Perception of the Impact of Freshmen Academic Involvement Activities, and Use of Academic Support Services on Academic Performance - (A Case Study of Virginia Tech Second –Year Engineering Students): Implications for Counseling

by

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ABSTRACT

This study identifies and discusses the academic activities and support services that second-year-engineering students perceived as having impacted their freshman year academic performance. Guided by Astin's (1984) student involvement theory, this investigation involved a total of 34 participants, and was conducted at a large land-grant university in the southeastern United States during the spring semester of the 1998/99 academic year.

The following questions were addressed by this study: (1) Which academic activities do students consider as important to their academic performance? (2) Which academic support services do students consider as important to their academic performance? (3) Are there academic performance level-related differences in students' perceptions of the impact of various academic activities in which they are involved, relative to their academic performance? (4) Are there academic performance level-related differences in students' perceptions of impact of the academic support services they use, relative to their academic performance? (5) Are there gender-related differences in students' perceptions of the impact of various academic activities in

which they are involved, relative to their academic performance? (6) Are there gender-related

differences in students' perceptions of impact of the academic support services they use, relative

to their academic performance? (7) Are there race-related differences in students' perceptions of

the impact of various academic activities in which they are involved, relative to their academic

performance? (8) Are there race-related differences in students' perceptions of impact of the

academic support services they use, relative to their academic performance?

The data for this study were gathered from 9 focus group interviews and from an

accompanying open-ended questionnaire. The 34 participants were divided into groups

according to their academic performance levels, gender and race. There were six unsuccessful

academic performers with below 2.00 GPAs; 12 low academic performers with GPAs below 2.7

but not less than 2.00; and 14 high academic performers with GPAs of 2.7 and above. The racial

and gender composition was: 25 White students, 9 Black students; and equal numbers of males

and females (17 each). The criteria for participation were being a second-year, full-time student

enrolled in the 1998/99 academic year. Data were analyzed through content analysis, constant

comparative data analysis and supplemented by NUD*IST.

The resulting findings demonstrate a link between academic involvement activities and

academic performance. The academic involvement factors that students perceived as either

positively or negatively impacting their freshman year academic performance were identified

and categorized into three general themes: (1) effort and involvement, (2) peer interaction and

(3) faculty interaction. Effort and involvement factors refer to the specific learning activities

implemented and the academic support services students used during the freshman year. Peer

interaction factors are the relationships and contacts with fellow students that were perceived as

impacting academic performance. Faculty interaction refers to a student's contact with

professors inside and outside of the classroom and the perceived impact of these interactions on academic performance. The critical factors identified for success in engineering include doing homework and completing assignments, making good use of one's time, using supportive programmatic resources, and receiving academic support from interacting with peers and faculty. Students who expend effort in these areas are more likely to perform at a higher academic performance level than those who do not.

Acknowledgments

First and foremost, I thank God for giving me the energy and health to take on a project of this magnitude and to bring it to completion.

This project was accomplished because of the assistance and support of many individuals. I start by thanking the students who gave of themselves by participating in this study; I wish them all the best for the rest of their tenure at Virginia Tech and in all their future endeavors.

I am deeply indebted to my committee members for their commitment and dedication for collectively making it possible to successfully execute this project. Words cannot express how grateful I am to each and every one of them for sharing their knowledge and experiences from the conception, design and implementation of my study. I am very grateful to Drs. Hildy Getz and Tom Hohenshil for their time, feedback and unwavering support. Appreciation is extended to Dr. Jimmie Fortune, whose vast knowledge in the area of qualitative research was greatly tapped in the implementation of this case study project. To Dr. Delores Scott I am eternally grateful for enthusiastically sharing her knowledge and interest in improving student academic success in higher education, and her unending support and encouragement. A special thanks goes to Dr. Claire Cole Vaught for her support, encouragement, patience for over seven years and her optimism and faith in me. Words cannot express how grateful I am to her for her professional assistance, guidance and her invaluable contributions to my learning experience. I feel very fortunate to have been advised by her and to have experienced her commitment to excellence and high standards.

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<center>**Chapter One**</center>

Background

　　Low college graduation rates and high student attrition are major sources of concern --

not only to institutions of higher learning, but also to parents, the government, and funding

agencies (Livengood, 1992, and Moller-Wong & Eide, 1997). According to a 1992 study by the

American College Testing program (Tinto, 1993), the rate of graduation in universities and

colleges for the past forty years has been declining, particularly in the eighties and nineties.

Statistics from this study indicate that the already low graduation rate of 52.6 percent in 1983

dropped further to 46.7 percent in 1992. Other statistics indicate that of all freshmen who enter

college on a full-time basis, only 40 percent complete their degrees in the standard four-year-

year period (Erickson & Strommer, 1991). Thus, an alarming 60 percent of students admitted to

institutions of higher learning take longer than 4 years to earn their degrees, or even more

disturbing, do not complete them at all. The situation has generated calls for more accountability

on the part of institutions of higher education. Parents, funding agencies, and the general public

are increasingly demanding value for their investment in higher education (Livengood, 1992, and

Moller-Wong & Eide, 1997).

　　There are strong indications that high student attrition rates may be impacting some

universities' academic credibility, as well as their ability to attract private and federal revenue. In

addition, student attrition is also a growing concern for parents, funding agencies, and especially

for our nation's students, who may experience social and/or psychological problems as a result of

their inability to complete a university degree. To illustrate, when a student drops out of college

prior to graduation, there is a loss of financial revenue for the college, which in turn leads to

increases in tuition and likely requests for additional support from funding agencies (Moller-

Wong & Eide, 1997). One must also consider the immeasurable economic impact to the U.S. from the deficit of a domestically trained, well-educated, highly skilled workforce. The seriousness of these problems is a major reason why many universities, including Virginia Polytechnic Institute and State University (Virginia Tech), are implementing a variety of programs and services designed to encourage students to avert failure and persist to completion of their degree programs.

Virginia Tech's concern for student retention is reflected by the number of initiatives that have been developed in recent years, two of which are reviewed here. The first is the Center for Academic Enrichment and Excellence (CAEE), which is oriented toward providing academic support for the general student population. The Center for Academic Enrichment and Excellence, formerly Office for Academic Enrichment Program, was established in 1995. The Center offers academic support services to enhance the success of different segments of the Virginia Tech student population. Their programs include the following:

1. Project Success, is a program that helps students in academic difficulty learn how to improve their grades and graduate from Virginia Tech. This is open to all undergraduates with less than 2.00 GPA.

2. Tutoring Program- CAEE offers free tutorial services to all Virginia Tech students in select subjects (mostly preparatory freshman and sophomore classes).

The second is the Office of Minority Engineering Programs (OMEP), a college-specific retention initiative, that was established in 1992 to help increase the recruitment and graduation of underrepresented populations in the College of Engineering. Even though the very name of the program implies that its services are only for minority students, it also offers services for the general engineering student population. Some of the programs and services are as follows:

1. Black Engineering Support Team (BEST), Academic Hispanic Outreach Alliance (AHORA) and Women in Engineering Support Team (WEST). These are mentoring programs for Black, Hispanic and female engineering freshmen that are designed to ease their adjustment to the academic rigors of Virginia Tech. They provide the freshmen with the opportunity to work with upper-class students from their corresponding population and to learn from them how to survive academically at Virginia Tech in a "non-traditional" major.

2. Student Assistance Center, another component of OMEP, offers free electronic and face-to-face tutorial services to all engineering students. Tutoring is available in freshman and sophomore engineering courses, as well as in some upper level courses.

All these programs and services are evidence of Virginia Tech's commitment to increased student retention rates and minimize attrition. This study was designed to contribute to those efforts by generating information that will strengthen ongoing programs and possibly lead to the development of new initiatives.

Introduction

In the past, the pre-enrollment characteristics of students were considered to be the standard predictor of college success. Of particular significance were college entrance scores, high school grades, and overall class ranking (Livengood, 1992; and Blumner & Richards, 1997). Students who did well in one or more of these quantitative dimensions were assumed to be able to do college level work and succeed. More recently, that assumption has been challenged. Research findings suggest that college pre-enrollment characteristics only account for about 25 percent of college academic performance (Mouw & Khanna, 1995). A report by Erickson and Strommer (1991) indicates that more than 50 percent of college students fail to

complete their studies. Based on those findings, the emerging conclusion seems to be that: (a) quantitative pre-enrollment characteristics only slightly impact college outcome; and (b) performance in college is influenced by the way students mediate their college experience (Astin, 1984; Pace, 1984; Pascarella & Terenzini, 1991; and Davis & Murrell, 1993). However, while there is general agreement on the impact of students' efforts on college outcome, little has been done to identify specific academic activities that students engage in on their own (i.e. academic involvement), which seem to promote college success (Willis, 1989). This study was designed to fill that gap, and is aimed at identifying specific learning activities and resources that students perceive as having impacted their academic performance at Virginia Tech. Identification of these activities and resources will provide useful information for improving and strengthening the focus of university-initiated student success programs.

Statement of the Problem

As mentioned earlier, this study was motivated by declining enrollment and attrition in U.S. colleges of engineering over the past fifteen years, with the resultant cost to students, institutions, parents and the economy (Moller-Wong & Eide, 1997). As Astin (1993a) and Reichert and Absher (1997) have observed, student attrition in the freshman and sophomore years has resulted in only 44 percent graduation rate among engineering students. This is problematic, according to Ludwig (1995) in view of the selective nature of engineering programs and the relatively high SAT scores of engineering students. The concern is expressed both in universities and the nation that so many students who did well enough in high school to be accepted into engineering programs are not able to persist in the program (Moller-Wong & Eide, 1997). In fact, the situation has generated fears that there may not be sufficient engineers

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available to fill the anticipated 25 to 30 percent increase of technical manpower by the turn of the century (Board of Engineering Education-National Research Council, 1992).

In response, a number of studies have been undertaken to identify factors associated with student retention/attrition in engineering programs. Typical among the factors considered are gender, race, personality differences and intellectual factors (Riechert &Absher, 1997; Moller-Wong &Eide, 1997; Besterfield-Sacre , Atman & Shuman, 1997; Felder, Forrest, Baker-Ward, Dietz, & Mohr, 1993; 1994; Hrabowski & Maton, 1995; and Schaer, Aull, Pancake, Curtis, & Wiens, 1991). Surprisingly, not much attention has being given to what engineering students do and how they learn -- such as the learning activities they implement, the academic support services and resources they use, the contacts they make, as well as gender or race-related differences. This study focuses on those largely under-researched areas. The purpose is to identify specific learning activities and academic support services that engineering second-year students implemented and utilized during their freshman year at Virginia Tech, which they perceived as having facilitated their learning and enriched their college experiences.

Research Questions

The following specific research questions were addressed:

1. Which academic activities do students consider as important to their academic performance?

2. Which academic support services do students consider as important to their academic performance?

3. Are there academic performance level-related differences in students' perceptions of the impact of various academic activities in which they are involved, relative to their academic performance?

4. Are there academic performance level-related differences in students' perceptions of impact of the academic support services they use, relative to their academic performance?

5. Are there gender-related differences in students' perceptions of the impact of various academic activities in which they are involved, relative to their academic performance?

6. Are there gender-related differences in students' perceptions of impact of the academic support services they use, relative to their academic performance?

7. Are there race-related differences in students' perceptions of the impact of various academic activities in which they are involved, relative to their academic performance?

8. Are there race-related differences in students' perceptions of impact of the academic support services they use, relative to their academic performance?

Purpose of the Study

The study is designed to: (a) identify the academic activities, facilities, and services that second-year engineering students perceived as important to their freshman year academic performance; and (b) determine if there are gender- and race-related differences in the perception of the impact.

In identifying those activities and resources that seemed to strengthen students' performance, the researcher expects to generate information that will help counselors and college administrators design intervention planning that will assist freshmen and sophomore engineering students who experience academic difficulties. This information will also be useful in designing new student retention initiatives and in strengthening existing programs, thereby mitigating declining enrollment and attrition in Colleges of Engineering.

Significance of Study

On a practical level, one objective of this research was to contribute to ongoing university-wide student retention effort through the identification of those activities and academic support services that make the university experience rewarding and ultimately successful, i.e., leading to graduation. The information generated would also contribute to strengthening current academic enhancement programs, as well as future program initiatives.

At the theoretical level, the researcher hoped to contribute to an improved understanding of the learning process by identifying specific educational activities and support services that students perceive as impacting their academic performance. The aim was to shed some light on the various learning activities that seem to positively influence college outcomes and thus contribute to a more accurate assessment of how a student's level of academic involvement impacts his or her ability to learn and persist through graduation.

Theoretical Base

This study was guided by Astin's (1984) student involvement theory, which postulates that the more physical and psychological energy a student devotes to the college experience, the more he or she learns. In other words, the amount of learning that occurs in college is directly proportional to the quantity and quality of a student's involvement in people, activities, and opportunities that are provided by the university. As an elaboration of the theory, Astin outlines six areas/types of college involvement: place of residence, athletic involvement, student government, participation in honors program, student-faculty interaction, and academic involvement. Astin believes that students' involvement in each of those categories not only strengthens certain types of skills but also tends to integrate students into the university community, thereby encouraging them to persist to graduation (Astin, 1993b, and Tinto, 1993).

Involvement in student government, for example, has been found to strengthen leadership and interpersonal skills, and therefore a sense of responsibility. Student-faculty interactions have been associated with the development of intellectual and interpersonal skills, which can result in integration into the academic community. Participation in honors program has been associated with enhancement of students' self-confidence and sense of self-worth, and therefore a desire to seek and to attain higher goals. Academic involvement has been found to enhance personal development and learning outcomes. The nature of this theory and, in particular, its comprehensive coverage to several aspects of college experience makes the theory useful for this study.

Definition of Terms

The following list identifies and defines the key concepts that are used in this study:

Academic Involvement

This is the extent to which a student implements learning activities and uses academic support services beyond class attendance, completing homework assignments, and other activities that are necessary to meet basic course requirements (Astin, 1984; Willis, 1989 and 1993). Academic involvement, as used in this study, comprises the learning activities that students implement and the academic support services that they use, which they perceive as impacting their academic performance. Again, the emphasis is on learning activities that a student implements, which *exceeds* what is minimally required to meet course requirements (Willis, 1989). Doing more than what is required includes, for example, a student's interaction with faculty and fellow students outside of the classroom, participation in study groups, use of tutorial services and attendance at workshops, seeking help from academic support services, belonging to a professional organization, indication of interest or enthusiasm in courses, doing

additional reading, doing individual research, and other such activities. This definition of

academic involvement is informed by studies which assert that college learning is based on

integration, commitment and the amount of time, energy and effort devoted to the college

experience (Astin, 1984; Tinto, 1993; Pace, 1984; Willis, 1989; and Pascarella & Terenzini,

1991).

Academic Activities

The definition of academic activities for this study is informed by a process-oriented

perspective that was derived from cognitive and information-process models (Weinstein

&Mayer, 1986). This model, which assumes that learning is strongly influenced by the strategies

students use, specifies three strategies: cognitive, meta-cognitive, and resource management.

Each of these is further divided into different learning activities. Cognitive strategies pertain to

how learners manipulate information when responding to task requirements. These have been

categorized as rehearsal, elaboration, organization and critical thinking. Meta cognitive

strategies are the executive functions for assessing and controlling the use of cognitive strategies,

including planning, monitoring, and regulating. Resource management strategies involve

establishing conditions that facilitate learning, including effective use of time and study

environment, effort regulation, peer learning and help seeking.

These learning activities are the actions that are directed at acquiring information, such as

organizing and transforming information, self assessment, reviewing class and text notes,

seeking and selecting information, seeking or consulting with professors, studying with peers,

seeking academic assistance or using tutorial and other academic support services. In this

research, learning activities will be defined as the application of those behaviors that are directed

at acquiring knowledge and information, as noted above (Weinstein & Mayer, 1986; Zimmerman & Pons; 1986, and Zimmerman, 1990).

Academic Performance:

The definition of academic performance in this study is based on work by Blustein, Judd, Krom, Vinair, Padilla, Wedemeyer, & Williams, (1986) who identify the concept as persistence in an institution with a specified grade point average (GPA). In this study, academic performance will be defined as a student's ability to attain a 2.00 GPA in order to maintain eligibility. For the purposes of this particular study, high academic performers are those students with a 2.7 GPA or above; low academic performers are characterized as students with less than 2.7 GPA but not lower than 2.00; and unsuccessful academic performers are those with less than 2.00 GPA.

Perception

Perception in this study is the meaning that participating students attach to their college experiences, interaction with professors, note taking, time management and exam preparation, for example. The concept also includes the students' assessment of the impact of specific learning activities and use of academic support services on their academic performance, or their ability to meet course requirements.

Academic Support Services

These are the programs and facilities that are available at Virginia Tech to help students succeed and/or to promote activities that help students to succeed. In this study academic support services refer to, but not be limited to programs offered by the Center for Academic Enrichment and Excellence, College of Engineering programs such as the Student Assistance

Center, Minority Engineering Programs, departmental tutorial services, and the Cook Counseling Center programs.

Limitations

There are various limitations associated with the type of methodology applied in this study. The reliance on data on the recall of information by participants was one of the problems that had to be addressed. This is because of the effect of time lapse on the ability of participants to recall events or information. There was also the dilemma of different interpretations and perceptions about learning activities and academic support services, reflecting the students' different backgrounds, interests and experiences (Morgan, 1993). One concept invariably has different meanings for different people since what one person perceived one way, could be perceived in another way by another person.

The purposeful sampling technique that was applied in this study restricts the generalizability of the results of this study. It should be noted that the findings of the study were not expected to reflect attrition/rention issues in other colleges at Virginia Tech, nor in other Colleges of Engineering throughout the country. In fact, the intention was not to produce generalizable results, but rather to obtain in-depth information from students on the phenomenon that was studied. However, since most engineering students appear to have similar entry level characteristics, the results could be generalizable to some extent.

Overview of the Chapters

This introductory chapter is followed by a review of relevant literature (Chapter Two). The third chapter is an explanation of the methodology and procedures that were used in the study. Chapter 4 presents the analysis and results of the study. Chapter 5 presents the findings

of the study, while Chapter 6 discusses the results and implications, and makes recommendations

based on the findings of the study.

Chapter Two

Literature Review

Introduction

The literature pertaining to student attrition, retention and college success is presented in six sections: (a) student attrition and retention; (b) academic performance and persistence; (c) perceived impact of learning activities on academic performance; (d) perceived impact of student involvement on academic performance; (e) perceived impact of academic support services on academic performance; and (f) gender and race-related differences in learning activities and the use of academic support services. The first section of the review focuses on documented trends in enrollment and graduation among college students in general, and among engineering students in particular. Public reactions to the observed decline in college graduation rate are summarized and institutions' responses are also indicated.

The second section of the review presents research evidence that seems to link grades (i.e., academic performance) with a student's decision either to stay through the completion of his or her degree (i.e., persistence), or to drop out of college. Special attention is given to the importance of freshman year performance on students' persistence. The next three sections of the review summarize the findings of previous studies that have tried to assess the perceived impact of learning activities, academic support services, and student involvement, respectively, on academic performance or learning outcome. The final section of the review presents information from studies that explored possible gender-and race-related differences in the use of learning activities and academic support services, and the probable effect of those differences on academic outcome.

Student Attrition and Retention

Student attrition and retention in institutions of higher education is a subject of increasing academic and public interest. "Retention research" dates back to the early 1970's, with Astin's (1975) study of 51,721 students in 217 institutions, which revealed a 40 percent dropout rate in four-year institutions. A 1992 study by the American College Testing Program (Tinto, 1993) also indicated increasing student attrition and a corresponding decline in graduation rates between 1983 and 1992. According to the study, college graduation rate, as a percentage of total enrollment (cohort), dropped from 52.2 % in 1983 to 46.7 % in 1992. Erickson and Strommer (1991) report that 50% of all freshmen accepted into colleges do not persist to graduation. Berger and Braxton (1998) report that almost one-half of students entering two-year colleges and more than one-fourth (28.5%) of students entering four-year collegiate institutions depart these institutions at the end of their first year. While student attrition is a national and institution-wide phenomenon, some academic programs seem to be experiencing higher rates of this problem than others. According to published reports, engineering is one of the programs in which the problem is particularly acute (Besterfield-Sacre, Atman & Shuman, 1997).

The relatively high rate of attrition in engineering has been observed in a longitudinal study by Astin (1993a) involving 25,000 participants from 217 institutions across the United States. Designed to assess student interest in some majors and careers, the study used data collected in 1985 (initial survey) and 1990 (follow-up statistics) that were obtained from a survey questionnaire. The findings from this study indicate that: (a) only about 44% of all students who start their college careers as engineering majors persist to graduation with engineering degrees; and (b) interest in engineering tends to wane sharply between the freshman and sophomore years. The researcher attributes the declining interest and high rate attrition in engineering

programs in part to the tendency among engineering faculty to "grade on the curve." This method of evaluation, the researcher observes, tends to put students who perceive themselves as high ability individuals in the average categories, therefore generating feelings of inadequacy and frustration among those students.

