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Institutional predictors of Black college students' academic success in Computer Science and Mathematics majors

Francis O. Onukwuli

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INSTITUTIONAL PREDICTORS OF BLACK COLLEGE
STUDENTS' ACADEMIC SUCCESS IN COMPUTER
SCIENCE AND MATHEMATICS MAJORS

A DISSERTATION
SUBMITTED TO THE FACULTY OF CLARK ATLANTA UNIVERSITY
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR
THE DEGREE OF DOCTOR OF EDUCATION

BY
FRANCIS OSITA ONUKWULI

EDUCATIONAL LEADERSHIP

ATLANTA, GEORGIA
JULY 1990

R = 5  T = 67
The purpose of this study was to examine the extent to which controllable institutional variables, as perceived by Black college students, are related to their academic performance. The population for this study came from an historically Black college in Atlanta, Georgia.

Using an Ex Post Facto research design, the study focused on the freshman year experience by asking 38 second year computer science and mathematics majors to review their freshman year retrospectively. Data were collected from the population using the Student Survey on Awareness and Utilization Instrument. Pearson correlation and regression were used to analyze the data.

The study revealed that there is a significant relationship between 7 of the awareness and utilization variables (independent) and students' academic performance (dependent). The study concludes by recommending that colleges institutionalize certain practices for freshmen in order to enhance their academic prowess.
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The author wishes to thank the 38 students who willingly participated in this study. Further appreciation goes to my advisor, Dr. Olivia Boggs, and dissertation committee members, Drs. Trevor Turner and Sidney Rabsatt for their constructive criticism and invaluable help throughout this endeavor. Special thanks goes to the Computer and Information Science Department secretary for administering the instrument and to Ms. Minnie Moore for her typing assistance.

Finally, the writer must express his deep and profound appreciation to his colleagues and friends for their understanding and support, and to his family for living with a part-time father and brother. Their acceptance and understanding of sharing the writer made it possible to dedicate this dissertation to Anthonia, Francis Jr., Victor, the late Chief Mathias N. Onukwuli, the late Madam Ujueze Onukwuli, and her Majesty Ocheze Ileka.
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CHAPTER I
INTRODUCTION

Poor academic performance usually becomes a permanent barrier to opportunities for higher education and higher paying careers. Because of the pivotal role of education, educators, planners, and policy makers must find ways of equalizing educational experiences for traditionally low and underachieving populations. Without aggressive intervention, low income and minority students will continue to experience poor academic performance at all educational levels.

In 1990, Black Americans are far less likely to have a college education than White Americans. In 1988, 20.1 percent of Whites over age 25 had completed four years of college. The rate for Blacks was 10.9 percent (One Third of a Nation, 1989).

The growing population of minorities in America means that schools, colleges, and universities must become prepared to teach a drastically different student "with a greater variety of backgrounds, languages, values, and abilities than ever before" (Hodgkinson, 1985, p. 14). Because "schools have not been structured to be responsive to the concerns of underserved minorities" (Marshall, 1987, p. 2), there is a national movement to sensitize and reform school curricula and teaching methodologies.

These reform activities have gone beyond the sporadic attempts of a few educators and have begun to engage the
attention, efforts and resources of the business community, government agencies, private foundations and educational personnel. The reason behind this resurgence of interest in school administration and curriculum reform is precisely the same impetus behind the flood of educational reports: The Tucker Report (1981), A Nation at Risk (1983), The David Report (1984), and The Closing of the American Mind (1987), to mention a few. Also, a recent report, Toward a Lean and Lively Calculus (1987), characterized the national problem in these terms:

Nearly 500,000 students study calculus each year in the United States, yet fewer than 25% of these students survive to enter the science and engineering pipeline, blocking access to professional careers to vast majority of those who enroll. The elite who survive are too poorly motivated to fill our colleges, too few in number to sustain the needs of American business academe, and industry, too ill suited to meet the challenges of the next century (p.6). These demographic data have helped shaped the orientation and direction of computer science and mathematics education.

Statement of the Problem

The purpose of this study was to examine the extent to which college students' academic success is related to their awareness and utilization of institutional resources
such as library services, academic advisement, faculty consultations, study groups, counseling and tutorial services, and academic clubs. The research was based on the premise that students' awareness and utilization of these resources significantly contribute to their academic success.

**Evolution of the Problem**

The literature is replete with studies which document a relationship between cognitive, psychological, and socio-economic factors and academic performance. Results of these studies show that academic achievement may be influenced by a myriad of factors.

Parental involvement in students' academic and social lives is one variable that would seem to have potential for influencing students' achievement in that parents have direct access to children (Walberg, 1984). Carter (1981), felt that the lack of discipline within the school has encouraged a great deal of "finger pointing" between the school and the home. Educators accuse parents of failing to support school authorities when their children need discipline, and of being too permissive and lenient. Historically, school personnel assume responsibility for supervising the students via loco parentis, i.e. in the absence of the parent; school officials can act in the best interest of the child to maintain discipline and an orderly learning environment. As a result, school authorities developed a variety of strategies to maintain discipline within the schools.
Boyer (1987) indicated that the modern day undergraduate college is in trouble because of a host of problems, shortcomings, mistakes, and inadequacies. Further, he pointed out that there are conflicts and tension points on college campuses that impair effective undergraduate education. These concern the organization and allocation of college resources, priorities of the faculty, and conditions of learning and teaching. Boyer concluded that "many of the nation's colleges are more successful in credentialing than in providing quality education for their students" (p. 77).

Edmonds (1982) described principals' leadership and attention to the quality of instruction as being one of the important variables for students' achievement. He further pointed out that although school improvement is a product of a unified effort, involving school-wide integration of attitudes, goals, and procedures, the administrator emerges as being the central force in establishing and maintaining a successful operation. Essentially, the study indicated that the actions of the designated leaders are crucial to success because they influence the behavior of teachers.

In the early 1980s, the American public became increasingly worried about the quality of American education and educators, government agencies, the business community, and citizens' groups launched research projects, commissions, and task forces to study schooling and to consider how to improve it.

The College Board's Educational Equality Project
describes, in Academic Preparation for College (1983), the problems engendered by lack of adequate college preparation (problems apparently not solved by the remedial opportunities available):

In recent years, many college entrants have not had the knowledge and skills needed for higher education. Many have been severely limited in their choice of college or have been unable to pursue their choice of program. Many inadequately prepared college students have dropped out in frustration or have failed their courses. Many who did graduate had such poor records that they could not go on to graduate or professional study (p. 6).

These statements are so global that it is useful to look at the data that are causing the concern. A publication of the Educational Commission of the States (ECS) offered this analysis of students' difficulties in mathematics.

There was a steady decline in science achievement of 17 year-olds in national assessments in 1968, 1973, and 1977. The decline in physical science, however, does not appear to be as steep from 1973 to 1977. The decline in mathematics achievement does appear to be as the decline in chemistry and physics (Statistical Abstract of the United States, 1988, p. 125).

More young people finish high school today than ever before. However, in 1985, 12.5% of all 16 to 24 year olds
dropped out of high school, according to the Department of Education (Youth Indicators, 1988). At a minimum, a high school education is essential to an increasingly high-technology society. The recent Workforce 2000 report by the Hudson Institute concluded that new jobs in the service industries will demand much higher skill levels, such as familiarity with computers and other technologies, and will lead to more joblessness and lower earnings among the least skilled (Johnson and Packer, 1987). This trend is reflected in the average earnings of high school dropouts which fell 42% from 1973. The average earnings of high school graduates has fallen 28.2% since 1973 (Youth and America's Future, 1988).

