CAN SUPPLEMENTAL INSTRUCTION HELP EDUCATIONAL LEADERS INCREASE COLLEGE STUDENTS' SUCCESS IN CHALLENGING COURSES?

Yohanes A.K. Honu, Rock Valley College

ABSTRACT

I examined students' performance in the Supplemental Instruction (SI) program of one community college in the southeastern United States. The data analysis consists of eight semesters of archived data. The Spearman correlation results indicated a positive correlation between SI hours and course grades. It also showed a positive relationship between high school GPA and course grades. Also, an independent sample t-test revealed that students who participated in the SI program outperformed their peers. This research suggests that educational leaders can enhance students' performance using SI programs. It also suggests High School GPA is an excellent predictor of college students' performance. Several higher education institutions adopted Multiple Measures Placement, including High School GPA, to place students in classes. High school and college administrators can collaborate to align their curricula to promote students' performance and success. The SI program's budget can challenge educational leaders because it is free to students. However, educational leaders may recover the SI program monies because performance funding implemented by several states in the United States involved student performance outcomes. The results of this study have several implications for educational leaders and the research community. It will also fill the literature gap.

Keywords: Supplemental Instruction, Supplemental Instruction Hours, Academic Prepareness, Student Performance, GPA, Community College Students.

INTRODUCTION

The Supplemental Instruction (SI) program has been around for several decades. Educational leaders worldwide used the SI programs outside the usual faculty instruction hours to increase student success in challengng courses for nearly half a century (Dawson et al., 2014). The SI program aims at helping at-risk students to be successful in challenging classes. Colleges define student performance differently. These include Grade Point Average (GPA), graduation rate, college entrance exams, and course grades (Cohen & Brawer, 2013). For this study, the researcher student performance as course grades.

Educational leaders use various modalities of the SI program. The modality primarily involved in-person, virtual/online, or hybrid one-on-one or small groups of students (Dawson et al., 2014; Sembiring, 2018). Usually, educational leaders use students (peers) who mastered the course to help their peers (Ghenghesh, 2018; Liu, 2018). Although SI has been around for nearly half a century, research studies examining the effect of SI programs on community college students' performance are void in the literature. Americans commonly refer to two-year higher education institutions as community colleges. The scarcity of examination of community colleges' SI programs may be due to research not being part of many community colleges' faculty

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responsibilities. Also, SI program examinations may not be the focus of community college research. For example, the community college involved in this investigation has about a decade of SI stored data that they did not subject to rigorous statistical analysis.

The problem addressed in this study was performance challenges in rigorous courses. According to Dawson et al. (2014), many students are at-risk students passing rigorous courses. Many community college students face academic barriers such as lack of previous knowledge, test-taking skills, and access to technology, and non-academic obstacles such as poverty and hunger, transportation to school, and homelessness problems making them vulnerable to not excelling in their classes (Dawson et al., 2014; Tinto, 2006). Native Americans faced access to education challenges in the United States and were more affected by poverty than their peers (Mosholder & Goslin, 2013). Understanding whether the SI programs are working or not is critical in providing direction for educational leaders. Also, this study's results will inform educational leaders of the benefits of the SI programs.

Musah & Ford (2017) pointed out that there are scarce studies involving the effect of academic preparedness on the academic performance of community college students participating in SI programs. High school Grade Point Average (GPA) indicates academic preparedness for college programs (Hongtao et al., 2018). Examination of academic preparedness can foster partnerships between community colleges and transfer institutions to improve student performance, but there is limited research testing the relationship between academic preparedness and the academic performance of community college students (Hongtao et al., 2018; Musah & Ford, 2017).

This archived quantitative SI data investigation aimed to: (1) examine the correlations between SI hours and course grades among community college students. (2) The correlations between high school GPA and course grades. (3) compare the performance of SI students with non-SI students. The researcher accomplished these by addressing the research questions: (1) What are the correlations between the predictor variable SI hours and course grade outcome among community college students? (2) What are the correlations between the predictor variable high school GPA and course grade outcome among community college students? (3) Will the performance of students participating in the Supplemental Instruction program (SI-students) differ from non-SI students among community college students? This investigation contributed to filling the gap in the literature regarding preparedness and the effect of SI programs on community college students' performance.