The seriousness of the problem of attrition has generated several "student departure" theories focusing on a variety of factors that seem to contribute to retention in engineering programs. Felder, Forrest, Baker-Ward, Dietz, and Mohr's (1993) longitudinal study of 124 college freshmen enrolled in an introductory chemical engineering course in North Carolina State University collected data on a variety of academic predictors, including family and community background, attitudes, personality types, study skills, and freshman-year performance records, and correlated them with students' performance in the course. The findings indicate that the probability of passing the course and therefore persisting in the program depended on: (a) community background; (b) time devoted to an outside job; (c) father's educational level; and (d) sensing/intuition preferences on the Myers-Briggs Type indicator. A student's performance in the course was also found to correlate positively with SAT mathematics and verbal scores, freshman-year grade-point average and performance in other academic subjects.

Another study designed to analyze and monitor student attrition was conducted by Moller-Wong and Eide (1997). The purpose of the study was to develop a diagnostic tool for understanding the factors associated with engineering student success and for identifying engineering students who are potentially at risk of leaving the institution. The participants in this study included 1,151 students who were accepted into the College of Engineering program at Iowa State University for the first time in the fall of 1990. The longitudinal tracking procedure

successfully identified 90% of students with varying degrees of risk of attrition (high, mild, medium, and low) based on such factors as "background, organizational, academic and social integration, attitude and motivation' and institutional fit" (Moller-Wong &Eide, 1997, p.8).

The growing prevalence of student attrition, coupled with the rising costs of higher education and dwindling funds, have generated public displeasure and intensified the demand for greater accountability among institutions of higher learning. Livengood reported in 1992 that dissatisfied stakeholders and funding agencies such as state legislatures and governments want institutions to justify the legitimate expenditure of funds they have appropriated (Astin, Korn, & Green, 1987; Blustein et al., 1986; and Willingham, Young and Morris, 1985). Parents, too, want more value for their money -- perhaps now more than ever before. Colleges and universities are intensifying their efforts not only to recruit as many students as possible, but also to retain as many of them as they can in order to be economically viable (Erickson & Strommer, 1991).

Academic Performance and Persistence

Several writers and researchers have linked persistence in college with academic performance. Erickson and Strommer (1991), for example, assert that academic performance during a student's first year is critical to his or her overall adjustment to college. Tinto's analysis of college attrition (1988) indicate that students' academic performance in the first semester of their freshman year is crucial to their perception of their integration into the university community. He hypothesized that the student who was more socially integrated was more likely to be academically integrated also, and thus more likely to persist to graduation.

Astin's (1993a) longitudinal undergraduate outcome study (cited above) also linked persistence to academic performance, particularly in engineering. He asserts that students who

enroll as engineering majors tend to be high ability students. However, the commonly utilized

procedure of "grading on the curve" tends to lower the academic performance of many of the

students. As a result, their frustration and dissatisfaction with their academic performance early

in the program often results in their decision to leave engineering.

Hrabowski and Pearson's (1993) discussion of the Meyerhoff, a scholarship program

designed to enhance the success of minorities in engineering, attributes attrition in engineering

programs to poor academic performance by students in freshman year courses. In 1995,

Hrabowski and Maton conducted an outcome assessment study of the above program. The study

compared 69 participants of the Meyerhoff program with a control group of 43 African-

American students with similar entry academic credentials from the general student population.

The result of the study indicated that the Meyheroff students performed significantly better

academically than the equally prepared African-American students from the general student

population. Their results also indicate that in addition to improved academic performance, the

Meyerhoff students achieved better integration, better mastery of difficult technical course

materials, and higher task focus, as well as received sufficient peer support for academic

achievement and opportunities to both help and be helped (a strong supportive environment).

Felder, Forrest, Baker-Ward, Dietz, and Mohr's (1994) longitudinal study found that the

probability of passing a course was critical to persistence (or attrition). Astin's (1975)

longitudinal study (1968-1972) designed to assess various influences on a student's decision to

persist or drop out, included personal background information such as age, gender, race, parents'

income, education, and occupation as influencing variables. The result indicated that academic

performance was a major influence on a student's decision to drop out. According to Astin, a

student who is doing well academically is less likely drop out than one who is not. Based on that

study, he concluded that an initiative that enhances academic performance is likely to enhance retention and reduce attrition.

Perceived Impact of Learning Activities on Academic Performance

A review of existing research on predictors of college success (Mouw & Khanna, 1995) indicates that academic and intellectual variables (such as ACT, SAT, high school records) account for only a small portion of academic performance in college. Several studies designed to test the accuracy of pre-entry credentials (i.e., high school records and SAT and ACT scores) as predictors of academic success in college indicate only a moderate success of pre-enrollment characteristics. The results seem to suggest that pre-college academic ability alone does not account for college achievement. The evidence seems to indicate the critical importance of student effort (i.e., the degree to which students actively participate in their studies) and basic academic skills in college performance.

There are several studies that corroborated this hypothesis. One of these is Mouw and Khanna's (1995) study in a midwestern university of two groups of first-year students. The first group included students who were predicted to succeed on the basis of their previous achievements (SAT, ACT scores and high school records), while the second group consisted of students not expected to succeed due to a history of low academic performance and standardized test scores. Their progression toward graduation was compared based on their academic performance during their freshman year. The study, designed to test the accuracy of pre-entry credentials (i.e., high school records and SAT and ACT scores) as predictors of academic success in college, demonstrated their moderate success in predicting college success. Their findings indicate the critical importance of student effort (i.e. the degree to which students actively participate in their studies) and use of basic academic skills in college performance.

They concluded from their findings that college success is attributable to factors other than pre-entry credentials.

Another effort in this area is Larose and Roy's (1995) study that was designed to test the predictive accuracy of Test of Reaction and Adaptation in College (TRAC), a new instrument for measuring a student's personal dispositions beliefs, behaviors and emotional reactions (i.e., non-intellectual components toward learning). This study was conducted with 196 students (127 females and 69 males) from an urban college and 443 students (211 females and 181 males) from a rural college in Canada. The results indicate that TRAC-related indices are better predictors of success in college than high school record or scores on college entrance exams. From this finding the researchers conclude that pre-college credentials alone do not predict college success. Moreover, they specifically identified the extent to which students actively participate in their learning, (such as the quality of examination preparation), and the importance given college studies, also the readiness to seek help from faculty and peers when experiencing learning difficulties and the use of effective work methods. According to the researchers, "whereas first-term success… may depend on factors that are related to the high school-college transition, long term success is more closely related to the quality of students' learning experiences" (Larose and Roy, 1995, p. 303).

Perceived Impact of Involvement on Academic Performance

Another area of growing research interest is *student involvement* and its relationship to student development and academic performance. A growing body of research evidence seems to link student involvement, such as active student participation in the learning process, with the quality and quantity of learning outcomes, increased student motivation, and personal development (Adams, 1979; Astin, 1984; Pace, 1984; Tinto, 1975, 1993; Willis, 1989; and

1993). These researchers believe that the more students take an active role in their studies and college life, the more integrated they become, and the better they tend to perform academically. Based on that notion, considerable effort is being made to identify types of college activities in which students voluntarily participate, the extent to which they participate in those activities, and the impact of participation on students' development and academic performance. Some of the best known works in this area include that of Adams (1979), Astin (1984), Pace (1984), Willis, (1989), and Willis (1993). The findings and conclusions of some of those studies are reviewed in this section and useful insights are drawn for the proposed research.

Despite the growing consensus on the importance of student involvement and its impact on student development and academic performance, considerable differences exist with regard to the definition of "involvement." In general, however, most statements about involvement describe it as personal initiative, commitment, going beyond the requirements of a course, engaging in non-required activities such as own-reading (self-assigned), attending tutorials, and academic out-of-class contacts with peers and faculty (Adams, 1979; Astin, 1984; Pace, 1984; Willis, 1989; and Willis, 1993). Adams, for example, defines student involvement, as "engaging in the activities of a course with thoroughness and seriousness; feelings, motives, purposes, and self-direction or a capacity for commitment and checking where the study is leading, as a personal undertaking" (Adams, 1979, p. 511).

Astin's (1984) discussion of student involvement theory, which evolved from his "student dropout study," defines the concept as the amount of physical and psychological energy that a student devotes to his/her college experience. He proposes that: (a) involvement occurs along a continuum; different students manifest different levels of involvement in a given subject and the same student manifests different degrees of involvement in different subjects; (b) involvement

has both quantitative and qualitative features, such as the amount of time a student spends studying a subject, and the amount of learning that actually takes place during that time; (c) the amount of student learning and personal development associated with any educational program is directly proportional to the quality and quantity of student involvement in the program; and (d) the effectiveness of any educational policy or practice is directly related to the capacity of that policy or practice to increase student involvement. Astin further identifies six aspects of the college experience in which involvement can occur. These are place of residence, athletics, student politics, honors program, student-faculty interaction, and academic involvement.

Willis' (1989) study of 58 first and second year students from Victoria University (New Zealand), which involved assessing their learning strategies and conducting interviews, identifies two major types of student involvement: academic and institutional. She defines involvement as a commitment expressed through engagement with the task, and concludes that: (a) the involved learner is an active participant in the learning process; (b) involvement facilitates the development of learning skills or techniques; and (c) the type of learning activities implemented during that time impacts learning and subsequently academic performance.

Pace's (1984) research on college outcomes focuses primarily on the quality of effort made by students. The longitudinal study obtained responses to a 14-scale "Quality of Student Effort Questionnaire" from 12,000 students from 40 colleges over a three-year period. The findings suggest that whatever personal development occurs in college is not due to entry characteristics or to the college they attended, but rather to the quality (seriousness) of the efforts students make while in college.

The foregoing review clearly establishes the relationship between student involvement and college performance, and consequently the decision to persist, which culminates in retention.

The decision to include student involvement in this proposed study is based on that notion. The goal of this research is to determine from the students themselves the types of things they did during their freshman year, which they perceived as having facilitated their academic performance.

Perceived Impact of Academic Support Services on Academic Performance

In response to increased demand for accountability from the public and funding agencies, and also in an effort to increase graduation rates and help students realize their academic missions, more and more universities are now providing their students a variety of academic support services (Prager, 1991). These services are provided in various forms. Examples include learning resource centers, discipline-based centers or regular learning centers, freshman seminars, semester-long orientation programs or college survival skills classes. Other services include skills assessment in reading, writing or mathematics, placement tests for preparatory classes, and tutorial services. Some of these services are designed to facilitate a student's transition to college and help him or her adjust to college level work. Others are intended to help students become more efficient and effective as learners (Keenan & Gabovitch, 1995). Prager's (1991) review of an annual report on Learning Centers by Platt (1987) observed that academic support programs and services are no longer restricted to the under-prepared students, but rather are increasingly extended to the general student population.

Accumulated research evidence seems to suggest that all types of students, regardless of the strength of their entry credentials, actually benefit from the use of academic support services. Moore's (2000) study of the persistence of African-American male engineering students revealed that their academic success was related in part to academic support services. These students believed that persistence and achievement were directly related to seeking and using the

available resources on campus when needed. Such resources include interacting with faculty and peers, as well as taking advantage of supportive services provided by the office of Minority Engineering Programs. Hrabowski and Pearson (1993) indicate that the Meyerhoff students who used a variety of university-provided services such as study groups, tutorial services, and peer support achieved significantly higher levels of academic performance and integration, including better mastery of difficult technical course material. A longitudinal study on the effect of a "Freshman Seminar" at the University of South Carolina (a form of support resource for freshmen), found that students who enter college with weaker credentials and participate in support oriented programs persist and do as well as non-participants with strong credentials, despite their risk for attrition (Keenan & Gabovitch, 1995). Hrabowski and Maton's (1995) study of a program designed to enhance the success of African-Americans in an engineering program found that the use of academic support services contributed to the success of the students who participated in the program. Students who participated in the program were found to have performed significantly better than their peers from the general student population with similar backgrounds who did not participate in the program.

Abrams and Jernigan's (1984) outcome study of the impact of students' use of academic support services and participation in a reading and study skills program on students' academic performance found that students who participated in the program improved their reading skills and earned a grade of "C" or higher in their classes. The study, which was conducted at Eastern Michigan University, involved 219 high-risk freshmen students who did not achieve the minimum admission requirement based on their college entrance scores and high school record. The students were accepted on condition that they participate in a program of support services called PASS (Promote Academic Survival and Success) for one year before enrolling in regular

classes in the university. The sample was made up of 60 % males, 40 % females, 30 % African-Americans, and 70 % Caucasians, Hispanics and Asians. Data were obtained for the study by correlating students' pre-entry academic achievement with their college academic performance. Based on their findings, the researchers concluded that use of academic support services significantly enhanced students' performance.

Gender and Race Differences in Learning Activities and Use of Academic Support Services

The widespread interest in student attrition and college success and the ensuing studies this attention has generated often overlook possible gender and race-related differences. Very little information is available, particularly with regard to possible differences in the use of learning activities and the impact of academic support services on performance and college success by students with different racial backgrounds and genders. One of the few studies available in this area is Felder et al.'s 1994 longitudinal study of gender differences in student performance in engineering, which addresses the possible differences in learning activities and effect of academic support services between male and female students. The study, involving 87 male and 34 females in Chemical Engineering at North Carolina State University, found that even though females enter engineering programs as academically prepared or better prepared than their male counterparts, they scored or performed lower in engineering courses. The researchers suggested that difference in academic performance could be attributable to differences in learning techniques or activities implemented. The study further suggests that male students tend to use more active learning techniques such as explaining material or problems to someone else and, thus, benefit from group work. The study also found that females tend to be passive in group discussions or work, and also tend to use passive methods. Relative to male students, females more frequently reported that they benefited more from having

material explained to them. Based on their findings, the researchers recommend the provision of academic support services such as support groups for female engineering students to enhance their academic performance and thus their willingness to persist to graduation in engineering.

Another gender-related engineering attrition study was reported by Schaer et al.(1991). The purpose of the survey research was to develop an instrument for identifying the barriers perceived by freshmen engineering students regarding successful completion of an engineering degree. It tested the significance of five literature-cited barriers: sexual discrimination, financial concerns, academic comfort, career awareness and locus of control and male and female students' opinions toward engineering careers. The data for the study were collected from three randomly selected samples from a freshman engineering class, made up of 203 males and 35 females. A survey questionnaire was used. The results identify financial concerns and sex barrier stereotypes, as the most significant barriers perceived by freshmen engineering students regarding successful completion of an engineering degree. The results further indicate significant differences between male and female students' opinions toward engineering careers. From these findings, the researchers identified a number of ways to enable female engineering students to cope with their college experience and, ultimately, to reduce the dropout rate among women in engineering. Their recommendations include: (a) "value clarification of the internal barriers that women face in terms of self-confidence about their learning skills;" (b) "the exploration of social perceptions, and abilities for academic achievement to enable them acquire better ways of evaluating their progress in engineering programs" and (c) "provision of information on institutional policies and available support services" (Schaer et al., 1991, p. 51).

Conclusion

The increasing rate of student attrition is an issue of growing public concern and research interest. This national phenomenon is particularly significant in engineering programs. The relatively high student attrition in engineering programs is widely perceived as a threat to the national economy and, in particular, to its ability to compete in today's technologically advanced global market.

Another dimension to the problem is the relatively higher incidence of student attrition among minorities and women, despite their exceptional pre-enrollment credentials. Attrition among women and minorities in engineering programs is viewed with particular concern not only for their gross under-representation in the profession, but especially for precluding the use of all available human resources in the nation and also for limiting the career choices of these segments of the population -- not to mention the loss of revenue to institutions that are experiencing the phenomenon.

These concerns are some of the reasons for the renewed research interest in student attrition, the proliferation of retention programs, both targeted (e.g., engineering programs) and university-wide. Some of these studies have been reviewed in this chapter. The review presented evidence on: (a) the types and effectiveness of programs designed to increase student retention and success in college; (b) perceived impact of certain learning activities and academic support services on students' academic performance; (c) possible racial and gender differences in the learning activities implemented and academic support services used; (d) the possible relationship between involvement and academic performance; and (e) types and effectiveness of targeted programs designed to increase student retention among minorities and women in engineering programs.

Chapter Three

Methodology

Introduction

A review of the literature on student attrition, retention, and college success (Chapter 2) indicates the limited success of pre-enrollment characteristics in explaining students' academic performance in college. The review also identified other factors such as the learning activities, study habits, voluntary involvement, discipline, and effort as useful predictors of academic performance and college success (Astin, 1984; Pace, 1984; Pascarella & Terenzini, 1991' and Brackney & Karabenic, 1995). The focus of this study is student initiated-involvement (the extent to which students actively participate in their studies on their own) and perceptions of the impact of involvement on academic performance. The study is also designed to identify the academic activities and academic support services that engineering freshmen perceive as impacting their academic performance. These foci establish the phenomenological thrust of the study, and thus, the need for the qualitative research approach. This chapter discusses that approach and the specific procedures that were followed in this study.

Qualitative Research Method

Qualitative research, the method selected for this study, involves the use of natural settings, humans as the instruments of the study, purposeful sampling, inductive analysis, and detailed descriptive reports (Lincoln & Guba, 1985). This is in contrast with the more conventional quantitative methods, such as surveys, in which respondents are limited to predetermined responses that are influenced by the researcher, and may not necessarily reflect the respondents' views (Patton, 1987, and Converse & Presser, 1986). Qualitative research makes it possible for the respondents (participants) to provide insights into their experiences by

responding and describing their experiences in their own words, without being limited to standardized and pre-determined categories (Stewart & Shamdasani, 1990). This methodology was helpful in obtaining insights about what individual students do when they are freely involved in academic activities, as well as when they use academic support services provided by the university.

Over the years, there has been a general preference for quantitative studies in higher education (Jacobi, 1991). In recent years, however, qualitative studies are becoming increasingly popular to use for studying students. The recommendation to use a qualitative methodology for this purpose is based on its effectiveness, especially in giving expression to the uniqueness of individual students, which higher education professionals, such as student affairs officers, espouse (Kuh & Andreas, 1991). Examples include earlier exploration of learning outcomes done by some researchers in Europe and New Zealand (Marton & Svesson, 1984; Marton & Saljo, 1976; Willis, 1989; and 1993) who interviewed their participants and used other qualitative (research) methods. Unlike conventional quantitative studies where researchers purportedly are detached from the subjects while masking individual differences, qualitative studies directly engage participants in their environments, and have the potential to generate more accurate descriptions of students' experiences (Goetz & LeCompte, 1984; and Kuh & Andreas, 1991).

The usefulness of qualitative methods and their demonstrated effectiveness over quantitative methods when dealing with information of personal nature are the reasons for their application in this study. The remainder of this chapter describes the method, the procedure for recruiting participants, sample, collecting and analyzing the data.

Focus Group Interviews-Procedures

The methodology chosen for this study is focus group interviews, which were used in combination with an open-ended questionnaire to collect the needed information. The focus group interview is a method whereby a group of people is selected to participate in a planned discussion under the direction of a moderator (Krueger, 1994). Interviews are conducted with about 5 to12 people on specifically targeted issues (Krueger, 1994, and Flores & Alonso, 1995), for the targeted purpose of discovering what participants think about those issues.

The growing popularity of focus group interviews in research is attributable to several factors. During focus group interviews, participants discuss feelings, attitudes, and reactions about the topic under discussion. The technique is especially useful in discerning participants' opinions, feelings, attitudes and behaviors about the topic or issues being investigated, (Flores & Alonso, 1995). When focus groups are used, the researcher is often engaged with the participants in their environments (Kuh &Andreas, 1991) and the participants are able to express their ideas in a spontaneous way without being limited to the structured responses of a questionnaire (Bertrand et al., 1992). A special strength of focus group discussions is participants' reactions to other members' comments, and the opportunity to expand or build on spoken observations. This synergistic effect yields data that might not be anticipated by the researcher, which could add a different dimension to the study (Stewart & Shamdasani, 1990).

The use of focus group interviews in this study made it possible for the researcher to gain in-depth insights into participants' decisions to implement and use particular learning activities and academic support services. More importantly, it was possible to discuss which of those activities were most helpful or effective, and the ways in which they were useful, as well as a student's perception of the impact of specific activities on his or her academic performance

(Patton, 1987). The application of focus groups in this study, generated information on how students perceived their comprehensive learning experiences impacted their academic performance. In addition, participants' verbal responses were used to illustrate the findings of the study.

