

**ACADEMIC SUCCESS FOR INNER CITY HIGH SCHOOL YOUTH:
Use of Supplemental Instruction with an Urban High School
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While various strategies for learning support have been employed and found useful at the college and university level (Noel, et.al., 1985), it has been difficult to transport these strategies to the public secondary schools. Particularly troublesome has been the effective development of programs addressing the needs of inner city, racially diverse, secondary schools (Blanc, 1981). Supplemental Instruction (SI), an effective model for the college level that was developed at the University of Missouri - Kansas City, was selected as the major academic support component for the inner city secondary students at Westport High School.

Background of the Westport Project

Westport High School, located in the heart of Kansas City, was the site for use of Supplemental Instruction (SI) to raise the academic performance of ninth and tenth grade students. When the SI program began in 1988, the pupil population at Westport High School was 60 percent Black, 20 percent Latino, 14 percent Anglo, and 6 percent Asian. The total drop out rate was 30 percent. Additionally, on any given day 30 percent of the students were absent. Nearly 50 percent of the students were two years behind in reading and math and 25 percent were one year behind grade level in reading and math. Nearly 60 percent of the students were economically-disadvantaged, as evidenced by their qualification for the Free Lunch Program.

The opportunity to work with these high schools students occurred in 1988 as a part of the Schools, Colleges, Universities Project (SCUP), a grant from the U.S. Department of Education. The purpose of SCUP was to encourage students to complete high school and continue with post-secondary education or pursue a vocational career. UMKC provided training and supervision for the Supplemental Instruction component of the program. This federal grant was supported with funds from a private initiative, PROJECT CHOICE, an educational support program provided by the Ewing Marion Kauffman Foundation.

Students who participate in PROJECT CHOICE and follow its guidelines, including graduation from high school on schedule, will receive free tuition, fees, books, room, and board to attend the vocational school, technical school, college, or university of their choice. To date, nearly 700 ninth, tenth, eleventh, and twelfth grade students at Westport High School chose to participate in PROJECT CHOICE. These students also were the participants in the SI program.

Common Student Learning Problems

While students may be underprepared for a multiplicity of reasons, one common educational concern about such students is that they typically lack the ability to reason effectively. Research suggests (Arons & Karplus, 1976) that half of entering college freshmen have not yet attained reasoning skills at the formal (abstract) operational level described by Piaget and Inhelder (1958). Students who appear to operate at the concrete (nonabstract) level consistently have difficulty processing unfamiliar information when it is presented through the abstract media of lecture and text.

Student questions about material are often detail-oriented and superficial. Rarely do they ask or answer questions which require inference, synthesis, or application.

They can operate at more advanced levels once they have mastered a concept, but to do so they require regular instruction that either anchors the concept directly in their previous experience or provides a concrete experience with data from which the concept may be inferred. (Atkins & Karplus, 1962; Fuller, 1980; Karplus et al., 1976; Renner et. al., 1976). Deficiencies in these fundamental skills underlie most problems with basic academic skills, e.g., reading, language, and mathematics.

Research studies with a wide variety of high school populations indicate that substantial gains in the level of reasoning and questioning skills can be achieved expeditiously through appropriate strategies and techniques (Blanc, 1981; Schneider & Renner, 1980). Keimig (1983) echoes these same findings for the post-secondary setting. In large part, Supplemental Instruction follows a "learning cycle" format (Atkins & Karplus, 1962; Fuller, 1980; Karplus, et. al., 1976; Renner, 1971; and Renner, et. al., 1976).

Overview of Supplemental Instruction (SI)

SI, an academic support program, is effective in addressing the general problem of student reasoning and the specific problem of student academic performance (Martin, et. al., 1983). The initial part of this overview focuses on the use of SI as it was originally designed for use at the college level. Following this section is an explanation of how the model was adapted for use at the high school level.

Deanna C. Martin, Ph.D., developed Supplemental Instruction in 1974 to address rising attrition rates at the University of Missouri-Kansas City. In 1981 and again in 1985, the SI model earned validation as an Exemplary Educational Program by the U.S. Department of Education. Since 1984, the Center for Academic Development at the University has received funding from the National Diffusion Network (U.S. Department of Education) to assist other post-secondary institutions implement the program. Faculty members and student support personnel from nearly 400 institutions have received training to enable them to offer SI to their students. In addition to yearly SI reports that are submitted to UMKC from hundreds of colleges and universities that have successfully implemented SI, the professional literature continues to report on SI's effectiveness (Wolfe, 1987).