LITERATURE REVIEW

A scholarly literature review identifying common themes and differences provides the foundation for research studies (Dawson et al., 2014; Warwick, 2011). The purpose of the literature review was to provide information on the theoretical framework that supports the Supplemental Instruction (SI) program, the United States community colleges, SI strategy, and some student success factors. The purpose of the literature review was to provide information on the United States Community Colleges and SI strategy and some student success factors.

United States' Community Colleges

Community colleges are one of the United States' unique inventions that put publicly

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funded higher education close to the communities that started more than 100 years ago in Illinois. More than one hundred thousand higher education institutions are in the United States (National Center for Education Statistics, 2020). Harvard University, formerly Harvard College, established in 1636, is the first higher education institution in the United States, and the oldest community college established in 1901 is Joliet Junior College. Community colleges prepare two-year Associate Degree holders for four-year institutions and Universities and others with employable skills to enter the workforce (Cohen & Brawer, 2013; Wood, 2012). Numerous community college programs also have certificates embedded in Associate Degree programs (Cohen & Brawer, 2013). Community colleges are one of the significant drivers of the United States economy because of the considerable number of skilled students they prepare for industries and businesses and transfer institutions.

The enactment of the landmark Morrill Act of 1862 and the GI Bill of 1944 helped increase higher education enrolment numbers in the United States (Duemer, 2007; Geiger, 2015). The Morrill Act encouraged land-grant higher institutions, while the GI bill supported veterans' enrolling in college. Additionally, the Higher Education Act of 1965 and several reauthorizations provided financial assistance to students covering their tuition and other associated costs, and the explosion of high schools boosted college enrolment numbers (Hegji & Collins, 2020; Levine & Levine, 2011).

United States Community colleges admit more than one-half of the Nation's higher education students (Cohen & Brawer, 2013). The open-admission policy of community colleges is the primary reason for community colleges' admission of numerous less academic achieving students (Cohen & Brawer, 2013; Hlinka, 2017; Roman, 2007). The United States community colleges enroll many underrepresented minority (URM) groups, students facing financial challenges, part-time students, single parents, adult learners, and GED or high school dropouts (Cohen & Brawer, 2013; McClenney & Waiwaiole, 2005; Roman, 2007). These student situations bring many challenges, such as college readiness and performance challenges, student retention problems, dealing with diverse student populations, and budget challenges (McComb & Lyddon, 2016; Webb & Hongwei, 2015).

Educational institutions that promote diversity and inclusion and create friendly environments for students – a sense of belonging enhance students' success, especially the underrepresented minorities (Colbert-Getz et al., 2016; Keith et al., 2016). Specifically, Fincher (2010) found that the diversification of educational leaders significantly enhances URM groups' retention. This finding adds to the complex nature of student success strategies. Bailey emphasized the need for educational leaders to recognize the multiple factors that affect the URM students' student success outcomes and design strategies to resolve them. Several higher education institutions, including community colleges, include SI programs to enhance success (Rabitoy et al., 2015).

Supplemental Instruction and Some Student Success Factors

About five decades ago, Deanna Martin of the University of Missouri started the Supplemental Instruction (SI) program to help student performance in rigorous courses (Hongtao et al., 2018). The SI strategies mainly involve one-on-one or small groups of extra assistance to at-risk students to increase their academic performance and retention (Dawson et al., 2014; Wu & Sheftel, 2020). Several educational leaders have added online components to the traditional

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face-to-face strategy to serve various student populations (Sembiring, 2018; Wu & Sheftel, 2020). Providing students with multiple options of the SI lessons is necessary to help diverse college students. However, Sembiring (2018) pointed out that a considerable number of students preferred in-person meetings to virtual ones. Numerous students use the free-of-charge SI program to enhance their performances in college-level classes. For example, data from 1993 to 2005 involving 12,471 students showed that 44.3% of the students participated in the SI program (Zaritsky & Toce, 2006).

Interactions between SI students and their peer leaders are vital in increasing student performance in challenging courses. Additionally, the interaction between students and employees of higher education institutions is essential for student retention (Tinto, 2006). The evidence that knowledge is socially constructed, affecting the learning of course concepts, student performance, and student retention rates may pose severe challenges to several community colleges than transfer institutions. Many commuter community college students may have academic and social interaction challenges because most leave campus immediately after their classes (Tinto, 1987).