Clearly there is a need to investigate relationships between and among institutional variables which may have implications for positively impacting the academic experiences of traditionally low achieving students.

**Purpose of the Study**

The purpose of the study was to determine if there are identifiable resources and services inherent in the institutional fabric of colleges which are beneficial to students' academic progress. The study focused on institutional factors as opposed to personal or familial factors in order to provide institutions with relevant and useful data which can be controlled and manipulated. The study is particularly relevant for Black colleges and the students therein.
Significance of the Study

The significance of the study lies in its potential for providing a basis on which Black colleges may develop crucial and defensible procedures that will encourage students to familiarize themselves with and utilize the resources of the college campus.

Assumptions of the Study

The following assumptions were made at the beginning of the study:

1. The sample of students from the college which responded to the questionnaire was representative of the population of first semester sophomore students in Black colleges.

2. The data were reported accurately and consistently for each student who participated in the study.

Limitations of the Study

The following limitations controlled the study:

1. The study was confined to first semester computer science and mathematics sophomores who were enrolled at a Black college in Atlanta, Georgia. This means that the only generalization possible is to the population from which the sample was drawn.

2. The study included only students attending a private historically Black college and the data were based on
their perceptions.

**Research Questions**

The study was guided by the following research questions:

1. Are there specific variables within institutions that promote academic achievement of students?
2. Does students' awareness of various institutional resources promote academic achievement?
3. Does students' utilization of various institutional resources promote academic achievement?

**Organization of the Study**

Chapter I was an introduction to the study which included a statement and evolution of the problem, purpose and significance of the study, assumptions, limitations, and research questions. Chapter II is a review of the literature. The theoretical framework is presented in Chapter III. Chapter IV is a review of the research methodology and procedures. The summary, findings, conclusions, and recommendations.
CHAPTER II
REVIEW OF RELATED LITERATURE

The literature was reviewed around pertinent theories and variables that are related to the academic performance of students, in general, and college students, in particular. The two major themes around which the literature was reviewed are 1) factors which influence learning and 2) collegiate indicators of academic success.

Factors Which Influence Learning

In research completed over a decade ago, Persell (1977) documented that environmental variances are a major cause of differential achievement levels between Black and White learners. Further, she suggested that social inequalities inevitably lead to educational inequalities.

Based on the myriad of reports which assailed the disparate achievement levels of students based on their economic standing, numerous studies arose which suggested approaches for equalization. While many studies focused on correcting perceived defects in the individual, Ryan (1976) and others asserted that this approach results in creating stereotypes and blaming the victim.

The Getzel and Guba Social System Model (1957) can be linked to or compared with student academic achievement, i.e. success or failure. In the model, the formal organization, the school, represents the nomethetic aspect which involves the roles and expectations that define the normative dimen-
sions of activity in the school. The ideographic aspect is associated with the individual needs and dispositions, i.e., the needs of the students. The student brings to the school setting certain values which are directly related to his or her home environment. If the values or norms which are influenced by the parents are in direct contrast to that of the school or formal organization, conflict arises which could have a negative impact on student achievement. On the other hand, if the student receives adequate (culturally defined) parental involvement and a study environment that complies with the expectations of the school, the student should be an academic achiever.

Maslow's (1954) hierarchy of needs are relevant to the students' sociological needs that teachers and classrooms should acknowledge and support. Poor children usually are categorized as low achievers. Their social environments are often void of home-based learning and reference materials which supplement the educational supplies at the school. Using the logic of Maslow (1954), when lower physiological needs and environmental needs are not met, it is difficult to even contemplate aspiring to higher order levels.

A large number of economically disadvantaged children are forced to live in high crime areas where the basic survival needs are necessarily at a higher priority level of importance than needs of esteem and self-actualization.

John Goodlad (1983), author of *A Place Called School*, conducted extensive research on 38 schools in 7 states. He
recommended several teaching strategies that should lead to improved student achievement: teachers should teach in a variety of ways for varying purposes, feedback should be positive, individualized attention should be allocated, students should be kept engaged, and all instructional time should be used more efficiently. Examination of Goodlad's work verifies his concern for identifying institutional or school-based factors for the improvement of learning.

LaPointe, Mead, and Phillips (1989) indicated that nationally students are not learning what many adults think they should. The national results are confirmed by several international studies showing that the attainments of American students compare unfavorably with students in other countries (Purvis, 1989).

Nisbet and Shucksmith (1988) suggested that rather than focusing on the deficits that children bring into the classroom, teachers should help students "harness their metacognitive knowledge and use it to operate and develop new strategies for learning" (p. 57). Basically, these researchers suggest that school personnel should vigorously help students to learn how to learn.

A recurring theme in the literature on indicators of learning is the need to focus on the specific needs of the learner. Anderson (1981) and Cockburn (1983) found that while teachers profess to teach based on the learner's abilities, many do not. Anderson further suggested that for low achieving students confusion and misunderstanding are most
often the norm.

Sociologist Sara Lawrence Lightfoot (1983) asserted that effective schools must "create an environment that will connect them to the wider world and protect them from it" (p. 368). Her research was based on case studies of urban, suburban, and elite high schools.

The literature on factors which influence learning suggested that the classroom and school environments are crucial to the academic success of students, particularly economically disadvantaged students. The recent literature takes a particular stance regarding the need to move away from deficit theories of low achievement. The reviewed studies are replete with school-based and classroom-based variables which, when activated, should positively impact students' academic achievement.

**Collegiate Indicators of Academic Success**

A study by the Institute for Services to Education (1979) examined the correlation between standardized college admissions tests and life achievement of students attending historically Black colleges. The study sample included 121 people who had graduated from one of eleven historically Black colleges in 1971. The students' ACT (American College Testing Program) scores were correlated with measures of educational attainment, occupational status, and self-perceptions of success. Findings showed that despite their low initial scores on standardized tests, study participants
were able to achieve considerable educational and career success.

Specifically, results indicated that:

1. Standardized test scores are not valid predictors of the future educational attainment and career success of Black students.

2. Undergraduate grade point averages are valid predictors of the future educational success of Blacks to the extent that higher grade point averages may be associated with higher salaries.

3. The historically Black colleges provide an opportunity to obtain a bachelor's degree and, thereby, enhance access to further education and career success to students who more than likely would not be admitted to college using traditional admissions criteria.

Walker's study (1977) indicated that common linguistic patterns impede the academic progress of Black students entering college. The results of this study suggest that post-secondary institutions need to institute instructional programs to assist students in developing standard English communications skills.

Bracey (1988) examined the relationship between computer anxiety and achievement of students enrolled in a required computer science course in an urban university. He found that students with high computer anxiety had lower achievement in the required computer science course.

In another study related to success in computer science,
Hoffman (1989) focused on the relationship between students' success in writing computer programs and their level of cognitive development (verbal ability and mathematics reasoning). Regression analysis showed that level of cognitive development, when combined with verbal reasoning, is linearly predictive of programming ability.

Wileman (1982) studied the relationship between mathematical competencies and probable success in beginning computer science courses. The study reinforced the importance of all students attaining mathematical competencies while in high school and suggested the need for more accurate student advisement.