Despite the advantages of focus groups interviews as enumerated above, there are several limitations. One limitation is the potential need for group participants to identify with each other, i.e., a tendency for participants to respond in ways that are similar to group members they admire or with whom they wish to form an alliance. Another potential problem with the methodology is interviewer bias, which can result in participant compliance -- in other words, the tendency of participants to react to cues of the moderator. These limitations were overcome by the use of skilled moderators, who kept the discussion focused in an attempt to ensure that (1) only relevant issues were discussed, and (2) participants were not influenced by the interviewer or other group participants. In addition, a peer debriefer was used and "member checks" were conducted. Member checks involve having participants read report of the focus groups' discussions for verification of interpretation of information gathered (Merriam, 1998). These procedures have been discussed in the "Trustworthiness" section of this chapter (Lincoln & Guba, 1985; and Jacobi, 1991).

Participants

This study was designed to identify second-year engineering students' perceptions of the perceived impact that their implementation of academic activities and use of support services had on their freshman year academic performance. Engineering second-year students were selected for this study because of: (1) the availability of freshman year Grade Point Average (GPA) for the selected population, (2) the high attrition rate between the freshman and the sophomore year

and (3) the reported importance of the freshman and sophomore years to persistence in engineering (Astin, 1993a, and Hrabowski & Pearson, 1993). The participants were selected from 1,274 second-year students in the College of Engineering at Virginia Tech. The participants in this study were full-time second year students in the College of Engineering at Virginia Tech.

To identify these individuals, a list of eligible second year students was obtained from the Associate Dean of the College of Engineering, and 500 students on that list were subsequently contacted. Two hundred out of the 500 students contacted responded. Sixty-five (65) students were recruited from the 200 students who responded. The 65 students were contacted with the help of a telephone contact script (Appendix A) to determine their availability for participation in the focus group discussion. Those who agreed to participate were sent a packet containing general information about the study, formal invitation and a request to confirm their willingness to participate. These materials were sent one week before the sessions were to be held. The participants were also given the option to e-mail their confirmation, and many responded that way. Students who confirmed their willingness to participate were called three days before their session and, and again the day before their session, to remind them of their scheduled sessions. Of the 65 students who agreed to participate in the study, 34 of them actually turned up for the sessions.

In accordance, with the objectives of this study, the participants were divided into 3 categories: high academic performers, low academic performers, and unsuccessful academic performers. For the purposes of this study, the high academic performers were those with grade point average (GPA) of 2.7 and above, the low academic performers were those with less than 2.7 GPA but not below 2.00, and the unsuccessful academic performers were those with less than 2.00 GPA. The participants were further divided into groups by race and gender. The sample

consisted of Black female and male and White and male students in their second year of studies in the College of Engineering.

Recruitment Procedures

The participants were recruited through phone and e-mail contacts (see Appendix A) to request and confirm their participation in the research project (Krueger, 1994). During the contacts, the students were informed of the purpose and plan of the study (see Appendix A), namely, that their acceptance involved participating in a group discussion with peers on three topics: learning activities, use of academic support services, and academic performance (see Appendix A). Even though it was recommended that participants not know each other, it was not always possible to satisfy this requirement due to the relatively small number of women and Black students in the College of Engineering. Thus, the students were informed of the possibility that they might know some of the other participants in the focus groups.

During the phone or e-mail contacts, participants were also informed of the location of the sessions (Hancock Hall on the Virginia Tech campus) as well as the incentive for participation. For this study the incentive was $10.00 for each participant, which was provided immediately after the group discussions had ended. Refreshments were served at the beginning of each group discussion.

The focus groups started early in the spring semester, to minimize stress that often develops as the semester goes into full gear. A letter explaining the study, the procedures, date, time, and location were sent to students who agreed to participate in the study (see Appendix B). Participants were called the night before the focus group session for confirmation of attendance and as a reminder (see Appendix C). All participants signed the consent form prior to participation in the focus group discussions (see Appendix D). The consent form included

information about the study: the purpose, the procedures to be used, risks, if any, involved in participating, compensation, confidentiality of information discussed, freedom to withdraw, and subjects' responsibility. The importance of confidentiality was fully explained to participants. In particular, if direct quotes would be used in writing up the findings, their names would be changed so that they could not be identified. In addition, the tapes on which the sessions were recorded would be destroyed after the study.

Member checks were done after the data analysis, and interpretation procedures were conducted to establish the credibility of the study. This process involves having participants read copies of the written interpretations of the data gathered for accuracy of representation of their contributions. Member checks provide the participants with the opportunity to assess the accuracy of information and to confirm and react meaningfully to their data input. Where there were discrepancies, appropriate correction was made to minimize errors in interpretations and misunderstanding (Lincoln & Guba, 1985).

Selection of Sample

Due to the qualitative nature of this study, purposeful sampling procedures were used to generate homogeneous groups for this study (Patton, 1987). This procedure made it possible to select a sample that provided the broadest range of information possible on the various topics of the research (Lincoln & Guba, 1985). Homogeneity was reflective of race, gender, and academic performance level of second-year engineering students from the College of Engineering. The use of homogeneous groups made it easier to generate more detailed information, since participants were more able to identify with each other's experiences (Morgan, 1993).

Due to the sensitive nature of the study topic, academic performance level was used as partitioning characteristic (Morgan, 1993). That is, participants were divided into groups based

on their academic similarities. Two other characteristics included gender and racial background. The following groups were generated:

1. White males with less than 2.7 GPA but not less than 2.00

2. White males with 2.7 GPA or above

3. White females with less than 2.7 GPA but not less than 2.00

4. White females with 2.7 GPA or above

5. Black females with GPA less than 2.7 but not lower than 2.00

6. Black females with 2.7 GPA or above

7. Black males with GPA of 2.00 and higher

8. White females with below 2.00 GPA

9. White males with below 2.00 GPA

The purpose of placing participants in groups that corresponded to their level of academic performance was to assess possible differences in the learning activities and academic support services implemented and used, and perception of the impact of those activities on academic performance.

The central issue in sample selection for focus groups is not generalizability, but to learn about participants' experiences and perspectives (Patton, 1987, and Stewart & Shamdasani, 1990). Though the findings of this study may not be generalizable, they can indicate the critical issues to consider in the university-wide effort to provide academic support services that can enhance or improve students' academic performance (Jacobi, 1991). The sample was not representative of the population studied. However, as previously indicated, the intent was not so much to generalize, but to learn about participants' experiences and perspectives (i.e. freshmen

engineering students' academic involvement experiences from their own perspectives) (Morgan, 1988).

Pilot Study

The data collection process for this study started with the pilot study focus group discussion. The pilot study focus group discussion was held at the beginning of the spring semester during the 1998/99 academic year. A group of students with similar characteristics participated in the pilot study. The session consisted of 6 White male second-year students in the College of Engineering, who were all enrolled in school the previous year and on full-time enrollment during the 1998/99 academic year. The purpose of the pilot study was to test the instrument, evaluate the conditions and format of the discussion -- e.g., to determine if the 90-minute sessions would be sufficiently long to conduct the interviews, and if the questions would be understood. During the pilot study the participants asked for explanation of the terms and the co-moderator (the researcher) had to clarify them. As suggested by Kruegers (1994), both the researcher and the moderator carefully considered the wording and sequencing of questions, as well as the procedures used by the moderator after the first session. Based on those reflections, changes were made to some of the questions. Another change that was made was to write the key concepts with their meanings on the board at beginning of each session. Where major changes are made to the questions or the moderator's procedure, Krueger suggests that the data of the first session not be included in the data analysis of the study. Because of the changes that were made, data from the pilot study were excluded from the findings of this study.

Data Collection

The data for this study consist of participants' responses to questions asked by the researcher and their responses to an open-ended questionnaire. This section describes the location, instrument, and procedures that were used in collecting the needed data. As indicated above, the selected location for the focus groups was Hancock Hall, which provided excellent facilities for the discussions (comfortable chairs around a table). This setting made it easy for the moderators and other participants to engage in the discussion (Patton, 1987; Stewart & Shamdasani, 1990 and Morgan, 1993). Consent was given by the participants to audio-tape the sessions. They were also informed of the need for the presence of a note-taker.

Moderators were selected based on their previous experience with moderating focus groups. The personnel involved in this study were involved in a 2-hour training session as an important component of the data collection portion of this research, as outlined in Appendix E. Objectives of the training were to describe the study; to explain the methods and procedures; to assign and explain roles; to answer questions about concerns; to present and discuss schedules; and to desensitize participants to possible biases. The methods and procedures used in the study were also described to the staff to enable them to become familiar with the research and how they fit in. The personnel's specific roles were assigned and thoroughly explained so that they would be completely familiar with was expected of them during the data collection process. They were also given ample opportunity to ask questions and express whatever concerns they had prior to the data collection to better enable them to assume their roles in the process. The researcher presented and discussed the schedule for the focus group discussions to enable the staff to plan their calendar and determine when they were going to be available for each session.

An exploration of staff biases was conducted to sensitize them to possible biases about the topic of the study and to make sure that they were not associated with any of the possible participants.

The data gathering was conducted in two parts. The first part involved focus group discussion using a question guide, which consisted of specific questions that captured the essence of the research topics, starting from the general to the specific (see Appendix F) (Krueger, 1994; Patton, 1987; and Morgan, 1993). The second part involved the use of open-ended questionnaire (see Appendix G), which allowed for triangulation. Triangulation is the use of more than one mode of data gathering, thus compensating for inherent weakness in both methods while enhancing the credibility of the study (Lincoln & Guba, 1985; and Patton, 1987). In addition, a note-taker was available to capture the non-verbal aspects of communication, such as body language or the tone of voice of the participants. As stated earlier, the discussions were conducted by skilled moderators assisted by a co-moderator (the researcher), who also operated the audio taping equipment. The nine focus group discussions were each tape-recorded; notes were also taken to make sure that all the discussions were accurately captured. An experienced transcriber transcribed the tapes within 2-3 days after each session had been conducted.

In qualitative research, such as focus group interviews, the instrument of measurement is the researcher, whose experience with the phenomenon being studied establishes his or her appropriateness as "the instrument" of the research (Miles & Huberman, 1994). In this case, the researcher's extensive experience as a counselor for students with academic difficulties in a University Counseling Center further strengthens her qualification as researcher in this study.

At the beginning of each focus group session, the moderator made opening comments (see Appendix H), thanking participants for coming, welcoming them to the discussion, explaining the purpose of study, and discussing guidelines about the discussion session. They

were informed of the need for the discussion to be taped, and of the estimated length of the discussion session (90-120 minutes). An extra audio-tape recorder was available in case of technical difficulty. The moderator went over the guidelines for the discussion, such as the need for every participant to freely express his or her opinion -- whether their views support or differed from those of the other participants. The moderator asked that comments be verbalized one at a time (especially for the purposes of transcription), and also stressed that there were no "good" or "bad" opinions (Flores & Alonso, 1995). Names of the participants were written on folded index cards and placed on the table in front of the participants. This made it possible for participants to address each other by name, and for the moderator to call them by name.

Data Analysis

The data analysis for this study was influenced by Krueger (1994) who stressed the need to stick to the intent of the study. The analysis involved continuously working with data, organizing it, breaking it into manageable parts, synthesizing it, identifying patterns, finding out what is important and what is to be learned, and making decisions on what is significant to report (Bogdan & Biklen 1998). Toward that end, at the end of each focus group discussion session, debriefing meetings were held with the moderator, the co-moderator and the note-taker to share impressions, discuss emerging patterns and review responses to the open-ended questionnaire. The responses on the questionnaire were reviewed for the purposes of comparing them to what was discussed during the focus group discussion to check for consistency. During the debriefing meetings notes were written about the emerging patterns and the general flow of the discussion. Each of the audio-taped sessions was transcribed separately and returned within 2-3 days. The transcripts were saved on different disks according to dates, time and the population. The themes generated resulted from a series of activities by the researcher following the focus group

discussion. The transcripts were read three times initially. During the first reading, notes were

taken on the margin of the transcripts. The transcripts were read a second time while listening to

the tapes to get as much clarification as possible. It was when the transcripts were read the third

time that actual coding of data occurred. The transcripts were color coded for the purposes of

identifying key points and emerging patterns. During this process the tape recordings were

reviewed as needed for clarifying participants' responses. These patterns were compared with the

patterns generated from the questionnaire and the debriefing sessions to ensure consistency. This

resulted in 38 factors that were perceived as helpful, and 22 factors that were perceived as not so

helpful, which participants perceived as impacting their academic performance.

As suggested by Patton (1990), further content analysis was performed on the resulting

data, which involved searching the data for patterns that were important to the purpose of the

study. Particular attention was paid to actual examples that the students used to illustrate their

points. The data was further searched with NUD*IST, (Non-numerical, Unstructured Data

Indexing, Searching and Theorizing), a computer program designed by Thomas and Lyn

Richards in 1991 to organize coded qualitative data. This additional analysis resulted in the 38

helpful factors being reduced to 9 categories, and the 22 not-so-helpful factors being reduced to 7

categories, which is shown in Tables 4.2 and 4.3.

The next stage of the analysis involved separating the patterns into distinct themes to

make more meaningful use of the data (illustrated in Tables 4.2 and 4.3). This process involved

identifying the similarities and overlaps so as to make sure that they were grouped appropriately,

which was accomplished using the Glaser and Strauss (1967) constant comparative method of

data analysis. The results are presented in Chapter Four.

Trustworthiness

In qualitative studies there is always the threat of instrumentation due to changes that can occur in human instruments. Human beings characteristically enter situations with some form of preconceived notions (Lincoln & Guba, 1985). In order for a qualitative study to be credible, steps have to be taken to ensure the trustworthiness of the study. Credibility in a qualitative study is synonymous with validity in a quantitative study. The trustworthiness of this study was satisfied by using procedures that minimized investigator bias, thus enhancing its credibility. These procedures included the use of a peer debriefer, and participants' verification of findings (i.e. member checks). Specifically, at the end of each session, one or more participants were asked to volunteer to read the report of their session. These participants did the member check for their session. Participants from each of the groups were given a copy of the summary report of their session for the purposes of verifying the information generated. The peer debriefer was used principally to ensure objectivity and credibility of the research results. The peer debriefer was a "neutral" person who was used at every stage of the study to listen to the tapes, to read the transcripts and interpretations, and to detect areas that might have been overlooked by the researcher. The peer debriefer probed the biases of the researcher to ensure objectivity in the data analysis and interpretations (Lincoln & Guba, 1985). The peer debriefer also assisted in the collection of the data (note-taker), and thus was in a position to help clarify the information as needed throughout the study. The researcher and the note-taker met two days after each session to share the reports that were generated from the focus group discussions. The note-taker further validated the findings by listening to the tape-recordings and reading the transcripts alone before meeting with the researcher to discuss the conclusions.

Logistics

   As previously mentioned, the sessions were all held in Hancock Hall, due to its

accessibility, availability of informal and comfortable meeting rooms, and to the students'

familiarity with the building, as suggested by Crowson (1987). The participants, moderator, note

taker and co-moderator all sat in the same area of the room. A tape recorder was used to tape

each of the discussion session to make sure participants' responses were accurately captured. The

nine focus groups conducted for this study were arranged during the spring semester of the

1998/99 academic year. They were started early in the semester, before the demands of

deadlines and due dates prevented too many students from participating in the study. Access to

students was obtained by securing permission from the Institutional Review Board for Human

Services and the Associate Dean for Academic Affairs in the College of Engineering (see

Appendix I). The list of potential participants for the study was obtained from the Associate

Dean for Academic Affairs. Permission was obtained to use confidential university records for

this study. Participants signed consent forms prior to participating in the group discussions (See

appendix D). The consent forms contain information on the confidentiality of the study, option to

withdraw, and permission to use quotes from their responses during the focus group discussions.

   This chapter presented a description of the approach and the specific procedures that

were used in the data collection and analysis of this study within the phenomenological

perspective of this study.

Chapter Four

Results of Study

Introduction

The rationale for this study, as indicated in earlier chapters, is to:

1. Identify the academic activities and academic support services that engineering students perceive as impacting their academic performance in their freshman year;

2. Determine if there are any differences in students' perception of academic activities and academic support services based on their level of academic performance; and

3. Determine if there are gender- and race-related differences in students' perception of the impact of the academic activities and academic support services on academic performance.

To achieve these objectives, a series of focus group discussions were conducted with second-year students in the College of Engineering. The discussions provided the students with an opportunity to describe in their own words the academic activities and support services they implemented and used, which they perceived as impacting their academic performance. The results of those discussions are presented in this chapter in three separate sections. Part One identifies and describes the groups of students involved in the study and how they were formed. Part Two describes the processes and procedures used to obtain the needed information. Part Three summarizes group observations and findings.

Group Descriptions

The participants of this study were second-year students in the College of Engineering. They were selected from the 1,274 sophomores enrolled in the College of Engineering during the 1998/99 academic year. The criteria for selection were that the participants be: (a) in their

second year in the college, and (b) be currently enrolled at Virginia Tech. A list of 500-second year students who met these criteria was obtained from the Associate Dean of the College of Engineering, and eligible students were contacted by mail. Two hundred individuals responded, who were subsequently contacted and recruited by telephone. Of the 200 students contacted, 65 initially agreed to participate in the study. However, only 34 students actually participated in the focus group discussions.

The participants were divided into three categories: high academic performers, low academic performers, and unsuccessful academic performers. For purposes of this study, high academic performers are defined as participants with a GPA of 2.7 or above. Low academic performers are categorized as students with GPA's lower than 2.7 but not below 2.00. Unsuccessful academic performers are students with a GPA of less than 2.00. The rationale for dividing the participants into groups based on their academic performance was to ascertain if there was a difference in the students' perception of the impact of academic activities and academic support services implemented and used, based on their academic performance level. The participants were further divided into groups by race and gender. Participants and their specific groups are identified with symbols as indicated on the table of participants. Table 4.1 is a tabular representation of the groups and their profiles:

Table 4.1. Detailed Breakdown of Group Participants

Group or Category	Grade Point Average (GPA)	Race	Gender	Number of Participants
High Academic Performers	2.7 GPA and above	White	Males (HWM)	7
		White	Females (HWF)	4
		Black	Females (HBF)	3
Low Academic Performers	2.00 GPA to below 2.7 GPA	White	Males (LWM)	4
		White	Females (LWF)	4
		Black	Black (LBF)	3
Unsuccessful Academic Performers	Less than 2.00 GPA	White	Females (UWF)	3
		White	Males (UWM)	3
* High and Low Academic Performers	2.00 and higher	Black Males		3

Group Participants
* Too few to study separately

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Group Profiles

High Academic Performers

As previously noted, high academic performers are categorized as students with GPAs of 2.7 and above. Academic performance is generally measured by a student's scholastic achievement as reflected by a specified grade point average (GPA) (Blustein, et al., 1986). At Virginia Tech, successful academic performance is defined as a student's ability to attain a GPA of 2 .00 or better, thus permitting them to retain academic eligibility. Therefore, the high academic performers in this study are those participants who have attained and exceeded the 2.00 GPA required to maintain academic eligibility at Virginia Tech. In total, there were fourteen students in this category, and a breakdown of these participants by gender and race is shown in Table 4.1. As indicated, there were 7 White males (HWM), 4 White females (HWF), and 3 Black females (HBF). There were no groups conducted for Black males in this high academic category.

Low Academic Performers

Low academic performers are defined herein as students who are making satisfactory progress toward their degrees, and are able to maintain their academic eligibility at Virginia Tech. In this study, low academic performers are defined as participants with a GPA of less than 2.7 GPA, but not less than 2:00. There were eleven students in this category, which are represented by race and gender in Table 4.1. As indicated, there were 4 White males (LWM), 4 White females (LWF) and 3 Black females (LBF). Again, no groups were conducted for Black males in this category.

The Unsuccessful Academic Performers

The unsuccessful academic performers in this study are categorized as students with a GPA of less than 2.00 and who, for that reason, lost their academic eligibility. This category was included for a specific reason: namely that the specific academic activities and support services identified by successful students as being useful could provide useful insights in planning interventions for students experiencing academic difficulties. In addition, it was important to be able to compare and contrast the learning patterns of successful versus unsuccessful students. There were 6 students in the "unsuccessful" category; 3 White males (UWM) and 3 White (UWF) females. There were no Blacks in this category.

* **Black Male Participants**

Only one focus group was conducted for Black males in this study, as there were insufficient numbers to justify a session for both high and low academic performers among Black males. This is probably a reflection of their smaller representation in the College of Engineering, an illustration of a national trend for which programs such as Meyeroff' (Habrowski, 1993) were established to reverse. The 3 (BM) participants of this group were a combination of high and low academic performers.

Description of Procedure

To collect the necessary information for this study, a series of focus group discussions (one for each category of participants) was organized. In all, nine focus group discussions were conducted during the Spring semester of the 1998/99 academic year. All of the sessions were held in Hancock Hall due to the participants' familiarity with and accessibility to the building. Upon arrival at the location, the participants were greeted by the researcher (the co-moderator) at the building entrance and shown into the room. They were then served food and refreshments.