Although the collaborative learning strategy is unique for the SI programs, several faculty members use the collaborative learning strategy as a teaching strategy to enhance student learning and performance (Appavoo et al., 2019; Zambrano et al., 2019). The SI also prepares students for teamwork beyond academic boundaries, such as awareness of diversity in the workplace and enhancing employability (Robbins & Hoggan, 2019). Also, peer leaders also benefit from the SI by increasing their self-efficacy and mastery of the subject (Zaritsky & Toce, 2006). An online collaborative learning environment poses more challenges to students than face-to-face collaborative learning. Appavoo et al. (2019) found that 52 out of 155 were inactive in collaborative learning activities.

Educational leaders providing ideal learning environments that create atmospheres for student interactions can promote mastery of course concepts to increase performance and decrease dropping from rigorous courses or college to enhance retention (Colbert-Getz et al., 2016; Tinto, 1975). The interactions among students during SI activities can lead to higher academic performances and retention than individuals working alone (Appavoo et al., 2019; Dawson et al., 2014). Musah & Ford (2017) and Oja (2012) noted that students' participation in SI programs is voluntary. The voluntary nature of SI programs could pose challenges to higher education administrators and faculty members because they could only recommend the SI activities to an at-risk student (Tinto, 2017).

An investigation about five years ago involving community colleges revealed that the disadvantaged students were more than twice the Caucasians who took part in the SI program (Rabitoy et al., 2015). Disadvantaged students are not as likely to pass the challenging SI courses as their peers. Rabitoy et al. (2015) research revealed performance differences among ethnic groups. Hongtao et al. (2018) also reported achievement gaps between disadvantaged students and their peers. The SI addresses equity problems of disproportionate metrices of SI students.

College readiness or academic preparedness, academic engagement and social interactions, money availability to finance education, role models and motivation from family and friends, and demographic factors are the most frequent variables that affect student performance and retention. The quality of education acquired by students before college has long been documented to affect the success of college students (Bean, 1980). In the United States, High Schools or General Education Development (GED) curricula prepare students for college.

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Hepworth found that academic preparedness (GPA) affected students' performance (course grade) significantly. Contrarily, more than a decade ago, Dennis noted that college readiness did not affect college GPA and retention of first-generation students.

Faculty members and SI peer leaders that facilitate student learning must design the lessons to encourage student interactions during the learning process because researchers found that knowledge is constructed through intentional and unintentional social interactions leading to learning from one another (Zambrano et al., 2019). Hepworth considered social interactions a secondary factor affecting student success because social integration was not significantly related to the course grade. Demographic factors such as the level of education of parents or family members, family income, and whether a student is a commuter or a residential student can affect student retention (Cohen & Brawer, 2013). A considerable number of community college students who are commuters may have challenges involving academic and social interactions. These various factors affecting student success mean student success is complicated and must be approached holistically.

RESEARCH METHOD

The researcher examined quantitative archived data to determine if one community college in the United States' southeastern region is working. The archived data comprised eight semesters (fall 2015 to fall 2017 and spring 2016 to spring 2019) of Human Anatomy and Physiology I and College Algebra data. Archived data refers to stored data, including SI program data commonly found in educational institutions. The SI data had no identifiers of research subjects. Often, stored data do not have elements of research design stages that may pose cause-effect statistical analysis challenges. Academic leaders at this institution performed a few descriptive statistics outcomes for college use without rigorous statistical analysis.

The community college where this study took place has a population of nearly 4,500. Caucasians dominated the student population forming about 83.4% of the entire student population, followed by 5.9% African American students. The percentage of Hispanic students was 4.3%, while the remaining ethnic groups form the remaining portion of the student population. Students aged 18 through 29 constituted 62% of the student population, while students under 18 years old form 14% of the student population. The 24% of the students ranged from 30 to 64 years. The average age of the student population was 26.6 years.

One hundred fifty-four students voluntarily participated in the SI program. Five students did not identify their ethnicity. Out of the 149 students who participated in the SI program noted their race, 78.5% were Caucasians, followed by African Americans making up 13.4%, and the rest of the student group made up 8% (Table 1). Although the SI department relied on the SI peer-leaders to log student attendance and hours, the researcher observed no abnormalities in recording student attendance and hour spent.