Studies completed by Hall and Wenger (1989) indicated that undergraduates have difficulty with algebra and word problems. Eighty-five junior and senior computer science undergraduates enrolled in an artificial intelligence course were asked to solve simple mathematics word problems. Many of the students found the problems to be difficult and failed to solve them.

Cafolla's (1988) study examined whether college students' success in writing computer programs is related to level of cognitive development. Like Hoffman (1989), this study found a direct relationship between cognitive skills and programming skills.

Joyce and Showers' (1988) work indicated that study groups and coaching programs, when properly formulated, represent powerful strategies for instructional improvements that
impact on student learning. In their work, study groups and coaching programs are attached to training, continuous, experimental and integrate theory with practice and feedback.

Astin (1982) pointed out that we have for years tended to think of undergraduate program "quality" as synonymous with "resources invested." The "best" colleges and universities are frequently thought to be those with high-ability and high-achieving students, more books in the library, more faculty with terminal degrees, lower student-faculty ratios, larger endowments and so on. Although a reasonable argument can be made that undergraduate program quality and resources have radically altered the nature of discussions of undergraduate program quality, increasingly claims to quality must be based on other factors. Rather than focusing on the availability of resources, the focus should be on how students use those resources.

Johnson and Napier (1987) investigated the influence of locus of control and ACT (American College Testing) scores in predicting grade point average (GPA) of college freshmen at a predominantly Black college in Mississippi. A total of 322 freshmen were administered the Rotter Locus of Control Inventory during the first month of school. The ACT scores and composite GPA were obtained at the end of the academic year. The conclusion was that locus of control was not related to GPA, while ACT scores were. They suggested that future researchers should test for change over time (i.e., between the freshman and sophomore years).
Barber (1981) and Knefelkamp (1982) found that the challenges of college, which include entering a new environment, assuming new roles and responsibilities, and encountering increased or differing challenges to their self esteem, may inhibit use of skills and structures evident in other situations. For example, adults returning to college after a long absence may fail to use problem solving strategies or social skills which they use at home or at work on a daily basis.

Parker (1978) suggested that students' growth is enhanced when their sense of being participants in a community of scholars is created. In such a community, students observe and engage with faculty in a variety of contexts, all of which encourage critical analysis, empathetic discussion, and reflection of ideas, information, and choices. Many private colleges provide ideal environments in this respect and there is considerable evidence that students who participate in this type of community progress more rapidly than do students who do not become intellectually engaged (Winter, Stewart, and McClelland, 1981).

Although Parker's work and validating sample drew from a rather restricted group (University of Minnesota students) subsequent research has provided evidence of the relevance of the findings. For instance, Clinchy and Zimmerman (1981) found that the scheme provided a useful framework for studies of student development in a women's college. Differences were noted in the experiences for men. Goldberg, Marwine, and
Paskus (1978) used it with young students and Daloz, Noel and Miller (1980) studied its relevance for reentry students in nontraditional settings. They found the model useful as a guide in counseling and programmatic planning for students.

Tracey and Sedlacek (1984) examined the relationship between non-cognitive dimensions (self-concept, self-appraisal and academic familiarity) with grade point averages of Black and White students. The non-cognitive dimensions were found to be related to persistence for Black students, but not for White students.

Astin (1985) has done extensive work in the area of identifying predictors of academic success among Black students. He has noted that America's ethnic and racial minorities are grossly underrepresented in higher education and higher level occupations which require collegiate training. Recent reports document that limited gains in enrollment of minorities made during the last two decades appear to be eroding (Orlans, 1990).

**Summary**

The literature provided a solid rationale and basis for the study. Moving from the deficit models of the 1950s and 1960s, more recent studies focus on learning environments which are necessary for traditionally low achieving students to experience success. Several of the reviewed studies concur with the notion that there are things which can occur within institutions that have a positive impact on achievement of
Black students.

The previously referenced research of Nisbet and Shucksmith (1988) focused on the need to help students develop their natural cognitive abilities. Two separate studies found that students experience difficulties in mathematics and computer science as a result of limited cognitive abilities. These findings are clearly interrelated and, more importantly, these studies had clear implications for the dissertation research.

The literature repeatedly stressed the role of institutional factors which can be created or manipulated to benefit the student. Several of the reviewed studies either explicitly stated or implicitly suggested that for Black college students, nontraditional approaches to academic success must be explored by colleges.
CHAPTER III
THEORETICAL FRAMEWORK

The research was designed to determine if selected variables interact as depicted in the theoretical model (see figures 1 and 2). Figure 1 represents a macro model which suggests that students' awareness and use of institutional variables has some effect on their academic achievement. Figure 2 represents a micro model in which the specific institutional resources are identified.

Dependent Variable

The dependent variable for the study was academic achievement as measured by the grade point average.

Independent Variable

The independent variable for the study was awareness and use of library services, academic advisement system, faculty consultations, study groups, counseling and tutorial services, and academic clubs. Awareness and use were viewed and studied as two separate tasks.
Figure 1: Macro model of the theoretical framework

- **STUDENTS**

- **AWARENESS OF INSTITUTIONAL RESOURCES**

- **UTILIZATION OF INSTITUTIONAL RESOURCES**

  **Effect on**

- **ACADEMIC ACHIEVEMENT**
Figure 2: Micro model of theoretical framework.

Students

Awareness of College Resources

Library Services and Facilities

Academic Advisement System

Faculty Consultations During Office Hours

Study Groups

Counseling and Tutorial Services

Academic Clubs

Utilization of College Resources

Library Services and Facilities

Academic Advisement System

Faculty Consultations During Office Hours

Study Groups

Counseling and Tutorial Services

Academic Clubs

Effect on

Academic Achievement
**Relationship Between the Variables**

The theoretical framework suggests that the independent variables influence the dependent variable in the following manner:

<table>
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<tr>
<th>Independent Variables</th>
<th>Dependent Variable</th>
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<tr>
<td>1. Library Services and Facilities</td>
<td>Academic Achievement</td>
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<tr>
<td>2. Academic Advisement System</td>
<td></td>
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<tr>
<td>3. Faculty Consultations</td>
<td></td>
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<tr>
<td>4. Study Groups</td>
<td></td>
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<tr>
<td>5. Counseling/tutorial Services</td>
<td></td>
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<tr>
<td>6. Academic Clubs</td>
<td></td>
</tr>
<tr>
<td>7. Library Services and Facilities</td>
<td></td>
</tr>
<tr>
<td>8. Academic Advisement System</td>
<td></td>
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<tr>
<td>9. Faculty Consultations</td>
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<tr>
<td>10. Study Groups</td>
<td></td>
</tr>
<tr>
<td>11. Counseling/tutorial Services</td>
<td></td>
</tr>
<tr>
<td>12. Academic Clubs</td>
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</table>

William Boyd (1980) suggested that because Black students can enter college with substantially lower Scholastic Aptitude Test scores than their White peers and are expected to achieve on an equal par, other factors should be considered when predicting the academic success of Black students. The identified independent variables for this study attempted to study nontraditional predictors as suggested by Boyd.

Culler (1986) also identified institutional variables which had implications for high school mathematics programs. The independent variables used by Culler and Boyd were useful
In order to test the theoretical framework, the following null hypotheses were developed:

**Null Hypotheses**

In order to test the variables used in the dissertation research.
H7: There is no significant relationship between students' utilization of library services and facilities and students' academic achievement as measured by the SSRAU.