To make them more comfortable and relaxed, the participants were encouraged to introduce themselves to each other. After the meal, the participants were seated at the table. Prior to beginning the discussions, students were given index cards to make name tents so they could be called by their first names.   The moderator, co-moderator and the note-taker were introduced, and the participants introduced themselves. This was followed by the welcome address of the moderator, who subsequently gave an overview of how the session was going to proceed. At the beginning of each session, the key concepts were written on the board and defined. The purpose of defining these discussion topics was to establish a common understanding of the terms and concepts, as well as to stimulate participants' thinking. The discussion was facilitated with interview questions and appropriate probes from the interview guide (Appendix F).

Each of the nine sessions, which all lasted approximately 90 minutes, was taped to ensure that the discussions were accurately captured. The moderator was assisted by the co-moderator (the researcher) and the note-taker. At the end of each session, the participants were asked to complete a two-part, open-ended questionnaire. The first part asked for standard demographic information, while the second part requested information on the academic activities and support services that participants implemented and used, in addition to their perception of the impact of those services on their academic performance. Someone from each group agreed to read the report of their session to verify the accuracy of information recorded. Thereafter, the participants were given their compensation, for which they signed. Every session ended with a debriefing session between the moderator, the co-moderator, and the note-taker. During the debriefing sessions, impressions and possible emerging patterns were shared and discussed. The results of the focus group discussions are presented in the remainder of this chapter in three sections. Part

I has the themes and how they were generated. Part II presents the general observations about the groups, and Part III the general results discussed in light of the derived themes.

Results

I. Data Analysis and Generation of Themes

The nine, 90-minute focus group discussions each generated a great deal of information, which, for ease of understanding and presentation, is organized into themes. These themes are the items or concepts mentioned repeatedly by the participants that seem to capture the recurring essence of the data (Merriam, 1998). The process of reductively classifying information into a number of themes in order to make sense of data was suggested by Patton (1990) as an effective data management tool. Data management for this study involved organizing the notes from the different sessions, conducting debriefing meetings after each group discussion, and categorizing the information into folders and disks for easy retrieval.

The process of organizing the data into themes necessitated a series of activities following the focus group discussions. First, debriefing meetings were held involving the moderator, the co-moderator (the researcher), and the note-taker, during which impressions were shared, emerging patterns were discussed, and responses to the open-ended questionnaire were reviewed. The tapes from the focus group discussions (after each session) were all sent to an experienced transcriber, who returned them within 2-3 days. On receipt of the transcripts, the researcher and the note-taker met to compare notes, reconcile differences, and develop a brief summary report. The transcripts from each focus group discussion were then read several times until they were clearly understood, enabling the data to be analyzed and coded. At the beginning of the data analysis, the transcripts were again read several times in order to obtain a general

overview of the data (Cresswell, 1998). Specific activities were conducted during each of the readings, as follows:

First Reading Activities: Notes were made in the margins, which were later compared to the emerging patterns observed and compiled from the debriefing meetings and the participants' responses in the open-ended questionnaire.

Second Reading Activities: The tape recordings were reviewed while reading the transcripts, with special attention paid to the emerging patterns, participants' perceptions, and the meanings the students were assigning to the specific words they were using.

Third Reading Activities: The transcripts were color-coded to identify key points and emerging patterns. The objective of the coding was to make sense of the information generated from the focus group discussions. As suggested by Hammersley & Atkinson (1995), coding entails several readings of the transcripts in order to identify and become familiar with the patterns that capture the essence of the data. The specific activities of the coding are as follows:

1. Developing categories for the patterns that emerge;

2. Naming the categories that reflect the information they represent;

3. Changing the names whenever more appropriate ones emerge;

4. Clarifying the meaning of each concept and exploring their interrelationships; and

5. Using those concepts to organize the data and to describe and explain the study.

The observed patterns or categories were reviewed and compared to the data from both the open-ended questionnaire and notes from the debriefing sessions to check for consistency. The information from the transcripts, the open-ended questionnaire, and the debriefing sessions was developed into a composite synopsis for further analysis, using "content analysis," and a computer program called "Non-numerical, Unstructured Data Indexing, Searching and

Theorizing" (NUD*IST), which is designed to organize coded qualitative data. As defined by

Patton (1990), content analysis is a procedure for examining a body of information for the

purpose of identifying patterns that are important to the study. In this study, content analysis was

used to identify responses that indicate a participant's perception of the academic activities and

support services that influenced his or her freshman year academic performance. Both content

analysis and the NUD*IST program were used to search the text for specific academic activities

that the participants implemented and academic support services that they used. The

mechanically identified patterns or categories were applied as "nodes" in the NUD*IST program.

These nodes were used in retrieving the relevant passages in the text (i.e., the transcripts) that

were then used in the analysis. NUID*IST supplemented the retrieval of statements that

illustrated the findings.

"Impact," as used in this analysis, refers to the perceived influence of certain academic

activities and academic support services on participants' academic performance. As discussed in

the remainder of this chapter, some of those influences were perceived as "helpful," while others

were perceived as "not-so-helpful." A search of participants' responses (transcripts, notes taken

by the note-taker and from debriefing sessions) using the content analysis and NUDIST

programs identified 38 "helpful" and 22 "not-so-helpful factors."

An examination of the 38 factors revealed several recurrent themes, which were

subsequently grouped according to their similarities. This grouping was accomplished using the

constant comparative data analysis method developed by Glaser and Strauss (1967), involving

sorting the raw data by continuously comparing occurrences of respondents' remarks for the

purpose of deriving themes. This analysis was performed in two stages. The first stage looked

at the scope of the data, resulting in the identification of 9 recurring categories: (I) involvement

activities, (II) use of resources, (III) learning techniques used, (IV) scheduling, (V) responsibility for work, (VI) approach to homework, (VII) extent of interacting with other students, (VIII) contact with instructors, and (IX) course activities.

Stage Two involved a further analysis of the 9 categories identified above. Due to the presence of similarities and overlaps in the 9 patterns identified, they were further collapsed to make them more inclusive as suggested by Lincoln and Guba (1985). The categories were organized into 3 themes: (I) Effort and Involvement; (II) Peer Interaction; and (III) Interaction With Faculty. Table 4.2 presents a comprehensive look at the 38 individual helpful factors (alphabetized), and how they were collapsed in the 9 recurring categories, and the 3 factors themes.

Table 4.2. Helpful Factors, Categories, and Themes

Individual Factors Perceived as Contributing to Academic Performance (in alphabetical order)
Associating with hardworking people, Attending classes, Attending help sessions, Being in interesting classes, Belonging to BEST, Belonging to WEST, Class participation, Doing homework, Doing sample problems in text, EF design group project, Finding people to relate to, Getting help from professors and teaching assistants during their office hours, Going over homework in preparation for tests or exams, Hands-on job opportunity, Having a Mentor from CAEE, Having captivating professors, Helping others learning by explaining material to classmates, Joining NSBE, Keeping up with work, Knowing people in the same major, Learning to manage time, Listening and taking notes in class, Networking, Participating in study groups, Participation in CAEE study retreat, Practical application of material learned, Reading before and after class, Reading material more than once, Reviewing notes taken, Seeing professors for advising, The Library, The Math Emporium, The Writing Center, Tutoring from CAEE, Tutoring from SAC, Using notes from professors' websites, Working with males in their hall, Working with upper class students,

Nine Recurrent Categories of Helpful Factors

Involvement Activities	Resources Used	Learning Techniques Used	Scheduling	Responsibility for Work	Course Activities	Approach to Homework	Extent of Interaction with Other Students	Contact With Instructors
Belonging to WEST Belonging to BEST Joining professional organizations Working with upper-class students Hands on job opportunities	Tutoring from CAEE Tutoring from SAC Using the library Using the Writing Center The Math Emporium CAEE study retreats CAEE mentoring program	Learning by explaining material to classmates Reviewing notes taken Reading material more than once Listening and taking notes in class Doing sample problems in text Using notes from professors' websites Going over homework in preparation for tests or exams Reading before and after class	Learning to manage time	Keeping up with work Actively participating in class Attending classes Attending help sessions	Actively participating in class	Doing homework	Working with males in their hall Knowing people in the same major Networking Finding people to relate to Associating with hardworking people Participating in study groups	Seeing and talking to instructors Using office hours Seeing professors for advising EF design project Having interesting classes Having engaging professors Application of material

Three Helpful Factors Themes

Effort and Involvement	Peer Interaction	Faculty Interaction

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An examination of the 22 factors perceived as not-so-helpful identified several recurrent themes which were then grouped according to their identified similarities. Again, the comparative data analysis method developed by Glaser and Strauss (1967) was applied. The analysis was done in 2 stages. The first stage looked at the scope of the data, from which seven categories were identified. These are: (I) use of resources; (II) scheduling; (III) responsibility for work; (IV) approach to homework; (V) course activities; (VI) extent of interaction with other students, and (VII) contact with instructors.

In Stage Two of the analysis of the data on not-so-helpful factors, the7 categories were further collapsed. As with the helpful factors identified above, the not-so helpful factors were organized into the three main themes already identified: (1) Effort and Involvement; (2) Peer Interaction; and (3) Interaction with Faculty. Table 4.3 presents a comprehensive look at the 22 individual no-so-helpful factors (alphabetized), and how they were collapsed in 7 recurring categories, and the 3 factors themes.

Table 4.3. Not-So-Helpful Factors, Categories, and Themes

Factors Perceived as Not-So-Helpful to Participant's Academic Performance *(in alphabetical order)*
Being placed on academic probation after first semester, believed professors were trying to weed out students, coping with distractions from peers, difficulty getting along with roommates, doubting one's abilities, experiencing academic difficulty for the first time, first semester of Engineering Fundamentals (EF), having to learning from bad grades, having to use the Math Emporium, no one to study with, not accepting having to study in order to do well, not attending classes, not attending help sessions, not doing homework when not collected, not keeping up with work, not knowing where to get help, not using office hours, not using resources, poor time management, professors' negative attitudes, professors' ineffective teaching styles, unexpected degree of work load

Seven Recurrent Categories of Not-So-Helpful Factors

Use of Resources	Scheduling	Responsibility for Work	Approach to Homework	Course Activities	Extent of Interaction With Other Students	Contact With Instructors
Not knowing where to get help	Poor time use	Not keeping up with course work	Not doing homework when collected	Difficulty of first semester of EF	No one to study with	Not using office hours
Not using resources		Difficulty coping with distractions		Not attending classes	Difficulties getting along with roommates	Felt professors were trying to weed out students
Having to use the Math Emporium		Not accepting having to study to do well		Not attending help sessions	Coping with distractions from peers	Professors' negative attitude
				Doubting ones' abilities		Professors' ineffective teaching styles
				Experiencing academic difficulty for the first time		
				Unexpected amount of work load		
				Being put on academic probation after the first semester		
				Having to learning from bad grades		

Three Not-so-Helpful Factors Themes

Effort and Involvement	Peer Interaction	Faculty Interaction

The information from the open-ended questionnaire was found to be similar to the information from the focus group discussions about the academic activities and academic support services implemented and used. This comparison, a form of triangulation, gives further trustworthiness to the data generated. Table 4.4 below presents the data from the open-ended questionnaire:

Table 4.4. Questionnaire Response on the Factors Perceived by Participants as Helpful to Their Freshman Year Academic Performance

Low Academic Performers (White Males)	Helpful Academic Adjustment and Interaction Factors	Helpful Peer Interaction Factors	Helpful Faculty Interaction Factors
1. LWM I		1	2
2. LWM II		1	1
3. LWM III	1	1	1
4. LWM IV	2	1	
High Academic Performers (White Males)			
1. HWM I	2	1	
2. HWM II	1	1	1
3. HWM III	1	1	1
4. HWM IV	1		2
5. HWM V	1	2	
6. HWM VI	1		2
7. HWM VII	2		1
Low Academic Performers (White Females)			
1. LWF I		2	1
2. LWF II	2	1	
3. LWF III	1	1	
4. LWF IV	2	1	
High Academic Performers (White Females)			
1. HWF I	2		1
2. HWF II	1	2	
3. HWF III	2	1	
4. HWF VI	1	1	1
Low Academic Performers (Black Females)			
1. LBF I	3		
2. LBF II	2		1
3. LBF III	2		
High Academic			

Performers (Black Females)			
1. HBF I	1	1	1
2. HBF II	2		1
3. HBF III	2		1
Black Male Participants			
1. BM I	2		1
2. BM II	1	1	1
3. BM III	1	1	1
Unsuccessful Academic Performers (White Females)			
1. UWF I			
2. UWF II		1	
3. UWF III	1		
Unsuccessful Academic Performers (White Males)			
1. UWM I	1		
2. UWM II			
3. UWM III	1		

Explanation of Themes

As previously mentioned, the information gathered from participants' responses represents a combination of academic activities and support services that they perceived as either helpful or not-so-helpful to their academic performance during their freshman year. The responses have been grouped into three themes as stated earlier.

The following is a description of the themes and their component factors:

(1) *Effort and involvement* refers to the specific learning activities implemented by participants that they perceived as influencing their academic performance. This also includes the academic support services used by participants.

The *effort and involvement* factors identified by participants as influencing their freshman year academic performance include attending class and help sessions, doing homework, keeping up with work, the learning techniques used (such as doing sample problems, reading before and after class), and joining professional organizations. Academic support services perceived as influencing academic performance were tutorial services (offered by SAC and CAEE),

participation in the CAEE study retreats, the Writing Center, the Math Emporium, the Library, and participating in Office of Minority Engineering Programs (OMEP) programs such as BEST and WEST support groups.

(2) *Peer interaction* refers to students' relationships and contacts with fellow students. The particular peer-initiated factors or activities that were perceived as impacting academic performance included knowing other students in the same major, living with fellow engineering students in the same residence hall, networking, participating in study groups, finding students with whom to relate, associating with diligent students, and successfully coping with distractions from peers and difficulties with roommates.

(3) *Interaction with faculty* refers to students' contacts with faculty members inside and outside of the classroom and the perceived impact of these contacts on academic performance. Interaction includes the participants' perception of professors' teaching styles in the classroom, their interaction with professors during office hours, and interaction with professors who were their advisors.

General Group Observations

During the focus group discussions, written observations were made about the participants' responses to questions. Their behaviors were also observed when questions were asked about the academic activities and services that they perceived as impacting their freshman year academic performance.

Although the participants of the study were uniformly cooperative and provided substantial information, the White male low academic performers seemed uncomfortable about using academic support services. This became especially evident when they said they would not have used a service that indicated they needed help, because that would have implied that they

did not have the abilities to be successful in the College of Engineering. However, they also

claimed to be largely unfamiliar with any academic support services, and, in fact, displayed

irritation at not being aware of the available services -- even though they stated that they would

not have used them so as to avoid the implication of being seen as experiencing academic

difficulties. Instead, they felt that someone should have provided them the necessary

information, thereby absolving them of the responsibility of having to take independent action to

remedy their situation.

On the other hand, White female high academic performers and Black female low

academic performers agreed that it was up to students to look for resources and take advantage of

them, as illustrated in this statement:

> I mean, I think it's about initiating who you get to know. They can't give you
> everything. And you just have to go out there and ask people. I mean I know as a
> freshman you are a little bit intimidated, but you are already miles away from
> home, so you're going to have to get over that. And if the freshmen are
> intimidated, then how are you going to get it together. You can't make people do
> stuff that they don't want to do. If everybody is scared, then you're never going to
> get anything accomplished. **(LBF)**

In addition, the White female high academic performers who were not aware of many of

the academic support services did not seem resentful about not having been better informed of

them -- unlike the White male low academic performers. They could, however, see how those

services could have been helpful, as indicated in the following statement: "I agree with XXX

100% because sometimes I'll be walking to take a test and I'll be like, 'God, I wish I had

somewhere else to prep me for this' or something like that." (HWF)." White male high academic

performers were enthusiastic in their discussions about seeking help or using academic support

services. They appeared more willing to do whatever was necessary to do well, including

seeking help from outside sources. The White female high performers were equally enthusiastic

in their involvement, which is reflected in the fact that several stated that their participation in this study was not motivated by the compensation that was offered. Rather, they expressed a need to "vent" in the hope that their complaints and suggestions would be addressed by the College's senior administration. They also felt that they could help the university by sharing their concerns, and perhaps assist future students avoid experiencing what they had to go through.

With regard to specific programs, the White participants talked passionately about their dislike of the Math Emporium. They did not like the inaccessibility of the off-campus center (about 1/4 mile from the main campus), because of the time required to get there and then return to campus. This group of participants said it was difficult to get to the center when they have to travel by bus because it necessitated that they adhere to a bus schedule, which was not particularly convenient. They agreed that the time spent waiting for the bus both to and from campus could have been spent more productively in actual study hours.

The female participants spoke at length about their personal and emotional needs, which included difficulty with relationships, not finding enjoyable activities on campus, difficulty in finding people with whom to interact socially, and having to give up social life for academics. One of the female participants noted that it was more difficult for female engineering students to give up their social and personal needs than it was for males, who generally tended to have more difficulty socializing. Black and White female low academic performers sometimes tended to become sidetracked during the discussions and had to be re-directed to the topic at hand, which could be a reflection of their tendency to also become distracted from their studies, as well as to procrastinate. For example, a White female low academic performer said when she got together

with friends to study, she would instead spend the time socializing and ended up procrastinating with them.

The unsuccessful academic performers did not appear confident and, in fact, one of the female participants said that she almost did not show up for the discussion. It was apparent that they were embarrassed about their mediocre academic performance at Virginia Tech, which was exacerbated by the high expectations that they had of themselves and that others had for them. They expressed unhappiness about disappointing themselves and others who expected more of them as a result of not putting enough time and effort into their schoolwork. The guilt and shame that they felt came across when the participants in the group repeatedly blamed themselves for their poor performance.

General Findings

This section presents a summary of the data from the nine focus group discussions and the open-ended questionnaire. As indicated in Tables 4.2 and 4.3 above, the participants identified a number of academic activities and support services that they perceived as positively impacting their freshman year academic performance. As explained earlier, the 38 factors perceived as helpful and the 22 factors perceived as not helpful were organized into three themes: (1) effort and involvement (learning activities implemented and use of academic support services), (2) peer interaction (relationships and contacts with fellow students, and (3) faculty interaction (contacts with faculty inside and outside the classroom). The data from this study will be presented according to these three themes.

As indicated at the beginning of this chapter, the students in this study were separated into specific groups according to their gender, race and academic performance levels. The purpose of categorizing them in such a way is to be able to account for or explain possible

differences in their perceptions of the impact of certain academic activities and/or support

services on their academic performance. The analysis of the data indicates considerable

commonalties, as well as differences, in the academic activities and support services perceived

by different groups of participants as helpful or not helpful to their academic performance. The

following summary of these commonalties and differences regarding effective or ineffective

freshman year academic activities and support services is grouped according to academic

performance level, gender, and race. The three themes of effort and involvement, peer

interaction and faculty interaction provide the framework for presenting the academic activities

and support services perceived as helpful and not so helpful to participants' freshman year

academic performance.

(A) Presentation of Findings by Academic Performance Level

Helpful Factors

The following are the factors perceived as helpful by the high academic performers, the

low academic performers, and the unsuccessful academic performers.

High Academic Performers

This section discusses the effort and involvement factors, peer interaction and faculty interaction

dynamics that the high academic performers (participants with a GPA of 2.7 and above)

perceived as enhancing their freshman year academic performance.

(1) Effort and Involvement

Under the category of effort and involvement, the high academic performers mentioned several

academic activities and support services as helpful to their academic performance during their

freshman year. These include: attending classes and help sessions, reviewing notes, reading

course materials, doing sample problems, learning to manage time, using professors' web notes,

going over homework before tests, participating in class, doing homework, and taking notes. Students also mentioned the following academic support services as helpful to their academic performance: Office Minority Engineering Programs (OMEP)-BEST, WEST and Student Assistance Center, the Writing Center, tutorial services, the Center for Academic Enrichment and Excellence (CAEE) programs (Tutorial Services, Study Retreats and Mentoring Program) and the Math Emporium. The high academic performers credit using one-on-one tutorial services as an effective way to improve performance in several classes, such as math. The Writing Center was frequently identified as an effective way to improve writing skills, as well as to learn how to self-critique written assignments.   Several students indicated that belonging to WEST made it much easier to seek out both academic and social support. The following factors were also said to have been helpful:

- Active class participation enriched the learning process both inside and outside the classroom (i.e., with homework);

- Participation in a study retreat made it possible to get organized and get caught up with work;

- Associating with a mentor provided academic and social support, making it possible to stay focused on schoolwork.

