this study was to provide educational administrators and SI program coordinators a research process, easy to understand and implement, to ascertain the impact of retention programs on the students of color at their institutions.

The remainder of this chapter includes a more detailed review of the research paradigm, population and sample, instrumentation, procedures for collecting data,



consideration of human subjects, the analysis of data, SAS formula statement design, and theoretical constructs of the study.

### Research Paradigm

The use of a causal-comparative and ex post facto investigation was chosen because the research involved research conducted on events or conditions that already occurred (i.e., archival data from the Telfer (2003) study). This archival data set included all students of color at MWU who were enrolled in courses that offered SI for the time period beginning in the Fall semester of 2001 through the Fall semester of 2002. This research investigation utilized the archival data set from the Telfer (2003) study to further investigate whether SI attendance had an impact on the graduation and retention rates of students of color at MWU by using the Cochran-Mantel-Haenszel chi-square technique for each research question. The Pearson chi-square was also used in this study as a secondary analysis because it detects any kind of association, especially when using 2 X 2 tables (SAS Institute, 1999). The one-way ANOVA model was not used in this study because the groups were not randomly selected and the comparison involved more than two variables. The two-way analysis of variance (ANOVA) between-subjects technique was not used in this study because the data are categorical variables and not continuous variables. Based on the following criteria (Green & Salkind, 2003), the Cochran-Mantel-Haenszel chi-square technique was used with each of the sub-population variables in this investigation:

1. the studies relate two between-subject factors to a single dependent variable (i.e., Enrollment or Graduation Status);

2. each participant has scores on three variables (i.e., Ethnicity, SI Attendance, Enrollment or Graduation Status); and
3. each factor divides cases into two or more levels while the dependent variable describes cases on a quantitative dimension (i.e., Ethnicity has four levels: African-American, Hispanic/Latino, Asian, and Native American; SI Attendance has two levels: Attended SI, Did Not Attend SI; Enrollment has two levels: Enrolled, Not Enrolled; and Graduation Status has two levels: Not Enrolled and Did Not Graduate, Not Enrolled and Did Graduate).

For each of the comparisons in this investigation, the  $F$  test was performed on the main effects for the two factors and the interaction between the two factors for each ethnic group. The  $F$  test was used to test the statistical significance of the differences among the means of the statistical hypotheses (Green & Salkind, 2003), because it tests for differences in the means of the dependent variable (i.e., Enrollment or Graduation Status) broken down by the levels of the independent variables (i.e., Ethnicity, SI Attendance). The students' enrollment status and whether they did or did not attend SI was analyzed in the  $F$  test comparisons for the first research question. The students' graduation status and whether they did or did not attend SI was analyzed in the  $F$  test comparisons for the second research question. The design model is a cross sectional approach for each subgroup of the students of color:

G1	X	01
G2		02

In the post hoc analysis, three summary Cochran-Mantel-Haenszel (CMH) correlation statistics (i.e., Nonzero Correlation, Row Mean Scores Differ, and General

Association) were used to adjust for the effect of Ethnicity in the data to test for the hypothesis of no association to determine the levels of significance between the retention and graduation rates of each group (SAS Institute, 1999). Differences were determined to be significant at the associated  $p$ -value of  $<.05$ .

Although in educational research, retention and graduation rates are typically treated as interval data, as they are in the t-test, ANOVA, and MANOVA, some theorists recommend treating this research data as ordinal level measurements (Congos & Schoeps, 1993). Theorists, such as Nunnally (1978), believe that treating retention and graduation rates as interval data is the most appropriate because using interval data for this investigation provided a common and equal unit between categories, a scale of measurement that could be added and subtracted, and a method for maintaining the integrity of the data and conclusions by reducing occurrences of data recording errors and outliers. Accordingly, this study treated the retention and graduation rates as interval data.

Following, Table 3.1 provides a graphic depiction of the research questions as they related to the Cochran-Mantel-Haenszel chi-square technique used for this quantitative investigation.

Table 3.1. *Is there a significant increase in the retention/graduation rate within each group of students of color who attend SI in comparison to students of color who do not attend SI?*

	Attended SI				Did Not Attend SI			
	AA	H/L	A	NA	AA	H/L	A	NA
# Enrolled/Graduated at the end of Spring 2007	35	10	9	10	34	8	9	3
# Not Enrolled/Graduated at the end of Spring 2007	36	19	12	7	90	53	31	11

*Note* AA = African-American, H/L = Hispanic/Latino, A = Asian, NA = NativeAmerican

In summary, this quantitative investigation focused on students of color enrolled in courses that offered SI in fall 2001 through fall 2002. The causal-comparative, ex post facto method of research, allowed for inquiry into the impact of participation in SI on retention and graduation rates for students of color at MWU. For each of the comparisons in this investigation, the *F* test was performed on the main effects and interaction between the two factors (i.e., Ethnicity and SI Attendance). The students' enrollment and graduation status and whether they did or did not attend SI were analyzed in the *F* test comparisons.

#### Population and Sample

The population of this investigation was MWU undergraduate students of color who were enrolled in courses that offered SI for the time period beginning in the Fall semester of 2001 through the Fall semester of 2002. Each study had eight subgroups: African-American students who have attended SI and those that did not, Hispanic/Latino students who have attended SI and those that did not, Asian students who have attended

SI and those that did not, Native American students who have attended SI and those that did not. Archival data from the Fall semester of 2001 through the Fall semester of 2002 was utilized in this investigation. The students' enrollment and graduation status at the end of the Spring semester of 2007 was analyzed in the comparison. This time span was chosen because, according to a MWU Office of Institutional Research (2005) longitudinal study 46% of a typical MWU freshman class will graduate within five years. This percentage does not increase in any notable increase if given more years to completion, thus, the premise was that if a student was going to graduate, it was likely it would occur within five years of enrollment. Therefore, data from the end of Spring semester 2007 were used.

At the time the Telfer (2003) study was being conducted, MWU had an overall undergraduate population of approximately 18,000 students, with 9% (1,620) being students of color. Of the 1,620 students of color, 377 students of color were enrolled in courses that offered SI sessions during the time frame of the Telfer (2003) study and voluntarily participated in the study (i.e., allowed their SI attendance, grades, and academic data to be used for research studies). The participants were identified by ethnicity from all courses in which SI was offered beginning with the Fall semester of 2001 through the Fall semester of 2002. The 377 students were then divided in to two subgroups: 1) students of color enrolled in courses that offered SI who chose to attend SI sessions; and 2) students of color enrolled in courses that offered SI who chose not to attend SI sessions. Therefore, based on the Telfer (2003) archival data set, there were 377 participants involved in this investigation. The remaining 1,243 students of color at

MWU were not enrolled in courses offering SI, therefore, were not part of the research study.

Each subgroup had a sample size greater than 15, which Green and Salkind (2003) stated is necessary to yield reasonably accurate  $p$  values. Figure 3.1 provides a flowchart summarizing the detailed population demographics of this study, and highlights the population dynamics of a smaller percentage of students of color in the final population reflecting the smaller number of students of color enrolled at this predominately white university.

Since this was a data-driven research study, there were no incentives and no selection process. All students who met the criteria of this research investigation (i.e., enrolled in a course offering SI at MWU beginning Fall semester of 2001 through Fall semester of 2002) were included. All students enrolled in courses offering SI at MWU were informed before SI sessions commenced that their individual grades and names would be held confidential. It was also disclosed that the grades and attendance of students in courses offering SI would be included in a course summary report and educational research studies, unless they declined being included. During the first two class meetings at the beginning of each semester students were given the opportunity to decline having their grade, name, and SI attendance information included in research studies and summary reports. For all courses offering SI beginning Fall semester of 2001 through the Fall semester of 2002 no student declined to have their information included. Therefore, all students of color enrolled in courses offering SI were included in the Telfer (2003) study and provided the data set for this research investigation. To protect confidentiality, once the Spring 2007 graduation and enrollment data was received and

computed, the data was cleansed of students' names and personal identification information and the spreadsheets destroyed by the SI program supervisor.

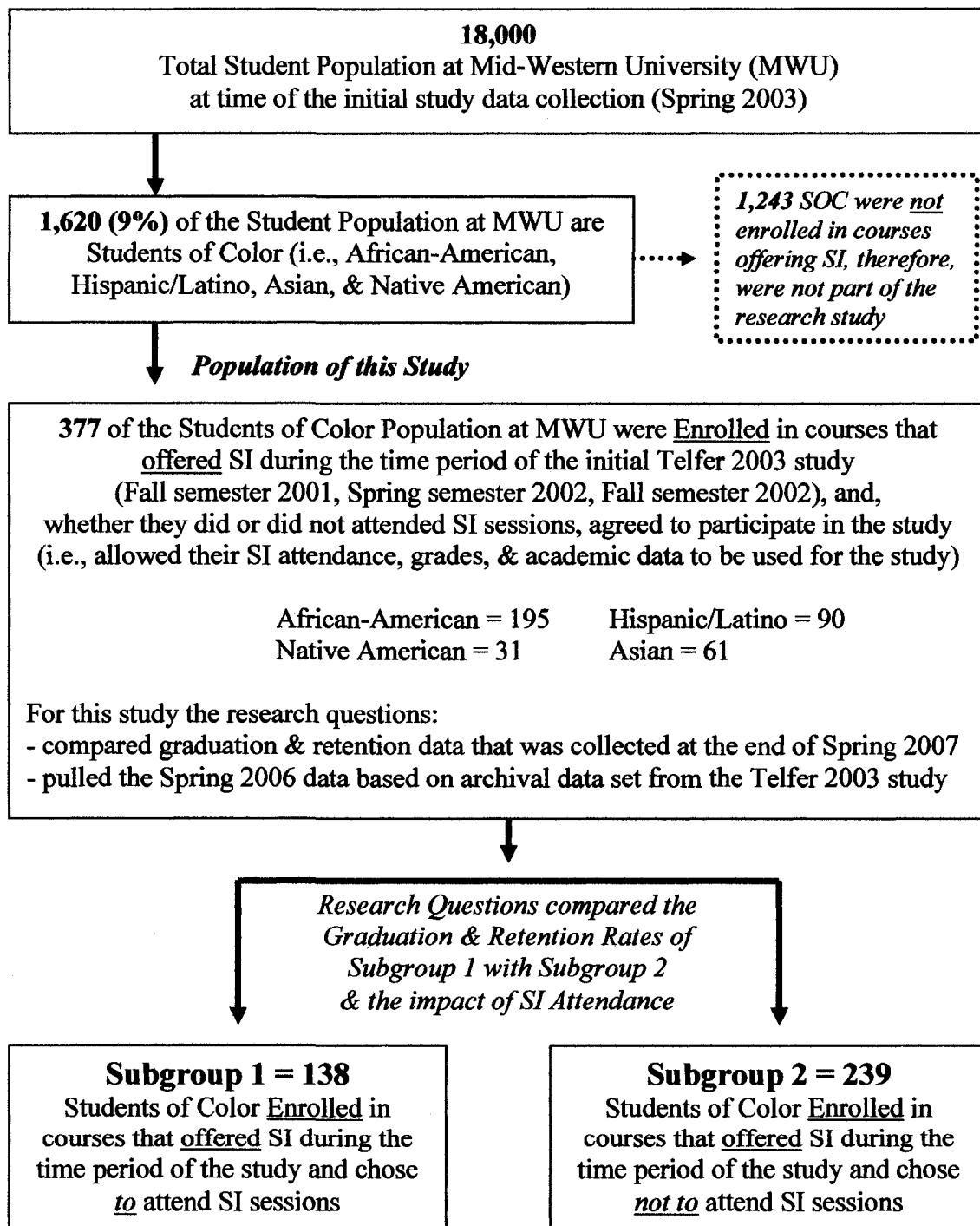


Figure 3.1. Population Demographics of Study

## Data Collection

The initial data set from the Telfer (2003) study provided the source for investigation of persistence and graduation rates for students of color at MWU. This archival data identified students who participated in the initial study and analyzed long range effects of the SI program on the graduation and retention of students of color at MWU. The students' enrollment and graduation status at the end of the Spring semester of 2007 was analyzed in the comparison. Archival data from the Spring semester of 2007 were used for this investigation, and were collected by the MWU Minority Student Services records and the Office of Institutional Research. In September 2007, the Office of Institutional Research prepared data reports to verify the accuracy and validity of the data obtained by Minority Student Services.

A letter was submitted to the MWU Minority Student Services SI program staff requesting the number of students, by ethnicity, from all courses where SI was offered beginning with the Fall semester of 2001 through the Fall semester of 2002, for each of the following categories: a) students of color who were enrolled at MWU during the Spring semester of 2007; b) students of color who were not enrolled at MWU during the Spring semester of 2007 and have not graduated; and c) students of color who were not enrolled at MWU during the Spring semester of 2007 and have graduated (See Appendix A). The letter included an attachment listing the participants of the Telfer (2003) study, by name and social security number, organized by ethnic group, course name, and whether they did or did not attend SI during the Fall 2001 through Fall 2002 time period (See Appendix B). The researcher was given written permission from the Director of



Minority Student Services to continue research regarding the SI program in conjunction with this study (See Appendix C).

Since this study involved data relating to human subjects, an application form and letter was submitted to the MWU Institutional Review Board (IRB) requesting permission to utilize the data set collected during the researcher's earlier study (Telfer, 2003) for further investigation (See Appendix D). The aggregated data retrieved from Minority Student Services for this study did not include personal identifiers of the students involved, only summary numbers by ethnic group for each category being investigated. To protect the confidentiality of the participants, the spreadsheets listing the students' names and social security numbers attached to the letter requesting data from Minority Student Services (MSS) were destroyed once the data were retrieved.