H8: There is no significant relationship between students' utilization of the academic advisement system and students' academic achievement as measured by the SSRAU.

H9: There is no significant relationship between students' utilization of faculty office hours and students' academic achievement as measured by the SSRAU.

H10: There is no significant relationship between students' utilization of study groups and student academic achievement as measured by the SSRAU.

H11: There is no significant relationship between students' utilization of counseling and tutorial services and students' academic achievement as measured by the SSRAU.

H12: There is no significant relationship between students' utilization of academic clubs and students' academic achievement as measured by the SSRAU.

**Definition of Terms**

The following terms are operationally defined for the study as follows:

1. **Library Services and Facilities** - The array of learning resources available to students, including a) the college library, b) the media center, c) the curriculum materials
d) the data processing center, e) the learning resources center, and d) campus communications media.

2. **Academic Advisement System** - The set of procedures for helping a student move smoothly through his or her undergraduate general education and major programs of study.

3. **Faculty Consultation** - The period reserved by faculty for meeting with students in order to further explain concepts presented in class, discuss matters not explored in class, or discuss other matters of importance to the student.

4. **Study Groups** - Student liaisons established to discuss and solve homework problems and assignments and to prepare for examinations.

5. **Counseling and Tutorial Services** - The institutional services designed to provide intensive academic and personal assistance to help students academically, psychologically, and emotionally.

6. **Academic Clubs** - Special interest groups that provide academic enrichment and support services to student members.

7. **Student Achievement** - Operationally defined as grade point average.
CHAPTER IV

METHODS AND PROCEDURES

Chapter IV contains a description of the research methodology and a collection of the data for purposes of analysis, interpretation and implication. The chapter begins with a discussion of the design of the study and then presents description of the setting, description of the population, sampling procedures, description of the instruments, data collection procedures, statistical analysis, and summary of the chapter.

Design of the Study

Using an Ex Post Facto design, the research focuses on the freshman year experience by asking second year students to retrospectively review their freshman year. Of particular importance is ascertaining students' awareness of and interactions with college resources during their first year.

Description of the Setting

The setting for this study is one of the colleges in the Atlanta University Center (AUC) which is located in South West Atlanta, Georgia. The AUC is the largest consortium of higher education institutions in the world serving Black young men and women. The consortium consists of six institutions: Clark Atlanta University, Interdenominational Theological Center, Morehouse College, Morris Brown College, Spelman College, and Morehouse School of Medicine. The AUC colleges, as the largest Black College
community in the world, provides the best setting locally and probably nationally, for a study of this nature.

**Description of the Population**

The population for this study consisted of first semester Sophomores in one of the six predominantly Black colleges in Atlanta. Due to data accessibility, one of the colleges was utilized in this study. The college enrolled over eighteen hundred students during the period of the study.

**Sampling Procedures**

The sample of the population for this study consisted of thirty-eight first semester second year Computer Science and Mathematics majors in one of the six predominantly Black colleges in Atlanta. A questionnaire containing forty-two items that were related to the major concerns of the study was administered to each of the participants.

**Description of the Instruments**

The Student Survey on Resource Awareness and Utilization (SSRAU) was used to collect data from the population for the purposes of assessing, via students perception, the degree to which their awareness and utilization of institutional resources was consistent with their academic achievement. The instrument was designed in such a fashion as to objectively solicit input from the respondents while minimizing the potential for bias.

**Data Collection Procedures**

Data were collected from the target population using the SSRAU instrument and a structured interview with the college registrar.
The highest standards of confidentiality of subjects and respect for privacy were enforced.

**Statistical Analysis**

Pearson Correlation was used to determine the relationship between each variable and students' academic achievement and test for significance of the relationship. In addition, Regression analysis was used to predict the value of the dependent variable based on the values of the independent variables. According to Slavin (1984), "correlational analyses provide information on many relationships between variables, and use of correlation designs allow for study of independent variables over which the researcher cannot have any control" (p. 61).

This section presents each null hypothesis and states whether the finding is significant or not significant. Tables are also presented to show how the decisions were made and supported by the research data. Tables 1-6 show the relationships between students' perceptions on each of the awareness variables and GPA using Pearson Correlation. Tables 7-12 demonstrate the relationship of students' perceptions of each of the utilization variables and GPA, using Pearson Correlation. Table 13 shows the students' response rate, in percent, for agreement or disagreement with each of the independent variables. Table 14 is a regression analysis table that shows the independent variables and their weight contributions (Beta) to academic achievement.

**Hypothesis 1 states:**

There is no significant relationship between students' awareness of library services/facilities and student aca-
academic achievement as measured by the SSRAU.

As shown in Table 1, there was no significant relationship between students' awareness of library services and grade point average as measured by the SSRAU (P = .736, df = 36, r = .056). Since the computed r value (.056) is less than the table value of r (.304), the null hypothesis was accepted.

Table 1
Relationship Between Awareness of Library Services and Academic Achievement

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Pearson r</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALSF/GPA</td>
<td>4.184</td>
<td>1.392</td>
<td>.056</td>
<td>.736</td>
</tr>
</tbody>
</table>

Note: n = 38, df = 36, GPA = 1.37, sd = 489

Based on these calculations, Hypothesis 1 was accepted.

Hypothesis 2 states:
There is no significant relationship between students' awareness of the academic advisement system and students' academic achievement as measured by the SSRAU.
As shown in Table 2, there was no significant relationship between the students' awareness of the academic advisement system and their grade point average. Since the computed \( r \) was less than .304, the null hypothesis was accepted.

Table 2

Relationship Between Awareness of the Academic Advisement System and Academic Achievement

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Pearson ( r )</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAAS/GPA</td>
<td>5.053</td>
<td>1.576</td>
<td>0.185</td>
<td>.267</td>
</tr>
</tbody>
</table>

Note: \( n = 38, \; df = 36, \; GPA = 1.37, \; sd = .489 \)

Hypothesis 3 states:

There is no significant relationship between students' awareness of faculty consultation hours and students' academic achievement as measured by the SSRAU.

As shown in Table 3, there was no significant relationship between the students' awareness of this dimension and grade point average (GPA). Since \( r \) was less than .304, the null hypothesis was accepted.
Table 3

Relationship Between Awareness of Faculty Consultation and Academic Achievement

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Pearson r</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFC/GPA</td>
<td>2.184</td>
<td>.730</td>
<td>.183</td>
<td>.270</td>
</tr>
</tbody>
</table>

NOTE: n = 38, df = 36, GPA = 1.37, sd = .489

Hypothesis 4 states:
There is no significant relationship between students' awareness of study groups and students' academic achievement as measured by the SSRAU.

As shown in Table 4, there was a significant relationship between students' awareness of study groups and GPA. Since r is less than .304, the null hypothesis was accepted.

Table 4

Relationship Between Awareness of Study Groups and Achievement

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Pearson r</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASG/GPA</td>
<td>.868</td>
<td>.811</td>
<td>-.011</td>
<td>.949</td>
</tr>
</tbody>
</table>
Hypothesis 5 states:
There is no significant relationship between students' awareness of counseling and tutorial services and students' academic achievement as measured by the SSRAU.
As shown in Table 5, there was a significant relationship between students' awareness of counseling and tutorial services and grade point average. Since $r$ is greater than .304, the null hypothesis was rejected.

