BUILDING STUDENT SUCCESS AND RETENTION: QUANTITATIVE DEMOGRAPHIC STUDY OF SUPPLEMENTAL INSTRUCTION

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ABSTRACT

My research examined student performance and retention strategies of the Supplemental Instruction (SI) program of one community college in the United States' southeastern region. The correlational data analysis involved eight semesters of archived data involving 308 community college students. Chi-square of independence analysis revealed that course grades for combined ethnic groups and retention status were related. The Caucasian ethnic group is different from the other ethnic groups because the performance of Caucasian students and retention status were correlated while the others did not. The variable relationships between course grades and student retention outcomes of various ethnic student groups informed educational leaders to avoid using one-tool-fits-all to address student needs. Future research must consider investigating performance within each academic course instead of lumping the classes together. In addition, future research must explore similar sample sizes of various ethnic groups when examining the relationship between academic performances and retention outcomes.

Keywords: Supplemental Instruction, Demographic Study, Student Retention, Community College, Underrepresented Minorities, Disadvantaged Students.

INTRODUCTION

The Supplemental Instruction program is one of the strategies that educational leaders use to increase student success outcomes such as performance (course grades), student retention rates, and graduation rates (Higgins, 2004; Hongtao et al., 2018). The SI program is a form of traditional tutoring but involves only rigorous courses to help at-risk students succeed (Dawson et al., 2014; Ghenghesh, 2018). The course grade is an indicator of student performance (Hongtao et al., 2018). The definition of student retention and graduation varies across the higher education landscape (Cohen & Brawer, 2013). However, student retention can be defined as a student's continuous enrollment over a defined academic period, such as semester to semester (fall to fall or spring to spring) or year to year student enrollment, while graduation refers to the percentage of students who received any form of credential. Student retention is defined as a semester-to-semester (fall to spring) enrollment or graduation for this research investigation.

Personnel of educational institutions collect and archived or stored large volumes of data, including SI program data, from their daily activities over several years (Black, 2012). In many instances, essential research design stages of planning and execution are absent in archived data because those data generally are collected and stored with no forecast to analyze the data. Later, researchers may find it necessary to examine the data. Correlation designs are beneficial in addressing the problem of analyzing archival data collected for various reasons that cause-effect analytical methods may not be applicable.

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According to Dawson et al. (2014), the SI strategy to increase performance and retention of at-risk students started in 1973 at the University of Missouri. Supplemental Instruction programs are predominantly one-on-one or small groups of extra assistance provided to at-risk students. Several educational leaders have added online tools and resources to face-to-face meetings to serve various student groups (Dawson et al., 2014; Sembiring, 2018). Peers (students) that have previously completed the course with good grades and mastered the course are predominantly involved in leading the SI lessons (Ghenghesh, 2018; Hongtao et al., 2018; Liu, 2018). Although SI has been around for about four decades, there are limited examinations of the SI programs to understand the performance and retention of various student groups (Hongtao et al., 2018).

Rabitoy et al. (2015) have documented performance differences among ethnic groups, while Hongtao et al. (2018) reported achievement gaps between disadvantaged students (underrepresented minorities - URM, first-generation students, and Pell Grant-eligible students) and their peers. Rabitoy et al. (2015) also found that the number of disadvantaged students enrolled in the SI program in one community college was more than twice their peers, primarily because the disadvantaged students were not as likely to pass the challenging courses as their peers. The disadvantaged student is a term that refers to URM, first-generation students, and Pell Grant-eligible students, while those whose parents or immediate families do not have a college degree are called first-generation students. Americans refer to Black/ African Americans, Native-Hawaiian/ Pacific Islanders, Hispanics, Asian Americans, American-Indian/ Alaskan natives, or two or more races as URM. The disproportionate performance challenges of passing rigorous courses and the unequal number of disadvantaged students taking the SI lessons is an equity issue.