TABLE 1
PERCENTAGES OF ANATOMY AND PHYSIOLOGY I AND COLLEGE ALGEBRA SUPPLEMENTAL INSTRUCTION ETHNIC GROUPS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	African American	20	13.0	13.4	13.4
	Hispanic	4	2.6	2.7	16.1

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	Two or More Races	4	2.6	2.7	18.8
	Caucasian	117	76.0	78.5	97.3
	Asian	4	2.6	2.7	100.0
	Total	149	96.8	100.0	
Missing	Unknown	5	3.2		
Total		154	100.0		

DATA ANALYSIS

The researcher used the IBM SPSS Statistical Software Version 26 for the data analysis (Green & Salkind, 2017). To investigate the correlations between SI hours and course grades among community college students, the researcher used data of all 154 students who attended the SI lessaons. The sample size the correlations between high school GPA and course grades and to compare the performance of SI students with non-SI students consisted of 154 SI students and 154 non-SI students totaling 308 participants. I selected the 154 non-SI students randomly from 1,091 students.

The researcher used non-parametric Spearman's correlation to investigate the direction and strength of the relationship between SI hours and course grade outcomes. The type of correlation coefficient to use depends on whether correlational assumptions are met or violated and the nature of the variables themselves: nominal, ordinal, interval, or ratio. The SI hours is a continuous variable, while and the course grade is an ordinal variable. The SI hours were severely skewed to the left and did not follow normal frequency distribution (Figure 1). The skewness of the SI hours and one of the variables being an ordinal variable eliminate the Pearson correlation and leaves Spearman's correlation as the best option (Green & Salkind, 2017).

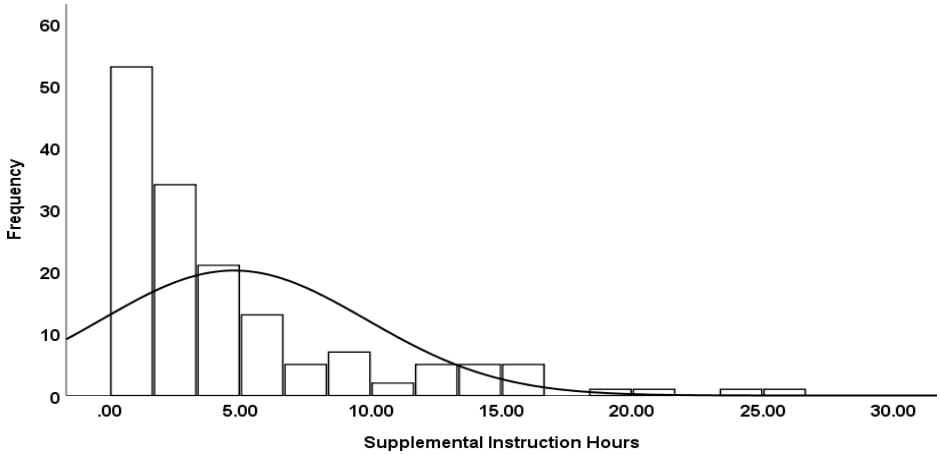

FIGURE 1
FREQUENCY DISTRIBUTION OF SUPPLEMENTAL INSTRUCTION HOURS OF ANATOMY AND PHYSIOLOGY I AND COLLEGE ALGEBRA STUDENTS

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The researcher also used non-parametric Spearman's correlation to examine the correlations between high school GPA and course grades. Comparing course grades of students who participated in the SI program with those who did not participate in the SI program involve using independent samples t-test. To do this, the reseachers used each students grade points instead of letter grades that could not yield to using t-tst analysis. This involved conversion of categorical course grades to grade points (A = 4, B = 3, C = 2, D = 1, E = 1, and W = 0) (see Hongtao et al. (2018).

RESULTS

The first research question investigated the correlation between SI hours and course grade outcomes among community college students. The correlation coefficient was 0.195 (Table 2). The results of the Spearman correlation indicated that there was a positive correlation between SI hours and course grade outcomes among community college students, ($r_s(154) = 0.016$, $p < 0.05$) (Table 2). The top and bottom results are similar because the Spearman correlation compares each variable to the other (Table 2). There is evidence that as student participation in the SI program measured by the hours the student spent increases, the course grade increases (Table 2).