Table 5
The Relationship Between Awareness of Counseling and Tutorial Services and Academic Achievement

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Pearson $r$</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASG/GPA</td>
<td>1.842</td>
<td>1.197</td>
<td>.518</td>
<td>.001</td>
</tr>
</tbody>
</table>

Note: $n = 38$, $df = 36$, GPA = 1.37, $sd = .489$

Hypothesis 6 states:
There is no significant relationship between students' awareness of academic clubs and students' academic achievement as measured by the SSRAU.
As shown in Table 6, there was a significant relationship between students' awareness of academic clubs and GPA.
Table 6
Relationship Between Awareness of Academic Clubs and Academic Achievement

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Pearson r</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAC/GPA</td>
<td>.605</td>
<td>.638</td>
<td>.479</td>
<td>.002</td>
</tr>
</tbody>
</table>

Note: n = 38, df = 36, GPA = 1.37, sd = .489

Hypothesis 7 states:
There is no significant relationship between students' utilization of library services and students' academic achievement.

As shown in Table 7, there was a significant relationship between students' utilization of library services and grade point average. Since r was greater than .304, the null hypothesis was rejected.

Table 7
Relationship Between Utilization of Library and Achievement

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Pearson r</th>
<th>probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>ULS/GPA</td>
<td>2.789</td>
<td>1.742</td>
<td>.379</td>
<td>.019</td>
</tr>
</tbody>
</table>
Hypothesis 8 states:
There is no significant relationship between students' utilization of the academic advisement system and students academic achievement as measured by the SSRAU.
As shown in Table 8, there was no significant relationship between students' utilization of academic advisement and academic achievement. Since $r$ is less than .304, the null hypothesis was rejected.

Table 8

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Pearson $r$</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>UAAS/GPA</td>
<td>1.053</td>
<td>.759</td>
<td>.163</td>
<td>.329</td>
</tr>
</tbody>
</table>

Note: $n = 38$, $df = 36$, $GPA = 1.37$, $sd = .489$

Hypothesis 9 states:
There is no significant relationship between students' utilization of faculty consultation hours and students' academic achievement as measured by the SSRAU.
As shown in Table 9, there was no significant relationship between utilization of faculty consultation and GPA. Since $r$ was greater than .304, we do not accept the null
hypothesis.

Table 9
Relationship Between Utilization of Faculty Consultation and Academic Achievement

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Pearson r</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>UFC/GPA</td>
<td>.658</td>
<td>.481</td>
<td>.321</td>
<td>.050</td>
</tr>
</tbody>
</table>

Note: n = 38, df = 36, GPA = 1.37, sd = .489

Hypothesis 10 states:

There is no significant relationship between students' utilization of study groups and students' academic achievement as measured by the SSRAU.

As shown in Table 10, there was a significant relationship between students' utilization of study groups and GPA. Since r was greater than .304, the null hypothesis was accepted.
Table 10

The Relationship Between Utilization of Study Groups and Students' Achievement

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Pearson r</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>USG/GPA</td>
<td>.763</td>
<td>1.714</td>
<td>.489</td>
<td>.002</td>
</tr>
</tbody>
</table>

Note: n = 38, df = 36, GPA = 1.37, sd = .489

Hypothesis 11 states:
There is no significant relationship between students' utilization of counseling/tutorial services and students' academic achievement as measured by the SSRAU.

As shown in Table 11, there was a significant relationship between students' utilization of counseling and tutorial services and their academic achievement. Since r was greater than .304, the null hypothesis is rejected.
Table 11

The Relationship Between Utilization of Counseling and Tutorial Services and Academic Achievement

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Pearson r</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>UCTS/GPA</td>
<td>1.842</td>
<td>1.219</td>
<td>.508</td>
<td>.001</td>
</tr>
</tbody>
</table>

Note: n = 38, df = 36, GPA = 1.37, sd = .489

Hypothesis 12 states:
There is no significant relationship between students' utilization of academic clubs and students' academic achievement.

As shown in Table 12, there was a significant relationship between students' utilization of academic clubs and their grade point averages. The null hypothesis was rejected.

Table 12

The Relationship Between Utilization of Academic Clubs and Academic Achievement

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Pearson r</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>UCA/GPA</td>
<td>.558</td>
<td>.669</td>
<td>.644</td>
<td>.000</td>
</tr>
</tbody>
</table>

Note: n = 38, df = 36, GPA = 1.37, sd = .489
Students' awareness of academic clubs contributed negatively to their academic achievement. This finding is supported by the Achievement Factors Response Rate Table (Table 13). This table illustrates that 32.9 percent of the students were in agreement and 67.1 percent were in disagreement with the awareness of academic clubs variable.
TABLE 13
Achievement Factors Response Rate for
the Independent Variables
(Response by percent)

<table>
<thead>
<tr>
<th>Variable</th>
<th>False</th>
<th>True</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALSF</td>
<td>52.30</td>
<td>47.70</td>
<td>100.0</td>
</tr>
<tr>
<td>AAAS</td>
<td>36.25</td>
<td>63.69</td>
<td>100.0</td>
</tr>
<tr>
<td>AFC</td>
<td>27.20</td>
<td>72.80</td>
<td>100.0</td>
</tr>
<tr>
<td>ASG</td>
<td>57.90</td>
<td>42.10</td>
<td>100.0</td>
</tr>
<tr>
<td>ACTS</td>
<td>52.00</td>
<td>48.00</td>
<td>100.0</td>
</tr>
<tr>
<td>AAC</td>
<td>67.10</td>
<td>32.90</td>
<td>100.0</td>
</tr>
<tr>
<td>ULSF</td>
<td>45.26</td>
<td>54.74</td>
<td>100.0</td>
</tr>
<tr>
<td>UAAS</td>
<td>48.65</td>
<td>51.35</td>
<td>100.0</td>
</tr>
<tr>
<td>UFC</td>
<td>34.20</td>
<td>65.80</td>
<td>100.0</td>
</tr>
<tr>
<td>USG</td>
<td>61.85</td>
<td>36.85</td>
<td>100.0</td>
</tr>
<tr>
<td>UCTS</td>
<td>41.50</td>
<td>58.50</td>
<td>100.0</td>
</tr>
<tr>
<td>UAC</td>
<td>68.42</td>
<td>31.58</td>
<td>100.0</td>
</tr>
</tbody>
</table>

As shown in Table 14, when Regression analysis was performed at a .01 level of significance on the selected independent variables, the combined factor of awareness and utilization of academic clubs was a greater contributor to students' academic achievement than are the other variables in the regression equation. The beta weight of .961 or contribution of academic clubs (awareness and utilization) towards students' academic achievement was highly signifi-
cant. In other words, for every unit change in academic achievement, the beta weight for academic clubs changed by .961. However, it was interesting to note that the awareness of academic clubs alone had inverse relationship with students' academic achievement (beta = -.416).