The problem addressed in this study was performance and student retention challenges in rigorous courses. Many students have difficulties passing challenging courses leading to reduced performance and retention rates (Dawson et al., 2014; Hongtao et al., 2018). Consequently, many higher education institution leaders across the United States implemented Supplemental Instruction (SI) programs outside the standard instruction hours to enhance performance and retention. Despite many SI programs implemented across the higher education landscape, there are limited investigations to understand how to better serve various student groups, especially the disadvantaged students who disproportionally participate in the SI programs (Hongtao et al., 2018; Musah & Ford, 2017). For example, the SI program at this community college in the southeastern region of the United States that this researcher examined span over 10 years without any statistical analysis except a few random descriptive statistics outcomes.

Examining correlations between student performance and student retention outcomes among community college ethnic student groups could inform educational leaders to better serve various student groups. There are limited SI program examinations to understand student groups' performance and retention (Hongtao et al., 2018). The purpose of this correlational study using archived quantitative Supplemental Instruction (SI) data was to investigate relationships between course grade as the predictor variable and student retention outcomes (fall to spring or graduation) of ethnic groups (African American, Hispanic, Native American, Asians, and Caucasians). This is done by addressing the research question: What are the correlations between course grade as the predictor variable and student retention outcome among community college ethnic student groups?

This correlational study involving a detailed analysis of a SI program at one community

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college in the United States' southeastern region provided outcomes on what is working and areas that need improvement and provided direction for the college leaders and researchers. The outcome of this investigation contributed to filling the gap in the literature regarding demographic studies considering the SI and various student groups. The literature review includes Supplemental Instruction Strategy, Black/African American Students, Hispanic Students, and Asian American Students. The researcher addressed why this research is essential with this literature review structure.

LITERATURE REVIEW

Researchers commonly use archived data in Supplemental Instruction (SI) investigations at both universities (Hongtao et al., 2018; Musah & Ford, 2017) and community colleges (Oja, 2012; Rabitoy et al., 2015). Although higher education administrators have used student support services for several decades to help students, higher education policies partly speed up student success strategies to enhance student performance, retention, and graduation rates (Li & Kennedy, 2018). This is because higher education policies added student success outcomes such as student performance, student retention, and graduation rates to enrollment numbers in calculating public institutions' money from the state and the national governments. This form of funding is referred to as performance-based funding.

Comprehensive student success strategies are necessary for higher education students to be successful. The SI program is one effective strategy that complements student performance and retention strategies across the higher education landscape. The researcher investigated correlations between the performance and retention of various student groups. Although many disadvantaged students participate in the SI programs, there are limited investigations regarding the performance and retention of these student groups (Hongtao et al., 2018). The purpose of the literature review was to provide information on the SI strategy and underrepresented minority students; African Americans, Hispanic, Asian Americans, and Caucasians.

Supplemental Instruction Strategy

Various student support services such as the Supplemental Instruction (SI) and peer-tutoring, mentoring program, staff support, socialization with faculty, and participation in school club activities enhance performance and retention outcomes of various student groups (Whitten et al., 2020). Unlike conventional tutoring programs that involve less challenging courses, SI programs require rigorous courses that a considerable number of students could not obtain passing grades, and those courses have low retention rates (Hongtao et al., 2018; Srivastava & Rashid, 2018). The SI strategy can increase the performance and retention of at-risk students (Higgins, 2004; Rabitoy et al., 2015).

United States' SI strategy began more than four decades ago at the University of Missouri (Dawson et al., 2014). Faculty lectures and demonstrations alone are insufficient for student learning, performance, and retention (Chrysikos et al., 2017). Higher education institution administrators adopted various approaches to the SI programs that predominantly involve one-on-one meetings between students and SI peer leaders (Dawson et al., 2014; Musah & Ford, 2017). The SI peer leaders are students who have completed the course with excellent grades and mastered the courses (Ghenghesh, 2018; Hongtao et al., 2018; Liu, 2018).