The requested data were retrieved by the Minority Student Services SI program staff from the archived SI records and the GQL/SAS computerized student registration and information system. The MSS SI program staff are trained and were provided authorization by the Office of Institutional Research to use the GQL/SAS system to retrieve student information in relation to the SI program and students of color. The aggregated data from the Spring semester of 2007 provided by Minority Student Services was anonymous, de-linked, and contained no personal identifiers. The MWU Minority Student Services office provided the summarized numerical data in the summary spreadsheets to this investigator in September 2006 (See Appendix E). Due to a change in MWU computerized student registration and information system the data was required to be collected by Minority Student Services a second time in August 2007. In August 2007, formal requests were submitted to the Office of Institutional Research to prepare data

reports to verify the accuracy and validity of the data obtained from the new computer system by Minority Student Services (See Appendix F). The Office of Institutional Research prepared and submitted the data reports to this investigator in September 2007.

### Data Analysis

The researcher analyzed the aggregated data compiled by the MWU Minority Student Services office and Office of Institutional Research using the Cochran-Mantel-Haenszel chi-square technique, for the study of each sub-group of interest. As noted, participant in the study have scores on three variables (two factor/independent variables – Ethnicity & SI Attendance; and one dependent variable – Enrollment or Graduation Status). The first research question data analyzed the extent to which there was a significant increase in the retention rate within each group of students of color who attend SI in comparison to students of color who do not attend SI. The second research question analyzed the extent to which there was a significant increase in the graduation rate within each group of students of color who attend SI in comparison to students of color who do not attend SI.

The *F* test was performed on the main effects and interaction between the two factors (i.e., Ethnicity and SI Attendance). In accordance with Green's and Salkind's (2003) follow-up analyses, because the main effect for SI involves more than one level, follow-up tests were conducted to evaluate pair wise differences among the two levels (i.e., participants who attended SI, and participants who did not attend SI) averaging across ethnicity. The students' enrollment status and graduation status was analyzed in the comparisons. In the post hoc analysis, three summary Cochran-Mantel-Haenszel

correlation statistics (i.e., Nonzero Correlation, Row Mean Scores Differ, and General Association) were used to adjust for the effect of Ethnicity in the data to test for the hypothesis of no association to determine the levels of significance between the retention and graduation rates of each group (SAS Institute, 1999). Differences were determined to be significant at the associated  $p$ -value of  $<.05$ . The significance of the test (i.e., the  $p$  value) ensures the repeatability, reliability, and validity of the study. Joppe (2000) defines reliability as “the extent which results are consistent over time and provide an accurate representation of the total population under study. If the results of a study can be reproduced under similar methodology, then the research instrument is considered to be reliable.” (p.1) According to Patton (2002) “validity determines whether the research truly measures that which it was intended to measure or how truthful the research results are. Researchers generally determine validity by asking a series of questions, and will often look for the answers in the research of others.” (p. 71)

As noted, Green and Salkind (2003) stated that the Cochran-Mantel-Haenszel chi-square technique yields reasonably accurate  $p$  values with populations with a sample size greater than 15 cases per group. This investigation had a population of  $N=377$ , with each subgroup sample size greater than 15 cases. The Cochran-Mantel-Haenszel chi-square technique was used in the study of each sub-group of interest in this investigation because: a) the studies relate two between-subject factors (i.e., Ethnicity and SI Attendance) to a single dependent variable (i.e., Enrollment or Graduation Status); b) each participant has scores on three variables (two factors – Ethnicity and SI Attendance, and one dependent variable - Enrollment or Graduation Status); and c) each factor divides cases into two or more levels (i.e., Ethnicity – African-American, Hispanic/Latino, Asian,

Native American; and SI Attendance – did attend or did not attend) while the dependent variable describes cases on a quantitative dimension (Enrollment and Graduation) (Green & Salkind, 2003). The Pearson chi-square was also used in this study as a secondary analysis because it can detect any kind of association, especially when using 2 X 2 tables (SAS Institute, 1999). These associations are significant to this study in that they can determine the extent to which Ethnicity or SI Attendance has on the Enrollment or Graduation status of students of color at MWU. The one-way ANOVA model was not used in this study because the groups were not randomly selected and the comparison involves more than two variables. The two-way analysis of variance (ANOVA) between-subjects technique was not used in this study because the data were categorical variables and not continuous variables.

The results are presented using the SAS computer software FREQ procedure, which produces one-way to *n*-way frequency and cross-tabulation (contingency) tables. The two-way tables compute tests and measures of association, whereas, *n*-way tables shows stratified analysis computing statistics within, as well as across, strata (SAS Institute, 1999). According to Mantel and Haenszel (1963), displaying tables for each cell frequency and cross-tabulation of the Cochran-Mantel-Haenszel chi-square can make a significant interaction more understandable. In accordance with the FREQ procedure, the following results sections were included to present the significant effects of the *F* test comparisons used to test the statistical significance of the differences among the means of the statistical hypotheses for each ethnic group: 1) cross-tabulation table without controlling for ethnicity; 2) cross-tabulation frequency table controlling for ethnicity for

each ethnicity; and 3) the table testing for the hypothesis of no association (Maxwell & Delaney, 2002).

The SAS software program FREQ procedure was used to analyze the data findings of this study because it can compute various statistics to examine the relationships between two classification variables adjusting for any stratification variables. The FREQ procedure displays the output in a report format and can also save the output in a SAS data set (SAS Institute, 1999). The data computations of the FREQ procedure are important to this study because the association and frequency of occurrences can determine the extent to which Ethnicity or SI Attendance has on the Enrollment or Graduation status of students of color at MWU.

The SAS data set for this study, SIGraduationRetention, was created by inputting the Graduation/Retention data as cell count data. The following data step statement, or formula, in Table 3.2 was written by the study investigator to create the SAS data set SIGraduationRetention.

Table 3.2. *The SAS System FREQ Procedure - SIGraduationRetention Data Set*

---

```

SIGraduationRetention;
Input ethnicity $ graduationretention $ SI $ Count @@; datalines;
AA   YES   YES   35   AA   YES   NO   36
AA   NO    YES   34   AA   NO    NO   90
HISP YES   YES   10   HISP YES   NO   19
HISP NO    YES   8    HISP NO    NO   53
Asian YES   YES   9    Asian YES   NO   12
Asian NO    YES   9    Asian NO    NO   31
NA    YES   YES   10   NA    YES   NO   7
NA    NO    YES   3    NA    NO    NO   11
;run;

```

---

The variable Ethnicity takes the values African-American, Hispanic/Latino, Asian, and Native American, the variable SI takes the values yes and no, and the variable Graduation/Retention takes the values yes and no. The variable count contains the number of students corresponding to each combination of data values. The double at sign (i.e., @@) indicates that more than one observation is included on a single data line. In this formula, two observations were included on each line (SAS Institute, 1999).

To determine whether there was an association between SI Attendance and Graduation/Retention, the Pearson chi-square statistic was used to assess the association in the corresponding 2 X 2 table. The table's formula statement specifies the table to compute statistics with. To specify the statistics to compute, the options are entered after a slash (/) in the tables formula statement. The formula statement graduationretention\*si specifies a table where the rows are SI Attendance and the columns are Graduation/Retention status (SAS Institute, 1999). The second statement, ethnicity\*graduationretention\*si, incorporates Ethnicity in to the association equation. Finally, the chisq option requests Pearson chi-square statistics for assessing the association (SAS Institute, 1999). The following formula statement in Table 3.3 specifies this analysis. Differences were determined to be significant at the  $p$ -value of  $<.05$ .

Table 3.3. *The SAS System FREQ Procedure - Tables Formula Statement*

---

```
proc freq data=sigraduationretention order=data;
weight count;
tables graduationretention*si/chisq;
run;
proc freq data=sigraduationretention order=data;
weight count;
tables ethnicity*graduationretention*si/chisq cmh;
run;
```

---

## Summary

The purpose of this quantitative investigation was to measure: a) the extent to which there is a difference between the retention rates of students of color at MWU who attend SI to students of color at MWU who do not attend SI; and b) the extent to which there is a difference between the graduation rates of students of color at MWU who attend SI to students of color at MWU who do not attend SI. Based on the research questions, the hypotheses for this study were:

HØ1: There will be no significant increase in the retention rate within each group of students of color who attend SI in comparison to student of color who do not attend SI.

HØ2: There will be no significant increase in the graduation rate within each group of students of color who attend SI in comparison to student of color who do not attend SI.

As dictated by the four ethnic categories utilized by the MWU Office of Institutional Research for identifying students of color at MWU, the population studied included undergraduate students from the following four ethnic groups: African-American, Hispanic/Latino, Asian, and Native American.

Archival data for the time period beginning in the Fall semester of 2001 through the Fall semester of 2002 were used in the Telfer (2003) study and were also utilized in this investigation to identify students who participated in the initial study, and to analyze long range effects of the SI program on the graduation and retention of students of color at MWU. Data from the Spring semester of 2007 was used for this investigation, and was collected by the MWU Minority Student Services records and the Office of Institutional

Research. The students' enrollment and graduation status at the end of the Spring semester of 2007 was analyzed in the comparison. The archival data population included students at the Freshman, Sophomore, Junior, and Senior class levels. According to a longitudinal study by the MWU Office of Institutional Research (2005), of a typical MWU freshman class 20% graduate with a bachelor's degree within four years, 46% within five years, and 54% within seven years. The rationale for using the Spring semester of 2007 data to measure the enrollment and graduation status of the students included: 1) the premise that all classifications of students in the study, including those classified as first semester Freshman during the Fall semester of 2002, would have five years to achieve graduation by the end of Spring semester 2007; and 2) the MWU Office of Institutional Research would have the student enrollment and graduation data from the end of Spring semester of 2007 analyzed and available by August 2007 to begin the data analysis of this investigation.

This quantitative investigation involved a causal-comparative, ex post facto method of research, using the Cochran-Mantel-Haenszel chi-square technique (Green & Salkind, 2003) for each research question. The Cochran-Mantel-Haenszel chi-square technique was used with each of the studies in this investigation because: a) the studies relate two between-subject factors to a single dependent variable; b) each participant has scores on three variables (two factors – Ethnicity & SI Attendance; and one dependent variable – Enrollment or Graduation Status); and c) each factor divides cases into two or more levels while the dependent variable describes cases on a quantitative dimension (Green & Salkind, 2003). The *F* tests were performed on the main effects for the two factors and the interaction between the two factors. The students' enrollment status and



graduation status were analyzed in the comparisons. This study treated the retention and graduation rates as interval data.

In the post hoc analysis, three summary Cochran-Mantel-Haenszel correlation statistics (i.e., Nonzero Correlation, Row Mean Scores Differ, and General Association) were used to adjust for the effect of Ethnicity in the data to test for the hypothesis of no association to determine the levels of significance between the retention and graduation rates of each group (SAS Institute, 1999). Differences were determined to be significant at the associated  $p$ -value of  $<.05$ .

The SAS software program FREQ procedure was used to analyze the data findings of this study because it can compute various statistics to examine the relationships between two classification variables adjusting for any stratification variables. The FREQ procedure displays the output in a report format and can also save the output in a SAS data set (SAS Institute, 1999). The data computations of the FREQ procedure are important to this study because the association and frequency of occurrences can determine the extent to which Ethnicity or SI Attendance has on the Enrollment or Graduation status of students of color at MWU.

The instruments that were used to collect the archival data included: 1) the letter of request for data to MWU Minority Student Services; 2) the attachment to the MWU Minority Student Services letter listing the participants of the Telfer (2003) study to be included in the data retrieval; 3) the application and letter to the MWU IRB requesting permission to continue use of previous archival data (Telfer, 2003); and 4) the data spreadsheets to be used by the Minority Student Services office in providing the summarized numerical data. To protect the confidentiality of human subjects, the

spreadsheet listing the students' names and social security numbers attached to the letter requesting data from Minority Student Services was destroyed once the data was retrieved. Additionally, the data provided by Minority Student Services was anonymous, de-linked, and contained no personal identifiers.

Quantitative research methods involve the use of standardized statistics that can be administered in predetermined procedures. The results of these statistical tests yield significance, defined as the extent to which the measuring instrument (i.e., the Cochran-Mantel-Haenszel chi-square) measures what it is supposed to measure (Davies & Dodd, 2002). Through quantitative research these facts, behaviors, variables, and relationships can be delimited into measurable categories that can be applied to all of the subjects or wider and similar situations (Winter, 2000). Thereby, providing a means of generalizing the findings of a study in a much more general context. Chapter 4 will provide a detailed review of the findings resulting from the data analysis conducted for this study.

## CHAPTER IV

### PRESENTATION OF DATA

The purpose of this quantitative investigation was to measure the extent to which there is a difference between the retention and graduation rates of students of color at Mid-Western University (MWU) who attended SI to students of color at MWU who did not attend SI. This study used the four ethnic categories utilized by the MWU Office of Institutional Research for identifying students of color at MWU. The population studied included undergraduate students from the following four ethnic groups: African-American, Hispanic/Latino, Asian, and Native American.

This chapter provides an overview of the findings yielded from the quantitative research investigation using the Cochran-Mantel-Haenszel chi-square technique for the following research questions:

1. Is there a significant increase in the retention rate within each group of students of color who attend SI in comparison to students of color who do not attend SI?
2. Is there a significant increase in the graduation rate within each group of students of color who attend SI in comparison to students of color who do not attend SI?

The remainder of this chapter reviews the findings regarding population demographics for participants, research design, and a detailed analysis of data findings for this quantitative investigation.

## Population Demographics

Of the 1,620 students of color at MWU, 377 students of color were enrolled in courses that offered SI sessions during the time frame of the Telfer (2003) study and voluntarily participated in the study. The population demographics of this study can be viewed in graphs as illustrated in Figure 4.1.