Supplemental Instruction is a non-remedial academic support program which targets high-risk courses. Offered to all students enrolled in a particular course, SI provides assistance on an outreach basis in regularly-scheduled, out-of-class study sessions that begin the first week of class. To our knowledge, the features of SI which were innovative to assistance programs when SI was initiated in the mid-1970's are as follows: high risk courses are identified instead of high risk students and everyone in those courses is offered assistance; student participation in small group SI sessions is voluntary; and evaluation of SI goes beyond student and faculty satisfaction surveys and includes actual rates of institutional change. SI looks at persistence from the institutional (macro) rather than the individual (micro) level.

The SI model identifies high risk courses as having 30 percent or higher rate of D or F grades and withdrawals. Often these classes are large lecture sections. On some campuses they may be general education requirements or gatekeeper classes, critical introductory courses that must be passed to enter a program of study.

Other key elements of SI that differentiate it from group tutoring and other forms of academic support are: the SI leader attends all targeted class sessions; the SI leader is trained in specific teaching/learning theory and techniques before the beginning of the term; the SI program is supervised by a trained professional staff member; the program is offered only in classes in which the faculty member invites and supports SI; SI sessions are conducted regularly and integrate course content with learning

strategies; the SI leader facilitates and encourages the group to process the material rather than acting as an authority figure who lectures to participants; and the program is evaluated rigorously.

The SI supervisor is responsible for the program on campus. These responsibilities include training SI leaders and gathering and maintaining administrative support and faculty cooperation. The SI supervisor provides support for the SI leaders by attending class and monitoring SI sessions during the first three to four weeks and periodically throughout the remainder of the term.

An SI leader is a college student who is approved by the instructor of the targeted course and at best has successfully taken the instructor's class. SI leaders attend all class sessions, take notes, read all assigned material, and conduct three or four 50-minute SI sessions each week. SI leaders are presented as students of the subject. As such, they present an appropriate model of thinking, organization, and mastery of the discipline. The SI sessions integrate how to learn with what to learn. Students who attend SI sessions discover appropriate application of study strategies, e.g., note taking, graphic organization, questioning techniques, vocabulary acquisition, and test preparation, as they review content material. Students have the opportunity to become actively involved with the course material as the SI leaders use the text, supplementary readings, and lecture notes as the vehicle for learning how to study.

It is important to note that students typically perceive their need as content-centered. Experience shows, however, that their most common need is for the prerequisite learning skills that are basic to content mastery. The SI leader recognizes the difference between students' perceived needs and the students' real needs and supports the former while leading students to perceive the latter.

Evaluative data demonstrate SI's effectiveness for improving student performance, reducing attrition rates, increasing reenrollment rates for succeeding semesters, and increasing graduation rates.

Holding admissions test scores and high school rank as equivalent, the SI group outperforms the non-SI group. In courses offering SI, rates of unsuccessful enrollments (percentage of D and F grades and withdrawals) are lower than they were prior to the addition of SI. SI-participating students earn a higher percentage of A and B grades, lower percentage of D and F grades, and withdrew from the course at half the rate as non-SI participating students. Followup studies have repeatedly documented that the reenrollment rates of SI-participating students have exceeded non-SI participating students by approximately ten percentage points. The reenrollment rate for Spring 1990 repeated this average.

A recently completed study of UMKC students suggested that SI had a positive effect on graduation rates as well. The freshmen who participated in SI during Fall 1983 had graduated by Fall 1989 at a rate 12.4 percentage points higher than non-SI participating students. The difference was statistically significant at the 0.008 level.

Significantly, students benefit from SI whether they scored in the upper, middle, or lower range of admissions test scores and high school rank. Minority students also demonstrate equal success with other students who participated in SI. Minority students participated in SI at the same or higher rates than the others. Since the introduction of SI at the University of Missouri-Kansas City in 1974, these results have been replicated.

In addition, a representative sample of one hundred colleges and universities (public, private, two-year, and four-year) submit annual reports to a national data base that UMKC maintains. These reports evaluate the effectiveness of SI on a national scale. While colleges adopting SI may differ from the University of Missouri-Kansas City model in a variety of ways, their data show similar results.