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The SI activities include small group meetings, online tools and resources, and face-to-face meetings to serve various student groups (Dawson et al., 2014; Sembiring, 2018). However, face-to-face meetings dominate the SI activities except for higher education institutions that offer only distance education programs (Dawson et al., 2014). Numerous students prefer face-to-face courses over online courses or programs (Sembiring, 2018). The reasons why a student prefers face-to-face programs include limited reliable internet access or equipment like a desktop computer or laptop or other portable devices to participate in the online instructions (Sansone et al., 2018). Disadvantaged low-income students have higher technological challenges than their peers. Consequently, educational leaders must provide students with multiple SI choices.

Tinto's retention theory and different learning theories, such as social constructivism and collaborative learning following Tinto's retention theory, considerably contributed to the understanding of the SI model (Chrysikos et al., 2017). The collaborative learning theory that emphasized team learning among peers provided a sound base for SI activities (Jacobs et al., 2008). A collaborative learning strategy involves purposeful activities that allow students to talk to one another, compare notes, discuss essential concepts and lessons as a team, develop a shared understanding of course problems and solve them together, learn from each other, and get peer support (Zambrano et al., 2019). The students also utilize the various perspectives of each other within the group to be successful.

Black/African American Students

Although many Black/African American students participate in Supplemental Instruction (SI) programs, there are limited research studies to understand the relationship between participating in the SI programs and the performance and retention of these students (Hongtao et al., 2018). The Black/African Americans have an African origin. The researcher hereafter referred to the Black/African Americans as African Americans. The SI investigation of Hongtao et al. (2018) involved 16,297 undergraduate students, out of which 10,788 (62.5%) was underrepresented students. The African American students formed 4.2% (685 students) of the research subjects.

African American students' performance and retention outcomes lag that of Caucasian students (Hongtao et al., 2018; Johnson, 2013). The academic and non-academic hurdles affecting African American students' performance and retention are variable and differ from other ethnic groups in many ways, although there may be overlaps (Cohen & Brawer, 2013). Despite these findings, many educational leaders use the one-tool-fit-all model in addressing student success issues (Knapp et al., 2020).

Student success outcomes of African American students lag behind their peers (Johnson, 2013; Wyner, 2019). For example, between 2005 and 2014, African American students had the lowest four-year graduation outcome for each year using aggregated data for the Maryland community college system Maryland Higher Education Commission (2019) in 2005, the difference between Asian students, who recorded the highest graduation rate within the Maryland community college system, and African American students was 26.5%, and the difference in 2014 was 21.7%. By 2014, African American students closed the achievement gap by 4.8%, although they still recorded the lowest student success outcomes.

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Hispanic Students

Like African American students, many Hispanic students, also known as Latino students, participate in Supplemental Instruction (SI) programs. However, there are limited investigations to understand the relationship between the participation of Hispanic students in the SI programs and their performance and retention (Hongtao et al., 2018). Hispanics, also known as Latinos, have Latin-American origins. Hongtao et al. (2018) noted that the research participants were 41.9% (6,828) Hispanic students out of 16,297 undergraduate students who participated in the SI.

The open-admission policies and low tuitions and fees of the community colleges attract many low-income Hispanic students (Rabitoy et al., 2015; Roman, 2007). The United States' demography is changing rapidly, and demographers estimate that Hispanics will form 20% of the Nation's population by 2030 compared to 15% in 2006 (Santos, 2010). Many Hispanic students are not ready for college increasing the challenges of passing rigorous courses (Cohen & Brawer, 2013; Hongtao et al., 2018).