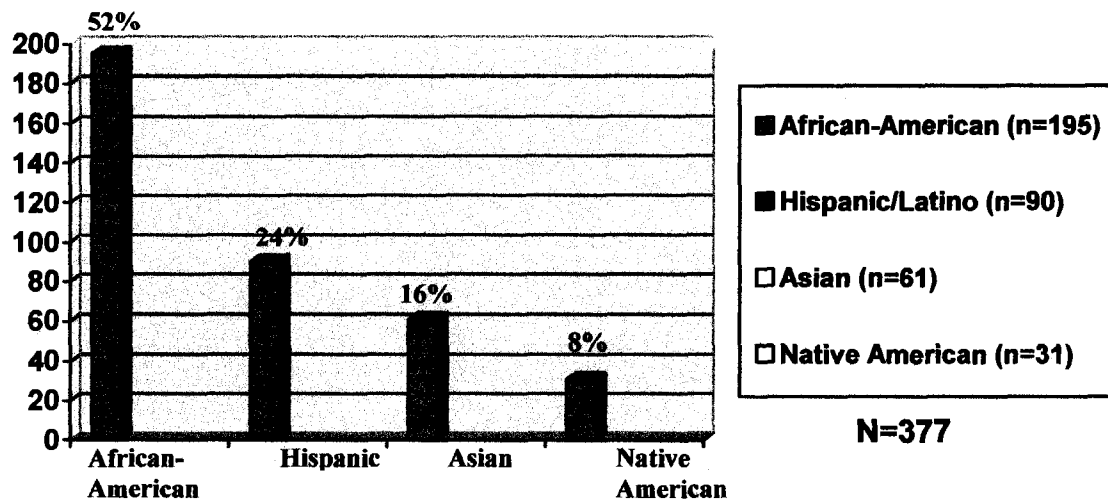


Figure 4.1. Population of Study Participants Distributed by Ethnicity

The following table, Table 4.1, contains counts of the students who graduated/reenrolled, by ethnicity and whether they attended SI.

Table 4.1. *SI Attendance and Graduation/Retention Data for Study Participants*

Ethnicity	SI Attendance	Graduation/Retention		Total
		Yes	No	
African-American	Yes	35	36	71
African-American	No	34	90	124
Hispanic/Latino	Yes	10	19	29
Hispanic/Latino	No	8	53	61
Asian	Yes	9	12	21
Asian	No	9	31	40
Native American	Yes	10	7	17
Native American	No	3	11	14
		<b>n=118</b>	<b>n=259</b>	<b>N=377</b>

## Data Findings

Results of this investigation are presented using the FREQ procedure, which produces one-way to  $n$ -way frequency and cross-tabulation (contingency) tables. The two-way tables compute tests and measures of association, whereas,  $n$ -way tables show stratified analysis computing statistics within, as well as across, strata (SAS Institute, 1999). The data computations of the FREQ procedure are important to this study because the association and frequency of occurrences can determine the extent to which Ethnicity or SI Attendance has on the Enrollment or Graduation status of students of color at MWU.

Table 4.2 presents the cross-tabulation of SI Attendance and Graduation/Retention, without controlling for Ethnicity. In each cell, the values printed under the cell count are the table percentage, row percentage, and column percentage, respectively (SAS Institute, 1999). For example, in the first cell, of the students that did Graduate/Reenroll 46.38 % of those students attended SI and 53.62 % did not attend SI. In the second cell, of the students that did not Graduate/Reenroll 22.59 % attended SI and 77.41 % did not attend SI. The Cochran-Mantel-Haenszel Chi-Square, Pearson Chi-square, and the  $F$  test all indicated there is significant evidence of an association between graduation/retention and SI attendance, whereas the probability of graduating/reenrolling is greater when students attend SI. Therefore, the null hypotheses were rejected when not controlling for Ethnicity.

Table 4.2. *The SAS System FREQ Procedure - Table of Graduation/Retention by SI, Without Controlling for Ethnicity*

Graduation/Retention	SI		
Yes	Yes	No	Total
Frequency	64	74	138
Percent	16.98	19.63	36.60
Row Percentage	<b>46.38</b>	<b>53.62</b>	
Col Percentage	54.24	28.57	
No			
Frequency	54	185	239
Percent	14.32	49.07	63.40
Row Percentage	<b>22.59</b>	<b>77.41</b>	
Col Percentage	45.76	71.43	

Table 4.3. *The SAS System FREQ Procedure, Statistics for Table of Graduation/Retention by SI, Without Controlling for Ethnicity*

Statistic	DF	Value	p-value
Probability			
Chi-Square	1	23.0122	<.0001
Likelihood Ration Chi-Square	1	22.6034	<.0001
Continuity Adj. Chi-Square	1	21.9195	<.0001
Cochran-Mantel-Haenszel Chi-Square	1	22.9511	<b>&lt;.0001</b>
Phi Coefficient		0.2471	
Contingency Coefficient		0.2399	
Cramer's V		0.2471	

Note. Differences were determined to be significant at the  $p$ -value of <.05

Table 4.4. *The SAS System FREQ Procedure, Fisher's Exact Test*

Cell (1,1) Frequency (F)	64
Left-sided Pr <=F	1.0000
Right-sided Pr <=F	1.725E-06
Table Probability (P)	1.168E-06
Two-sided PR <=P	3.240E-06

Total Sample Size = 377

To address the question whether SI Attendance is associated with Graduation/Retention status after adjusting for Ethnicity, an analysis of a set of tables was performed analyzing the set of tables for each of the following ethnicities: African-American, Hispanic/Latino, Asian, and Native American. The Cochran-Mantel-Haenszel statistic was the most appropriate for this type of study because it addresses whether rows and columns are associated after controlling for the stratification variable (SAS Institute, 1999), which in this study the stratification variable was ethnicity. When applying the Cochran-Mantel-Haenszel statistic using the FREQ procedure, the stratification variable needs to be controlled for to ensure the sample has the same type of persons (i.e., African-American, Hispanic/Latino, Asian, and Native American). Otherwise, the study cannot validly compare the effect of the main factor (SI Attendance) on the outcome (retention and graduation rates) (Wacholder, Silverman, McLaughlin, & Mandel, 1992).

Table 4.5 presents the cross-tabulation of SI Attendance and Graduation/Retention, controlling for the African-American ethnicity. In this example, in the first cell, of the students that did Graduate/Reenroll 49.30 % of those students attended SI and 50.70 % did not attend SI. In the second cell, of the students that did not Graduate/Reenroll 27.42 % attended SI and 72.58 % did not attend SI. The Cochran-Mantel-Haenszel Chi-Square, Pearson Chi-square, and the *F* test all indicated there is significant evidence of an association for African-American students between graduation/retention and SI attendance, when controlling for the African-American ethnicity. Therefore, the probability of graduating/reenrolling is shown to be greater for African-American students who attend SI in comparison to African-American students who do not attend SI. Thus, the null hypotheses were rejected for the African-American student population.

Table 4.5. *The SAS System FREQ Procedure, Table of Graduation/Retention by SI, Controlling for Ethnicity = African-American*

Graduation/Retention	SI		
Yes	Yes	No	Total
Frequency	35	36	74
Percent	17.95	18.46	36.41
Row Percentage	<b>49.30</b>	<b>50.70</b>	
Col Percentage	50.72	28.57	
No			
Frequency	34	90	124
Percent	17.44	46.15	63.59
Row Percentage	<b>27.42</b>	<b>72.58</b>	
Col Percentage	49.28	71.43	
Total	69	126	195
	35.38	64.62	100.00

Table 4.6. *The SAS System FREQ Procedure, Statistics for Table of Graduation/Retention by SI, Controlling for Ethnicity = African-American*

Statistic	DF	Value	p-value
Probability			
Chi-Square	1	9.4503	<.0021
Likelihood Ratio Chi-Square	1	9.3357	<.0022
Continuity Adj. Chi-Square	1	8.5177	<.0035
Cochran-Mantel-Haenszel Chi-Square	1	9.4019	<b>&lt;.0022</b>
Phi Coefficient		0.2201	
Contingency Coefficient		0.2150	
Cramer's V		0.2201	

*Note.* Differences were determined to be significant at the  $p$ -value of <.05

Table 4.7. *The SAS System FREQ Procedure, Fisher's Exact Test*

Cell (1,1) Frequency (F)	35
Left-sided Pr <=F	0.9993
Right-sided Pr <=F	0.0018
Table Probability (P)	0.0012
Two-sided PR <=P	0.0030



Table 4.8 presents the cross-tabulation of SI Attendance and Graduation/Retention, controlling for the Hispanic/Latino ethnicity. In example, in the first cell, of the students that did Graduate/Reenroll 34.48% of those students attended SI and 65.52% did not attend SI. In the second cell, of the students that did not Graduate/Reenroll 13.11% attended SI and 86.89% did not attend SI. The Cochran-Mantel-Haenszel Chi-Square, Pearson Chi-square, and the *F* test all indicated there is significant evidence of an association for Hispanic/Latino students between graduation/retention and SI attendance, when controlling for the Hispanic/Latino ethnicity. Therefore, the probability of graduating/reenrolling is shown to be greater for Hispanic/Latino students who attend SI in comparison to Hispanic/Latino students who do not attend SI. Thus, the null hypotheses were rejected for the Hispanic/Latino student population.

Table 4.8. *The SAS System FREQ Procedure, Table of Graduation/Retention by SI, Controlling for Ethnicity = Hispanic/Latino*

Graduation/Retention	SI		
Yes	Yes	No	Total
Frequency	10	19	29
Percent	11.11	21.11	32.22
Row Percentage	<b>34.48</b>	<b>65.52</b>	
Col Percentage	55.56	26.39	
No			
Frequency	8	53	61
Percent	8.89	58.89	67.78
Row Percentage	<b>13.11</b>	<b>86.89</b>	
Col Percentage	44.44	73.61	
Total	18	72	90
	20.00	80.00	100.00

Table 4.9. *The SAS System FREQ Procedure, Statistics for Table of Graduation/Retention by SI, Controlling for Ethnicity = Hispanic/Latino*

Statistic	DF	Value	p-value
Probability			
Chi-Square	1	5.6091	<.0179
Likelihood Ratio Chi-Square	1	5.3051	<.0213
Continuity Adj. Chi-Square	1	4.3531	<.0369
Cochran-Mantel-Haenszel Chi-Square	1	5.5468	<b>&lt;.0185</b>
Phi Coefficient		0.2496	
Contingency Coefficient		0.2422	
Cramer's V		0.2496	

*Note.* Differences were determined to be significant at the  $p$ -value of <.05

Table 4.10. *The SAS System FREQ Procedure, Fisher's Exact Test*

Cell (1,1) Frequency (F)	10
Left-sided Pr <=F	0.9951
Right-sided Pr <=F	0.0204
Table Probability (P)	0.0156
Two-sided PR <=P	0.0249

Table 4.11 presents the cross-tabulation of SI Attendance and Graduation/Retention, controlling for the Asian ethnicity. In example, in the first cell, of the students that did Graduate/Reenroll 42.86% of those students attended SI and 57.14% did not attend SI. In the second cell, of the students that did not Graduate/Reenroll 22.50% attended SI and 77.50% did not attend SI. The Cochran-Mantel-Haenszel Chi-Square, Pearson Chi-square, and the  $F$  test all indicated there is no significant evidence of an association for Asian students between graduation/retention and SI attendance, when controlling for the Asian ethnicity. Therefore, the probability of graduating/reenrolling is shown to be no greater for Asian students who attend SI compared to Asian students who do not attend SI. Thus, the null hypotheses were accepted for the Asian student population.

Table 4.11. *The SAS System FREQ Procedure, Table of Graduation/Retention by SI, Controlling for Ethnicity = Asian*

Graduation/Retention	SI		
Yes	Yes	No	Total
Frequency	9	12	21
Percent	14.75	19.67	34.43
Row Percentage	<b>42.86</b>	<b>57.14</b>	
Col Percentage	50.00	27.91	
No			
Frequency	9	31	40
Percent	14.75	50.82	65.57
Row Percentage	<b>22.50</b>	<b>77.50</b>	
Col Percentage	50.00	72.09	
Total	18	43	61
	29.51	70.49	100.00

Table 4.12. *The SAS System FREQ Procedure, Statistics for Table of Graduation/Retention by SI, Controlling for Ethnicity = Asian*

Statistic	DF	Value	<i>p</i> -value
Probability			
Chi-Square	1	2.7435	<.0977
Likelihood Ration Chi-Square	1	2.6748	<.1020
Continuity Adj. Chi-Square	1	1.8521	<.1735
Cochran-Mantel-Haenszel Chi-Square	1	2.6985	<b>&lt;.1004</b>
Phi Coefficient		0.2121	
Contingency Coefficient		0.2075	
Cramer's V		0.2121	

Note. Differences were determined to be significant at the *p*-value of <.05

Table 4.13. *The SAS System FREQ Procedure, Fisher's Exact Test*

Cell (1,1) Frequency (F)	9
Left-sided Pr <=F	0.9933
Right-sided Pr <=F	0.0879
Table Probability (P)	0.0612
Two-sided PR <=P	0.1402

Table 4.14 presents the cross-tabulation of SI Attendance and Graduation/Retention, controlling for the Native American ethnicity. In example, in the first cell, of the students that did Graduate/Reenroll 58.82% of those students attended SI and 41.18% did not attend SI. In the second cell, of the students that did not Graduate/Reenroll 21.43% attended SI and 78.57% did not attend SI. The Cochran-Mantel-Haenszel Chi-Square, Pearson Chi-square, and the *F* test all indicated there is significant evidence of an association for Native American students between graduation/retention and SI attendance, when controlling for the Native American ethnicity. Therefore, the probability of graduating/reenrolling is shown to be greater for Native American students who attend SI in comparison to Native American students who do not attend SI. Thus, the null hypotheses were rejected for the Native American student population.