TABLE 2
SPEARMAN'S CORRELATION STATISTICS FOR SUPPLEMENTAL INSTRUCTION (SI) HOURS AND COURSE GRADE OUTCOMES

			Course Grade	SI Hours
Spearman's rho	Course Grade	Correlation Coefficient	1.000	0.195*
		Sig. (2-tailed)	-	0.016
		N	154	154
	SI Hours	Correlation Coefficient	0.195*	1.000
		Sig. (2-tailed)	0.016	-
		N	154	154
*. Correlation is significant at the 0.05 level (2-tailed)				

The second research question investigated correlations between high school GPA and course grades. Spearman correlation showed that there was a positive correlation between high school GPA and course grade outcomes among community college students, ($r_s(220) = <0.000$, $p < 0.01$) (Table 3). The correlation coefficient was 0.284 (Table 3).

TABLE 3
SPEARMAN'S CORRELATION STATISTICS FOR HIGH SCHOOL GPA AND COURSE GRADE OUTCOMES

			High School GPA	Course Grade
Spearman's rho	High School GPA	Correlation Coefficient	1.000	0.284**
		Sig. (2-tailed)	-	0.000
		N	220	220
	Course Grade	Correlation Coefficient	0.284**	1.000
		Sig. (2-tailed)	0.000	-
		N	220	308
**. Correlation is significant at the 0.01 level (2-tailed).				

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The third research question compared the performance of SI students with non-SI students. The independent sample t-test indicated that the performance of students participating in the SI program was statistically different from those not participating in the SI program, t (304.447) = 2.728, p = 0.007 (Table 4). The Levene test results showed a variation between the SI and non-SI samples using an alpha level of 0.05. Levene's Test for equality of variances was not met, p = 0.007, p < 0.05. Consequently, the independent samples t-test ANOVA results were interpreted using unequal variances, not assumed p-value since the homogeneous variance assumption was not met. The 154 students that participated in the SI program had a mean score of 5.88 (SD 4.28), while the 154 students that did not participate in the SI program scored 4.52 (SD 4.54).

TABLE 4
GROUP STATISTICS OF SI AND NON-SI RESEARCH PARTICIPANTS

	Levene's Test for Equality of Variances		**T-Test for Equality of Means**						
			t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
	F	**Sig.**						**Lower**	**Upper**
Equal variances assumed	7.274	0.007	2.728	306	0.007	1.364	0.500	0.380	2.347
Equal variances not assumed			2.728	304.447	0.007	1.364	0.500	0.380	2.347

Grade Point: $t(304.447) = 2.728$ ($p = 0.007$, $p < .05$), reject H_{o1}, accept H_{a1}; significant difference by SI, SI (SI) students found to be significantly higher (non-SI students $M = 4.12$, SI students $M = 5.88$).

DISCUSSION

This correlational research involving quantitative Supplemental Instruction (SI) data showed variable results. Rabitoy et al. (2015) found that the number of disadvantaged students enrolled in a SI program in one community college was more than twice their peers. Contrary to Rabitoy et al. (2015), this community college in the southeastern region of the United States had 78.5% Caucasians who participated in the SI program (Table 1). The high number of Caucasians participating in the SI program may result from Caucasians forming about 83.4% of the college student population. Many disadvantaged students take advantage of SI programs because they are less likely to pass challenging courses than their peers.

The Spearman correlation results indicated a positive relationship between SI hours and course grade outcomes among community college students (Table 2). The positive relationship between SI hours and course grade outcomes suggests that students can enhance their performance by participating in SI activities. Hongtao et al. (2018) further documented that the higher the SI sections attended, the greater the chances of passing challenging courses. Hongtao et al. (2018) added that disadvantaged students benefited more from the SI program than their peers. Although Hongtao et al. (2018) research involved combined STEM courses (Astronomy, Biology, Chemistry, Maths, Physics), the result is consistent with this SI study. The SI program

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involved in this study consists of one-on-one interactions between SI students and peer leaders. Hongtao et al. (2018) did not document if their investigation involved small groups, one-on-one interactions, or mixed methods. Also, Rabitoy et al. (2015) found that the number of SI sessions attended correlated with community college students' final grades. Rabitoy et al. (2015) investigated community college students involving two spring semesters, while this investigation involved eight semesters.