For the entire Maryland community colleges, the Hispanic population has consistently below the average four-year graduation outcome between 2005 and 2014, exhibiting a rise and fall pattern (Maryland Higher Education Commission, 2019). The mean for all students in 2014 was 38.9%, while the Hispanic population had 29.7, while Caucasians had 46.0%. Financial support for tuition and personal needs and caring for a family are significant roadblocks that negatively affect the performance and retention of Hispanic students (Roman, 2007; Santos, 2010). For example, Tovar found that 96.6 of 397 students said they spend considerable time on their family, which takes time away from their academic work. The number of hours these Hispanic students spent on their families negatively predicted their GPA. Philbin also noted that immigration hurdles that the United States' Hispanic students must navigate might be a crucial factor that negatively affects student success outcomes of Hispanic students in the Nation.

Asian American Students

Asian Americans consist of diverse ethnic subgroups, including Taiwanese, Chinese, Japanese, Filipino, Korean, Vietnamese, and Indian, who have Asian ancestry; they consist of more than 40 ethnic subgroups speaking over 300 different languages (Ing & Victorino, 2016; Pew Research Center, 2013). Several Americans regard Asian Americans as role model minorities who have high academic performance, especially in STEM disciplines (Chai & Weseley, 2017). Ing & Victorino (2016) argued that considering the Asian American subgroups as homogeneous and stereotyping them as role model minorities is misleading and confusing because education attainments and socio-economic status vary considerably among the Asian American subgroups. For example, in 2017, data collected on 22 Asian American subgroups showed that Taiwanese had the highest graduate and professional degrees (45.2%), followed by Indians (41.6) and Pakistanis (27.3%), while the Tongan subgroup had only 3.1% (AAPI Quick Stats, 2017). Trytten et al. (2012) noted that Asian Americans did not necessarily outperform other ethnic groups to be considered role models.

Asian Americans have more undergraduate degrees than any ethnic group in the United States (Pew Research Center, 2013). Forty-nine percent of Asian Americans complete undergraduate studies compared to 28% of the entire United States population. Asian Americans

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are more likely to participate in STEM-related clubs than their peers (Chai & Weseley, 2017). Their academic engagement of Asian Americans was positively correlated to educational performance (grade point average) (Ing & Victorino, 2016). Ing & Victorino (2016) observed differences in the performance of Asian American subgroups. The East Indian and Pakistani ethnic subgroups outperformed the Filipino and Thai Chinese subgroups. The outcomes of Ing & Victorino (2016) suggest that aggregated data of different ethnic groups can mast essential factors necessary for educational strategies to enhance student performance and retention. Despite these observations, there are limited research investigations involving Asian Americans (Ing & Victorino, 2016).

Caucasian Students

People of European origin constitute the Caucasian ethnic group commonly referred to as Whites (Johnson, 2013). The researcher referred to people that have European origin as Caucasians. Like the disadvantaged students, Caucasians also have academic and non-academic challenges. However, Caucasians generally have higher academic performance and retention rates than disadvantaged students (Maryland Higher Education Commission, 2019). (Maryland Higher Education Commission, 2019). Several reasons make it possible for Caucasians to have higher academic success than disadvantaged students (Schudde, 2016). For example, many Caucasian students are ready for college due to various reasons, such as Caucasian segregated high school districts that have high performance, limited homelessness, minimal financial burdens, and minimal transportation problems that can promote their performance, retention, and graduation rates (Cohen & Brawer, 2013; Schudde, 2016). Also, many Caucasian students are non-first-generation students with parents who guide them throughout their education journey and act as role models (Dennis et al., 2005; Swecker, 2013).

Hongtao et al. (2018) examined 16,297 students who participated in Supplemental Instruction (SI) programs and found that 5,505 (33.7%) were Caucasians. Also, an analysis of SI archived data from 1993 to 2005 showed that out of about 12,471 students, 44.3% of Caucasians participated in the SI program (Zaritsky & Toce, 2006). The results of Hongtao et al. (2018) and (Zaritsky and Toce (2006) showed that the number of disadvantaged students participating in SI is higher than Caucasians. The large number of students who participated in the SI programs could pose budget challenges to higher education institutions because educational leaders offer the SI programs to students free of charge.