(2) Peer Interaction

Frequent interaction with fellow students was perceived by the high academic performers as positively influencing their academic performance. The specific relationships and contacts that the high academic performers identified as enhancing their academic performance include: knowing people in the same major, being familiar with fellow engineering students who lived in the same residence hall, studying in study groups with fellow students, networking and

associating with hardworking people during their freshman year. High academic performers also stated that by participating in study groups they learned more as a result of attempting to explain the material to each other. They said that knowing and meeting fellow engineering students made it possible for them to establish contacts for consultation with coursework when needed. Associating with hardworking people was believed by the high academic performers to have helped in maintaining focus during their freshman year.

(3) Faculty Interaction

High academic performers uniformly mentioned their contacts with professors inside and outside of the classroom as helpful to their academic performance. In particular, the high academic performers spoke about their professors' teaching styles and meeting with them during their regularly scheduled office hours. The former component -- the professor's teaching style -- was perceived as positively influencing academic performance because of the hands-on projects they assigned to augment the material presented in class. With regard to one-on-one meetings during office hours, the students indicated that such interactions helped them clarify the material, as well as enabled them to develop a more individualized relationship with a professor, which was often challenging in a large class. Many believed that their use of office hours made coping with academic challenges easier.

Low Academic Performers

The following is a presentation of the effort and involvement, peer interaction and faculty interaction factors perceived by low academic performer (less than 2.7 GPA but not less than 2.00) as helping their freshman year academic performance.

(1) Effort and Involvement

The discussions with the low academic performers generated a variety of effort and involvement factors perceived as helpful to academic performance. The factors they perceived as helpful included: attending help sessions, reviewing notes taken, reading material, using professors' web note, doing homework, learning to manage time, being motivated enough to keep up with work and taking notes. Additional factors they perceived as positively influencing their freshman year academic performance were: participating in OMEP programs-WEST and BEST, using the library and the Math Emporium, and joining professional organizations. The latter was identified as an effective means of facilitating interactions with actual professionals, and learning more about different areas of engineering and the relevance of their classes to the workplace. The low academic performers observed that BEST team leaders were encouraging and were also essential in pointing freshmen in the right direction with regard to keeping up with homework assignments and in course selection. Furthermore, they believed that staying motivated enough to keep up with work was essential to being successful in engineering disciplines.

(2) Peer Interaction

The low academic performers identified a number of relationships and contacts with other students as positively impacting their academic performance. In particular, these students identified participating in study groups, networking with classmates, having people with whom to relate, and consulting with upper class students as helpful to their freshman year academic performance. They stated that interacting with other students made it possible for them to establish a cooperative network, which facilitated discussions about class problems, as well as

enabled them to learn from one another. Low academic performers also said that participating in study groups made learning faster and easier.

(3) Faculty Interaction

The faculty interaction factors that low academic performers perceived as helpful to their freshman year academic performance included the in-class instructional style of their professor, and the students' use of office hours outside the classroom. With regard to the classroom setting, the low academic performers believed that group project assignments were a helpful learning device -- both as a way to help them absorb the material and a means of learning how to work effectively on a team. Outside the classroom, these students believed that more informal contacts with professors during their office hours made it possible for them to clarify material presented in class and provided them with the opportunity to understand expectations, and get a better idea of what they needed to do to succeed in their classes.

Unsuccessful Academic Performers

This section is a presentation of the effort and involvement, peer interaction and faculty interaction factors that the unsuccessful academic performers perceived as helping their freshman year academic performance.

(1) Effort and Involvement

Effort and involvement factors that unsuccessful academic performers perceived as helpful were professors' web notes, reading material, taking notes, and learning to manage time. The support services that they mentioned as being helpful included the Math Emporium, tutorial services, and participating in an Academic Probation group during the second semester, which provided support and helped them learn to manage time more effectively. These participants also stated that the use of tutorial services in the College of Engineering Student Assistance

Center, belonging to WEST, and the Math Emporium were helpful in completing homework and learning the material.

(2) Peer Interaction

Unsuccessful academic performers believed that relationships and contacts with other students, such as in study groups, positively influenced their academic performance. Participants in this category said that interacting with fellow engineering students living in the same hall provided ready access to people with whom to do coursework. Explaining material to others was also said to be helpful in identifying areas that needed to be strengthened.

(3) Faculty Interaction

Participants in this category mentioned contacts with professors outside of the classroom -- either through formal contacts or during scheduled office hours -- as a means of enhancing their freshman year academic performance. As noted by the other groups, the unsuccessful students mentioned that faculty interaction was helpful in clarifying poorly understood academic concepts, as well as advising them with regard to class selection and registration.

Summary of Findings on Helpful Factors by Academic Performance Level

These findings indicate several commonalties and a few differences in the academic activities and support services that were perceived as impacting academic performance according to academic performance level. Factors perceived by all levels as helpful include: using web notes; learning to manage time; taking notes; using tutorial services, frequenting the Math Emporium; and belonging to WEST groups and professional organizations. Other commonalties noted by the various groups are participating in study groups, professors' teaching styles, attending help sessions, reviewing notes, reading material, doing homework, and using professors' office hours. The differences noted by various groups include the importance of

regular class attendance, participation in the CAEE mentoring program, the use of the Writing Center and library, class participation, participation in study retreats, joining professional organizations, being motivated enough keep up with work and associating with hardworking people emphasized by the low and high academic performers, and participation in Academic Probation group by the unsuccessful academic performers.

The high and low academic performers are more similar in their perceptions of the impact of academic activities and support services implemented and used on academic performance. Overall, the analyses identified more commonalties than differences. In fact, regardless of academic performance level, the participants seem to share similar beliefs about the academic activities and support services that positively impacted their academic performance.

Presentation of Findings by Academic Performance Level

Not-so-Helpful Factors

The following are the factors perceived as not particularly helpful to academic performance by the high academic performers, the low academic performers and the unsuccessful academic performers.

High Academic Performers

(1) Effort and involvement

The high academic performers identified a number of effort and involvement factors that they believed negatively impacted their freshman year academic performance. These include: experiencing academic difficulty for the first time, the unexpected level of academic demands, having to learn from getting bad grades, poor time management skills, not keeping up with coursework, and not accepting having to study frequently to do well. They also mentioned that having to use the Math Emporium, and failing to use the available academic support services or

resources were other factors that negatively influenced their academic performance.   The

unexpected level of academic difficulty is also believed to have negatively influenced academic

performance, because the participants were not used to having to study to do well. This resulted

in their not putting forth the effort required to do as well as they did in high school. As a result

of not developing good study habits at the beginning of their freshman year, they fell behind and

had difficulty keeping up, which resulted in poor academic performance early in their college

career.

(2) Peer Interaction

High academic performers did not perceive peer interaction to have negatively influenced

their freshman year academic performance.

(3) Faculty Interaction

The participants in this category sometimes did not find their contacts with professors

inside and outside of the classroom as especially helpful to their freshman year academic

performance. In fact, several high academic performers said that some of their professors'

teaching styles and their reticent attitudes during office hours negatively impacted their

performance. Specifically, some students indicated that the manner in which some professors

presented classroom material made it difficult for them to understand it. Moreover, some felt

that some professors were reluctant to engage in meaningful one-on-one interactions during

office hours and chose to refer them to books instead. If mentioned, this attitude was routinely

mentioned as not being conducive to academic success.   Their difficulty with understanding

material presented by such professors, either in class or during office hours, was believed by

high academic performers to have resulted in their below-expectation performance.

Low Academic Performers

(1) Effort and Involvement

The discussions concerning effort and involvement activities by the low academic

performers identified a variety of factors and services perceived as not helpful. For example,

they cited unexpected level of academic difficulty and demands, not accepting having to study to

do well, poor time management, having to recover and learn from receiving bad grades, and not

doing homework when not collected or graded as factors that negatively influenced their

academic performance. Other dynamics that they mentioned as impacting their academic

performance negatively included not availing themselves of resources and having to use the

Math Emporium. Failing to do homework was perceived as detrimental by the low academic

performers because of poor test scores as a result of being unprepared. These participants also

did not believe the Math Emporium to be a helpful resource because the tutoring staff seemed ill-

equipped to teach the material or help with the computers.

(2) Peer Interaction

The responses by participants indicated that not all peer group relationships and contacts

were perceived as helpful. The peer relationships that were thought to be, in fact, detrimental to

academic success during the freshman year involved interacting with peers who socialized

excessively and failed to take their work seriously. Coping with distractions from peers who

"partied a lot," for example, was credited by some to negatively influence their freshman

academic performance. Their inability to cope with such distractions made it difficult for them

to stay focused on coursework and to handle the academic demands of college. This, many

claimed, resulted in less-than-expected academic performance. In addition, rooming with or

even socializing with friends who tended to procrastinate resulted in the sometimes unconscious adoption of similar non-productive habits and thus also impacted their academic performance.

(3) Faculty Interaction

Low academic performers said they did not find some of their in-class and external contacts with professors particularly helpful to their freshman year academic performance. They indicated that their classroom contacts with professors who taught in what they perceived as an adversarial manner negatively impacted their academic performance. In fact, some of these low academic performers said some professors' teaching styles and attitudes made it difficult for them to learn the material presented, which resulted in feelings of discouragement. Specifically, these professors were viewed negatively because they would sometimes not answer their questions, which led many students to believe that these professor were trying to drive students away from the college or to "weed them out." Outside the classroom, failing to make adequate use of professors' office hours was believed to have negatively influenced their academic performance. Despite this, some participants mentioned reluctance to using professors' office hours so as not to be seen as seen as experiencing academic difficulties.

Unsuccessful Academic Performers

(1) Effort and Involvement

The unsuccessful academic performers discussed a broad range of effort and involvement factors as not facilitating their academic performance. The factors they perceived as not helpful to their academic performance included: not attending classes, unexpected level of academic difficulty and demands, being put on academic probation, not doing homework, not keeping up with coursework, and not attending help sessions. They also stated that not accepting having to study to do well and failing to use resources or getting help when needed negatively influenced

their academic performance. These participants also said that their frequent absence from classes resulted in not understanding material and poor test performance. They said that repeated absences from class contributed to failing those classes. In addition, unsuccessful academic performers mentioned that not doing homework resulted in poor performance, stating that failing to complete homework assignments made them fall behind, which subsequently made it difficult to cope with academic challenges, and thus, resulted in academic probation. Some mentioned that difficulty with attending classes or taking action to remedy their academic situation was due to personal problems such as long distance relationships, and feeling depressed.

(2) Peer Interaction

While participants perceived certain relationships and contacts with other students as not helping their academic performance, not interacting with fellow students in meaningful ways was also perceived as negatively impacting academic performance. For example, some students cited not knowing fellow engineering students as a drawback. Unsuccessful academic performers believed that failing to make worthwhile contacts with peer engineering students made it difficult to find people with whom to form study groups, which was viewed as a disadvantage. Other deleterious peer-interaction factors included difficulty in coping with peers who did not take their work seriously, as well as more general roommate mismatches.

(3) Faculty Interaction

Participants in this category perceived some of their contacts with professors inside the classroom as not helpful. These students noted that some professors' teaching styles made it difficult to understand the material presented in their classes, which became a source of frustration and discouragement. As noted above, this negative interaction led them to believe that some professors were trying to weed out students from the college. Unsuccessful academic

performers also said that their inability to interact with professors outside the classroom was detrimental to their academic performance, because they missed the opportunity to have material explained and clarified for them.

Summary of Findings on Not-so-Helpful Factors by Academic Performance Level

There were both similarities and differences in the academic activities and support services perceived as not helpful in the findings grouped according to academic performance level. The similarities include: professors' teaching styles, unexpected level of academic difficulty and demand, not accepting having to study to do well, not doing homework, not getting help when needed or knowing where to get help, difficulty in coping with distractions from peers, and not using office hours. The differences in factors perceived as not helpful as grouped by academic performance level include: not attending class, not attending help sessions, being put on academic probation, not knowing fellow engineering students well enough, and not getting along with roommates reported by the unsuccessful academic performers.

(B) Presentation of Findings by Gender

Helpful Factors

The following are the factors perceived as helpful to academic performance by the male and female participants of this study.

Males

(1) Effort and Involvement

The effort and involvement factors that males indicated were helpful to their academic performance include reading material, attending help sessions, attending classes, reviewing notes taken, doing sample problems, using professors' web notes, doing homework, learning to manage time, reviewing notes taken, taking notes, and joining professional organization. The services

that males reported were advantageous to their freshman year academic performance include: BEST, academic probation group, the Math Emporium, the library, tutorial services, the Writing Center, and the study retreat offered by CAEE.

Male participants said several of the above-named factors were helpful in different ways to their academic performance. For example, they indicated that attending help sessions when available was extremely helpful in determining what to study for tests, which improved their performance. Participants also credited their participation in the Academic Probation group with showing them that managing time was an essential component in an engineering program. Furthermore, they stated that the BEST team leaders provided guidance during course registration with regard to course and professor selection. Doing homework was said to have provided the opportunity to practice material presented in class, which was associated with learning the material more thoroughly and thus being prepared for tests.

(2) Peer Interaction

The male participants perceived their contacts and relationships with other students as helpful to their academic performance, and these include participation in study groups, knowing fellow engineering students, and networking/associating with hardworking students. Knowing fellow engineering students created easier and more meaningful access to classmates in order to consult about coursework, which made learning the material and solving problems easier and faster. Male participants also believed that their participation in study groups made it possible to solve problems faster and to get peers' perspectives on the material being learned, making it more comprehensible. Associating with hard-working students was also cited as a source of maintaining focus and keeping up with coursework.

(3) Faculty Interaction

The male participants mentioned that contacts with faculty inside and outside the classroom influenced their freshman year academic success. The contacts that they perceived as helpful to their academic performance were professors' teaching styles and interactions with professors during their office hours. Several students mentioned that even though the content of some classes appeared tedious, the professor's engaging teach style made these classes much more interesting and therefore facilitated increased alertness and learning. The male participants said their contacts with professors outside the classroom during office hours was helpful in obtaining clarification on material not thoroughly understood in class, which was believed to have been helpful in learning the material and increasing their class performance.

Females

(1) Effort and Involvement

The effort and involvement factors that the female participants said positively influenced their freshman year academic performance include reading the material, attending help sessions, reviewing notes taken, doing sample problems, using professors' web notes, taking notes, doing homework, and learning to manage time. The female participants also stated that the use of support services definitely helped their academic performance. The academic support services that they mentioned as being helpful to their academic performance are OMEP programs (WEST and BEST), the Math Emporium, CAEE programs (Mentoring and Study Retreat Programs), tutorial services, the library and the Writing Center. They also said that joining professional organizations was beneficial to their academic performance.

In particular, the female students believed that their participation in BEST and WEST provided the necessary support and encouragement for them to cope with and survive their first

year in the College of Engineering. Several participants said that belonging to a BEST team afforded them the opportunity to meet students in different engineering majors and upper-class students from whose experiences they could benefit. Study retreat programs were also noted as a way to stay focused on academics in an environment conducive to learning.   In addition, the Writing Center was mentioned as helping to improve grades in classes where writing was important, because their experienced staff spent time with participants and showed them how to critique their own work.

(2) Peer Interaction

The female participants perceived contacts and relationships with other students as contributing to their academic performance. The contacts with other students that were perceived as helpful include knowing fellow engineering students, having people with whom they could relate, studying with males and knowledgeable upper class students, and networking. In particular, these students stated that being familiar with and developing beneficial relationships with peer engineering students made it possible for them to form study groups, as well as to obtain individualized help with academic problems when needed. These female students also noted that participating in peer study groups made it possible to explain material to each other, which was believed to have made learning faster and easier.

(3) Faculty Interaction

The female participants perceived contacts with professors inside and outside of the classroom as helpful to their freshman year academic performance. They viewed professors' teaching styles and their meetings with them during office hours and for both academic help and advising as having enhanced their scholastic performance. They indicated that their meetings with professors during their office hours helped clarify expectations about what they needed to

do to be successful in their classes. In addition, the female participants noted that talking with professors during their office hours was helpful because they clarified material not previously understood. Female participants also stated that completing design projects related to classroom concepts made the practical application of material presented more apparent, and thus facilitated their learning.

Summary of Findings on Helpful Factors by Gender

Among the female and male participants, a significant number of similarities, as well as a few differences, were recorded as factors that enhanced freshman year academic performance. The similarities include reading the material, attending help sessions, reviewing notes, using professors' web notes, doing homework, learning to manage time, presentation of subjects, taking notes, attending study retreat, using tutorial services, professors' teaching styles, and using office hours, the Math Emporium, taking part in OMEP programs (B EST and WEST), CAEE program (Study Retreats), and finding people with whom to relate, and the Writing Center. The differences observed by the male and females with regard to freshman year academic performance are participating in an academic probation group by males and participating in CAEE mentoring program and studying with males reported by females.

Not-so-Helpful Factors

Males

(1) Effort and Involvement

The effort and involvement factors that males perceived as not helpful include: poor time management, unexpected level of academic difficulty and demand, having to learn from getting bad grades, not attending help sessions, not attending classes, having to study to do well, not doing homework, not using resources and having to use the Math Emporium. Participants

observed that having to study to do well was primarily due to neglecting to allocate sufficient time and consistent effort into their coursework, which resulted in poor academic performance. As a result of disregarding homework assignments, participants indicated they did not practice the material and, consequently, were rarely prepared for quizzes or tests.

(2) Peer Interaction

Relationships and contacts with fellow students were perceived in some cases as not helpful to academic performance, particularly when they were unable to cope with distractions from peers who socialized a great deal. Their inability to cope with such distractions was acknowledged as being partially responsible for failing to keep pace with class assignments, resulting in poor academic performance.

(3) Faculty Interaction

Males observed that certain interactions with professors inside and outside the classroom were not helpful to their academic performance. With regard to in-class contact, some students noted that the teaching styles of some instructors led them to believe that these professors were trying to drive away or "weed out" certain individuals. As a consequence, some students experienced feelings of discouragement and thus did not perform as well as they might have. The male participants also noted that some professors refused to answer questions in class, instead referring them to the textbook for help. This phenomenon was also mentioned as occurring outside the classroom, and was cited as having a negative influence on their academic performance during freshman year. Despite this, most male participants who did not seek assistance during office hours believed that meeting with their professors would have helped them better understand class materials.

Females

(1) Effort and Involvement

With regard to effort and involvement factors, the female participants cited the following as having negatively influenced their academic performance during their freshman year: poor time management, unexpected levels of academic difficulty and demand, experiencing academic difficulty for the first time, not attending classes, being put on academic probation, not attending help sessions, having to study to do well, not doing homework, not knowing where to get help, not using resources or asking for help when needed, and having to use the Math Emporium. The female participants also noted that not attending classes negatively impacted their scholastic performance because they did not learn the material well enough to do well on tests, resulting in poor performance. In addition, they stated that not doing homework contributed to their poor performance in their classes during their freshman year.

(2) Peer Interaction

Peer interaction was not always viewed in a positive manner by the female participants. Echoing similar complaints heard earlier, these students indicated that their academic performance was negatively impacted through interactions with students who did not take their work seriously. Such associations, they noted, created distractions and caused them to procrastinate -- both of which resulted in their falling behind in coursework, despite their good intentions. Another problem associated with peer interaction was not knowing fellow engineering students well enough, which made it difficult to form study groups. These female students stressed that not participating in studying groups negatively impacted their freshman year academic performance.

(3) Faculty Interaction

The female participants said their contacts with some professors -- both inside and outside the classroom -- were not helpful to their freshman year academic performance.   In particular, they noted that the teaching styles and attitudes of some individuals made it difficult to understand material and thus did not facilitate the learning process. In fact, some of the female students said that they felt "put down" when they were informed that they should have learned the material prior to coming to college. They argued that such professors were not helpful because they declined to explain problematic concepts during class. However, female participants also noted that not taking advantage of office hours had a negative influence on their academic performance, because they missed valuable opportunities to have poorly understood materials explained to them in a more informal setting. Thus, this group of students indicated that their lack of interaction with professors – who sometimes made them feel uncomfortable about asking for help -- negatively influenced their academic performance because of the overlooked occasions to obtain additional help in clarifying concepts and expectations.

Summary of Findings on Not-so-Helpful Factors by Gender

The findings regarding factors that were perceived as not helpful to academic performance by gender shows that there were several commonalties and few differences in participants' perceptions. The similarities include: some professors' ineffective teaching styles and attitudes, poor time management, unexpected level of academic difficulty and demands, experiencing academic difficulty for the first time, being on academic probation, learning from poor grades, not attending help sessions, not attending classes, having to study to do well, not doing homework, and having to use the Math Emporium. Regarding differences, the females emphasized not asking for help when needed and not becoming familiar with peer engineering

students with whom to form study groups as factors that had a negative impact on their freshman year performance. The males stressed the perceived negative influence of some professors whom they viewed as trying to weed out students from the program.