Table 4.14. *The SAS System FREQ Procedure, Table of Graduation/Retention by SI, Controlling for Ethnicity = Native American*

Graduation/Retention	SI		
	Yes	No	Total
Yes			
Frequency	10	7	17
Percent	32.26	22.58	54.84
Row Percentage	<b>58.82</b>	<b>41.18</b>	
Col Percentage	76.92	38.89	
No			
Frequency	3	11	14
Percent	9.68	35.48	45.16
Row Percentage	<b>21.43</b>	<b>78.57</b>	
Col percentage	23.08	61.11	
Total	13	18	31
	41.94	58.06	100.00

Table 4.15. *The SAS System FREQ Procedure, Statistics for Table of Graduation/Retention by SI, Controlling for Ethnicity = Native American*

Statistic	DF	Value	p-value
Chi-Square	1	4.4094	<.0357
Likelihood Ratio Chi-Square	1	4.5821	<.0323
Continuity Adj. Chi-Square	1	3.0071	<.0829
Cochran-Mantel-Haenszel Chi-Square	1	4.2669	<.0389
Phi Coefficient		0.3771	
Contingency Coefficient		0.3529	
Cramer's V		0.3771	

Note. Differences were determined to be significant at the *p*-value of <.05

Table 4.16. *The SAS System FREQ Procedure, Fisher's Exact Test*

Cell (1,1) Frequency (F)	10
Left-sided Pr <=F	0.9941
Right-sided Pr <=F	0.0402
Table Probability (P)	0.0343
Two-sided PR <=P	0.0669

Total Sample Size = 31

Table 4.17 presents the three summary (CMH) statistics (i.e., Nonzero Correlation, Row Mean Scores Differ, and General Association) that were used to adjust for the effect of Ethnicity in the data to test for the hypothesis of no association (SAS Institute, 1999). The CMH statistic follows the chi-square distribution under the hypothesis of no association, and in Table 4.17 it takes the value 21.2015. The associated *p*-value is <.05, which indicated an overall significant association between SI Attendance and Graduation/Retention even when controlling for Ethnicity. Therefore, the null hypotheses were rejected.

Table 4.17. *The SAS System FREQ Procedure, Summary Statistics for Graduation/Retention by SI, Controlling for Ethnicity - Cochran-Mantel-Haenszel Statistics (Based on Table Scores)*

Statistic Probability	Alternative Hypothesis	DF	Value	p-value
1	Nonzero Correlation	1	<b>21.2015</b>	<b>&lt;.0001</b>
2	Row Mean Scores Differ	1	<b>21.2015</b>	<b>&lt;.0001</b>
3	General Association	1	<b>21.2015</b>	<b>&lt;.0001</b>

*Note.* Differences were determined to be significant at the  $p$ -value of  $<.05$

Table 4.18. *The SAS System FREQ Procedure, Summary Statistics for Graduation/Retention by SI, Controlling for Ethnicity - Estimates of the Common Relative Risk (Row1/Row2)*

Type of Study	Method	Value	95% Confidence	Limits
Case-Control (Odds Ratio)	Nonzero Correlation	2.8966	1.8315	4.5812
	Logit	2.8893	1.8240	4.5768
Case-Control (Odds Ratio)	Nonzero Correlation	2.0026	1.4873	2.6963
	Logit	1.9689	1.4634	2.6490
Case-Control (Odds Ratio)	Nonzero Correlation	0.7032	0.5949	0.8312
	Logit	0.7095	0.6016	0.8367

Table 4.19. *The SAS System FREQ Procedure, Summary Statistics for Graduation/Retention by SI, Controlling for Ethnicity - Breslow-Day Test for Homogeneity of the Odds Ratios*

Chi-Square	0.8307
DF	3
Pr > Chi-Square	0.8421
Total Sample Size = 377	

## Summary

The purpose of this study was to determine if a SI academic assistance program impacted retention and graduation rates of students of color at MWU. Of the 1,620 students of color at MWU, 377 students of color were enrolled in courses that offered SI sessions during the time frame of the Telfer (2003) study and voluntarily participated in the study. The population studied included undergraduate students from the following four ethnic groups: African-American, Hispanic/Latino, Asian, and Native American. The study population was divided into eight subgroups to investigate the extent to which there is a difference between the retention and graduation rates of students of color enrolled in courses offering SI at MWU who attend SI to student of color enrolled in courses offering SI at MWU who do not attend SI. Based on the research questions, the hypotheses for this study were:

HØ1: There will be no significant increase in the retention rate within each group of students of color who attend SI in comparison to student of color who do not attend SI.

HØ2: There will be no significant increase in the graduation rate within each group of students of color who attend SI in comparison to student of color who do not attend SI.

The Cochran-Mantel-Haenszel Chi-Square, Pearson Chi-square, and the *F* test all indicated there is significant evidence of an association for African-American, Hispanic/Latino, and Native American students between graduation/retention and SI attendance, when controlling for ethnicity. Therefore, the probability of graduating/reenrolling is shown to be greater for African-American, Hispanic/Latino, and

Native American students who attend SI in comparison to African-American, Hispanic/Latino, and Native American students who do not attend SI. Thus, the null hypotheses were rejected.

The Cochran-Mantel-Haenszel Chi-Square, Pearson Chi-square, and the  $F$  test all indicated there is no significant evidence of an association for Asian students between graduation/retention and SI attendance, when controlling for the ethnicity. Therefore, the probability of graduating/reenrolling is shown to be no greater for Asian students who attend SI compared to Asian students who do not attend SI. Thus, the null hypotheses were accepted.

The following tables, Table 4.20 and 4.21, present a cross-tabulation summary of SI Attendance and Graduation/Retention, controlling for Ethnicity, for each ethnic group.

Table 4.20. *The SAS System FREQ Procedure, Table of Graduation/Retention by SI, Controlling for Ethnicity = African-American, Hispanic/Latino, Asian, Native American*

Graduation/Retention	Ethnicity	SI Attendance	
		Yes	No
Yes	African-American	49.30%	50.70%
	Hispanic/Latino	34.48%	65.52%
	Asian	42.86%	57.14%
	Native American	58.82%	41.18%
No	African-American	27.42%	72.58%
	Hispanic/Latino	13.11%	86.89%
	Asian	22.50%	77.50%
	Native American	21.43%	78.57%



Table 4.21. *The SAS System FREQ Procedure, Statistics for Table of Graduation/Retention by SI, Controlling for Ethnicity = African-American, Hispanic/Latino, Asian, Native American*

Ethnicity	Statistic Probability	DF	Value	p-value
AA	Cochran-Mantel-Haenszel Chi-Square	1	9.4019	<.0022
H/L	Cochran-Mantel-Haenszel Chi-Square	1	5.5468	<.0185
A	Cochran-Mantel-Haenszel Chi-Square	1	2.6985	<.1004
NA	Cochran-Mantel-Haenszel Chi-Square	1	4.2669	<.0389

**Note. Differences were determined to be significant at the p-value of <.05**

AA = African-American, H/L = Hispanic/Latino, A = Asian, NA = Native American

The three summary Cochran-Mantel-Haenszel (CMH) statistics (i.e., Nonzero Correlation, Row Mean Scores Differ, and General Association), used to adjust for the effect of Ethnicity in the data to test for the hypothesis of no association, indicated an overall significant association between SI Attendance and Graduation/Retention (SAS Institute, 1999). Further discussion of conclusions and recommendations that emerged from the data analysis findings of this study is available in detail in Chapter 5.

## CHAPTER V

### SUMMARY AND CONCLUSIONS

In the past few years important advances have been made in research addressing issues facing students of color and identifying factors that may be more sensitive to their college adjustment experience (i.e., cultural assimilation and academic preparation). Steele and Aronson (1995, 1997) suggested that stereotype threat and a lack of identification with the education environment can lead to poor academic performance and isolation from the academic environment. Similarly, Solorzano and Villalpando (1998) studied how subtle behaviors or communication of racism (i.e., microaggressions) and the campus climate affect the educational experience of students of color. Several common themes have emerged from recent studies involving barriers to the retention of students of color, to include: poor secondary preparation, indifferent recruitment, stringent admissions standards, inadequate financial aid support, the institution's culture and climate, racism, lack of faculty and staff of color role models, faculty and staff perceptions of students of color and their ability to succeed, family support, cultural isolation, and lack of cultural, social, and academic assistance programs (Aragon, 2000; Astin, Chang, & Kim, 2004; Dennis, 1998; Ford & Lang, 2002; Gurin, 2001; Gurin, Lehman, & Lewis, 2004; Hurtado, Lindholm, Kohn, Mahoney, & Sax, 2005; Misra & McMahon, 2006; Swail, Redd, & Perna, 2003; Terrell & Wright, 1998). To avoid extending the problematic historical trend of lower retention rates of students of color, colleges and universities are examining their past and current practices to remove these barriers and provide a more supportive environment for students of color to succeed academically and socially (Gregory, 2000). Programs such as Supplemental Instruction

(SI) provide one means of support. A recent Telfer (2003) study demonstrated that SI significantly improved the GPA for students of color that attended SI sessions at Mid-Western University (MWU). To address the historical trend of lower retention rates of students of color, it was also important to determine if the SI program has an impact on the retention and persistence to graduation of students of color at MWU attending SI.

Many students enter college without the experience of interacting with others whose backgrounds differ from their own. Through a diverse campus environment students will learn about these differences, and, equally as important, will learn about the similarities as well (Gurin, Lehman, & Lewis, 2004). When conceptualizing the campus climate for diversity, different ethnic groups often view the campus differently (Hurtado, Milem, Clayton-Pedersen, & Allen, 1999), and each conception is valid because it has real consequences for the individual (Astin, 1968; Tierney, 1987). Longitudinal studies have shown that campus environments with greater proportions of students of color, provide a learning platform where students are more likely to socialize and develop friendships with students from different ethnic groups, and discuss racial issues with peers (Antonio, 1998; Chang 1999; Hurtado, Dey, & Trevino, 1994; Milem & Hakuta 2000). An especially important study including 461 colleges and universities throughout the United States (Astin, Chang, & Kim, 2004), indicated students were most likely to engage in four types of cross-racial interactions (i.e., eating together, studying together, dating, and interacting with someone of a different ethnic background) when structural diversity was implemented and present. Given the need for support systems for students of color, programs like SI take on heightened importance.

The purpose of the research reported in this quantitative investigation was to measure the extent to which there is a difference between the retention and graduation rates of students of color at Mid-Western University (MWU) who attend SI to students of color at MWU who do not attend SI. The population studied included undergraduate students from the following four ethnic groups: African-American, Hispanic/Latino, Asian, and Native American. The remainder of this chapter includes a review of the research design, findings, interpretation of findings, discussion, barriers for students, critique of the study, implications, recommendations for future research, and conclusions.

### Research Design

A quantitative, causal-comparative, ex post facto method of research, using the Cochran-Mantel-Haenszel chi-square technique was used with each research question in this investigation. The students' enrollment status and graduation status were analyzed in the comparisons. For each of the comparisons, the *F* test was also performed to test the statistical significance of the differences among the means of the statistical hypothesis. The Pearson chi-square was used in this study as a secondary analysis because it detects any kind of association (SAS Institute, 1999). In the post hoc analysis, three summary Cochran-Mantel-Haenszel (CMH) statistics were used (SAS Institute, 1999). Differences were determined to be significant at the associated *p*-value of  $<.05$ .

Archival enrollment data from the Fall semester of 2001 through the Fall semester of 2002 was utilized in this investigation to identify students who participated in initial SI courses. These students were tracked for persistence and graduation using data collected in Spring 2007.

At the time the Telfer (2003) study was conducted, MWU had an overall undergraduate population of approximately 18,000 students, with 9% (1,620) being students of color. Of the 1,620 students of color, 377 students of color were enrolled in courses that offered SI sessions during the time frame of the Telfer (2003) study and voluntarily participated in the study (i.e., allowed their SI attendance, grades, and academic data to be used for research studies). The participants were identified by ethnicity from all courses in which SI was offered beginning with the Fall semester of 2001 through the Fall semester of 2002. The 377 students were then divided in to two subgroups: 1) students of color enrolled in courses that offered SI who chose to attend SI sessions; and 2) students of color enrolled in courses that offered SI who chose not to attend SI sessions. The remaining 1,243 students of color at MWU were not enrolled in courses offering SI, therefore, were not part of the research study.

### *Research Questions*

The research questions at the heart of this study were:

1. Is there a significant increase in the retention rate within each group of students of color who attend SI in comparison to students of color who do not attend SI?
2. Is there a significant increase in the graduation rate within each group of students of color who attend SI in comparison to students of color who do not attend SI?

The null hypotheses for this study were:

HØ1: There will be no significant increase in the retention rate within each group of students of color who attend SI in comparison to student of color who do not attend SI.

HØ2: There will be no significant increase in the graduation rate within each group of students of color who attend SI in comparison to student of color who do not attend SI.

### Summary of Findings

The findings from this research determined the extent to which Ethnicity or SI Attendance had on the enrollment or graduation status of students of color at MWU. In the cross-tabulation of SI Attendance and Graduation/Retention without controlling for Ethnicity, students that participated in SI graduated or persisted at a rate of 46.38% compared to a rate of 53.62% for those students did not attend SI. Of the students that did not Graduate/Reenroll 22.59% attended SI and 77.41% did not attend SI. The Cochran-Mantel-Haenszel Chi-Square, Pearson Chi-square, and the *F* test all indicated there is significant evidence of an association between graduation/retention and SI attendance, whereas the probability of graduating/reenrolling is greater when students attend SI. Therefore, both null hypotheses were rejected.

To address the question of whether SI Attendance is associated with Graduation/Retention status after adjusting for Ethnicity, an analysis of a set of tables was performed analyzing the set of tables for each of the following ethnicities: African-American, Hispanic/Latino, Asian, and Native American. The Cochran-Mantel-Haenszel statistic was the most appropriate for this type of study because it addresses whether rows and columns are associated after controlling for the stratification variable (SAS Institute,

1999), which in this study the stratification variable was ethnicity. When applying the Cochran-Mantel-Haenszel statistic using the FREQ procedure, the stratification variable needs to be controlled for to ensure the sample has the same type of persons (i.e., African-American, Hispanic/Latino, Asian, and Native American). Otherwise, the study cannot validly compare the effect of the main factor (SI Attendance) on the outcome (retention and graduation rates) (Wacholder, Silverman, McLaughlin, & Mandel, 1992).