THEORETICAL FRAMEWORK

Tinto's (1975) theory on student retention served as the guiding framework for this correlational research of quantitative Supplemental Instruction (SI) data from one community college in the southeastern United States. Theoretical frameworks and models can guide new investigations and provide direction for research investigations' purpose, questions, and hypotheses (Chrysikos et al., 2017). Many learning theories emphasizing collaborative learning, active learning, learning communities, and student engagement have provided a sound base for implementing SI programs to enhance student learning and retention (Dawson et al., 2014; Hlinka, 2017; Jacobs et al., 2008). Educational leaders use the SI programs to provide additional help to at-risk students to minimize failing grades or withdrawing from rigorous courses

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(Higgins, 2004; Hongtao et al., 2018).

Tinto's retention theory provided the foundation for using peers (students) to help other students by facilitating the SI lessons (Hlinka, 2017; Jacobs et al., 2008). Previously, educational leaders used full-time tutors or faculty members to facilitate SI lessons (Dawson et al., 2014; Liu, 2018). The SI leaders must facilitate the learning process instead of delivering the knowledge and expect students to understand the course materials, pass the tests, and be retained or successful at college (Jacobs et al., 2008).

The core of peer learning theoretical frameworks is the awareness that peer interactions and learnings are a two-way communication process (Astin, 1970). The students participating in SI programs and peer leaders' behaviors, attitudes, interactions, and relationship building during the SI sections are essential for the SI programs to be successful (Srivastava & Rashid, 2018). Astin (1970) and Dawson et al. (2014) emphasized that the SI process is a two-way communication pathway. The SI peer leaders must be alert in observing the tutees, listen, and pay attention to the tutees to resolve lesson problems quickly (Srivastava & Rashid, 2018). Clarifying crucial concepts of the course and reinforcing those concepts, and allowing the students to do most of the talking is an essential responsibility of the SI leaders (Srivastava & Rashid, 2018). Making tutees do most of the talking drives the learning from the SI leaders to the tutees (Srivastava & Rashid, 2018). Research studies such as correlational investigations can fuel applied research investigations and theories (Vladimir & Karel, 2018).

RESEARCH METHOD

The researcher used archived data for this correlational research to determine if the Supplemental Instruction (SI) in one community college in the United States' southeastern region effectively addresses performance and retention problems associated with rigorous courses. Black (2012) noted that higher education institutions' personnel collect and store large volumes of data that may not have essential research design stages because the higher education personnel collect and store the data with no intention to analyze the data. Later, investigators may find it necessary to examine the data. The correlation design is essential in addressing the problem of analyzing stored quantitative data that cause-effect analytical methods may not be applicable (Black, 2012).

DATA ANALYSIS

The IBM SPSS Statistical Software Version 26 was used for the data analysis (Green & Salkind, 2017). The correlational data analysis involved eight semesters (fall 2015 to fall 2017 and spring 2016 to spring 2019) of the Supplemental Instruction (SI) program archived data (Table 1). The sample size is 308 (154 students who participated in the SI program and 154 students randomly chosen from 1,091 students who did not participate in the SI program) (Table 1); that is, 154 of the research participants did not involve random selection, while 154 involve random selection. Analysis of the Human Anatomy and Physiology I and College Algebra quantitative SI data showed that a sample size of 308 students is enough for the correlational analysis.

The researcher used online software to calculate the ideal sample size (n) (Raosoft Inc, n.d.). The calculation resulted in a minimum of 235 samples for this correlational study. The

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study's 308 research participants are 24% higher than the required minimum sample (Table 1).