TABLE 14

Relationship amongst Selected Independent Variables and Students' Academic Achievement:

Regression Analysis on the Total Sample (N = 38)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Contribution of Variable to Academic Achievement Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC (AAC and UAC)</td>
<td>.961</td>
</tr>
<tr>
<td>ASG</td>
<td>-.108</td>
</tr>
<tr>
<td>AFC</td>
<td>.059</td>
</tr>
<tr>
<td>UAAS</td>
<td>.095</td>
</tr>
<tr>
<td>ALSF</td>
<td>-.233</td>
</tr>
<tr>
<td>UFC</td>
<td>.173</td>
</tr>
<tr>
<td>AAAS</td>
<td>-.082</td>
</tr>
<tr>
<td>ACTS</td>
<td>.316</td>
</tr>
<tr>
<td>ULSF</td>
<td>-.239</td>
</tr>
<tr>
<td>USG</td>
<td>.219</td>
</tr>
<tr>
<td>UCTS</td>
<td>.008</td>
</tr>
<tr>
<td>AAC</td>
<td>-.416</td>
</tr>
</tbody>
</table>
Summary

The purpose of this chapter was to present the macro and micro models, null hypotheses, and the statistical analysis of the data with respect to the relationships between each independent variables and the dependent variable.

Based on the perceptions of students' significant relationships, at .05 level of significance for the Pearson Product-Moment Coefficient of correlation, were found to exist between awareness and counseling and tutorial services (ACTS) and academic achievement (GPA), awareness of academic clubs (AAC) and academic achievement (GPA), utilization of library services and facilities (ULSF) and academic achievement (GPA), utilization of faculty consultation hours (UFC) and academic achievement (GPA), utilization of study groups (USG) and academic achievement (GPA), utilization of counseling and tutorial services (UCTS) and academic achievement (GPA), and utilization of academic clubs (UAC) and academic achievement (GPA). In addition Regression Analysis of the data revealed that when .01 limits was reached in the regression, the combined factor of awareness and utilization of academic clubs was the strongest predictor of students' academic achievement (see Table 14). However, students' perception on the awareness of library services and facilities, academic advisement system, faculty consultation, study groups, and utilization of academic advisement system components of the SSRAU showed that no significant relationship exists between each of these variables and their academic achievement.

In Chapter 5, the results are summarized and discussed. Conclusions and recommendations for further research are also presented.
CHAPTER V
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter is divided into three sections. A summary of the purpose of the study along with the methodology and statistical procedures utilized in the study is presented in section one. The findings of the study are summarized and conclusions are presented in the second section, and recommendations for further study are outlined in the third section.

Summary of the Study

The purpose of this study was to determine whether students' awareness of library services and facilities, academic advisement system, faculty consultations during office hours, study groups, counseling and tutorial services, and academic clubs impact on their academic achievement, and to ascertain whether students' utilization of library services and facilities, academic advisement system, faculty consultations during office hours, study groups, counseling and tutorial services, and academic clubs impact on their academic achievement. In addition, it endeavored to provide information necessary for the development of a better understanding of how Black students' awareness and utilization of institutional resources impact students' achievement and to encourage colleges to recognize the importance of educational research in solving problems concerning college administration.

To fulfill the purpose of this study, the following research questions were formulated:
1. Are there variables within an institution that propagate the academic achievement of students?

2. Does students' awareness of various institutional resources promote academic achievement?

3. Does students' utilization of various institutional resources promote academic achievement?

Data for the study were collected by using the Student Survey on Resource Awareness and Utilization (SSRAU) questionnaire which measured the students' perception of the SSRAU instruments. The instrument was administered to the students on April 24, 1990 by the Computer and Information Science Department Secretary.

Data obtained from the instrument were analyzed with Nie's (1980) Statistical Packages for Social Science (SPSS) using the Clark Atlanta University's VAX 11/780 mainframe computer. Pearson correlation and regression analysis were used to analyze the data.

Findings and Conclusions of the Study

The Findings/results of the study are summarized in this section and pertinent conclusions are stated. The results and conclusions are presented with respect to the research questions.

Each Null Hypotheses was tested at the .05 alpha level for significance. In the statistical analysis section of the paper, the research spelled out the rejection of the appropriate null hypotheses and the reason for said recommendation.

Thus, Null Hypotheses 1, 2, 3, 4, and 8 were accepted because their correlations were not significant ($r = .056, .185, .183, -.011, \text{ and } .163$ respectively). Hypotheses 5, 6, 7, 9, 10, 11, and 12 were re-
jected because their correlations were significant \( r = 0.518, 0.479, 0.379, 0.489, 0.508, 0.644 \) respectively.

Here, the rejected Hypotheses are restated with the appropriate decisions.

Hypothesis 5 states:

There is no significant relationship between students' awareness of counseling and tutorial services and student academic achievement.

Hypothesis 11 states:

There is no significant relationship between students' utilization of counseling and tutorial services and student academic achievement.

Hypotheses 5 and 11 were rejected because their Pearson \( r \) values were significant as stated above. These Hypotheses looked at the entire student data and not at individual student data. The fact that 48 percent of the students were aware of the college's counseling and tutorial services and 52 percent were unaware, and 58.50 percent of the students utilized these services and 41.50 percent did not, should be of grave concern to faculty, administrators, and even parents (See Table 13). The significant finding revealed that the students awareness and utilization of counseling and tutorial services partly contributed to their academic achievement.

Hypothesis 6 states:

There is no significant relationship between students' awareness of academic clubs and student academic achievement.
Hypothesis 12 states:
There is no significant relationship between students' utilization of academic achievement.

The significant Pearson \( r \) values for the Hypotheses implied that they had to be rejected. 32.9 percent of the students were aware of academic clubs and 67.1 percent were unaware, and 32.58 percent of the students belonged to and used academic clubs, and 68.42 percent did not belong to or use it. As can be seen in Table 14, the combined factor of awareness and utilization of academic clubs was the greatest contributor to students academic achievement.

Therefore, it is crucial for faculty and administrators to fully support academic club programs by initiating academic policies that will encourage and promote students' awareness and utilization of the clubs. The reason for the high beta (.961) contribution of awareness and use of academic club towards students' academic achievement is obvious. They act as spurs to greater achievement, largely because they provide the students with clearer insight and opportunities in their academic and career fields, and because the students come to share those clearly and publicly stated high standards of performance with their club members.

Hypothesis 7 states:
There is no significant relationship between students' utilization of library services and facilities and student academic achievement.

Hypothesis 7 was rejected because the computed Pearson's co-
efficient of correlation of is significant at .05 alpha level. As can be seen in Table 13, 54.74 percent of the students were in agreement and 45.26 percent were in the disagreement with the variable utilization of library services and facilities. Academic institutions and the public should endeavor to always provide their institutions adequate library services and facilities because of their potential to influence student academic achievement.

Hypothesis 9 states:

There is no significant relationship between students' utilization of faculty consultation hours and student academic achievement.

The significant finding for Hypothesis 9 indicated that it had to be rejected. In Table 13, it can be seen that 65.80 percent of the students were in agreement and 34.20 percent were in disagreement with the variable utilization of faculty consultation hours. Since this variable positively contributed to the students' academic achievement (r = .321), faculty should make themselves available for and open to interactions with students during their scheduled consultation hours.

Hypothesis 10 states:

There is no significant relationship between students' utilization of study groups and student academic achievement.

Hypothesis 10 was rejected because our finding was significant (r=.489). In response to this Hypothesis, it can be seen in Table XIII that 36.85 percent of the students were in agreement and 61.85 percent were in disagreement with the variable utilization of study groups. One reason why study group significantly contributed to
efficient of correlation is significant at .05 alpha level. As can be seen in Table 13, 54.74 percent of the students were in agreement and 45.26 percent were in the disagreement with the variable utilization of library services and facilities. Academic institutions and the public should endeavor to always provide their institutions adequate library services and facilities because of their potential to influence student academic achievement.