*Results of SI Attendance and Graduation/Retention, Controlling for Ethnicity*

In the cross-tabulation of SI Attendance and Graduation/Retention, controlling for the African-American ethnicity, of the students that did Graduate/Reenroll 49.30% of those students attended SI and 50.70% did not attend SI. Of the students that did not Graduate/Reenroll 27.42% attended SI and 72.58% did not attend SI. The Cochran-Mantel-Haenszel Chi-Square, Pearson Chi-square, and the *F* test all indicated there is significant evidence of an association for African-American students between graduation/retention and SI attendance, when controlling for the African-American ethnicity. Therefore, the probability of graduating/reenrolling is shown to be greater for African-American students who attend SI in comparison to African-American students who do not attend SI. Thus, both null hypotheses were rejected.

In the cross-tabulation of SI Attendance and Graduation/Retention, controlling for the Hispanic/Latino ethnicity, of the students that did Graduate/Reenroll 34.48% of those students attended SI and 65.52% did not attend SI. Of the students that did not Graduate/Reenroll 13.11% attended SI and 86.89% did not attend SI. The Cochran-Mantel-Haenszel Chi-Square, Pearson Chi-square, and the *F* test all indicated there is

significant evidence of an association for Hispanic/Latino students between graduation/retention and SI attendance, when controlling for the Hispanic/Latino ethnicity. Therefore, the probability of graduating/reenrolling is shown to be greater for Hispanic/Latino students who attend SI in comparison to Hispanic/Latino students who do not attend SI. Thus, both null hypotheses were rejected.

In the cross-tabulation of SI Attendance and Graduation/Retention, controlling for the Asian ethnicity, of the students that did Graduate/Reenroll 42.86% of those students attended SI and 57.14% did not attend SI. Of the students that did not Graduate/Reenroll 22.50% attended SI and 77.50% did not attend SI. The Cochran-Mantel-Haenszel Chi-Square, Pearson Chi-square, and the  $F$  test all indicated there is no significant evidence of an association for Asian students between graduation/retention and SI attendance, when controlling for the Asian ethnicity. Therefore, the probability of graduating/reenrolling is shown to be no greater for Asian students who attend SI compared to Asian students who do not attend SI. Thus, both null hypotheses were accepted.

In the cross-tabulation of SI Attendance and Graduation/Retention, controlling for the Native American ethnicity, of the students that did Graduate/Reenroll 58.82% of those students attended SI and 41.18% did not attend SI. Of the students that did not Graduate/Reenroll 21.43% attended SI and 78.57% did not attend SI. The Cochran-Mantel-Haenszel Chi-Square, Pearson Chi-square, and the  $F$  test all indicated there is significant evidence of an association for Native American students between graduation/retention and SI attendance, when controlling for the Native American ethnicity. Therefore, the probability of graduating/reenrolling is shown to be greater for



Native American students who attend SI in comparison to Native American students who do not attend SI. Thus, both null hypotheses were rejected.

Three summary Cochran-Mantel-Haenszel (CMH) statistics (i.e., Nonzero Correlation, Row Mean Scores Differ, and General Association) were used to adjust for the effect of Ethnicity in the data to test for the hypothesis of no association (SAS Institute, 1999). The CMH statistic follows the chi-square distribution under the hypothesis of no association, and resulted in the value 21.2015. The associated  $p$ -value is  $<.05$ , which therefore indicated an overall significant association between SI Attendance and Graduation/Retention even when controlling for Ethnicity. Therefore, both null hypotheses were rejected.

#### Discussion of Findings

The findings of this study showed that SI had a significant impact on the retention and persistence to graduation for African-American, Hispanic/Latino, and Native American students at MWU. However, this study concluded that SI did not have a significant impact on the retention and persistence to graduation for Asian students at MWU. It is important to determine why SI attendance had a significant impact for some ethnic groups and not others. To decipher this phenomenon, factors relating to ethnic identity development, learning styles and academic achievement, self-concept of academic ability, and specific social and cultural experiences and needs were reviewed to provide a theoretical understanding of how and why these factors may play a role in the academic achievement and retention of students of color.

According to Thompson (2007), despite the continued growth in the nation's minority population, little progress has been made in increasing enrollment and retention of students of color in colleges and universities. Additionally, educational attainment levels continue to be substantially lower for African-American, Hispanic/Latino, and Native American students than that for white and Asian students (Swail, Redd, & Perna, 2003). To address these issues, colleges and universities have begun to develop recruitment and retention programs that have a particular emphasis on attracting and retaining students of color. Benefits students of color acquire through retention programs include: the development of their ethnic identity, increased self-concept of academic ability, opportunities for academic and personal success, and the engagement of social support (Moxley, Najor-Durack, & Dumbrigue, 2001). When students utilize programs, such as SI, the academic achievement they obtain helps develop their confidence and self-concept of academic ability, pride in academic and personal success, motivation to continue to achieve in many different areas, and an overall development of their academic identity (Benton, 2006; Torres, Howard-Hamilton, & Cooper, 2003). The findings from this research support the assertion that retention programs can help retention and graduate rates for students of color. African American, Hispanic, and Native American students received significant benefits from their participation in SI, whereas Asian American student retention or graduation rates were not significantly impacted by participation.

Many ethnic development models exist that examine broad concepts of diversity by an overarching general ethnic group (Phinney, Cantu, & Kurtz, 1997). The premise of contemporary research is that not all ethnic groups or cultures are the same (Torres,

Howard-Hamilton, & Cooper, 2003). Each ethnic group has a distinct cultural heritage that makes them different from each other (Sue & Sue, 1999). To summarize and understand the research findings of this study, it is important to explore research that pertains specifically to each ethnic group involved. Accordingly, the issues of students of color, ethnic identity, learning and academic achievement, and the impact of the SI program discussed previously will be revisited for each individual ethnic group investigated.

### *African-American Students*

Oyserman, Bybee, and Terry (2003) focused on interrelationship of macro and micro level theory and research associated with the ethnic identity of African-American students and their academic performance. Macrosociological factors, such as low economic status (Ogbu, 1992, 1995), and the pervasive presence of stereotypes (Steele & Aronson, 1995, 1997) were found to have debilitating effects on minority academic performance. According to Oyserman, Bybee, and Terry, African-American students who are successful manage to construct identities that help them achieve in school. Constructing this type of identity includes three components: connectedness to the African-American community, feeling that achievement is part of being African-American, and having an awareness of racism and other limitations and how to overcome them. The relationship of ethnic identity and academic efficacy (i.e., the power to influence one's environment and to control one's destiny), have a strong correlation for academic success and retention of African-American students in that individuals who believe they can make it are far more likely to actually make it than those who do not

(Oyserman, Bybee, & Terry). In concurrence, Benton (2006) stated that developing and possessing a strong ethnic identity did promote academic achievement. Participation in SI may provide the type of support group with peers that aids in development of this identity.

One of the most significant reasons for learning about and using different African-American identity development theories is that individuals can become more cognizant of how people of color process and perceive the world. It has been shown (Baldwin, Duncan, & Bell, 1992) that African-American students experience social, systemic, and institutional oppression and discrimination when attending predominantly white institutions. How the faculty, staff, and students react and interact with the African-American students greatly impacts their ethnic identity development. The African-American student's ethnic identity development and connection with the campus environment directly influences their level of psychosocial development. Howard-Hamilton (1995) found that African-American students who become involved in extracurricular activities, such as cultural organizations, exhibit higher levels of self-esteem and ethnic identity development. There is also a significant relationship between a positive self-concept and the support of faculty, staff, and students in making the college environment more comfortable for African-American students (Torres, Howard-Hamilton, & Cooper, 2003). Understanding the premises of the various ethnic development theories and models can assist college and university faculty, administration, and staff to be more culturally responsive, raise the self-efficacy of African-American students, and reduce racism and prejudice on campus (Howard-

Hamilton, 2000). In particular, elements of support can be incorporated into the SI programming to aid in the developmental progression of identity.

It was concluded that, in addition to their ethnic identity development and academic development, having strong and active ties to the campus community through campus support systems also plays a significant role. The findings from this research underscore that Supplemental Instruction results in significantly more success for African-American students in persistence and graduation.

### *Hispanic/Latino Students*

The notion of Hispanic/Latino ethnic identity is both sensitive and complex. More than twenty countries of origin with distinct cultures claim the Hispanic/Latino cultural group. The label Hispanic/Latino is used mainly in the United States and represents individuals who were either born in or whose family originates in Central or Latin American and certain Caribbean countries. What these countries share is the Spanish language and other cultural traits, such as some foods, dance, festivals, and so on. It is the distinctive historical and societal context of Hispanic/Latinos in the United States that provides many of the commonalities for Hispanic/Latino identity development (Ferdman & Gallegos, 2001).

Torres (2007) investigated the Hispanic/Latino identity development during the first two years of college. Three conditions were found to influence ethnic identity of Hispanic/Latino students in the first year of college: the environment where they grew up, family and generational influences, and their self-perception of status in society. Torres found that change occurred to the Hispanic/Latino students' identity when students

experienced conflict with culture or when a change in relationship within the environment occurred. The research also found that students were very proud of their ethnic origin regardless of what conditions applied to their level of ethnic identity (Torres).

Ferdman and Gallegos' (2001) model of Hispanic/Latino identity development focused on the dimension of defining one's orientation towards one's identity as being Hispanic/Latino. Educators need to understand nuances among the cultures and conditions that may impact the individual Hispanic/Latino student. Diversity in the Hispanic/Latino culture requires sensitivity to country of origin and to generational issues. Research shows (Burton, 2006) common dimensions for Hispanic/Latino students to succeed in higher education include: being involved, the family's role, the role of campus leaders and mentors, embracing academics, desire to be successful, and involvement in Hispanic/Latino organizations. Students who entered college having had greater contact with other Hispanic/Latinos and experience dealing with stereotypes and prejudice may be less vulnerable to these stereotypes than students who are unaware and unprepared for handling these issues (Ethier & Deaux, 1990, 1994).

Hispanic students enrolled in Supplemental Instruction significantly increased their rates of persistence and graduation relative to those Hispanic students who did not participate. However, of note, Hispanic students did not have as large of percentage of retention or graduation rates as other minority groups who participated in SI. This finding raises some interesting questions regarding differences in experience of the program by different minority groups. Future research is required in this area to determine reasons for these discrepancies in experience.

### *Asian Students*

Asian Americans are the most diverse ethnic group in the United States, making the study of ethnic development for this group challenging and complicated (Yeh & Hwang, 2000). In the review of various Asian ethnic identity development models, Yeh and Huang (1996) found that although many theories suggest that ethnic identity development is predominantly an internal, intro-psychic process, their data suggested that Asian students are actually greatly influenced by relationships and external forces. One theory of Asian identity development (Kim, 2001) is often cited as a general theory applicable to all Asian groups. Kim (2001) found that the process of Asian identity development involved five distinctly different stages that are sequential and progressive. The first stage, ethnic awareness, begins before entering elementary school when the child's attitude toward being Asian is either positive or neutral. In the second stage, white identification, Asian children begin to develop a sense that they are different from the white children with whom they begin to have contact in the educational setting. One reaction is for the students to begin to identify with the white students, considering themselves very similar to white peers, not acknowledging cultural differences, and accepting white standards, values, and beliefs (Ponterotto & Pedersen, 1993; Yi & Shorter-Gooden, 1999). The third stage, awakening to social political consciousness, often occurs in the college years when the student begins to see themselves as a minority in society, sheds previously held white-identified ideals, develops a more positive self-concept, becomes more centered and politically conscious about being Asian, and embraces their ethnic culture. Redirection to Asian consciousness, begins when the Asian student starts to embrace their Asian identity and demonstrate a desire to immerse

themselves in Asian heritage. During this period the student can feel anger or outrage at white society and may need to work through the emotionally reactive phase to feel good about themselves and become proud to be Asian. In the final stage, incorporation, individuals achieve a healthy, secure balance, feeling both comfortable with their own identity and appreciative of other racial groups, including the white culture. Yoshioka, Tashima, Chew, and Maruse (1981) note that in addition to the effects of the college culture, identity development is a result of both individualized reactions to those cultural influences and characteristics unique to the various Asian subpopulations. Thereby, a supportive campus environment can provide a significant incentive to the development of ethnic identity of Asian students.

It is believed that Asian students may experience Steele and Aronson's (1995, 1997) concept of stereotype threat in reverse. Because the most common stereotype of Asian students is that they are highly intelligent and academically gifted, they experience tremendous pressure to live up to the stereotype to always maintain high academic achievement. In line with Oyserman, Bybee, and Terry's (2003) premise of efficacy, a positive implication is that Asian students do actually succeed academically at high rates because of their reaction to the stereotype. In striking contrast, those Asian students who have difficulty learning find it difficult to admit they are not intelligent and instead of seeking out academic assistance will leave college citing other reasons (Oyserman, Bybee, & Terry, 2003).

The Asian student population is one of the smaller ethnic groups on MWU's campus, but they have strong and active ties to the campus community through: the presence and support of the Minority Student Services office, a commitment to diversity



by administration, involvement in cultural organizations (both academic and social), cultural events celebrating the Asian culture (i.e., Asian history month), a very active and supportive mentoring program, the presence of individuals of color in administration, faculty, and staff on campus, scholarships and financial aid programs, support programs (i.e., ACE bridge program, GEAR-UP, peer advising), opportunities for employment on campus, and academic assistance through SI. Even though the Asian students have many of the same opportunities and supportive factors in place as the African-American, Hispanic/Latino, and Native American student populations, the study concluded that SI did not have a significant impact on the retention and persistence to graduation of Asian students at MWU. This is an important finding, in that the Asian students were the only ethnic population in which SI did not have an impact. It is important to note that the Asian students graduated at the same rate as the students from other ethnic groups, indicating they achieved academically through other methods.