Table 1
NUMBER OF STUDENTS WHO ENROLLED IN HUMAN ANATOMY AND PHYSIOLOGY I (BIO 137) AND COLLEGE ALGEBRA (MAT 150) AND THOSE THAT PARTICIPATED IN SUPPLEMENTAL INSTRUCTION (SI) PROGRAMS

	SI BIO137	Total Non-SI	*Non-SI BIO137		SI MAT 150	Total Non-SI	*Non-SI MAT150
Fall 2015	12	56	12		25	225	25
Fall 2016	16	78	16		0	0	0
Fall 2017	4	15	4		7	73	7
Fall 2018	1	18	1		9	127	9
Sub-Total	33	167	33		41	425	41
Spring 2016	0	0	0		4	41	4
Spring 2017	22	49	22		5	51	5
Spring 2018	17	42	17		6	76	6
Spring 2019	16	88	16		10	152	10
Sub-Total	55	179	55		25	320	25
Grand Total	88	346	88		66	745	66

*Randomly selected students from non-SI students.

The researcher investigated statistical assumptions and chose appropriate statistical analysis. The investigator used Chi-Square of Independence to examine the relationship between course grades and retention status among community college students. The researcher used dummy coded the student groups: Caucasian = 1, African American = 2, Hispanic = 3, Native American = 4 and student retention status of students: Enrolled or graduated = 2 and not enrolled = 1.The non-parametric Chi-Square of Independence is an extension of cross tabulation. The researcher used the Chi-Square test of independence to determine whether two categorical variables (course grades and retention outcomes) are related. Researchers also refer to the Chi-Square test of independence as the Chi-Square test of association. If course grades and retention outcomes are related, it means the probability of course grades having a certain value is dependent on the value of the retention variable.

RESULTS

The sample size involved in the Supplemental Instruction (SI) data analysis was 308. Six students did not identify their ethnicity. Out of the 300 that documented their ethnic group, 82.1% were Caucasians, African Americans made up 8.9%, and the rest of the student group made up 9%. One hundred and fifty-four students participated in the SI program. Six students did not identify their ethnicity. Out of the 148 students that participated in the SI program and noted their race, 78.5% were Caucasians, African Americans made up 13.4%, and the rest of the

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student group made up 8% (Tinto, 2017).

The researcher failed to accept the null Hypothesis (H_0) that course grades will not significantly relate to student retention outcomes among community college ethnic groups. Table 2 shows the crosstabulation of ethnic groups, course grades, and whether the students persisted or not. For African Americans, 16 students returned to college or graduated, and 11 did not continue. In comparison, 175 out of 248 Caucasians persisted. Overall, 89 students were not retained, while 213 returned to college or graduated.

Table 2
ETHNIC GROUPS CROSSTABULATION FOR STUDENT RETENTION AND COURSE GRADE

Ethnic Student Groups			Course Grade						Total
			W	E	D	C	B	A	
African American	Student Retention	Not Enrolled	2	2	3	2	2	0	11
		Enrolled	4	1	3	4	1	3	16
	Total		6	3	6	6	3	3	27
Hispanic	Student Retention	Not Enrolled	1	0		1	1		3
		Enrolled	0	1		1	5		7
	Total		1	1		2	6		10
Two or More Races	Student Retention	Not Enrolled	0	0	0	1	0	0	1
		Enrolled	1	1	1	1	2	1	7
	Total		1	1	1	2	2	1	8
Caucasian	Student Retention	Not Enrolled	16	18	10	10	9	10	73
		Enrolled	41	12	13	30	52	27	175
	Total		57	30	23	40	61	37	248
Asian	Student Retention	Not Enrolled	0	0		1	0	0	1
		Enrolled	1	1		3	2	1	8
	Total		1	1		4	2	1	9
Total	Student Retention	Not Enrolled	19	20	13	15	12	10	89
		Enrolled	47	16	17	39	62	32	213
	Total		66	36	30	54	74	42	302

*Fall to spring or graduated.