(C) Presentation of Findings by Race

Helpful Factors

Whites

(1) Effort and Involvement

The effort and involvement factors that White participants said positively influenced their academic performance include attending help sessions, reviewing notes taken, reading material, doing homework, learning to manage time, taking notes, and using professors' web notes. They also said that their freshman year academic performance was positively influenced by using tutorial services, the library, the Writing Center, the Math Emporium and belonging to WEST. White participants also believed that attending help sessions helped them clarify material not understood in class.

(2) Peer Integration

White participants believed that their contacts and relationships with other students positively influenced their freshman year academic performance. In particular, they endorsed knowing fellow engineering students well enough to study with in groups or individually (which make learning easier and faster), working with more knowledgeable upper-class students, and associating with hardworking students. The White students also stressed that knowing other engineering students in their residence halls, especially in the same major, provided them ready access to people they could call upon for consultation with schoolwork.

(3) Faculty Interaction

Contacts with faculty inside and outside of the classroom were mentioned by White participants as influencing their freshman year academic performance. White participants said some of their professors' teaching styles helped their academic performance. They also noted that group design projects assigned by professors provided them opportunity to apply material presented in class, which facilitated their learning. White participants perceived using professors' office hours as helpful to their freshman year academic performance, and believed this interaction made it possible to ask questions that could not be addressed in class, especially in larger classes. In addition, these students stated that using office hours made it possible for them to become more familiar with the professors on an individual basis, thus helping them to feel more comfortable in class – again, a factor which was noted as facilitating the educational process.

Blacks

(1) Effort and Involvement

Black participants identified the following effort and involvement factors as positively influencing their freshman year academic performance: attending help sessions, reading material, doing homework, learning to manage time, taking notes, using professors' web notes, and doing homework. They also cited using tutorial services, participating in CAEE study retreats, OMEP programs (WEST AND BEST), and mentor programs, joining professional organizations, and using the Math Emporium, the Writing Center, and the library as having positively influenced their freshman year academic experience. In particular, participating in OMEP's BEST or WEST were said to have made it possible for them to meet fellow engineering students with

whom to study individually or in groups. Participants said that tutorial services provided them with the opportunity to obtain one-on-one instruction on material not understood in class.

(2) Peer Interaction

The Black participants perceived their relationships and contacts with fellow engineering students as positively influencing their freshman year academic performance. They said the established contacts provided them access to fellow students with whom they could study and relate. Moreover, participating in study groups was believed to have helped them prepare for tests, because they learned more effectively by explaining the material to others. Finding people with whom to relate was stated as very important to Black participants because of the added social support needed in a predominantly White institution.

(3) Faculty Interaction

Black participants believed that contacts inside and outside the classroom with professors positively influenced their academic performance during their freshman year. Specifically, they cited some professors' engaging teaching style as an effective way to stimulate interest in a class for which they initially had no enthusiasm. Moreover, using office hours was noted as a positive influence, because it afforded them an opportunity to have questions answered and concepts clarified in a more individualized setting.

Summary of Findings on Helpful Factors by Race

The academic activities and support services perceived as helpful to academic performance were largely similar for both Whites and Blacks. There were, however, a number of significant differences. The obvious similarities include attending help sessions; reviewing notes taken; reading material; doing homework; learning to manage time; using professors' web

notes; presentation of subjects; belonging to WEST; joining professional organizations; and using tutorial services, the library, the Writing Center and the Math Emporium.

A few differences were noted. Only the White participants mentioned belonging to the Academic Probation group, and only the Black students mentioned finding people with whom to relate, belonging to BEST, and participating in CAEE study retreat and mentoring programs. The overwhelming conformity in factors perceived by Whites and Blacks as helpful suggest that race is not a major factor in the academic activities and support services perceived by participants as positively impacting academic performance during the freshman year.

Not-so-Helpful Factors

Whites

(1) Effort and Involvement

The effort and involvement factors that White participants said had a negative influence on their freshman year academic performance include not attending classes, not attending help sessions, unexpected level of academic difficulty and demands, being put on academic probation, poor time management, having to learn from bad grades, not doing homework, not using resources, and being forced to use the Math Emporium. White participants also noted that not attending classes made it difficult to understand material well enough to do homework and succeed at exams, thus lowering class performance. They also reported that tutors at the Math Emporium were not knowledgeable enough about the computers to assist them with their difficulties and, as such, were not helpful to their freshman year academic performance.

(2) Peer Interaction

The White participants mentioned several relationship and contact factors that negatively influenced their freshman year academic performance. For example, many White students

mentioned difficulty of coping with distractions from peers who did not take the scholastic work seriously, making it tough to focus on schoolwork. These distractions resulted in getting behind academically and poor academic performance. In addition, not knowing fellow engineering students well enough to study with them was mentioned as having a deleterious effect on academic performance. Finally, the issue of not getting along with roommates was given as a negative factor.

(3) Faculty Interaction

The White participants mentioned that certain contacts with professors during their freshman year had a negative impact on their freshman year academic performance. These include the poor teaching styles and attitudes of some instructors, both inside and outside the classroom. They reported that some professors' teaching styles made it difficult for them to understand material in class, and they indicated that these teachers would not answer questions in class or even during office hours. This, they believed, was deliberately intended to "weed out" or otherwise eliminate "unfit" students from the college. In addition, the students who did not establish individualized contacts with their professors stated that it had a negative influence on their freshman year academic performance, since they missed opportunities to have poorly understood concepts clarified.

Blacks

(1) Effort and Involvement

Black participants identified certain effort and involvement factors as not helping their academic performance in their freshman year. These include learning from poor grades, poor time management, experiencing academic difficulty for the first time, unexpected level of academic difficulty and demands, and not using resources or getting help when needed. Black

students expressed that experiencing academic difficulties for the first made it difficult for them to realize that they needed to seek help. Furthermore, their stated lack of experience in coping with academic difficulties made them resistant to actively seeking tutorial help. These combined factors reduced their academic performance during their freshman year.

(2) Peer Interaction

Black participants did not mention any specific contacts with fellow students as negatively influencing their freshman year academic performance.

(3) Faculty Interaction

Black participants stated that some contacts with professors and their attitudes inside and outside the classroom negatively influenced their freshman year academic performance. As previously noted, some professors' teaching styles made it difficult to understand material presented in class. In addition, some professors referred these students to books for answers, stating that they should have learned the concepts in question prior to coming to college. Black participants noted that such responses to requests for assistance discouraged them from using office hours. This, they indicated, sometimes made them struggle on their own with material not understood instead of seeking help from professors.

Summary of Findings on Not-so-Helpful Factors by Race

The factors perceived as not helpful factors by Whites and Blacks are remarkably similar, with a few exceptions. Commonalties include poor time management; professors' teaching styles; not using resources or getting help when needed; and having to learn from poor grades. The differences include White participants' negative opinion of the Math Emporium; the concept that professors use their classes to "weed out" inferior students; not using office hours; difficulty in coping with distractions from peers who socialized a great deal, as well as Blacks students'

not finding any of their contacts and relationships with fellow students as negatively influencing their academic performance. These findings indicate that there were no marked differences by race in the academic activities and support services perceived as impacting academic performance.

Conclusion

A critical review of the data suggests that second-year engineering students' freshman year academic performance was impacted by three factors: effort and involvement, peer interaction, and faculty interaction. The data also indicate more commonalties than differences in the factors perceived as helpful and not helpful to academic performance. It is important to note that this observation cuts across academic performance level, gender, and race. Differences were observed among the findings grouped according to academic performance level.

Specifically, the extent to which participants invested their psychological and physical energy into those activities and services that were perceived as positively influencing freshman year academic performance varied among the high, low, and unsuccessful academic performers. (Astin, 1984; 1993b).

Chapter Five

Findings

> I think when you have such a wide base of people to draw from, the other
> students or professors or people who are English majors down the hall –
> when you have a lot of people that you know and that you can really go to
> if you have a problem, then it's a lot more helpful than if you're just a
> random number in a class. And I think here at Virginia Tech, the only
> way that doesn't happen is if you make it NOT happen. So, kind of like
> all these things that we're talking about are really only helpful if you take
> the effort to do it. **(HWF)**

The previous chapter identified the academic activities and support services that

engineering sophomores perceived as impacting their freshman year academic performance,

which are classified as helpful and not so helpful. In all, 38 helpful and 22 not-so-helpful factors

were identified. A subsequent analysis of those factors generated three dominant themes: (a)

effort and involvement; (b) peer interaction; and (c) faculty interaction. Effort and involvement is

associated with specific learning activities implemented, as well as the use of academic support

services. Peer interaction refers to participants' contacts and relationships with fellow students.

Faculty interaction is related to a student's contact with professors both inside and outside the

classroom. Both the helpful and not so helpful factors were organized and presented under those

three themes.

This chapter discuses the key factors that participants perceived as impacting their

freshman year academic performance, showing how each factor was perceived as helpful or not

so helpful. These factors were selected based on the frequency with which they were mentioned

and/or the emphasis that participants placed on those factors during the focus group discussions.

This analysis first identifies the factor and then describes the way(s) in which participants

perceived it as influencing their freshman year academic performance. As much as possible, the exact words of the students are used to illustrate the perceived impact.

As in Chapter Four, these factors are presented by theme (effort and involvement, peer interaction, and faculty interaction) and according to whether they were perceived as helpful and not so helpful. Paradoxically, some of the factors that were perceived by some participants as "helpful" were perceived by others as not so helpful.

Effort and Involvement Factors

This section is a review of the effort and involvement factors perceived by participants as helping and not so helpful to their freshman year academic performance. The effort and involvement factors identified by participants as particularly helpful are: (i) good time management; (ii) doing homework and completing assignments; (iii) attending help session; (iv) the Writing Center; (v) tutorial services; (vi) OMEP programs (BEST and WEST); (vii) CAEE Study Retreat; and (viii) and the Math Emporium.

Effort and involvement factors identified by participants as not-so-helpful include: (i) not doing homework; (ii) not attending classes; (iii) not attending help sessions; (iv) poor use of time; (v) not using resources when needed; and (vi) the Math Emporium.

Helpful Effort and Involvement Factors

The following introduces and discusses the factors that participants perceived as helping their freshman year academic performance.

Time Management

According to participants, time management consisted of the way they managed their class schedules, how effectively they used their time, whether or not they allowed sufficient time to do school work, and their ability to balance their time between academics and extracurricular

or social activities. All participants agreed that their ability to manage their time determined the

extent to which they were able to keep track of work and do well in their major.   Participants

believed that time management was critical to being able to do assigned work on time, enabling

them to meet deadlines rather than waiting until the last minute to complete needed assignments.

According to participants, learning to manage their time better helped them to overcome the

tendency to procrastinate and become unproductive. These students also believed that the ability

to manage time was essential to keeping abreast of the rigorous demands of an engineering

student -- especially with regard to making study time available on a regular basis. In addition,

participants stated that time management was a vital skill in being disciplined enough to adhere

to a study schedule, prioritize competing assignments, and generally stay on top of academic

demands. Successful time management was also credited with helping adjust to college life.

Students elaborated that although they initially wanted to participate in extracurricular activities

at the same level they did in high school, they soon realized that the rigors of their major

demanded more study time, which meant prioritizing better use of their time. This, they stated,

involved having to reduce their participation in some activities. These students asserted that

effective time management skills enabled them to participate in extracurricular activities, while

keeping up with their schoolwork. The following statements illustrate some participants, time

management strategies and their perceived advantages:

> ---about time management, I found that in scheduling like class or whatever, if
> you don't watch how your schedule, you found yourself procrastinating, just
> wasting a lot of time, going out, hanging out or playing basketball or something in
> the gym, working out. And kind of putting your work off because you're like.
> 'Well, I'll have time to do it then.' And then before you know it, you have a
> project due or a paper or something and you waste it, like a whole day. Like just
> not like working or anything---playing around. SO I definitely had to watch
> myself on how I handled my time. **(BM)**

To be in engineering, it's just about managing your time. But when it comes down to it, I just tried to keep up and get everything that was assigned done and I think you'll do better if you do like that. **(HWM)**

Wanting to do too much when you first get here and just trying to meet other people. And just do a lot of things, getting involved in organizations. Because in high school I was in EVERYTHING and I don't know I made it through then, but it's at a whole new level here. And you can't do the same things. And I'm thinking all right, I'm just going to continue the way I used to. You can't do that. You can't do that here. It requires different mindset, a different time schedule and everything. So I had to just step back and prioritize and get my time management skills back up to par, because I was always rushing. It got to the point where you gotta cut stuff out. Because I know if I could be halfways as active as I was in high school, I would be loving it. **(HBF)**

I totally actually agree with it. Second semester was spent working. Well after first semester I basically goofed around the entire semester just trying to get used to college, you know. Meeting people and my grades suffered from it, so second semester I buckled down and got real serious, spent weekends in doing work, every single night –work, work, work…..So I kind of tried to balance it as much as possible, and I ended up finding out if I do relax every once in a while and just kind of say 'All right, I'm going to work until this time and then just let everything go.' **(HWM)**

It was like straight after 9:00 got out of work, had to get myself ready for step team, change, went over to Litton Reaves and practice there until 2:00. So I had to make sure that I, at least, had some of my homework done so I wouldn't have to do homework when I came back, or whatever. And a lot of that, doing homework, trying to get it done before the day it was due. **(HBF)**

Both the high and low academic performers stressed the positive influences of time management on their freshman year academic performance. All of the students generally agreed that managing time was particularly difficult at the beginning of their college career because of the fact that they were by and large successful in high school with far less overall effort. All ranges of academic performers eventually realized that it was going to require more effort than they had expended in high school to earn good grades. However, the difference between those who met or exceeded their academic expectations, and those who did not, was how soon they realized that they needed better time management skills. One unsuccessful academic performer

who mentioned the positive influence of managing time said it was only after he ended up on academic probation that he learned how to manage time.

Although most students agreed that college success required more effort than they expended in high school, there were marked differences as to which groups of students actually made conscious changes in how they managed their time outside the classroom. During the discussions it became apparent that the high academic performers made more structured use of their time than the low academic performers, which clearly demonstrates the increased priority they gave to their academic goals. This corroborates the findings of Pascarella and Terenzini (1991) who maintain that a student's personal work habits, as well as a positive attitude towards his or her education goals, can have a profound effect on college academic performance. They also report a strong correlation between time engaged in learning activities and learning outcome.

Homework

The set of activities that participants described as doing homework and/or completing assignments include: completing assigned exercises, reading assigned materials, and doing problems (regardless or whether or not they were collected and graded by professors).

Doing Homework

Homework, according to participants, is the set of assigned or prescribed tasks, exercises, or cases, the completion of which is required as part of a course. Students stated that even though doing homework on a regular basis was time consuming, it provided them with several benefits during their freshman year, such as enabling them to stay current on coursework for a discipline in which falling behind is a common problem. Staying caught up, they maintained,

significantly enhanced their readiness for and performance on tests and quizzes which in turn, influenced how well they did on them.

Participants also believed that doing homework provided them with important opportunities to be actively involved in the learning process instead of being passive participants. Students added that due to the quantitative nature of their major, it was imperative for them to adopt an active or "hands-on" approach to learning to be able to master the material, such as reading and practicing new concepts instead of passively reading assigned material. Finally, participants also credited homework assignments for giving them valuable opportunities to apply the materials learned in the classroom, since there was not enough time to complete sample problems in class. The participants who described themselves as "hands-on" learners reported that doing homework was the only way they could utilize their preferred learning style. What follows are two representative statements of how students perceived the influence of doing homework on their freshman year academic performance:

> Keeping up is like the key to everything. If you can on stay on top of things, then you can get it done. If you're motivated to stay on top of things, you're motivated to actually do your work. And once you fall behind, you're completely overwhelmed. **(LWF)**

> I'm a bit of a homework freak. I think that repetition does enforce learning. And so the more homework problems I do, I know the more it helps me. **(HWM)**

The positive influence of doing homework was most frequently expressed by high academic performers, who expressed their tendency to do homework on a regular basis as a way of assessing their learning of material. It should be noted that these higher achievers did so regardless of whether the assignments were collected or graded. Low academic performers, on the other hand, admitted completing homework assignments only when they were sure the material was going to be graded or collected. These findings agree with Astin (1984; 1993b),

who postulated that the more involved students are in the learning, the more they learn. Astin also reports that students who are involved in class preparation activities such as doing homework or assigned tasks tend to be more satisfied and successful in their learning.

Doing Assigned Reading

According to the students, doing assigned reading involved completing assigned reading prior to class, which often involves taking notes in preparation for classes. All the students who raised reading assigned chapters as an issue believed that there were definite benefits to the practice, such as becoming familiar with the material before class. Familiarity with the course materials was reported to have made it possible for them to follow and understand lectures more effectively, as well as to participate more actively in class by asking or answering questions. Participants particularly mentioned the significance of doing assigned reading as a way to enhance retention for easy and quick retrieval of information during tests. Students also reported that taking notes while doing assigned reading made it easier for them to identify and jot down the most significant aspects of their professor's lecture instead of attempting to take notes of everything the instructor covered in class. This resulted in a student's ability to listen more attentively to lectures, as well as assisted him or her in narrowing down what to study in preparation for tests. Finally, many students maintained that doing reading assigned tasks made it easier for them to stay "caught up" and be prepared for tests and quizzes instead of continually playing "catch up." The advantages of reading ahead are illustrated in the following statements:

> Actually if I have read some of the material before hand, going into the class knowing some of it, then while he's lecturing I can make connections, on my own, rather than him saying this and this. It'll be like 'Oh, so he means that this can work there, and that means that.' So, I think for me it's kind of important to understand beforehand and then go in there with some idea. So while he's lecturing you can form your brain synapses or whatever, forming connections and stuff. **(LWF)**

So what I found myself doing second semester last year was I'd read through the section. I'd actually take notes on my own, out of the book, and then when I'd go to class, if the professor had something to say that was, you know, pertinent to something that I'd written down, I'd just make a little addition to it. Or else if we'd go through class and realize that, 'Well, we didn't cover this. And I'd just scratch it out and then when it comes time for test, I know I don't have to look over it. **(HWM)**

The practice of doing assigned reading was emphasized in the discussions with both the high and low academic performers, although it was clear that the latter cohort did not do so as regularly as did the high academic achievers. In fact, the lower academic performers sometimes discussed assigned reading in the context of how it would have been helpful if they had been able do it on a more regular basis, unlike the higher achieving students who made a regular practice of completing assigned reading. They discussed with passion the advantages of doing assigned reading before class. This finding supports the report by Pascarella & Terenzini (1991) who maintain that the more time a student actively spends in learning activities such as reading, taking notes, and answering questions, the more he or she learns and retains. This premise is echoed by Astin, (1984; 1993b) who concludes that the amount of learning that occurs is directly related to the amount and type of involvement in the activity. Even though all participants agreed on the helpfulness of doing assigned reading before class, it was obvious that the key to its impact was students' ability to follow through with their good intentions. However, the importance of doing homework -- and especially completing assigned reading -- was clearly illustrated by one student who stated that he "could not imagine going to class without being able to follow the lecture."

Solving Problems

Solving problems, e.g., doing problems or completing practice tests whether or not they were to be collected or graded by professors, was another homework activity that participants mentioned as positively influencing their freshman year academic performance. Participants

stated that they derived numerous benefits from doing problems on their own in their classes, including having the opportunity to go over material presented in class. As stated earlier, because students were usually unable to complete sample problems in class, they themselves would have to take added responsibility for determining how well they have learned material presented in class. Participants maintained that it was only by doing problems on their own that they were able to better learn and understand the material. Doing problems independently was also a strategy by which students assessed their own learning process. As noted by several students, the ability to do problems without looking at their in-class notes and the textbook was an indication to them that they had learned and understood the material, and were thus adequately prepared for quizzes and exams. Furthermore, participants believed that the practice of solving problems provided them the opportunity to actually apply the material, which was helpful in understanding the material. The following remarks by participants indicate the perceived usefulness of solving problems:

> I mean you sit there and instead of going through the book, and you don't know what's going to be on there out of the book. You can take a sample test of 20 problems. And be like, 'Hey, I did this. Wow, I know how to do this. Cool.' **(HWM)**

> I think example problems have to be the biggest thing for me. I can't learn just by them going over formula, I have to do it on my own. **(HWM)**

> And also doing sample problems in the book. If I go through these usually that will help me out on homework and tests or whatever. **(HWM)**
> Well, I'd say actually doing the homework probably helped a lot and group work. I'm more the type of person if I don't practice, I can't learn. I don't really learn by lectures. I learn by actually doing the work. **(LWM)**

> The only way to learn it is just to do problems, do problems, do problems. **(HWM)**

Although the need for solving problems was universally acknowledged, the practice of actually doing problems was primarily implemented by low and high academic performers. Not only did these two cohorts do the assigned problems, they also did problems beyond what was required to meet course requirements. These students viewed the practice of problem-solving more in the context of meeting their academic goals, and specifically as an important tool for assessing their learning of material. The implementation of learning activities for the purposes of educational self-assessment corroborates Willis (1989), who believes that learning activities impact retention and subsequent academic performance. Students who were actively involved in the learning process, who prepared for class by doing homework or assigned tasks, have been found to be more satisfied and successful in their learning than individuals who took a more passive approach to their education (Astin, 1984).