The professional literature recently has been focusing on the effectiveness of collaborative learning for improved student learning (Chronicle, 1989; Light, 1990; and Smith, 1989). SI has been utilizing a structured form of collaborative learning for over fifteen years.

Adaptation Of SI For Use At The High School Level

The SI model was adapted for use with the high school students in the following ways. The classes targeted for support were the ninth and tenth grade English and history classes. These classes were selected since most students had difficulty with English and history. The second adaptation was that participation in SI was mandatory for students who wished to qualify for PROJECT CHOICE.

Program Objectives at Westport High School

While the general desired outcome is to increase appropriate academic behavior among the targeted student population, the following measurable objectives were established:

1. To increase the retention rate, and keep pace with their original graduating class, of the targeted student population.
2. To increase the attendance rate of the targeted student population.
3. To increase the rate of completed class assignments of the targeted student population.
4. To increase class grades of the targeted student population.
5. To increase scores on standardized tests of the targeted student population.
6. To improve affective domain scores of the targeted student population.

Westport SI Program Design

Those selected to lead the SI sessions were college students who were approved by the high school course instructor and certified as content-competent. Most of these college students were education majors, but some were content area majors. They were recruited from Kansas City area colleges and paid through funds provided by the SCUP grant. SI leaders were trained in learning strategies most appropriate to their content discipline. Three to five days of training took place before they began working with the high school students. Additional training was provided through daily staff meetings.

The SI leaders went to the targeted class, listened, and took notes. By attending class sessions, SI leaders were better prepared to help students understand the language of the course as they integrated the lectures and readings. Since these SI leaders had direct knowledge of the class material, they were better able to model good student behavior during the SI sessions. High school students also were more responsive to the SI leaders since they attended class along with them. The SI leader and their Westport English or history teacher met briefly each week to discuss upcoming lesson plans. The teachers often shared handouts, curriculum guides, and other helpful materials that the SI leaders used to develop their SI session plans.

Typically, the SI leaders conducted two to three 50 minute SI sessions each week during regular school hours with their group of students. The designated period was made possible by scheduling all ninth graders in a learning enrichment class and all tenth graders in a study skill class. Each week the students attended SI sessions for English two days a week (either on Monday and Wednesday or Tuesday and Thursday) and history two days a week. On Fridays the students attended an

additional SI session, alternating between history and English each week. During specified times throughout the year, the students would stay with the learning enrichment or study skill instructors for specific learning projects or to undergo assessment activities.

SI leaders received supervision by staff from UMKC. The SI supervisors accompanied SI leaders to class lectures, planned strategies for SI sessions, and accompanied them to their SI sessions. After the SI session the SI supervisor would debrief the SI leader concerning what was observed and make suggestions for improvement. In addition to the UMKC staff, the learning enhancement and study skill teachers assisted with supervision. The time commitment of the SI supervisors varied over the course of the semester. During the first month of the academic term, the SI supervisor accompanied the SI leader to all class lectures and SI sessions. After this first intensive period, the supervisor's time commitment diminished.

The SI review sessions had an average of five students. The largest groups had ten students. These student groups generally had the same English or history teacher. However, they may have attended that class at a different class period during the day. The SI leader attended only one class session daily. This did not pose a major problem since the teachers had consistent lesson plans for their classes.

Since the learning enrichment and study skill classes were held during five of the seven class periods of the school day, SI sessions were scheduled throughout the day as well. Each SI leader generally led SI sessions during three of these class periods. SI leaders worked either in the early morning periods or from late morning until afternoon. SI leaders also attended a planning/in-service hour during the fourth class period which occurred over the lunch hour. Both SI leader shifts overlapped at this time. An additional hour each day was spent observing their content teacher and preparing for their next SI session.

By targeting high-risk courses rather than high-risk students, the SI program avoided the remedial stigma associated with most academic support programs. Therefore, students at various levels of ability participated freely in the risk-free environment of the SI sessions. At the onset, the program was proactive, not reactive, in that SI schedules were set during the beginning of the semester, allowing students to obtain assistance before they encountered academic difficulty.