The answers may lie in the ethnic identity development and academic development of the Asian student population. In particular, two important points made in the literature review stood out differently than with the other ethnic groups. The first is the way Asian students experience Steele and Aronson's (1995, 1997) stereotype threat in reverse. Because they are striving to live up to the stereotype of being intelligent and academically gifted, Asian students find it difficult to admit they are having trouble learning and instead of seeking out academic assistance will leave college citing other reasons. This reaction has a direct impact on the results of this study when measuring whether students persist to graduation. Another point made by Yeh and Huang (1996) found that Asian students are greatly influenced by relationships and external forces. It is

believed that the impact of these external forces and relationships may have a strong impact on the retention of Asian students at MWU. Many of these students are at the age where they are experiencing two of Kim's (2001) stages of identity development: awakening to social political consciousness, and redirection to Asian consciousness. During these stages Asian students begin to develop a more positive self-concept, become more politically conscious about being Asian, value their ethnic culture, embrace their Asian identity, and demonstrate a desire to immerse themselves in Asian heritage. With the population of Asian students being so small at MWU, their cultural organization memberships are also very small. In order to effect change, develop cultural events to celebrate their Asian heritage, and demonstrate their value and loyalty to their Asian culture, the same small group of students must be the leaders and workers for planning and supporting these events and activities. Therefore, the external forces and relationships may cause them to burn-out and/or to sacrifice academic achievement in support of their cause. This, undoubtedly, will have a negative affect on the persistence to graduation for the Asian students, again, directly impacting the results of this study.

### *Native American Students*

Until recent years, Native American students have been largely ignored in the literature on ethnic identity and academic achievement due to their small number in size. In the literature that does exist, cultural difference has been identified most frequently as the factor that leads to underachievement (Benton, 2006). The developmental issues Native American students face in colleges and universities are primarily tied to the history of tribal sovereignty and the government-sanctioned oppression of Native

American cultures in the United States. Tribal sovereignty is critical to Native Americans because of the history of their ethnic group. Many Native Americans feel many of the current developmental issues can be attributed to issues from the past, yet these same issues of sovereignty continue on today and influence the availability of education for many Native American students. Tribal members take great pride in the notions of sovereignty because they had inherent sovereignty before the United States was ever established (Benton, 2006). To understand Native American students, a person must respect their tribal affiliation and sovereignty.

At the core of Native American values are communal concerns, including: adherence to tradition, responsibility for family and friends, cooperation, and tribal identification (LaFromboise, Heyle, & Ozer, 1990). Educators who work with Native American students need to have a clear understanding of the central role these values play. The choices Native American students make are typically base on Native American values and may not necessarily be in line with the societal values prevalent in the college environment. In addition, the Native American values can conflict with the majority population's values of individualism competitiveness, and amassing property (LaFromboise, Heyle, & Ozer, 1990). Three models have been developed that can help faculty, administration, and staff understand the identity development of Native American students. The first model deals with categories of "Indianness" (i.e., how true to the culture the individual is), the second focuses on a healthy approach to acculturation in the majority culture, and the third focuses on factors that influence group consciousness. The issue of acculturation is a major concern with many Native American students and tribal members, as they do not want the youth of their tribes to lose their

tribal connections and identity (LaFromboise, Heyle, & Ozer, 1990). Campus environments primarily reflect the dominant society's values and generally reinforce these attitudes (Huffman, 1999). For Native American students who become part of the campus environment it requires moving deeper into the dominant society's cultural, which presents concern and conflict for Native American students who are attempting to hold on to their culture and ethnic identities and not assimilate into the mainstream culture.

In a recent study of ethnic identity and Native American students in higher education, Huffman (1999) found that the cultural differences these students experience at college explains more about their academic problems than any other theory. According to Huffman (1999), assimilated students (who are most like non-Native American students) and transcultured students (who can operate well in Native American and non-Native American cultures) are among the most successful in completing college. Marginal students (those who live on the margins of both the Native American and non-Native American cultures, not completely breaking with past traditions and yet not fully accepted into the mainstream university) are third in terms of graduation rates. Finally, the estranged students (who feel that Native American culture is not celebrated or appreciated by the university) have the lowest graduation rates. It is unknown how the Native Americans in the study were categorized among these groups.

Theorists, such as Ledlow (1992) and Ogbu (1992, 1995), view the individual failure of Native American students as being caused largely by historical and political forces beyond their control. In agreement, Ogbu (1992, 1995) classifies Native Americans as a castelike minority whose opportunities for educational and economic

success are routinely blocked. Deyhle (1992) conducted an extensive ethnographic study of Native American education involving Native American students from reservation communities. It was found that structural factors (i.e., funding, educational materials, political agendas, and so on) were restricting opportunities for Native American youth and failing them academically. The decision to leave school can then be seen as a rational response to irrelevant schooling, racism, restricted political, social, and economic opportunities, and the desire to maintain a culturally distinct identity Deyhle (1992).

The disinterest of Native American students in learning educational material that is essentially irrelevant to them has been cited frequently as a reason for dropping out (McDonald, 1978). In addition, Reyhner (1992) cites seven primary reasons Native American students drop out: large schools, uncaring/untrained teachers, passive teaching methods, inappropriate curriculum, inappropriate testing, student retention in grade, tracked classes, and lack of parent involvement.

Other overarching constructs (Torres, Howard-Hamilton, & Cooper, 2003) of the Native American culture important for educators to understand when working with students from this ethnic group include: 1) life is seen as a whole rather than in parts where the connectedness of all things in the physical and spiritual world are recognizing and honored; 2) abstract concepts and processes that require complex analysis of individual parts can be very difficult; 3) human beings are viewed as highly active in the spiritual world and there is the belief that an individual's action affect both the physical and spiritual worlds influencing their sense of self in relation to the environment; 4) difference in tribes and tribal affiliation are very important; and those students who enter college after living on a reservation experience the impact of cultural shock impact when

entering the college environment. The findings from this study showed that Native American students participating in SI persisted and graduated at rates higher than those Native American students who did not participate.

## Discussion

As the population of students continues to diversify, a common concern for many colleges and universities is how to go about achieving diversity and improving the social and learning environments for student from different backgrounds. Hurtado, Milem, Clayton-Pederson, and Allen (1999) argued that in order to improve the campus climate for diversity understanding and developing programs and policies that enact diverse learning environments is key. This involves understanding the environment from different ethnic perspectives, creating educational and social opportunities for improved race relations, and realizing the educational benefits of diverse learning environments for students in preparing them to meet the demands of a complex and diverse society and workforce. It has been found (Gurin, 2001; Gurin, Lehman, & Lewis, 2004) students who have meaningful diversity experiences in their college years have an increased engagement in complex active thinking processes, identified significant growth in intellectual engagement and motivation, and showed growth in a broad range of intellectual and academic skills. Thus, demonstrating the significance creating a diverse learning environment has on the intellectual and academic development of students. This study illustrated how these concepts were enacted through Supplemental Instruction and the positive impact this program had on persistence and graduation rates for most minority groups.

The literature supports the strong ties between identity development and minority student success. It is unknown how much of the positive impact of the SI program may be attributed to its location in the office of Minority Student Services. Future studies compared to SI programs situated elsewhere may provide further evidence regarding context of program location on student success. It is clear from this research that SI contributed to the persistence and graduation rates, albeit at differing rates. This research showed that not all minority groups experienced SI in the same way and underscored the need to conduct further research based on distinct minority groups versus lumping all minorities together. In particular, Asian American students and Hispanic/Latino students showed different outcomes. Asian American students outcomes were not impacted by their participation in SI and Hispanic/Latino students, while positively impacted by participation in SI, were not as successful as other minority groups, namely African-Americans and Native Americans.

### Implications of Study

Although this study was conducted at a single site, the implications of this study have long-reaching effects on institutions of higher education in terms of student persistence and graduation. This study contributes significantly to the literature of Supplemental Instruction, which is devoid of research relating SI to multicultural settings in higher education and the impact of the program on the academic achievement and retention of students of color. The on-going shift in student demographics, changing workplace, new technological advances, and expanding global marketplace are driving forces requiring colleges and universities in the United States to utilize alternative

methods of educating and preparing our students to face these emerging realities (Thompson, 2007). The findings show that participation in SI increases persistence and graduation rates for most minority groups. The SI program addresses both the academic achievement and retention issues of students of color, as well as instructs students how to develop higher-level thinking skills. SI is based on several different learning principles (i.e., behavioral, cognitive, social interdependence, and interpretive-critical), which strive to break the cycle of learned helplessness (University of Missouri-Kansas City, 2005).

As the population of students continues to diversify, a common concern for many colleges and universities is how to go about achieving diversity and improving the social and learning environments for student from different backgrounds. Hurtado, Milem, Clayton-Pederson, and Allen (1999) argued that in order to improve the campus climate for diversity understanding and developing programs and policies that enact diverse learning environments is key. The learning environment created in the SI program addresses several of these themes. It is unknown how much of the student success can be attributed to the environmental factors within the SI program versus general campus programming, however, the implication is that the significant impact of SI on students resulted in more students of color persisting to graduation.

Another implication from the findings of this research relates to the financial impact on the university. In a higher education climate in which outcome measurements and cost effectiveness are a priority, program evaluation has become essential (Congos & Schoeps, 1999). The following example demonstrates the potential increase in institutional cost effectiveness resulting from the SI program. On average, an institution of higher education receives approximately \$5,000 in income (student tuition and state



support) per student annually. Congos and Schoeps (1993) have indicated approximately a 10% greater reenrollment for students attending SI. The findings from this study showed a persistence rate on average of about 50% for students of color participating in SI relative to 25% for those students not involved in SI. For the numbers involved in this study, this would translate to approximately \$175,000 in additional income per year in retained income for MWU. The cost of the program to the institution is \$54,000, thus making the investment cost effective. Additionally, the cost to provide academic assistance for students through the SI program is significantly less than many traditional support services programs (i.e., individual tutoring) because SI provides academic support to groups of students at one time, and not on a one-on-one basis. Thereby, the results of this study support the premise indicating SI is an effective retention program, both academically and financially.

“Mid-Western University's Minority Student Services (MSS) is a comprehensive office which provides academic, personal, social and cultural support to students. To empower and retain students, the MSS team provides and enhances a campus environment where diversity is understood and celebrated” (Minority Student Services Annual Report, 2003, p.1). To achieve this mission, MSS has instituted several programs to assist students succeed, such as: GEAR-UP, ACE, mentoring, peer advising, scholarships, cultural organizations, cultural education, and SI. Each of these programs plays a significant role in the recruitment, growth, and retention of students of color at MWU. This study focused specifically on the SI academic assistant program and its impact on the retention and graduation of students of color at MWU. The placement of the SI program within MSS is very unique and provides an excellent opportunity for

multicultural related research associated with academic achievement, multicultural learning, and retention. Research, such as shown in this study, promotes the advancement in knowledge and literature relating to diversity issues, culturally specific factors, academic achievement, and the retention of students of color. Having the SI program administered within MSS may have a direct impact on the participation levels of students of color in SI sessions. This has been evidenced in MSS reports indicating participation in SI sessions is strongly encouraged through many of the MSS support programs, such as peer advising, mentoring, scholarship program, and summer bridge program (Minority Student Services Annual Report, 2003). The results of this study, as well as other supporting literature, have shown the correlation that SI attendance has a significant impact on the retention and GPA of students of color. When students seek out academic advising assistance from advisors within MSS when registering for courses, the MSS staff has knowledge of which course section numbers will offer SI for the upcoming semester and can better assist the students of color in determining which course sections to register for in order to receive the SI program support. Therefore, having oversight of the program in MSS can help ensure students of color learn about the SI program early on, are encouraged to attend, achieve academically at a higher rate, and persist to graduation.

The primary goal of MSS is to provide services and support for students of color to remain in college and to persist to graduation. Programs, such as SI, are important in that they teach students effective learning methods and study skills that are transferable to other courses and situations, and assist in achieving positive student outcomes. When coupled with other retention and support programs, the SI program can be a very

powerful catalyst in helping students of color remain in college, successfully persist towards graduation, and attain higher levels of academic achievement. This study also provides the MSS staff, SI team, and other MWU academic support staff with vital information regarding theories of student learning and learning styles, identity development of students of color, how identity impacts the student's educational experience, diversity issues, tools to assist students of color succeed, and methods of administering the SI program. This information can aid staff in encouraging more students of color to enroll in SI since they can discuss the tangible results of retention and graduation.

Given the pre-college learning and studying experience of the majority of students entering college, it is important for today's students to be taught how to learn and provided with specific learning tools to be successful in college-level learning tasks (Swail, Redd, & Perna, 2003). As described in this study, the Supplemental Instruction program is designed to provide an environment to introduce students to the learning and studying tools they need to achieve academic success. According to Arendale (1997), participating students consistently report that the SI sessions allow them to view the course material from a different perspective, and that the SI leaders engage them in activities that make learning fun and motivate them to excel. In this engaging environment, most students shift their learning paradigm from rote memorization of information to performing well on examinations to learning the material with a more conceptual understanding. This shift in learning results in an increase in critical thinking, problem-solving skills, test performance, and grades (Stone & Jacobs, 2006), which, in turn, will have a positive impact on student retention and persistence to graduation. The

delivery of SI through peer-instruction also benefits students by having SI Leaders who understand the new technological advances and how they might best be utilized in the SI model, communication, and course materials. The results of this research clearly show students benefited from participation.