Overall (all ethnic groups combined), course grades and retention were related to each other, X^2 (5, N = 302) = 21.550, p = 0.001 (Table 3). The researcher rejected the null hypothesis and accepted the alternate hypothesis. However, the Caucasian ethnic group was different from the remaining ethnic groups. There was a relationship between course grades and retention status of Caucasians, X^2 (5, N = 248) = 22.540, p<0.000, while no correlation existed between course grades and retention status among the remaining ethnic groups (Table 3).

Table 3
CROSSTABULATION CHI-SQUARE TESTS STATISTICS FOR COMMUNITY COLLEGE ETHNIC GROUPS

Ethnic Student Groups		Value	df	Asymptotic Significance (2-sided)
African American	Pearson Chi-Square	4.219[b]	5	0.518
	Likelihood Ratio	5.266	5	0.384
	Linear-by-Linear Association	0.337	1	0.561
	N of Valid Cases	27		
Hispanic	Pearson Chi-Square	3.651[c]	3	0.302
	Likelihood Ratio	4.038	3	0.257
	Linear-by-Linear Association	1.200	1	0.273
	N of Valid Cases	10		
Two or More Races	Pearson Chi-Square	3.429[d]	5	0.634
	Likelihood Ratio	3.256	5	0.661

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	Linear-by-Linear Association	0.026	1	0.873
	N of Valid Cases	8		
Caucasian	Pearson Chi-Square	22.540[e]	5	0.000
	Likelihood Ratio	21.818	5	0.001
	Linear-by-Linear Association	5.332	1	0.021
	N of Valid Cases	248		
Asian	Pearson Chi-Square	1.406[f]	4	0.843
	Likelihood Ratio	1.780	4	0.776
	Linear-by-Linear Association	0.006	1	0.939
	N of Valid Cases	9		
Total	Pearson Chi-Square	21.550[a]	5	0.001
	Likelihood Ratio	20.948	5	0.001
	Linear-by-Linear Association	6.644	1	0.010
	N of Valid Cases	302		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 8.84.
b. 12 cells (100.0%) have expected count less than 5. The minimum expected count is 1.22.
c. 8 cells (100.0%) have expected count less than 5. The minimum expected count is 0.30.
d. 12 cells (100.0%) have expected count less than 5. The minimum expected count is 0.13.
e. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 6.77.
f. 10 cells (100.0%) have expected count less than 5. The minimum expected count is 0.11.

Unlike Pearson's correlation coefficient (r), researchers use a different matrix when interpreting the Phi and Cremer correlation coefficients to determine the strength of the relationship between two variables (Black, 2012; McHugh, 2013). Values between 0.25–0.30 indicate moderately strong relationships, while 0.30–0.35 means strong relationships. The researcher used Cramer's V instead of the Phi correlation coefficient because the Chi-Square analysis was two (retention – 2 levels) by six (ethnic groups – 6 levels) (Tables 3). Researchers use Cramer's Phi correlation coefficient when the research is two by two levels. A very strong relationship existed between the Caucasian ethnic group and retention status, Cramer's V = 0.301. All ethnic groups' grades combined also had a strong relationship with retention status, Cramer's V=0.267.

DISCUSSION

The findings of this correlational research of quantitative Supplemental Instruction (SI) data are consistent with Tinto's (1975) theory on student retention, which served as the guiding framework for this study using data from one community college in the southeastern region of the United States. Course grades for all ethnic groups combined and retention status (Fall to spring or graduated) are related (Table 3). The Caucasian ethnic group is different from the remaining ethnic groups because the performance (course grades) of Caucasian students and retention status were correlated while the others did not (Table 3). Oja (2012) analyzed the correlation between spring to fall enrollment and the number of SI hours of community college students, while Zaritsky & Toce (2006) measured retention in terms of community college SI students who completed the course. While Zaritsky & Toce (2006) found a positive relationship between the number of SI students who completed the course and participation in the SI program, Oja (2012) found no correlation between spring to fall enrollment and the number of SI hours. Although the SI strategy has been around for more than four decades, the SI programs have limited examinations to understand various student groups' performance and retention.