Westport SI Program Evaluation Design

The Westport SI Program evaluation plan specified the analysis and collection of data in the following areas:

1. Objective measures of students who participated with SI in regards to their attendance, reenrollment in school, assignment completion rate, final course grades, and performance on standardized tests. These students would be compared with two groups of students:
 - a. students who chose not to participate in SI during the current year; and
 - b. students who attended Westport High School in recent years before the introduction of SI.
2. Pre- and post-questionnaires and interviews with SI-participating students about their perception of the program's impact.
3. Subjective and objective measures of SI leaders about their work performance and their attitudinal reaction to the program.
4. Subjective measures of Westport English and history teachers about their attitudinal reaction to the program.
5. Subjective measure of students concerning changes in the affective domain.

Westport SI Preliminary Evaluation Results

Based upon information provided by the Kansas City Missouri Public School District (Way, 1989 & 1990), early results from the SI program appear favorable. This information will be useful in revising and improving the SI activities for the next year at Westport High School. More extensive evaluation procedures are now being implemented in order to provide additional evaluation data for analysis.

When examining first semester grades from the 1989-90 school year, progress was made in improving the English course grades. The comparison groups were tenth grade students from first semester 1989 (PROJECT CHOICE Participants) and first semester 1988 (Students not eligible for PROJECT CHOICE.) Only PROJECT CHOICE students participated in Supplemental Instruction. The English grades were dramatically improved in 1989. The percentage of A and B grades grew to 28.7, over double from the previous year's 13.6. The percentage of F grades was lower during 1989, 23.2, as compared with 32.7 from 1988. Strong emphasis was placed on writing activities during the SI sessions. Social Studies grades were nearly the same in 1989 as they were in 1988.

On a survey of SI participating students in January, 1990, students were asked to rate the SI program with a five point scale (strongly agree, agree, unsure, disagree, or strongly disagree.) Uniformly the students rated their perception that the SI program was effective in helping them to perform better academically. When asked whether the SI program should be continued, 86 agreed.

The Westport English and history teachers, the study skill and learning enrichment teachers, and the reading teacher were also asked to rate the SI program with the same five point scale. The SI program received the same favorable ratings.

During Spring 1989 the PROJECT CHOICE students took the Tests of Achievement and Proficiency (TAP). From among the school district's junior high schools, a comparison school was selected which most closely matched PROJECT CHOICE students. After adjusting for preexisting differences, PROJECT CHOICE students had higher scores on the Mathematics, Written Expression, Using Sources, and Social Studies tests, but slightly lower scores on the Reading and Science tests. The Written Expression test showed a statistically significant difference between the two groups of students with the PROJECT CHOICE students scoring significantly higher on this test. They scored an adjusted mean score of 11.04 as compared with 9.15 expected mean grade equivalent for the comparison group.

In order to measure changes in the affective domain, the Piers-Harris Self Concept Scale was administered to PROJECT CHOICE students in the fall of 1988 and again in the spring of 1989. The Anxiety sub-scale score had a statistically significant difference between the pre-test and post-test, suggesting that student anxiety was reduced.

The attendance rate for PROJECT CHOICE students was compared with other groups that did not participate in Supplemental Instruction for the 1988-89 school year. The attendance rate for PROJECT CHOICE students was 83.0 percent. Attendance rates for non-SI participating students were lower: Westport Grade 10, 74.9 percent; Westport Grade 11, 80.1 percent; Westport Grade 12, 79.0 percent; and Comparison School Grade 9, 79.0 percent.

Based upon information from the second quarter of the 1989-90 school year, the number of discipline referrals have been reduced. The two comparison groups are this year's PROJECT CHOICE Tenth Graders and last year's Tenth Graders (last year's tenth graders were not eligible for PROJECT CHOICE). Examples of this reduction include: disruptive behavior, missing class without permission, fighting, and suspensions from school.

Summary

After two years of the pilot test, the initial results appear favorable. While there has been some difficulty in implementing this comprehensive learning assistance program during the regular school day, the results in improved academic performance and improved student discipline warrant further use of the program.

There are a variety of other ways that the program could be implemented in other high schools. Upper classmen, adult volunteers, parent volunteers, or other persons could serve as SI leaders and supervisors. Strong support from the high school administration and creativity open many opportunities for the adoption of Supplemental Instruction at the high school level.

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