Attending Help Session

Help sessions are defined as optional class meetings arranged by professors and provided as a supplement to regular classes. The participants in this study stated that help sessions provided them with the opportunity to meet with professors in smaller settings, to hear professors go over material presented earlier in class, to have the chance to review material before tests, and to hear lectures from different perspectives -- such as when they were facilitated by a different instructor.

Participants ascribed specific benefits to their attendance at help sessions. In particular, the smaller setting of help sessions made them more interactive than regular classes, thus providing multiple opportunities to interact with professors and have their individual needs met. Several students stated that they felt inhibited about asking questions in class, primarily because of the larger enrollments in many freshman classes. Help sessions were identified as a more

comfortable setting for them to ask questions they could not ask in their large classes. In

addition, many students spoke positively about attending help sessions offered by other

professors as a way to approach the material from a different perspective, and be exposed to a

teaching style that might be more effective for that student's particular needs. In other words,

attending another class section's help session provided an opportunity to learn a different method

of problem solving. Moreover, due to limited class time, help sessions offered professors the

occasion to go over problematic aspects of the homework assignments.   Participants believed

that this particular aspect of help sessions was especially helpful in clarifying material that they

did not understand in class, but which they needed to grasp to be able to do assigned homework

correctly. Most students who attended help sessions stated that they were an integral part of

exam preparation and performance in that they helped narrow down what students needed to

learn for tests. Finally, one female high academic performer observed that help sessions made

doing homework much easier and wondered why more students did not take advantage of this

supplement to regular classes. The following remarks illustrate the advantage that participants

perceived from attending help sessions:

> Some classes have help sessions, I think they are kind of helpful, because it's a
> smaller setting. In a help session, it's like a two-way conversation, as opposed to
> the professor they're telling you this and telling you that. And in help sessions,
> you ask him "what do you think about this? How do you do that?" And you get
> some feedback. So I'd kind of think that help sessions were actually helpful.
> **(LWM)**

> A lot of times your professor, whoever is teaching this course, you might have a
> hard time just understanding them. Or they might just have a teaching style that's
> harder or more difficult to understand. Whereas if you go to maybe a
> departmental study session, the person, whoever is there, another professor that
> holds the study session, they'll introduce it to you in a much clearer fashion or
> whatever. Because a lot of times when you're in class, they are trying to get their
> 50 minutes done. They've got stuff to cover and you're going 'I don't know what
> is going on.' Whereas, if you go to a study session, you can tell them to hold on.
> You can stop them. You can ask more questions because that's the big difference

right there. Teachers are trying to get syllabus. They're trying to do their syllabus thing, you know. And then in the study session you can ask them any question you want. And it might just be a better teacher to you, the person who's up there might just teach it better than your real teacher. **(BM)**

I think help sessions are always good.-- I find for the most part that you usually go to a help session before a test, usually they kind of narrow things down-what to study more. I think they've helped me out for the most part. **(HWM**)

A lot of times teachers will hold help sessions and I find those really helpful. I think it's much more helpful when the teacher does it as opposed to a TA, or someone else. I think it's really nice when the teachers take aside an hour a week and have a help session. And I know a lot of people don't go to those because like, you've got like 80 people in your XXX class and you get a help session and maybe 8 people are there. But it's really a big, big help and if you can just force yourself to go to them, it makes homework a lot faster, and, you just get more comfortable. Go to the help sessions, make yourself go. **(HWF)**

I think going to help sessions were always helpful. Some classes have like set up help sessions during the week that you could go to for help in that specific class. I remember going to EF study sessions during my freshman year to help with homework problems. **(BM)**

Although attendance at help sessions was not required, both the low and high academic achievers attended on a somewhat regular basis. These participants attended these sessions as a result of their motivation to use available resources to enable them get the most out of their college experience, thereby enhancing their academic performance. This is a further reinforcement of the influence of students' personal work habits and attitude towards academic goals on college performance (Pascarella & Terenzini, 1991).

The Writing Center

The Writing Center, an affiliate of the English department, provides non-mandatory writing services to the university community of undergraduates, graduate students, faculty and staff. Participants said the Writing Center offered them contacts with patient and helpful staff who assisted them with their writing requirements during their freshman year. Participants noted that the writing skills they acquired from the Writing Center staff helped them learn how to edit

their own papers. The care taken by the staff of the Writing Center in working with participants made it possible for them to have their writing questions and concerns clarified in a supportive setting. They also said their use of the Writing Center services considerably improved their writing, which resulted in better grades in their English classes. The perceived helpfulness of the Writing Center is illustrated in the following statement:

> The Writing Center. My first semester XXX teacher was a XXX, so I was in there frequently. And that was kind of neat. I didn't use it at all second semester because I think it helped build my writing skills and that it helped me to critique my own papers and stuff. **(HWM).**

The low and high academic performers' use of the Writing Center was an obvious indication of their active involvement in the learning process. Even though the Writing Center was familiar to all students, it was only the low and high academic performers who mentioned seeking help from this source when they were experiencing difficulties in their English classes. These two groups independently sought help from the Writing Center on a regular basis because they did not want their English classes to be an obstacle to realizing their overall academic goals. For the Writing Center to have had a positive influence on their freshman year academic performance as indicated by this finding, the low and high academic performers needed to have expended some effort into the process of accessing its use (Astin, 1984; and 1993b).

Tutorial Services

Tutorial services offer academic assistance to students in the form of individualized instruction on material presented in class but poorly understood. This personal assistance, often provided by peer tutors, was perceived by participants as an important resource, because it enabled them to ask questions they were unable to raise in class. Participants said that the use of tutorial services enabled them to catch on in those classes in which they felt lost. The opportunity for immediate feedback was also an exclusive benefit of using tutorial services.

Students indicated that tutors provided instantaneous advice about work they were doing -- a rarity in some classes in which not all work was graded or collected. The participants who used tutorial services believed it improved their performance in some classes. The use of tutorial services was also identified by one student as helping him adhere to a study schedule, in that it ensured that a prescribed amount of time was devoted to studying that subject on a regular basis. The following statements illustrate participants' perceived helpfulness of tutorial services:

> I lived in XXX so it was crazy and you usually didn't get a whole lot of sleep. I was in the courtyard. It was a bad experience there, but I started to realize that I got behind in the classes, and took the liberty of the academic center, the tutoring center over in at Hillcrest. And even I figured if I scheduled just an hour a week or something for some of my classes it helped out a lot, because it was like the appointments that you make there are mandatory. And so if you don't go to them you get into trouble and you can't even go for any more help or something. So it's like an obligation that you have to do and it's like you're binding yourself into a contract to work for an hour. I thought that was kind of cool. That helped me out a lot in calculus. **(HWM)**

> Instead of like giving us equations that we knew, we would derive them like for a half an hour. And then it was like, "OK, what part was I supposed to really know?" And then sometimes you go to get help from his office. And he was like, "Well you're supposed to know that. That's in the book." And I'm like, "OK, I don't understand what I'm reading, you know?" And I was like, "I didn't get it from the lecture, I don't know where I'm supposed to get it." And then I started going over to the Tutoring Center and they would explain it. They would go through each homework problem with us. And they'd be like, "This is the part in the chapter that you're supposed to be getting this from." And they'd show us where the equations were and show us which sections in there. You know, the chapter descriptions, of where we could find the information that explained it. And if we didn't quite catch it, they would actually go through it and explain like the terminology to us. And that's something we weren't getting in class. **(HBF)**

> But I think also that the tutoring has helped. Because it's more of a one-on-one. And it's more of my needs based instead of teaching the whole class. Because everybody knows that when the teacher teaches, you're going to have some people that understand and some people that don't. If you're one-on-one you can be like, 'OK, I got messed up right there on that line. Can you tell me how you got from step A to step B.' They go from Point A to Point F to Point B. And you're like, OK, I know I'm supposed to know everything in between, but can you at least refresh me. They make sure that I understand the whole procedure, so I don't get lost when I'm doing my homework. It helps me to have the one-on-one and having tutoring helps in making sure that I'm grasping everything. **(HBF)**

The advantage of using tutorial services was mentioned in all the focus group discussions except the group of White male low academic performers. White male low academic performers resisted using support services of this nature so as not to appear as needing help to succeed in the College of Engineering. It should also be noted that the use of tutorial services by the low and high academic performers who were aware of this service was proactive, unlike the unsuccessful academic performers, who used tutorial services was after being placed on academic probation. The high academic performer who used his appointments with a tutor as a way to maintain a study schedule clearly benefited from routinely studying material, as indicated by his successful performance in that class. This reinforces the finding that asking questions or having material explained positively influences mastery of material (Pascarella & Terenzini, 1991).

Office of Minority Engineering Programs (OMEP)

Office of Minority Engineering Programs (OMEP) offers voluntary support groups to underrepresented populations in the College of Engineering. The Black Engineering Support Team (BEST) and the Women in Engineering Team (WEST) are mentoring programs designed to ease the adjustment of Black and female engineering students to Virginia Tech's College of Engineering. They are offered during the fall semester only, and students need to participate for the entire duration of the program in order to access the full benefits offered through these support groups. In general, the students interviewed for this study said that their participation in these support groups had a positive influence on their freshman year academic performance. What follows is a discussion of students' perceived positive influence of their participation in the BEST and WEST groups on their freshman year academic performance.

BEST

Black Engineering Support Teams (BEST) are support groups for Black engineering freshmen, offered by the Office of Minority Engineering Programs in the College of Engineering. Each BEST group is made of freshmen engineering students. These BEST groups are led by upper class engineering students, who also play the role of mentors for members of their teams.

Participants stated that their participation in BEST groups enhanced their freshman year academic performance. In particular, they noted that their BEST leaders were a source of academic support through the ad hoc tutoring services they provided. In addition, BEST leaders were also helpful in disclosing information about other academic support services on campus, such as those offered through the Center for Academic Enrichment and Excellence (CAEE). Students said they used a variety of CAEE services to enhance their academic performance, including participating in study retreats. Many interviewees indicated that their participation in BEST eased their academic adjustment to the College of Engineering. In addition, participation in BEST support groups made it possible to get help with course and/or professor selection during registration periods. For many students, a very significant aspect of participating in BEST was that it put them in contact with other Black engineering students with whom they could relate. This association facilitated the formation of study groups with fellow Black engineering students, which they indicated was critical to their success. The access to fellow Black engineering students also made it easier to network and interact academically and socially, further enhancing their adjustment to college life.

The following statements illustrate how the Black participants perceived the helpfulness of their participation in the OMEP' BEST group:

Well, when I came in freshman year, I was offered to be entered in to a program called BEST, which stand for Black Engineers Support Team. And I accepted that and that was where you had a mentor to kind of watch over 4-5 students. I think that helped me a lot in one way because there were so many people I could relate to and all of us were in General Engineering so it wasn't like we were broken up in Electrical Engineering or CPE. We were all the same, so we were taking the same basic classes, chemistry, calculus, whatever, we just worked together. And I think that helped me a lot. Everybody in the group was Black. It was a Black Engineering Support Team. Everybody is also going to be able to relate to somebody of your color, same circumstances, everything. **(LBF)**

And your team leader was an upper-classman engineering student, a junior or senior who had been through what you are going experiencing. And he could help you on like what you were about to go through during your freshman year with problems. If you needed help in a class or scheduling a class something like that, you could call him or her and ask like, "OK, I'm thinking about taking this class. Which professor did you take? Is this a good professor? Is this a good class to take now? You'd just like go out to dinner with them, you know, sometimes just to socialize, have somebody to talk to, just go hang out with when you weren't studying or doing homework. **(BM)**

I just think the key to making it here is networking. I DEFINITELY think that is nothing other than exactly what I said. If there' s nothing else that I learn from here, I know the network. Wherever I go, you need to always find somebody that you can relate with and have someone to network. If I had to make it alone here, I don't know what I would do. I probably couldn't handle it. I mean because I know I have friends. I know I have people I can call on that will understand it that will explain it to me, or people to call me. It's like this big study system. It's like we're all here for one common goal. We need to work together to get it done. **(HBF)**

WEST

The Women Engineering Support Team (WEST) is a voluntary support group for female engineering freshmen offered by the Minority Engineering Programs in the College of Engineering. Each WEST group had an upper class female engineering student as its leader and mentor. Participants said that WEST had a positive influence on their freshman year academic performance, primarily because it facilitated contacts with more knowledgeable upper class female engineering students. These upper class students were credited with providing the

academic and social support that helped them to survive the academic demands of their freshman

year. Participants said the social support provided by WEST helped them gain increased

confidence and gave them the encouragement they needed to persist in the program -- despite the

relatively low number of female students in the College of Engineering.   In particular, some

students said that their involvement in WEST made it possible for them to participate in all-or

largely male classes without being self-conscious. Furthermore, WEST participants noted that

their group leaders helped them with class registration by suggesting appropriate classes to take,

as well as identifying the best professors for a particular course. They also said that their

participation in WEST groups made it possible to meet other female engineering students who

lived in the same hall, thereby providing them with networking and study group opportunities.

This exposure to other students in the same major was particularly helpful when preparing for

tests and completing homework assignments. The following statements illustrate participants'

perceived positive influences of participating in WEST support groups:

> And WEST, a support team for women in engineering, also set up by the
> Minority Engineering Program. If not for that program that it's offered…
> A lot of women wouldn't be here. I wouldn't be here either. Because
> XXX even helped me a lot. You can go up to XXX. And she's like a
> mother away from home. **(HBF)**

> I would have to say West is definitely a positive experience. It was just
> nice to have somebody to go to. Like I know there were people on my
> hall that if I was having a problem... like I know when I was having
> problems just coming to college and coping and different people all
> around me and just kind of things swarming around my head the first
> couple of weeks. It was really nice to go to someone who had been
> through all of it and survived it and could say, "Yes, you're going to be
> fine!" And not just like pat you on the back and say, "'Hey, this is
> something really good for you to do." Or "this is something really good
> for you to experience." Or "this is who you can go talk to." It was nice to
> have somebody who was kind of removed from the situation and could say
> "Look, I know it's bad, but this what you're going to do and this is how it
> can help." SO that was really positive for me. **(HWF)**

I think West was definitely a confidence booster, because especially now – I have a lot of classes where I'm the only girl in my class. Or I'll be in the classroom with 60 people and 4 of them will be girls. And I think – you know, they say that everyone's equal and blah, blah, blah. But in a lot of classes, people look at you funny. I mean I have to say that honestly. People will look at you – Oh my God, there's a girl in the class. And West gave me a lot. I had other women to talk to. I had other people who could say, "Well, this is how I get through it. This is how I deal with it." And it kind of gave me a base to kind of sit in the class and go, "OK, I'm the only woman engineer, but I belong here as much as anybody else does. This is my class and I'm going to do well." And so that definitely gave me a lot of confidence so I can sit in class and not be self-conscious or anything like that. So I can say that that definitely helped me. **(HWF)**

CAEE Study Retreat

The CAEE Study Retreat is a weekend program offered by the Center for Academic Enrichment and Excellence (CAEE) whereby students are provided a place exclusively for studying. Participants said there were many advantages to participating in this intensive weekend study program. For example, the isolated, off-campus location of the study retreat made it possible to get organized, remain focused and get homework done. In fact, several students noted that the study retreat made it possible for them to get caught up with work on which they had fallen behind. Moreover, their contacts with tutors during the weekend provided a ready source of immediate help with difficult material. In addition, the fact that there were other students participating in the study retreat made it possible to study in groups even though it was held at an off-campus location. The following participants' statements illustrate the helpfulness of their participation in a CAEE study retreat:

> Meantime we see that it really helps you. Because for me, it helped me get organized and focused and helped me get all my homework done. Because usually in the weekend, I sleep. **(HBF)**

> Study retreat, they put you out in the middle of nowhere and they MADE you basically study for, what, 15 hours. They put you out there in the middle of mountains and you're stuck out there and they make you do 15 hours a weekend of nothing but studying. So you get work done. They have tutors there. It's a weekend thing. And you sit behind your book.

It's a good way of pretty making yourself catch up with some things that you might have got behind on. That's what I found it really useful for. A couple of classes, if I got behind on some of the material, I'd go to a study retreat and I'd be right back on track. It has like 20 rooms in there and you're paired with someone, a roommate, another chance to network. One person is supposed to stay in the room. And there's another big room where everybody can go in and get work done too. And that gives you another chance to work with groups, especially if there are a couple of people taking the same classes and are having problems with stuff. So you get your work done there too. **(BM)**

Despite the overwhelming endorsement of the program by Black students, the program was largely unknown among the White students who participated in this study. Black participants attributed their knowledge of the CAEE Study Retreat and other support services to their participation in BEST and WEST. In fact, it became apparent during the groups discussions that Black students generally seemed very receptive to taking advantage of the available resources at Virginia Tech to enhance their learning. This finding was very encouraging, given that Virginia Tech is a predominantly White institution. Such universities are purported to promote alienation and isolation on college campuses (Allen, 1987; Pounds; 1987; Steward, Jackson & Jackson, 1990). This finding suggests that when students are well informed about available academic resources, they take advantage of them to enhance their academic performance. Once again, this finding corroborates the findings of Astin (1984, 1993b) who maintains that a program's effectiveness depends on the extent to which it increases a student's involvement in his or her own learning experience.

The Math Emporium (ME)

The Math Emporium is a math study center located off-campus, which offers computer-instructed math classes. Participants reported that the center provided them contacts with staff, teaching assistants, tutors and a quiet study environment conducive to focused work. Although this resource was described somewhat more controversially, students generally stated that the

Math Emporium was helpful to their freshman year academic performance in various ways. For

example, participants reported that the Math Emporium staff facilitated their learning by

answering their software questions, and explaining and clarifying uncertainties they had about

difficult math assignments. In addition, students noted that the availability of peer tutors, who

explained material at their level, made them feel comfortable. The added bonus of being able to

clarify material not well understood made doing assignments at the Emporium faster and easier.

Even though a graded component of some classes required that the student spend a prescribed

amount of time at the Math Emporium, students said it provided a nice environment in which to

study and work on assignments. It also offered an environment in which to meet with fellow

students to work on group projects, with or without the usually capable help from the

Emporium's staff and tutors. The statements illustrate the perceived helpfulness of the resources

available at the Math Emporium:

> Math Emporium. That helped me a lot. Because you had in linear
> algebra, I think – it was one class we had where it was required that you
> had to be in the Math Emporium for a certain amount of hours. Most of
> the time you got your work done before you went to the Math Emporium,
> but you still had to do like 2-3 hours and a quiz in there. So what
> eventually happened was, I was sitting in there one day, just trying to
> bypass time, and I noticed there were tutors in there. And I was like, "Oh,
> that's for my class." And then I just ended up going to tutor in there every
> time I had to do my hours. And that's how I made my hours up. And that
> helped a lot, especially in all my math classes. I ended up getting A's in
> every math class and it was because of those tutors there. They were
> really good. They were students, and they knew what they were talking
> about. A lot of the tutors at the Emporium are actually focused on that
> particular thing. **(LBF)**

> I think one of the good things that I guess coming in as a freshman that we
> had was I think the use of the Math Emporium. We did that our freshman
> year. And I know for at least 3 classes, I was required to go and put in 2-3
> hours a week and it was recorded. We had to turn in like your time or
> whatever. And like over there, you got help from like TA's that just
> worked there. And you could just raise your hand if you had a problem. Or
> sometimes professors come, and they put in hours during the week. And
> they help you out a lot too. So, I definitely think that was a good asset as

far as being an engineering student, having a math course or a science course. So I think that was a real good thing they could implement. It helped me a lot, especially in Vector Geometry, where we had a lab, a lab worksheet that we had to do, and you were assigned in a group with maybe 2 other students and you could go over there. And you did it on the computer and like if you had a question or how to input this equation or why isn't this graph working, there were TA's and teachers there that you could raise your hand and they'd give you help in completing your assignments. It was great. So it was very important to get it done and to get it done right. **(BM)**

Tutoring at the Math Emporium. I didn't really go to see them too much at all. I went there every once in a while, but they helped because they seemed to have this ESP, like if I was having a problem with one specific problem, they'd be like   'Oh, this is what you don't understand.' And everyone else is a having problem, like they knew the problems that other people in the Math Emporium were having and they'd be like, 'OK, people have been having problems with this and they could explain it pretty easily because they were closer in age, more of a peer, than say a professor would be. **(UWF)**

Despite the fact that the Math Emporium was used by all the participants in this study, it was apparent in some groups that the center was used primarily because it was a course requirement. As alluded to earlier (and will be elaborated on in the following section), opinions regarding the Emporium were somewhat mixed. For example, the Black participants strongly endorsed the ME and cited many positive influences of its services on their academic performance. The students who did not perceive the Math Emporium as helpful to their academic performance cited the off-campus location of the ME as the main deterrent. Nevertheless, even these detractors tried to make the best of the situation and eventually adapted. In fact, they adopted the ME as a study place to complete both math and non-math assignments while meeting attendance requirements. They also used the Math Emporium as a place to meet fellow students to work on group projects.