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IMPLICATIONS AND RECOMMENDATIONS

The results of this study have implications for educational leaders. Recommendations considering the results of this study may help higher education practices enhance student performance, retention, and graduation rates and contribute to student retention theories and future research. Research implications refer to the impact an investigation could have on practice and future research or the field of study (Black, 2012; Lyman & Longnecker, 2016). It also addresses how research affects the targeted community or subject field. Researchers also document unexpected results that do not align with the existing literature.

This demographic correlational study of quantitative SI data involving community college students showed variable relationships between student retention outcomes and various ethnic student groups. Oja (2012) analyzed the correlation between spring to fall enrollment and the number of SI hours of community college students, while Zaritsky & Toce (2006) measured retention of community college SI students using the number of students who completed the course. While Zaritsky & Toce (2006) found a positive relationship between the number of SI students who completed the course and participation in the SI program, Oja (2012) found no correlation between spring to fall enrollment and the number of SI hours. The non-relationship of the performance of African Americans, Hispanics, Native Americans, and Asian Americans ethnic groups in this study and retention status may be explained by the small sample size of these ethnic groups (Table 2). The various ways that researchers approach the same topic make comparing results challenging. Although the SI strategy has been around for more than four decades, the SI programs have limited examinations to understand various student groups' performance and retention. The outcome of this investigation contributed to filling the gap in the literature regarding demographic studies considering the SI and different student groups.

Recommendations for Practice

Considering the Chi-Square of Independence findings, this researcher recommends that educational leaders incorporate SI program strategy into various college activities, including innovative faculty classroom instructions, to enhance course grades. This research study showed that course grades were related to community college students' retention status. The SI programs improving course grades and retention could benefit colleges in various ways. For example, state officials use course grades and student retention, among other metrics, to determine the amount of state funding to colleges and universities.

Recommendations for Future Research

Future research must consider replicating this study to enhance generalization and investigate performance within each academic course instead of lumping the classes together. Several types of research, including this one, combined the SI courses without investigating if the individual academic courses are different or not. This correlational study can be extended to other challenging courses and less rigorous courses or focused research involving separate disciplines like biology, chemistry, and mathematics. Using peers to facilitate SI lessons has dominated the SI program. This investigation involved peer leaders. Educational leaders can work with researchers to test if there are differences in peers and faculty members leading the SI

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sessions. This area of research is void in the literature. Using this model for courses, even beyond challenging courses, would benefit collaborative learning.

Future research must explore similar sample sizes of various ethnic groups when investigating the relationship between academic performances and retention status. The sample size for Caucasians for this investigation was 82%, while the remaining ethnic groups combined formed only 20% of the research participants. Researchers can also perform focused research to investigate various ethnic groups' performance and retention within individual disciplines like biology, chemistry, and mathematics and examine performance and retention differences among individual courses.

CONCLUSION

The archived SI program data evaluations revealed that the SI program of one community college in the southeastern United States is working well. This investigation consisted of eight semesters of data: fall 2015 to fall 2017 and spring 2016 to spring 2019 of challenging Human Anatomy and Physiology I and College Algebra. Course grades for all ethnic groups combined and retention status were related. The Caucasian ethnic group is different from the remaining ethnic groups because the performance of Caucasian students and retention status were correlated while the others did not.

This research showed that the SI program increased community college students' performance and retention outcomes. Correlational studies like this investigation can foster partnerships between community colleges and high school institutions to improve student performance. This SI investigation filled the literature gap regarding demographic studies considering various student groups and provided direction for future research. It is necessary that educational leaders evaluate SI program data to check if the SI program is working well or not to reveal areas that need improvement. These research findings have implications for educational leaders. Recommendations considering the results of this study may help higher education practices enhance student performance, retention, and graduation rates and contribute to student retention theories and future research.

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