The researcher used Spearman correlation analysis to show a positive correlation between high school GPA and course grade outcomes among community college students (Table 3). Unlike this researcher, Hongtao et al. (2018) and Rabitoy et al. (2015) used GPA at the time of taking the course (prior GPA) to show the relationship between GPA and course grade. These researchers found that GPA and the number of SI sections students attended were correlated with students' final course grades. They noted that prior GPA substantially affects the order of males, females, students of color, and Caucasians. The result of this investigation in the southeastern region of the United States is consistent with the findings of Hongtao et al. (2018) research, although their study involved several combined STEM courses. The SI program in this study consists of one-on-one interactions between students and peer leaders. Hongtao et al. (2018) and Rabitoy et al. (2015) noted limited academic preparedness studies. Several higher education institutions use traditional placement methods such as Accuplacer, ACT, and SAT scores to place students in classes. Recently, many educational leaders adopted Multiple Measures Placement, including High School GPA, to place students in classes. This research suggests that High School GPA is an excellent predictor of college students' performance.

The independent sample t-test showed that the likelihood of community college students participating in SI programs passing rigorous courses is higher than those that do not participate in SI programs (Table 4). The results of a similar study conducted at LaGuardia Community College in New York more than a decade ago are consistent with the results from this community college in the southeastern United States (Zaritsky & Toce, 2006). Unlike the independent sample t-test used by this researcher, Zaritsky & Toce (2006) did not specify the type of statistical analysis they used to document a grade difference of one equals an increase of one letter grade. Several SI investigations in universities See Hongtao et al. (2018); Musah & Ford (2017); Dawson (2014) and community colleges See Oja (2012); Rabitoy et al. (2015) did not directly compare the performance of SI students with non-SI students. The focus of SI programs varies: these goals include comparing gender-based performance, lumping all courses, comparing transfer and non-transfer students, and the effect of gender and ethnicity of teachers on the performance of students (Dawson et al., 2014; Rabitoy et al., 2015).

IMPLICATIONS AND RECOMMENDATIONS

The scientific community refers to research implications as the impact of research studies on practice, future research, and how an investigation affects the research participant community (Lyman & Longnecker, 2016). Research implications also included unexpected observations that do not align with the current literature and knowledge. The positive relationship between SI hours and course grade outcomes among community college students is excellent and bad news to educational leaders. Educational leaders and faculty members can increase student performance by encouraging at-risk students to participate in SI activities. Increasing students' attendance in the SI programs means raising the budget for SI educational leaders, peer tutors,

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and SI leaders. Several researchers documented students' voluntary nature in SI programs worldwide (AbdulRaheem et al., 2017; Dawson et al., 2014; Musah & Ford, 2017; Oja, 2012). Higher education administrators and faculty members could only recommend the SI programs to at-risk students without enforcement.

The results of this study have budget implications for higher education institutions. Several educational institutions face budget challenges (Honu, 2019; Umbricht et al., 2017). However, educational leaders may recover monies invested in the staff to manage the SI program. Several states in the United States use course passing outcomes to calculate the funding to allocate to colleges (Umbricht et al., 2017). 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 (Umbricht et al., 2017).

The results of this correlational study of quantitative SI data from one community college in the southeastern region of the United States showed that academic preparedness measured by high school GPA effectively addresses performance problems associated with the rigorous SI program courses. The positive correlation between high school GPA and college course grade presents opportunities for high school and college administrators to align their curricula to promote students' performance and success. Academic preparedness studies can promote partnerships between community colleges and transfer institutions to improve student performance. Hongtao et al. (2018) and Musah & Ford (2017) noted that limited studies examine the relationship between academic preparedness and academic performance or retention of community college students taking part in SI programs. The outcome of this investigation contributed to filling the gap in the literature regarding academic preparedness. Research studies such as correlational investigations can fuel applied research investigations and expand existing scientific knowledge and improve scientific theories (Vladimír & Karel, 2018).

Recommendations for Practice

Considering the results of the correlational analysis involving SI hours and course grades, this researcher recommends that educational leaders use appropriate software to detect at-risk students from failing or withdrawing from rigorous courses. They must strategically refer those at-risk students to take advantage of SI because there was a positive correlation between SI hours and course grade outcomes among community college students. The SI programs' voluntary nature could pose challenges to higher education administrators and faculty members because they could only recommend the SI programs to at-risk students without mandatory enforcement. Faculty can provide extra credit points as an incentive to participate in the SI programs. Educational leaders invested much in the staff that manages the SI centers and SI leaders. Increasing the number of participants and SI courses has budget implications for educational leaders because SI lessons are free-of-charge for students. The SI programs budget, in addition to faculty salaries, can pose a challenge to educational leaders. However, educational leaders may recover the SI program monies because performance funding implemented by several states in the United States involved course passing rates (Umbricht et al., 2017). Consequently, educational leaders must consider investing in SI programs. They must perform a cost-benefit analysis of SI programs to determine the benefit of investing in SI programs. Students not at risk of failing a challenging course can also improve their grades by participating in the SI program.