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Hypothesis 10 states:

There is no significant relationship between students' utilization of study groups and student academic achievement.

Hypothesis 10 was rejected because our finding was significant (r=.489). In response to this Hypothesis, it can be seen in Table XIII that 36.85 percent of the students were in agreement and 61.85 percent were in disagreement with the variable utilization of study groups. One reason why study group significantly contributed to
students' achievement is that, through such groups, the students motivate each other by openly expressing doubt rather than adopting a faculty or an authoritative stance. They are willing to consider the ideas of their peers and able to provide a rational defense of their own position better than in the class.

In a stepwise multiple regression analysis, using students' academic achievement (GPA) as the dependent variable, the academic club (awareness and utilization), was the independent variable that made the greatest contribution (B = .961). Also, the independent variables awareness of counseling and tutorial services and awareness of academic club made significant positive and inverse contributions respectively (B = .316 and -.416).

The foregoing discussion and conclusions of the findings provided the researcher with the below responses to the research.

Response to Research Question 1:

The counseling and tutorial services and academic clubs awareness variables, and the utilization variables library services and facilities, faculty consultation, study groups, counseling and tutorial services, and academic clubs were the variables found to propagate the achievement of students at the institution where this research was conducted.

Response to Research Question 2

Students' awareness of counseling and tutorial services, and academic clubs does promote academic achievement.

Response to Research Question 3

Students' utilization of library services and facilities, faculty consultation, study groups, counseling and tutorial services,
and academic clubs were found to promote academic achievement.

In conclusion, the above awareness and utilization variables have the potential to influence students' learning/academic achievement in very different ways. But there are two significant problems with these measures:

1. They are all proxies for educational excellence and academic achievement, and
2. They are all inputs and, like other inputs to any educational system, they are very difficult to measure.

None of them tells what students actually learn and how much they grow as a result of their awareness and utilization. None of them tells us anything about educational outcomes. As a result, have no way of telling how academic institutions actually perform.

These findings, have two important implications which could serve as fundamental principles about the conditions of students academic excellence and achievement everywhere:

1. The amount of students' learning/academic achievement and personal development associated with any educational program is directly proportional to the degree of their awareness and utilization of resources in that program.
2. The effectiveness of any educational practice on any learning program is directly related to the capacity of that practice to increase students' awareness and utilization of that program resources.
Summary of Findings

1. Based on the students' perception, the awareness of counseling and tutorial services, academic clubs, utilization of library services and facilities, faculty consultation, study groups, counseling and tutorial services, and academic clubs were significant predictors of their academic achievement.

2. Students' perception on the awareness of library services and facilities, academic advisement system, faculty consultation, study groups, and utilization of academic advisement system components of the SSRAU showed that there was no significant relationship between each of these variables and their academic achievement.

Recommendations

1. It is recommended that additional studies utilizing larger samples and different student population and classification be done to replicate this research. College students at all levels should be used to expand the scope of the study.

2. It is recommended that instructors and higher educational administrators familiarize themselves with the current research on awareness and utilization of institutional resources and utilize the research in their efforts to improve students' performance.

3. Educational administrators and faculty should re-
cognize the extent to which institutional practices, pertaining to the awareness and utilization variables affect students' performance.

4. It is recommended that educational administrators develop counseling/tutorial service and practices in higher education which will favor the less assertive student.

5. College administrators and faculty alike should find ways to enhance and propagate students' awareness and use of institutional counseling and tutorial services, academic clubs, utilization of library services and facilities, faculty consultation, and study groups.

6. Faculty members in each department should assign students homework that will require the student to utilize library services and facilities.

7. Each department within the college should provide their students with a list of the counseling and tutorial services that are available at the college.

8. Since the utilization of a college resource implies the awareness of that resource, each department should encourage students to utilize the college counseling and tutorial services.

9. Each department should be encouraged to initiate academic clubs that will provide adequate opportunities for intense intellectual interaction between students and mentors.
10. College administrators should enforce the rules pertaining to faculty consultation hours. They must ensure that each faculty maintains regular contact with students.

11. Faculty should examine a variety of approaches to active modes of teaching and learning, and we recommend that college faculty increase their use by organizing small and large discussion/study groups in order to provide students the opportunity to interact and share ideas acquired in class.

The above recommendations are just a few that need immediate attention by faculty, staff, and administrators. The addressing of the above recommendations would enable students to best become aware and utilize institutional resources; it would enable them to become participants in the learning process rather than mere spectators.
BIBLIOGRAPHY


Cockburn, A. (1983). The quality of pupil learning experience Link 12, 12 - 20


MEMORANDUM

TO: Mr. President

FROM: Francis O. Onukwuli,
CIS Department

RE: Permission to Collect Research Data

DATE: January 18, 1990

I am in the process of writing my dissertation and I need your permission to collect research data (from the Registrar's office) for this purpose.

My research will utilize the Micro and Macro models developed by Dr. Olivia Boggs (my Dissertation Committee Chairperson), but it will focus on determining the extent to which the organization of institutional variables are related to the academic performance of Black College Students.

Your consideration of this request is greatly appreciated.

Thank you.

FOO/mr

copy: Dr. Olivia M. Boggs,
Associate Professor
APPENDIX B

TO: Francis O. Onukwuli
FROM: President
RE: Permission To Collect Research Data
DATE: January 20, 1990

I am writing to grant you permission to collect research data from the Registrar's Office for the purpose of writing your dissertation. By copy of this memo, I am informing Mrs. and Dr. of this decision.

Permission to access these data is granted with the following stipulations:

1. All subjects on whom data are collected will be anonymous; and

2. The College will remain anonymous.

If you have questions, please feel free to contact me. Good luck in your endeavors.

FOO: mem
Dear President:

Thank you for allowing me to collect research data from the Registrar's office. The name of the college and the students will be anonymous.

Hopefully, this study (Institutional Predictors of Black College Student's Academic Success in Computer Science and Mathematics), Majors) will yield pertinent information that will help us to form a better improvement plan for our students.

Again, thank you for your support, encouragement, and contribution towards my academic and professional development.

Sincerely yours,

Francis O. Onukwuli

FOO:mem
APPENDIX D
March 12, 1990

Dear Registrar:

In order to complete requirements for the Ed.D. degree at Clark Atlanta University, I am conducting a research study on the following topic: Institutional Predictors of Black College Student's Academic Success in Computer Science and Mathematics. This study is under the direction of Dr. Olivia Boggs; my dissertation advisor, and Drs. Sydney Rabsatt and Trevor Turner; members of my dissertation committee.

I have received permission to collect research data from your office. Enclosed is a copy of that confirmation.

I sincerely hope that you and your staff will assist me in obtaining information necessary for the completion of this study. I assure you that our college and students will have complete anonymity.

Please notify me, within the next week, when I can meet with you to further discuss my data requirements.

Thank you in advance for your time and consideration.

Sincerely yours,

Francis O. Onukwuli
CIS Department

FOO:mem

Enclosure
APPENDIX E
April 24, 1990

As part of my work fulfilling the requirements for a Doctoral in Higher Education Administration and Supervision at Clark Atlanta University, I am undertaking a survey of students' awareness and utilization of institutional resources in a Black institution of higher education. This study will assist in identifying students' awareness and utilization of institutional resources and factors which promotes the awareness and use of the resources.