The results of this study yield direct and significant benefits for students that attend SI in the form of retention and persistence to graduation for most students of color at MWU. Based on the results of these studies, students of color attending SI and applying what they learn can reasonably expect to pass the historically difficult course the first time taken, obtain a grade higher than students who do not attend SI, and persist to graduation. By participating in the SI program students also gain the benefit of learning and study skills that can be utilized with other courses where SI is not offered. The application of these skills will continue to assist students' academic achievement throughout their academic careers. By having a SI Leader assisting the faculty member, students are provided more opportunities available to contact one of these individuals when needing assistance. In addition to the faculty member and SI Leader, many students form peer study groups with students they meet attending SI sessions, further expanding the opportunities for assistance when needed. Also, there is no additional fee or cost associated with having SI for the course, and students who pass the course the first time taken do not incur additional tuition fees by having to repeat the course a second time.

The literature explores other benefits students acquire through retention programs, to include: the development of their ethnic identity, increased self-concept of academic ability, opportunities for academic and personal success, and the engagement of social support (Moxley, Najor-Durack, & Dumbrigue, 2001). Even though this was not the

focus of this research, one can extrapolate the benefits to include these areas. When students utilize programs, such as SI, the academic achievements they obtain helps develop their confidence and self-concept of academic ability, pride in academic and personal success, motivation to continue to achieve in many different areas, and an overall development of their academic identity (Torres, Howard-Hamilton, & Cooper, 2003; Burton, 2006).

Thompson (2007) described three categories of benefits students gain from participating in academic assistance and retention programs: educational, fringe, and existential. The SI program provides benefits in all three categories in terms of enhancing the students' intellectual capacity and skills, retention and persistence to graduation, and providing an engaging environment for peer contact, interactions with faculty, and expanding their academic experiences. Likewise, Astin's (1985) model of talent development explores the extent in which students are able to develop their talents as a result of being exposed to particular educational programs, such as the SI program.

### Recommendations for Future Research

Although Supplemental Instruction has had a substantial impact in a wide variety of institutions across the country, there are many future challenges that must be researched and redesigned to meet the needs of the 21<sup>st</sup> Century students. Following are four areas involving the SI program to be further investigated. The first area is to develop strategies for increasing students' participation in SI sessions. The findings from this research show that participation benefits students, but also shows that not all students opt to participate in SI. As faculty play a significant role in the students' learning,

involvement in class, and academic achievement, it is important for faculty members to understand the positive and supportive relationship between SI and student learning. Designing strategies to increase faculty buy-in and support for the SI program is the second area for future research.

The third area for further investigation is reaching today's students through new technology (i.e., incorporating e-mail as a means of communication and encouraging attendance at SI sessions). Traditionally, SI has been effective in increasing students' academic success when used at on-campus sites. With changes in technology, and the increase of distance learning and academic programs located at off-campus sites, the need to invent new delivery methods for SI has become increasingly more prevalent (Stone & Jacobs, 2006). Researching the impact in the form of delivery of SI on student retention and persistence to graduation is needed. Developing new strategies and models for SI to be used with alternative course delivery and with new technology is also very important to the sustainability of the SI program and to continue to provide students with academic support.

To improve academic success and retention, further research in redesigning the current SI model to implement at the high school level is needed to serve as a proactive approach in teaching students the learning and study skills needed prior to entering college. Just as the pre-college enrichment program and summer bridge program have a positive impact on the recruitment and retention of students of color, implementing the SI program at the high school level could also provide an academic assistance program that addresses the inadequate pre-college academic preparation of students of color.

Greene (2005) stated, “any attempt to address the problem of minority enrollment in higher education that does not focus on improving K-12 education will be ineffective” (p. 105). This premise establishes another platform for future research in the need to reform K-12 education to more appropriately and successfully prepare students of color for college. Evidence shows that the only reasonable prospect for increasing minority participation in higher education is increasing the supply of college-ready minority graduates (Greene, 2005). This cannot be achieved strictly through policies implemented at the college level; it must also come through improvement in the education students of color receive from their K-12 schools (Moxley, Najor-Durack, & Dumbrigue, 2001). Other important recommendations for future research that emerged from the results of this study include: 1) conducting a comparative study on the impact of SI on the GPA and retention of students of color at MWU in comparison to students of color at other predominantly white universities with similar student population demographics; and 2) compare the academic achievement and retention of students of color at MWU that attend SI with students of color at MWU who attend SI and also participate in other supportive retention programs, such as the peer mentoring program. Finally, it is recommended that further research be conducted to explore more fully why the Asian student population remains the only MWU population studied where SI does not indicate having a significant difference in improving GPA (Telfer, 2003), or retention and persistence to graduation and to uncover why Hispanic/Latino students did not obtain the level of success noted by other minority groups in the study.

## Conclusion

This study concluded that SI had a significant impact on the retention and persistence to graduation for African-American, Hispanic/Latino, and Native American students at MWU. However, this study concluded that SI did not have a significant impact on the retention and persistence to graduation for Asian students at MWU. As the number of ethnically diverse students on our college and university campuses continues to grow, a complex view regarding the study of diversity and retention has emerged. This view recognizes that the focus of diversity and retention research needs to go beyond the study of students of color as one general ethnic group, but instead need to investigate diverse ethnic groups individually (Torres, Howard-Hamilton, & Cooper, 2003). The results of this study were analyzed through this new lens, and the findings depict diversity and retention issues specific to each ethnic group included. Accordingly, ethnically specific social and cultural experiences and needs, ethnic identity, learning styles and academic achievement, self-concept and academic ability, and the impact of the SI program were examined to review how these issues impacted the results of the study for each individual ethnic group investigated.

When deciphering research literature to determine why the Asian student population consistently had results differing from the other ethnic groups, three important points regarding ethnic identity development and academic development were examined. The first is the way Asian students experience Steele and Aronson's (1995, 1997) stereotype threat in reverse. Because they are striving to live up to the stereotype of being intelligent and academically gifted, Asian students find it difficult to admit they are having trouble learning and instead of seeking out academic assistance will leave college



citing other reasons. With the population of Asian students being so small at MWU, their cultural organization memberships are also very small. All of these major points create reactions in the Asian student population that may have a direct impact on the results of this study when measuring whether students persist to graduation. It is less clear why Hispanic/Latino students had rates of success less than their counterparts. Further research is needed in this area.

Research over the years has provided valuable information and guidance in understanding how to achieve diversity, and concurrently improve the social, cultural, and learning environments for students of color. In the review of literature relating to the retention of students of color (Aragon, 2000; Astin, Chang, & Kim, 2004; Bean, 1983; Dennis, 1998; Ford & Lang, 2002; Gurin, Lehman, & Lewis, 2004; Hurtado, Lindholm, Kohn, Mahoney, & Sax, 2005; Misra & McMahon, 2006; Nora and Cabrera, 1996; Steele & Aronson, 1995, 1997; Swail, Redd, & Perna, 2003; Terenzini, 1994; Terrell & Wright, 1998; Thompson, 2007; Tinto, 1986, 1997), several common themes have emerged that present barriers for students of color and must also be addressed for retention programs to be effective: 1) academic preparedness; 2) campus climate/environment; 3) commitment to educational goals and the institution; 4) social, cultural, and academic integration; and 5) inadequate financial aid support.

The placement of the SI program within Minority Student Services at MWU may have provided an additional point of contact for students of color to participate in SI. Still, less than half of the students of color opted to participate in SI when it was available. The findings show that participation had a significant impact on retention and graduation, making outreach to students of color important. Significant findings from the

research provided the MWU campus community with a better understanding of the function, focus, importance, and services of MSS in relation to the university.

Through the SI program, students at MWU are provided an environment that introduces them to learning and study skills necessary to achieve academic success. Based on the results of this study, students of color attending SI and applying what they learn can reasonably expect to pass the historically difficult course the first time taken, come back in the following semester, and persist to graduation. By participating in the SI program students also gain the benefit of learning and study skills that can be utilized with other courses where SI is not offered. The SI program also provides students with more academic assistance options and flexible learning opportunities, peer study groups, peer instruction through the use of new technological advances, focus on the quality of learning, and additional academic assistance at no additional cost. Participation in the SI program develops students' confidence and self-concept of academic ability, pride in academic and personal success, motivation to continue to achieve in many different areas, and an overall development of their academic identity (Burton, 2006; Torres, Howard-Hamilton, & Cooper, 2003). The SI program provides three categories of benefits students gain from participating in academic assistance and retention programs: educational, fringe, and existential Thompson (2007). Being exposed to particular educational programs, such as SI, explores the extent in which students are able to develop their talents as a result of (Astin, 1985).

The U.S. Department of Education designated SI as a model postsecondary retention program and has advocated its implementation in colleges and universities throughout the United States (Blanc, DeBuhr, & Martin, 1983). For more than thirty

years, studies have shown the SI program yields strong results in student learning across disciplines, types of colleges, and student ethnicities (Barlow & Villarejo, 2004).

According to Clark-Unite (2004), Supplemental Instruction (SI) works because SI sessions are proactive and participatory rather than reactive and passive. Supplemental Instruction has proven its effectiveness in supporting retention and assisting higher education institutions achieve their most important objective, of graduating students who have achieved the student learning outcomes necessary for success in their courses, careers, and in making positive contributions to society (Stone & Jacobs, 2006). The findings from this study extend the research on SI in university settings. In particular, it is now known that students of color fare significantly better due to their participation.

As the diverse population of the United States shifts and grows, perhaps we should embrace and take heed in Bob Dylan's mantra, "The times, they are a changing!" (Justiz, Wilson, & Bjork, 1994). The changes in global competition, new technologies, and cultural shifts are indicating that the 21<sup>st</sup> Century must have a more diverse and highly educated workforce. In order to successfully meet this emerging reality, and to continue to be a premier force in the marketplace, the United States needs to pay critical attention to the diverse populations attending our schools and place education as a priority on the national agenda (Barack, 2004). Accordingly, "we cannot ignore these trends and their profound implications for our society and our universities. Nor should we react to them passively. We must act directly to determine our own destiny" (Duderstadt, 1999, p. 431). Supplemental Instruction can play a significant role in these changes.

## APPENDICES

## APPENDIX A

### INFORMATION REQUEST LETTER TO MWU MINORITY STUDENT SERVICES

August 31, 2007

Minority Student Services  
Supplemental Instruction (SI) Program  
121 Bovee University Center  
Mid-Western University  
City, State 00000

Dear SI Program Staff:

As partial fulfillment of the requirements for the degree of Doctor of Education at Central Michigan University (CMU), I am conducting a quantitative causal comparative research project on the Supplemental Instruction (SI) program at Mid-Western University (NWU). The purpose of this research project is to measure: a) the extent to which there is a difference between the retention rates of students of color at MWU who attend SI to students of color at MWU who do not attend SI; and b) the extent to which there is a difference between the graduation rates of students of color at MWU who attend SI to students of color at MWU who do not attend SI. I believe SI is a valuable academic assistance support program, and that the results of this study will further document the program's positive effect on the retention and persistence to graduation of students of color at MWU.

I have been given authorization by the CWU Institutional Review Board (IRB) to use data collected during my initial research study, conducted during the Fall semester of 2003, for further research. I had also been given permission by the Director of MSS to continue my research regarding the SI program in conjunction with my dissertation research project.

To complete my research study, I am in need of the following information from your office based on the attached lists of students. Spreadsheets listing the students by semester, ethnicity, course name, and whether they did or did not attend SI are attached to assist with the tallying.

- 1) Data relating to the attached list of African-American students:
  - a. the number of African-American students, on the list, enrolled at MWU during the Spring 2007 semester,
  - b. the number of African-American students, on the list, *not* enrolled at MWU during the Spring 2007 semester and *have not* graduated,
  - c. the number of African-American students, on the list, *not* enrolled at MWU during the Spring 2007 semester and *have* graduated.

- 2) Data relating to the attached list of Hispanic/Latino students:
  - a. the number of Hispanic/Latino students, on the list, enrolled at MWU during the Spring 2007 semester,
  - b. the number of Hispanic/Latino students, on the list, *not* enrolled at MWU during the Spring 2007 semester and *have not* graduated,
  - c. the number of Hispanic/Latino students, on the list, *not* enrolled at MWU during the Spring 2007 semester and *have* graduated.
- 3) Data relating to the attached list of Asian students:
  - a. the number of Asian students, on the list, enrolled at MWU during the Spring 2007 semester,
  - b. the number of Asian students, on the list, *not* enrolled at MWU during the Spring 2007 semester and *have not* graduated,
  - c. the number of Asian students, on the list, *not* enrolled at MWU during the Spring 2007 semester and *have* graduated.
- 4) Data relating to the attached list of Native American students:
  - a. the number of Native American students, on the list, enrolled at MWU during the Spring 2007 semester,
  - b. the number of Native American students, on the list, *not* enrolled at MWU during the Spring 2007 semester and *have not* graduated,
  - c. the number of Native American students, on the list, *not* enrolled at MWU during the Spring 2007 semester and *have* graduated.

To protect the privacy of the students, no identifiable information (i.e., name or social security number) will be used or mentioned in the study findings, and only the aggregated data will be presented. To assist with ensuring that confidentiality is maintained, I am asking that the information provided by MSS be anonymous, de-linked, and contain no personal identifiers. To assist with maintaining confidentiality, the attached data summary tables for each semester are to be used to provide the aggregated numerical data. I will analyze the aggregated data using Cochran-Mantel-Haenszel chi-square technique and the Pierson chi-square, for each study.

Any assistance you can provide me in collecting this data would be greatly appreciated. Please feel free to contact me at (734) 769-7100 ext. 6177 or via e-mail at [Dulcie.Telfer@med.va.gov](mailto:Dulcie.Telfer@med.va.gov) with any questions or to arrange for the coordination of this information.