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Challenging Anatomy and Physiology and College Algebra are prevalent among college courses. This researcher recommends that educational leaders go the extra mile to recruit many at-risk students of more difficult community college courses to participate in the SI programs while ensuring that other SI courses receive adequate attention. Faculty must design curriculum and pedagogy aimed at improving success. College leaders can benefit from research studies by incorporating appropriate research designs into SI data collection methods to enable various statistical analyses. 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. Correlation designs are beneficial in analyzing archival data collected for various reasons that cause-effect analytical methods may not be applicable. Educational leaders wanting to improve student performance and retention of challenging college-level courses must consider investing in SI programs.

This researcher recommends that high school and college administrators align their curricula to promote students' performance because of the positive correlation between high school GPA and college course grades. This investigation showed that academic preparedness studies could reveal students' academic performance at college to foster partnerships between community colleges and transfer institutions to improve course grades. Sharing data, teamwork, and partnerships between colleges and high schools can expand knowledge across the two spectrums Instead of working in silos.

Based on the results of the Independent Samples t-test, this researcher recommends that educational leaders focus on the SI strategy to improve student performance in rigorous courses because the academic performance of students who participated in the SI program was significantly higher than those who did not participate in the SI program among community college students. The archived SI program data evaluations revealed that the SI program of one community college in the United States' southeastern region is working. Using data to drive decision-making processes can enhance achieving educational goals. Research is predominantly part of the job description of four-year institutions and university faculty members. Contrarily, research is not part of many community colleges' faculty assignments in the United States, resulting in limited research studies in community colleges. Community college educational leaders must consider incorporating research into the job description of faculty to benefit them in various ways.

Recommendations for Future Research

Future research could investigate the various strategies of peer-led activities like one-on-one and small group sections and face-to-face, hybrid, and complete online methods to determine the most effective approach. Researchers must document the extra assistance provided to at-risk students to yield matching results. This study involved one-on-one and face-to-face meetings. This research study involved spring and fall semesters; future investigators must examine performance differences between academic semesters. Future research could also investigate the number of SI hours after which participation in the SI program does not improve a grade.

Future research should separate high school diploma students from General Education Development (GED) students to find out if there are performance differences. High schools or GED curricula prepare students for college. Correlational investigations can fuel applied research investigations, expand existing scientific knowledge, and improve scientific theories.

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Consequently, researchers must collaborate with research funding agencies to address limited academic preparedness investigations.

The data analysis involved in this study lumped Human Anatomy and Physiology I and College Algebra together. Future research must consider examining performances within each academic course. Researchers can extend this investigation to other challenging courses and non-challenging courses. This area of research in community colleges is void in the literature. Also, researchers must consider examining individual courses instead of lumping them together. Combined data could hinder understanding student success outcomes within each course or for different ethnic groups.

CONCLUSIONS

Improving students' performance in a rigorous course is challenging for many community colleges. Examination of quantitative archived SI data showed that the SI program of one community college in the southeastern United States is working well. Educational leaders would be happy to know that the money and time they spend on SI programs to help at-risk students pass challenging academic courses is working, which is the primary goal of SI programs. The Spearman correlation results indicated a positive correlation between Supplemental Instruction hours and course grade outcomes among community college students. The researcher also used Spearman correlation analysis to show a positive correlation between high school GPA and course grade outcomes among community college students. Furthermore, an independent sample t-test revealed that the likelihood of community college students participating in SI programs passing rigorous courses is higher than those not participating in SI programs. This research showed that the SI program increased community college students' performance.

Educational leaders must consider investing in SI programs because it works. The SI program's budget can challenge educational leaders because it is free to students. However, educational leaders may recover the SI program monies because performance funding implemented by several states in the United States involved course passing rates. These recommendations may help higher education leaders increase student performance in challenging courses. Although SI has been around for nearly four decades, the literature is void of examining academic preparedness and SI investigating community colleges' SI programs. These research results have implications for community college leaders and researchers. The recommendations and conclusions can help educational leaders increase student retention and success. It will also fill the literature gap.

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