The enclosed questionnaire is designed to be complete in a minimum of time. All responses will be kept confidential. Survey results will be provided to interested individuals upon request.

Please return your responses to the CIS Department secretary by May 1, 1990. Thank you for your participation and cooperation. Looking forward to receiving your responses.

Sincerely,

Francis O. Onukwuli, Faculty
CIS Department

This research has been approved by his Doctoral Committee at Clark Atlanta University, and we request your time and assistance.

Dr. Olivia M. Boggs, Chairman
Dissertation Committee
Clark Atlanta University
Department of Educational Leadership

Enclosure
APPENDIX F
THE STUDENT SURVEY ON RESOURCE AWARENESS AND UTILIZATION

This survey is designed to determine your awareness and utilization of resources at *** and in the *** Center. Please circle the response which best completes each of the following statements.

Thank you.

1. The *** Library is...
   a. in *** Hall.
   b. on ***
   c. in the *** Center.
   d. none of the above.

2. The Computer Science and Mathematics visual aids materials are...
   a. in the *** Library.
   b. in the *** Center.
   c. in the *** Office.
   d. none of the above.

3. The *** Center is...
   a. in the *** Office.
   b. in the *** Office.
   c. in the *** Center.
   d. none of the above.

4. The *** Center is...
   a. in the *** Office.
   b. in the *** Center.
   c. in the *** Library.
   d. none of the above.

5. The *** Center is...
   a. in the *** Building.
   b. in the ***
   c. in the *** Library.
   d. none of the above.

6. The Dean of Student's (*** ) office is...
   a. in the *** Building.
   b. in the *** Hall.
   c. in the ***
   d. none of the above.
7. The Office of Academic Affairs is ... 
   a. in the *** .
   b. in the *** Hall.
   c. in the *** Building.
   d. none of the above.

8. The office of the *** is.
   a. in the *** Hall.
   b. in the *** .
   c. in the *** Center.
   d. none of the above.

9. The Office of the *** President is currently ... 
   a. in the *** Hall.
   b. in the *** .
   c. in the *** .
   d. none of the above.

10. The President of *** is...
    a. Dr. *** .
    b. Dr. *** .
    c. Dr. *** .
    d. none of the above.

11. The Director of *** is...
    a. Dr. *** .
    b. Dr. *** .
    c. Ms. *** .
    d. none of the above

12. The Chairperson of the Computer Science Department is...
    a. Mr. *** .
    b. Mr. *** .
    c. Dr. *** .
    d. none of the above.

13. The Edsger Dijkstra's Structural Programming textbook for structural programming design is...
    a. in the *** Center.
    b. in the *** Library.
    c. in the *** Office.
    d. none of the above.
14. The Encyclopedia of Computer Science for writing term papers and completing projects is...
   a. in the *** Office.
   b. in the *** Center.
   c. in the *** Library.
   d. none of the above.

15. Video tapes on computer technology and on how computers are used in business and industry are...
   a. in *** .
   b. in the *** Center.
   c. in the *** Library.
   d. none of the above.

16. My academic advisor's office is located in...
   a. *** Hall.
   b. *** .
   c. *** Building.
   d. none of the above.

17. My academic advisor is ...
   a. Mr. *** .
   b. Mr. *** .
   c. Dr. *** .
   d. Mr. *** .
   e. Mr. *** .
   f. Mr. *** .
   g. none of the above.

18. The general education requirements for graduation may be found...
   a. in the College Catalog.
   b. in the Yearbook.
   c. in the *** .
   d. all of the above.

19. A listing of all teachers and their credentials may be found...
   a. in the Yearbook.
   b. in the Student Handbook.
   c. in the College Catalog.
   d. all of the above.

20. I usually meet with my advisor ....times each semester.
   a. one
   b. two
   c. three or more
   d. none of the above
21. I usually meet with my advisor whenever...
   a. one
   b. two
   c. three or more
   d. none of the above.

22. Individualized and small group tutorial sessions in Computer Science are available...
   a. in the *** Labs.
   b. in the *** Center.
   c. in both a and b.
   d. none of the above.

23. Individualized and small group tutorial sessions in mathematics are available...
   a. in the *** Center.
   b. in the *** Center.
   c. both a and b.
   d. none of the above.

24. There are .... Labs in the *** department.
   a. one or two
   b. three
   c. four
   d. none of the above.

25. The *** office is...
   a. in the *** Center.
   b. in the *** Building.
   c. in the *** Gynasium.
   d. none of the above.

26. Students can obtain counseling on academic career, social, and personal areas from ...
   a. the *** Center.
   b. *** faculty.
   c. both a and b
   d. none of the above.

27. I usually meet with the *** tutor for tutorial assistance .... times each semester.
   a. one
   b. two
   c. three or more
   d. none of the above.
28. I usually participate in small group tutorial sessions in .... each semester.
   a. Computer Science
   b. Mathematics
   c. both a and b
   d. none of the above.

29. I know about .... club.
   a. the ***
   b. the ***
   c. both a and b
   d. none of the above.

30. I usually attend the *** club meetings .... times each semester.
   a. one
   b. two
   c. three or more
   d. none of the above.

31. I usually borrow and use Computer Science and Mathematics books from the *** ..... times each semester.
   a. one
   b. two
   c. three or more
   d. none of the above

32. I usually review Computer Science and Mathematics tutorial packages in the *** Center ..... times each semester.
   a. one
   b. two
   c. three or more
   d. none of the above.

33. I usually view video tapes on Computer Science and Mathematics jobs and seminars in the *** Center ..... times each semester.
   a. one
   b. two
   c. three or more
   d. none of the above.

34. I usually use the laser printer in the *** for printing my term papers .... times each semester.
   a. one
   b. two
   c. three or more
   d. none of the above.
35. I usually use the Encyclopedia of Computer Science for writing term papers and completing projects .... times each semester.
   a. one
   b. two
   c. three or more
   d. none of the above.

36. I usually use the Dijkstra's Structural Programming textbook for structural programming design .... times each semester.
   a. one
   b. two
   c. three or more
   d. none of the above.

37. I usually participate in individualized tutorial sessions... times each semester.
   a. one
   b. two
   c. three or more
   d. none of the above.

38. I usually obtain academic, counseling and testing information from the counseling office.... times each semester.
   a. one
   b. two
   c. three or more
   d. none of the above.

39. I usually meet with my lab instructor for tutorial assistance .... times each semester.
   a. one
   b. two
   c. three or more
   D. none of the above.

40. I usually attend at least one of the *** Club meetings .... times each semester.
   a. one
   b. two
   c. three or more
   d. none of above.

41. Listed below are several academic clubs.
   a. ***
   b. ***
   c. ***
   d. ***
   e. ***
   f. ***
How many of these clubs do you belong to? Circle the club number(s) for your corresponding selection.

a. one (1 2 3 4 5 6)
b. two (1 2 3 4 5 6)
c. more than two (1 2 3 4 5 6)
d. none of the above

42. Each semester, I seek help on class assignments from my instructors...times during their consultation hours.

a. one
b. two
c. three or more
d. none of the above.

NOTE: *** are used in this instrument to keep the college anonymous.