Sincerely,

Dulcie D. Telfer,  
Candidate for the degree of Doctor of Education, Educational Leadership, CMU

# APPENDIX B

## LISTING OF STUDY PARTICIPANTS

### AFRICAN-AMERICAN STUDENTS

STUDENT'S NAME & SSN	COURSE	ATTEND SI	<i>DID NOT</i> ATTEND SI	ENROLLED DURING Spring 2007	NOT ENROLLED DURING Spring 2007 & <i>HAVE NOT</i> GRADUATED	NOT ENROLLED DURING Spring 2007 & <i>HAVE</i> GRADUATED
	ACC 201		X			
	BIO 101N	YES				
	BIO 101N		X			
	BIO 101N	YES				
	BIO 101N	YES				
	BIO 101P	YES				
	BIO 101P		X			
	BIO 101P		X			
	BIO 101P		X			
	BIO 101P		X			
	BIO 101P	YES				
	BIO 101P	YES				
	BIO 101P		X			
	BIO 101P	YES				
	BIO 101P		X			
	BIO 101P	YES				
	BIO 101P	YES				
	BIO 101T		X			
	BIO 101T		X			
	CHM 131		X			
	CHM 131	YES				
	CHM 131	YES				
	CHM 131	YES				
	CHM 131	YES				
	CHM 132		X			
	CHM 132	YES				
	CPS 180		X			
	CPS 180		X			
	CPS 180	YES				
	CPS 180		X			
	CPS 180		X			
	CPS 180	YES				

	MTH 105	YES				
	MTH 105	YES				
	MTH 107		X			
	MTH 130	YES				
	MUS 114	YES				
	MUS 114	YES				
	MUS 114	YES				
	MUS 114	YES				
	MUS 114	YES				
	MUS 114		X			
	MUS 114	YES				
	MUS 114	YES				
	MUS 114		X			
	MUS 114	YES				
	MUS 114		X			
	MUS 114	YES				
	MUS 114		X			
	PSY 100					
	PSY 100					
	PSY 100					

Notes:

1. The students' names and social security numbers have been deleted to ensure confidentiality.
2. The document content is individualized to collect data from each of the four semesters evaluated.



# HISPANIC/LATINO STUDENTS

STUDENT'S NAME & SSN	COURSE	ATTENDED SI	<i>DID NOT</i> ATTEND SI	ENROLLED DURING Spring 2007	NOT ENROLLED DURING Spring 2007 & <i>HAVE NOT</i> GRADUATED	NOT ENROLLED DURING Spring 2007 & <i>HAVE</i> GRADUATED
	ACC 201	YES				
	ACC 202		X			
	BIO 101N		X			
	BIO 101N	YES				
	BIO 101N		X			
	BIO 101P		X			
	CHM 131	YES				
	CHM 131		X			
	CHM 131	YES				
	CHM 132	YES				
	CHM 132	YES				
	CHM 132		X			
	CPS 180		X			
	MTH 107		X			
	MTH 130	YES				
	MTH 130		X			
	MTH 132	YES				
	MUS 114		X			
	MUS 114		X			

	MUS 114	YES				
	MUS 114		X			
	MUS 114		X			
	MUS 114	YES				
	MUS 114		X			
	MUS 114		X			
	MUS 114		X			
	MUS 114		X			
	MUS 114		X			
	MUS 114		X			
	MUS 114		X			
	PSY 100		X			
	PSY 100		X			

**Notes:**

1. The students' names and social security numbers have been deleted to ensure confidentiality.
2. The document content is individualized to collect data from each of the four semesters evaluated.

# ASIAN STUDENTS

STUDENT'S NAME & SSN	COURSE	ATTEND SI	<i>DID NOT</i> ATTEND SI	ENROLLED DURING Spring 2007	NOT ENROLLED DURING Spring 2007 & <i>HAVE NOT</i> GRADUATED	NOT ENROLLED DURING Spring 2007 & <i>HAVE</i> GRADUATED
		BIO 101N	YES			
		BIO 101P		X		
		BIO 101P		X		
		BIO 101T		X		
		CHM 131	YES			
		CHM 131		X		
		CHM 131		X		
		CHM 132		X		
		CHM 132	YES			
		CHM 132		X		
		CPS 180		X		
		CPS 180		X		
		MTH 107		X		
		MTH 132		X		
		MUS 114	YES			
		MUS 114		X		

## Notes:

1. The students' names and social security numbers have been deleted to ensure confidentiality.
2. The document content is individualized to collect data from each of the four semesters evaluated.

# NATIVE AMERICAN STUDENTS

STUDENT'S NAME & SSN	COURSE	ATTEND SI	<i>DID NOT</i> ATTEND SI	ENROLLED DURING Spring 2007	NOT ENROLLED DURING Spring 2007 & <i>HAVE NOT</i> GRADUATED	NOT ENROLLED DURING Spring 2007 & <i>HAVE</i> GRADUATED
	BIO 101N	YES				
	BIO 101N		X			
	BIO 101N		X			
	BIO 101N		X			
	BIO 101P		X			
	CHM 131	YES				
	CHM 132	YES				
	MTH 105		X			
	MTH 130		X			
	MUS 114	YES				
	MUS 114	YES				

## Notes:

1. The students' names and social security numbers have been deleted to ensure confidentiality.
2. The document content is individualized to collect data from each of the four semesters evaluated.

## APPENDIX C

### MINORITY STUDENTS SERVICES DIRECTOR'S PERMISSION LETTER

Minority Student Services, Director  
Mid-Western University  
City, State 00000

Dear Director:

As partial fulfillment of the requirements for the degree of Doctor of Education at Central Michigan University (CMU), I am planning to conduct a quantitative causal comparative research project regarding the Supplemental Instruction (SI) program at Mid-Western University (MWU). As the Director of the office administering the SI program, I am requesting your approval to continue my research regarding the SI program in conjunction with my dissertation research project.

The purpose of this research project is to measure: a) the extent to which there is a difference between the retention rates of students of color at MWU who attend SI to students of color at MWU who do not attend SI; and b) the extent to which there is a difference between the graduation rates of students of color at MWU who attend SI to students of color at MWU who do not attend SI. I believe SI is a valuable academic assistance support program, and that the results of this study will further document the program's positive effect on the retention and persistence to graduation of students of color at MWU.

During the Fall semester of 2003 I conducted a quantitative research study with the purpose of measuring the extent to which there was a difference between the grade point averages (GPA) of students of color at MWU who attended SI to students of color at MWU who did not attend SI. The study concluded that there was a significant increase in the GPA for the Native American and African-American groups, but there was not a significant increase in GPA for the Asian and Hispanic/Latino groups.

I have requested approval from the Institutional Review Board to open the Spring 2003 study, so that I may utilize the data set I compiled relating to students of color participating in the SI program for the time period beginning in the Fall semester of 2001 through the Fall semester of 2002. My intention is not to gather further data, but to conduct a further study using the same data. Archival data from the Spring semester of 2007 will also be used for the current investigation. To protect the privacy of the students, no identifiable information will be used or mentioned in the study findings, and only the aggregated data will be presented. Please feel free to contact me via e-mail at [Dulcie.Telfer@med.va.gov](mailto:Dulcie.Telfer@med.va.gov) with any questions, or to notify me of your approval decision.

Sincerely,

Dulcie Telfer, Candidate for the degree of Doctor of Education, Educational Leadership

## APPENDIX D

### MWU INSTITUTIONAL REVIEW BOARD (IRB) PERMISSION REQUEST LETTER

March 10, 2006

Institutional Review Board (IRB) Coordinator  
Office of Research and Sponsored Programs  
251 Foust Hall, Mid-Western University  
City, State 00000

Dear Coordinator:

As partial fulfillment of the requirements for the degree of Doctor of Education at Central Michigan University (CMU), I am planning to conduct a quantitative causal comparative research project regarding the Supplemental Instruction (SI) program at Mid-Western University (MWU). The purpose of this research project is to measure: a) the extent to which there is a difference between the retention rates of students of color at MWU who attend SI to students of color at MWU who do not attend SI; and b) the extent to which there is a difference between the graduation rates of students of color at MWU who attend SI to students of color at MWU who do not attend SI.

During the Fall semester of 2003 I conducted a quantitative research study with the purpose of measuring the extent to which there was a difference between the grade point averages (GPA) of students of color at MWU who attended SI to students of color at MWU who did not attend SI. The study concluded that there was a significant increase in the GPA within each group for the Native American and African-American groups. There was not a significant increase in GPA within each group for the Asian and Hispanic/Latino groups.

I am requesting approval from the Institutional Review Board to open the Spring 2003 study, so that I may utilize the data set I compiled relating to students of color participating in the Supplemental Instruction program for the time period beginning in the Fall semester of 2001 through the Fall semester of 2002. My intention is not to gather further data, but to conduct a further study using the same data.

Archival data from the Spring semester of 2007 will also be used for the current investigation, and will be collected from the MWU Minority Student Services records in August 2007.

I have been given permission by the MWU Director of Minority Student Services to continue my research regarding the SI program in conjunction with my dissertation research project.

Sincerely,

Dulcie Telfer, Candidate for the degree of Doctor of Education, Educational Leadership

# APPENDIX E

## SUMMARIZED DATA RETRIEVED FROM MSS

FALL SEMESTER 2001

### *STUDENTS WHO ATTENDED SI*

ETHNICITY	ENROLLED DURING SPRING 2007	NOT ENROLLED DURING SPRING 2007 & <i>HAVE NOT</i> GRADUATED	NOT ENROLLED DURING SPRING 2007 & <i>HAVE</i> GRADUATED
African-American			
Hispanic/Latino			
Asian			
Native American			
TOTALS			

### *STUDENTS WHO DID NOT ATTEND SI*

ETHNICITY	ENROLLED DURING SPRING 2007	NOT ENROLLED DURING SPRING 2007 & <i>HAVE NOT</i> GRADUATED	NOT ENROLLED DURING SPRING 2007 & <i>HAVE</i> GRADUATED
African-American			
Hispanic/Latino			
Asian			
Native American			
TOTALS			

SPRING SEMESTER 2002

*STUDENTS WHO ATTENDED SI*

ETHNICITY	ENROLLED DURING SPRING 2007	NOT ENROLLED DURING SPRING 2007 & <i>HAVE NOT</i> GRADUATED	NOT ENROLLED DURING SPRING 2007 & <i>HAVE</i> GRADUATED
African-American			
Hispanic/Latino			
Asian			
Native American			
TOTALS			

*STUDENTS WHO DID NOT ATTEND SI*

ETHNICITY	ENROLLED DURING SPRING 2007	NOT ENROLLED DURING SPRING 2007 & <i>HAVE NOT</i> GRADUATED	NOT ENROLLED DURING SPRING 2007 & <i>HAVE</i> GRADUATED
African-American			
Hispanic/Latino			
Asian			
Native American			
TOTALS			



FALL SEMESTER 2002

*STUDENTS WHO ATTENDED SI*

ETHNICITY	ENROLLED DURING SPRING 2007	NOT ENROLLED DURING SPRING 2007 & <i>HAVE NOT</i> GRADUATED	NOT ENROLLED DURING SPRING 2007 & <i>HAVE</i> GRADUATED
African-American			
Hispanic/Latino			
Asian			
Native American			
TOTALS			

*STUDENTS WHO DID NOT ATTEND SI*

ETHNICITY	ENROLLED DURING SPRING 2007	NOT ENROLLED DURING SPRING 2007 & <i>HAVE NOT</i> GRADUATED	NOT ENROLLED DURING SPRING 2007 & <i>HAVE</i> GRADUATED
African-American			
Hispanic/Latino			
Asian			
Native American			
TOTALS			

## APPENDIX F

### OFFICE OF INSTITUTIONAL RESEARCH VALIDATION REQUEST LETTER

September 7, 2007

Office of Institutional Research  
312U Warriner Hall, Mid-Western University  
City, State 00000

To Whom it May Concern:

As partial fulfillment of the requirements for the degree of Doctor of Education at Central Michigan University (CMU), I am conducting a quantitative causal comparative research project on the Supplemental Instruction (SI) program at Central Michigan University (CMU). The purpose of this research project is to measure: a) the extent to which there is a difference between the retention rates of students of color at CMU who attend SI to students of color at CMU who do not attend SI; and b) the extent to which there is a difference between the graduation rates of students of color at CMU who attend SI to students of color at CMU who do not attend SI. I believe SI is a valuable academic assistance support program, and that the results of this study will further document the program's positive effect on the retention and persistence to graduation of students of color at CMU.

I have been given authorization by the CMU Institutional Review Board (IRB) (please see additional e-mail documentation) to use data collected during my initial research study, conducted during the Spring semester of 2003, for further research. I had also been given permission by the Director of Minority Student Services (MSS) to continue my research regarding the SI program in conjunction with my dissertation research project. The archival data set from my initial research study contains the names, social security numbers, and ethnicity of the participants in the study. This information will be destroyed at the conclusion of the study.

Due to a change in the GQL/SAS computerized student registration and information system, I would like to compare and validate the data pulled earlier from the MSS office. To accomplish this I am in need of a report with the following statistical information from your office:

The NAMES, listed by ethnicity (African-American, Hispanic/Latino, Asian, Native American) of all students of color who graduated with a Bachelor's degree at the end of the following semesters:

**Spring 2007, Fall 2006, Spring 2006, Fall 2005, Spring 2005, Fall 2004,  
Spring 2004, Fall 2003, Spring 2003.**

I was informed that August graduations were discontinued, but I do not know which year that occurred. Therefore, I would also need the same information identified above for any August graduations that occurred between **Spring 2003 through Spring 2007**.

All information provided to me from your office will be protected, used strictly for the above mentioned research study, and will be destroyed upon the completion of the study. To protect the privacy of the students, no identifiable information (i.e., name or social security number) will be used or mentioned in the study findings, and only aggregated data will be presented. I will analyze the aggregated data using Cochran-Mantel-Haenszel chi-square technique and the Pierson chi-square, for each study.

Any assistance you can provide me in collecting this data would be greatly appreciated. Please feel free to contact me at (734) 439-3824 or via e-mail at [telfeldd@cmich.edu](mailto:telfeldd@cmich.edu) with any questions or to arrange for the coordination of this information.

Sincerely,

*Dulcie D. Telfer*

Dulcie D. Telfer  
Candidate for the degree of Doctor of Education  
Educational Leadership  
Central Michigan University

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