Not-So-Helpful Effort and Involvement Factors

This section presents and discusses the effort and involvement factors that participants reported as having had a negative influence on their freshman year academic performance. The effort and involvement factors that participants said were not so helpful include: (i) not doing homework; (ii) not attending classes; (iii) not attending help sessions; (iv) poor time management; (v) not using resources when needed; and (vi) the Math Emporium.

Not doing homework and completing assignments

According to students, not doing homework and/or completing assignments refer to failing to do assigned work, whether it was to be collected and graded or not. All participants agreed that doing homework and completing assignments was critical to doing well in classes. Thus, not competing homework and assignments negatively influenced their freshman year academic performance.

Students who tended not to do homework assignments stated the lack of useful feedback when the work was not collected and graded as the principal deterrent. This, they believe, contributed to their poor performance in class. They noted that not doing homework on a regular basis resulted in their failure to learn the material because it was not regularly practiced. Consequently, these individuals stated that they were never prepared for tests and thus did not do well in classes. In hindsight, those participants who did not do homework and complete assignments on a regular basis noted that it would have been far better for them to do homework regardless of whether or not it was graded or collected. The following statement illustrates this point:

> Well, I found that if you assigned homework, but you never collected it, I never did it. And that really just … if you never practiced like, say Math or something like that, you just don't get enough practice and you don't learn the material. I mean, I really don't like doing homework, but I mean there's a point where you need to learn how to do it. And if you

never collect the homework, then when it comes to a quiz or a test, you won't be prepared for it. And a couple of classes I've had like that I wasn't prepared because they didn't ever collect the homework. **(LWM)**

Students added that they now realized that staying abreast of current work was a critical success factor for such a difficult major. In fact, these students believed that not doing homework resulted in below expectation performance in classes that they could easily have passed. They said the ultimate price of failing to do coursework (graded or not) was being placed on academic probation for poor performance. The following statement illustrates this point:

I think the biggest problem with the transition is the slack factor. Just like he said, high school is pretty much… Anyone in engineering probably had an easy time in high school and they did nothing and they did well. I'll kind of back that up. I was also guilty of not doing everything. If it wasn't asked that we did it and turn it in, sometimes I wouldn't because I knew it wasn't going to be asked for. And in some ways that affected how well I did. So, it kind of grew from that. **(LWM).**

Participants equated their level of effort to the extent to which they kept up with homework, and as such attributed their level of academic performance specifically to not doing homework and assignments. They stated that they felt guilty and blamed themselves for the level of effort that they put into schoolwork and admitted that their rate of return was based on the reduced amount of effort they put into their schoolwork. The following statement clearly illustrates this point:

For it's really easy. If I do these two things then I'll do well in classes. If I always make it to class and I do my homework. The fact of the matter is that I don't always do that. I really honestly believe that if I had 100% attendance and I always did my homework, then I'd be fine, I'd be set. The fact is that I don't always do that. **(UWM)**

The negative influence of not doing homework and completing assignments was primarily mentioned by unsuccessful and low academic performers. As described earlier, the students accepted into the engineering disciplines tended to do well in high school with little or

no effort. Although their exemplary high school performance resulted in their acceptance into the College of Engineering, it often came with a price -- the lack of good study habits and capable study skills. This was an observation heard time and again --the need to adjust to college level academic demands. The low academic performers in particular realized this and decided to adjust their study habits and skills and stick with it so as to attain their educational goals. The unsuccessful academic performers, on the other hand, were unable to successfully act on the realization that they needed to take a proactive role in adjusting to college level academic demands. They attributed their difficulty with adjusting their study habits and study skills to personal problems and depression, which resulted in feelings of "being stuck," discouragement, helplessness, and in extreme cases, despair. They added that their emotional state made it difficult for them to take the necessary action to assuage their academic difficulties. Thus, the unsuccessful academic performers' level of participation in the learning process was obviously very different from the low and academic performers. This finding reinforces the findings by Pascarella & Terenzini (1991) that intellectual factors alone do not account for successful college performance.

Not Attending Classes

According to participants, not attending classes meant skipping classes or being always absent from classes. This, they maintained, had a negative influence on their freshman year academic performance in various ways. For example, it was difficult to do homework or complete assignments because the material was not understood, which resulted in not doing homework or doing it incorrectly. Attempts to study and especially to do well on tests were a struggle since participants did not attend the lectures. Moreover, it was difficult to get academic help from professors because they had not established in-class contacts with them. They said

that their habit of not attending class contributed to their poor academic performance and

ultimately landed them on academic probation. The participants who did not attend classes on a

regular basis believed that they did not learn material due to their frequent absence from class.

Repeated absences were frequently mentioned by participants as a significant contributor to

falling behind, subsequent poor performance, and feelings of discouragement. The following

statement illustrates this point:

> I got so I never went to class and so I would suck on the homework. And
> I just kind of gave up. And it's really horrible thing to do, but I just would
> get so frustrated. I was so amazed because last semester I like make
> friends with my lab partner in my physics lab and he helped me … like I
> had bombed on the first test, and I talked to him about it. "Well, I'll help
> you." It's like the genius guy, this Dean's List guy. And so I went and
> worked with him and one of his friends and just having that extra little bit
> and NOT giving up on it -- I learned SO MUCH more, it was just
> amazing. But yet I still find myself wanting to fall back into that giving
> up because I'm so overwhelmed. **(LWF)**

In addition, students cited specific attendance and resulting performance difficulties with

classes that they had not been able to "place out of" from high school, and were thus, to some

extent, repeating during their freshman year. A student's compromised performance in a class

that he or she was essentially repeating (at least they believed that to be the case -- often

wrongly) was attributed to the fact that the individual assumed the material would be sufficiently

familiar to enable reduced class attendance. The following statement clearly illustrates that

point:

> And I remember signing up for it, given the impression that I could test
> out of it, and then they told us that the whole test was going to be pre-
> calculus. And I got out my pre-calculus book and I was studying for this
> test because I was going to pass it, and it ended up being a bunch of stuff
> that I had done in high school, but I hadn't looked at it in two years, on the
> test. It ended up being more calculus than I expected and it's stuff that I
> could have done had I been given the chance to prepare for it. And I
> wasn't. So I was stuck in this pre-calculus class. I went to it half the time,
> and I never did my homework. It should have been an easy-A class, but I

remember that. Because I was in this class, they wouldn't let me in EF my first semester and I got behind and it kind of got me discouraged. **(UWF)**

These students also noted that their continued absences from class resulted in not having any in-class contacts with their professors, which made it difficult for them to establish a helpful rapport with that instructor. This, they believed, made it difficult for them to seek help with material not understood and failing such classes. The following statement illustrates this point:

I didn't have a very good class attendance and that really had a very negative effect. And also I had absolutely no communication with my EF professor. So I think better communication with him might have helped things a lot. **(UWF)**

The unsuccessful academic performers said that their repeated absence from class had a substantial negative influence on their academic performance -- a consequence for which they held themselves fully responsible.   The perceived negative influence of not attending classes on academic performance is illustrated in a statement above.

Not Attending Help Sessions

Participants believed that not attending help sessions had a negative influence on their academic performance. They said in hindsight that attending help sessions would have had a positive influence on their academic performance, because it would have provided them with the opportunity to have material clarified and their questions answered. They said that in many cases their psychological immobility as a result of personal problems and depression precluded them from taking advantage of the help sessions that were offered in some of their classes during their freshman year. Consequently, they felt discouraged not only as a result of depression, but also as a result of having realized that attending help sessions could have helped their academic performance.

Some participants admitted that after having fallen so far behind in schoolwork, they gave up completely and dismissed even the idea of attending help sessions to ameliorate their

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academic situation. Looking back, however, all those students believed that attending help sessions would have helped improve their academic performance. They also added that avoiding help sessions precluded any possibility of learning material well enough to succeed at tests, which resulted in their freshman year poor academic performance. The following statements illustrate this point:

> And so I had a lot of problems with depression and stuff my first semester. And it didn't seem like there was anywhere to turn and, of course, there were tons of help sessions available, and I never really went to any help sessions or anything like that even though I probably should have. **(UWM)**

> I never really went to any help sessions. It was just kind of like a learned helplessness thing, And it didn't seem like there was anywhere to turn. And the sad thing, I knew about them, and I still chose not to go. **(UWM)**

> Well, I actually had some interesting experiences just prior to coming here. I had been engaged to be married to a girl, and I'd been engaged to her for a year and a half and things suddenly went sour with that. And so I had a lot of problems with depression and stuff my first semester I never really went to any help sessions or anything like that, even though I probably should have. **(UWM)**

The unsuccessful academic performers were especially vocal in stating that avoiding help sessions had a strongly negative impact on their freshman year academic performance. As with the other respondents, these students attributed their absence from help sessions to the emotional paralysis that resulted from personal problems and depression. They were further immobilized by their overall discouragement, which made it difficult for them to seek help to remedy their academic difficulties. This outlook only reinforces the finding that it is the involved student who expends the effort to use university resources (Astin, 1984; 1993b; and Pace, 1984), and is predisposed to seeking assistance, such as attending help sessions (Zimmerman, 1990).

Poor Time Management

Poor time management is defined by participants as (1) not making time to study and (2) spending too much time on social and extracurricular activities -- both of which had a negative impact on their academic performance. Students noted that their poor use of time negatively influenced their freshman year academic performance because it resulted in their failure to devote sufficient time to schoolwork, getting behind in classes, continually having to play "catch up," and not learning material well enough to do well on tests. Many students reiterated the difficulty they had in balancing schoolwork and extracurricular activities, which made keeping up with schoolwork more and more problematic. Many students' difficulties with managing time was believed to have negatively influenced their academic performance, as illustrated by the following participants' statements:

> Well my first semester freshman year, I only took 14 credits and my workload wasn't that hard. But I still struggled trying to get to my elective classes, or something like that because I didn't take them really seriously, and I STILL kind of don't. I have a little trouble prioritizing very much. **(LWF)**

> I don't like being penned up in rooms all the time and I've always liked to go hiking and camping all those kinds of things. And it was really hard with my workload always having to be inside. Sometimes I would just throw my books down and just be like, 'I can't. I can't take this any more. I just have to go away.' I would leave school for like a weekend and sometimes just leave. I was getting stressed out. Yeah, I had really bad time management. My priorities were all screwed up too. **(UWF)**

Some students also mentioned that the ease with which they earned good grades in high school gave them the false impression that a similar level of effort would be sufficient to meet college level academic demands. Many soon realized, however, that not putting enough time and effort into studying eventually resulted in below expectation academic performance. The following statement illustrates this point:

Well, as I said, I mean I learned some things about college in that time. And all I tried to stick to what's important, what I'm here for. I'm not perfect with it, that's for sure. I still get… I still like to take a lot of breaks and go places and kind of get away from the work sometimes – probably more than I should. Just not studying as much as I would. Like 15 minutes look it over, it just doesn't work. But I just do what I can and try to stick to the class stuff. Because I know what happens when I don't. Let's just say my grades weren't all that great either, a lot less – a lot lower than they were in high school, that's for sure. **(LWM)**

All participants agreed that the initial freedom of being in college and having to make choices between competing demands often resulted in poor time management. Other students attributed the time management difficulties to depression. One participant, for example, reported sitting in a darkened room on a regular basis, avoiding academic demands, and thus falling behind -- a far too common problem in the College of Engineering. The following statements illustrate that point:

Yeah, I had really bad time management. My priorities were all screwed up too. **(UWF)**

I have a tendency to go into deep depressions as it is, and there was just so much stress that I would just not do anything. I didn't really want to look at any schoolwork whatsoever. And that was a very negative impact on everything, especially on my grades, 'Oh it was horrible!' You see the thing with engineering and how I had so many classes and so many things to do all the time. If you take one day where you just sit there and do nothing, you get really, really, really behind. And then you just start giving up because you think you're never going to be able to figure all this stuff out. **(UWF)**

Some students reported that their failure to meeting their academic expectations during the first semester taught them the critical importance of time management skill, such as having to consciously schedule their use of time, as indicated in the following statement:

And like, I guess, time wise, managing my time. I had no schedule whatsoever. Whenever I have work to do, I usually just wait to the last minute. And that's when I usually end up doing it. I found myself procrastinating more when I got here than in high school. My first

semester grades were not so good, and I did more work second semester my freshman year. And my grades improved. But I guess it's that in high school like you said earlier, that you can do like 45 minutes of work and get like straight A's. And then here you do 45 minutes for one class and you still have another 45 minutes to go in that same class. And if you don't do that work, you get behind and then when test comes, you're pretty much screwed. **(HWM)**

In fact, all participants mentioned that they soon realized the need to make better use of their time after their below expectation performance, which they referred to as "wake up call" during the first semester. However, the difference among the students is that the low and high academic performers actually made a decision to adjust their study habits and generally stuck with their plan. They also realized that more effort was needed to earn good grades than in high school. Thus, it was the unsuccessful academic performers who particularly stressed the negative influence that poor time management had on their academic performance. They realized what they needed to do to succeed, but simply did not take the necessary action to remedy their situation. This reinforces the importance of short range planning and time management skills in college (Britton & Tesser, 1991), as well as the necessity to prioritize college work or studies over extracurricular pursuits (Larose & Roy, 1995).

Not Using Resources Or Not Asking For Help When Needed

Participant said that not using academic resources and support services, such as utilizing tutorial services, had a definite negative impact on their academic performance during their freshman year. Many students said that they did not use resources because either they did not how or from where to seek help, or were simply too embarrassed or proud to actively seek assistance. Some stated that they had difficulties handling academic demands for the first time in their entire academic career, and thus were not accustomed to seeking and using available support services. They added that they did not want to be seen as struggling, and some even

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believed that they truly did not need outside assistance. One participant attributed poor

performance in a specific class to not using the tutorial services offered in the Student Assistance

Center in the College Engineering. All in all, the students generally claimed full responsibility

for their inadequate performance because they believed it was up to them to seek help and use

the available services to remedy their academic difficulties. The following statements illustrate

their rationale for not using resources or asking for help during their freshman year:

> Back then well, still somewhat now I tend to be very shy. I don't know
> how to reach out. And I didn't know where to go for help. I DO think I
> probably knew about the free tutoring, but there was no way you could
> have ever gotten me to get tutoring because it would have been just too
> much for me to handle. I was too shy to show up on my own and I would
> have needed somebody to just kind of drag me by the hand there until I
> got comfortable with it, and then I would have felt comfortable going back
> on my own. **(UWF)**

> I think my biggest problem was I didn't go anywhere. I didn't know
> where to go and I really didn't feel like I had anywhere to turn. If I
> couldn't do it on my own, it didn't get done. I had a pride issue. If you
> had to go for extra help, that meant you were stupid. So I was afraid to do
> it and I was terribly, terribly shy. So even when I knew I had a problem
> and I knew I needed help, I didn't know how to tell anybody that I needed
> help. And I'm STILL getting over that, but I'm learning that there are
> some professors you can actually talk to **(UWF)**

> Well, the first thing that sticks out in my mind is failing EF. BIG, BIG F.
> And looking back in a way I kind of blame myself. And I'm trying still
> not to blame myself for failing the class, like before first semester
> freshman year, I didn't think I needed to go to the Tutoring Center. I
> could have gone to get help from the tutoring center. **(HBF)**

As noted earlier, some students attributed their difficulties in using available academic

resources to emotional paralysis resulting from personal problems and/or depression. However,

these students also took full responsibility for their level of academic performance as a result of

their refusal to take advantage of available resources. One participant mentioned being aware of

the Counseling Center and how it could have been helpful to his situation. The following statements illustrate this point:

> Just the wide variety of tutoring services that are available. Like the tutoring services that are available. Like the tutoring services they have in the Student Assistance Center. And they have electronic tutoring and at the Math Emporium they have tutors there. I could have gone to them for some help with multivariable calculus and I never did. And that could have made a world of difference. **(UWM)**

> I broke up with my girlfriend that I had been going out with for like 4 years. And it was hard on me. ….And so I had a lot of problems with depression and stuff my first semester. And it didn't seem like there was anywhere to turn and, of course, there were tons of help sessions available, but I never bothered to go. And that my family has been having some financial troubles for about four years now. My Dad had retired and then he went into a business of his own again and it hadn't done so well. Now for a change, we're finally making ends meet but still, it's a strained lifestyle. And I mean, in all those things, it didn't go so well as far as mental health for me. And that's another thing I could have gotten help on. I could have gone to counseling or something for that, but you know, I chose not to do that. I guess I was kind of in a state of denial that it wasn't affecting me as much as it was. **(UWM)**

The students cited a variety of reasons for failing to use every available resource to improve their academic performance. For example, the White male low and high academic performers did not use many services because they were not aware of them. The White male low academic performers stated that not using support services was a combination of not being aware of their existence and their overall resistance to using them. They mentioned during focus group discussions that even if they had been aware of the services that they probably would not have used them so as not to be seen as lacking the ability to handle the academic demands of the College of Engineering.

The unsuccessful academic performers, on the other hand, stressed the negative impact of not using available resources on their academic performance. This is another indication that they did not consider themselves active participants in their own learning -- a concept that

corroborates the work of Pace (1984) who reported that students have to put forth the effort to use the facilities and resources provided by the university it they are to enhance their academic performance. In a nutshell, Pace maintains that a student gets out of college what he or she puts into it.

The Math Emporium

Of the many academic intervention programs and support services the students discussed, the Math Emporium (ME) was the most controversial. Some found it helpful; others thought of it as a hindrance. Those who perceived it as a hindrance said that their use of the ME made them feel disconnected from their professors, mostly because they did not have specific professors whose office hours they could use when they needed to have material explained or clarified. Students also mentioned that they did not like the grading system of the classes they took there because it was based on group work and attendance. In particular, they felt they did not have control over their own grades because whenever one or more group members did not clock in at the required time, the entire group suffered from resulting low ratings. They also mentioned that they did not like the fact that the computers available at the ME were different from the ones that were required for their major, and that staff were not very knowledgeable about the resulting software difficulties they were experiencing. Furthermore, many believed that students would have been better served if the ME had not been located off-campus because of the time required to get back and forth -- usually by bus. In other words, if the ME had been located on campus, they could have used their time more productively. The perceived disadvantages of the Math Emporium are illustrated in the following statements:

> We used the Math Emporium because we had to. It wasn't really that
> helpful. Like the Math Emporium they tried to push it as a big help, but
> every time I tried to use that it was pretty much useless. " **(LWM)**

The Math Emporium was just terrible, terrible, terrible! That was the worst experience my freshman year. I hated that place with a passion. **(HWF).**

I know that I took linear algebra second semester and I took it at the math emporium, that was all like tutorial and I felt very disconnected. That was like one of the negative experience I guess I would say I've had. Because I didn't feel like I had anybody to go to. Whereas other classes I was in, we met with the professor every week, you know, or I saw him two or three times a week and I could go talk to him and ask questions, but I had a professor in linear algebra and I would like send an e-mail and I wouldn't get anything back. But it seemed like that professor wasn't responsible for me, therefore it wasn't like I could really go to his office hours. So that was one of the negative things I really felt, like in that class I had absolutely no where to go when I had a problem. **(HWF)**

Can I say something about the Math Emporium, too? I have a severe passionate dislike for the Emporium. I took linear algebra in class and I understood it. And then I took vector geometry because I was like flipped from everybody else's schedule. And I took vector in the Math Emporium. And the problem was we had a lecture one-day a week and the professor didn't have enough time to explain what he needed to explain. And the second problem with Math Emporium is that you don't have enough grades. Like you go to class once a week and the teacher doesn't bother to collect homework. So the only grade you have is whatever you're doing at the Math Emporium, which were you had to coincide with random people in your class that your teacher grouped you up with to do projects on the computer. And the problem was that half the time group members won't show up. Half the time people at the Emporium cannot help you with your problems as they haven't bothered to look at it themselves, and you don't have any teacher to go to. **(HWF)**

Well, the Math Emporium would be a100 times better if it was on campus. The fact that you had to take buses and it takes you a half an hour to get there and back. That's an hour plus whatever you had to spend at the Math Emporium. If it was on campus, like near the drillfield, and no problems, it would be a lot better. A lot more people would go there. And the help would be 100 times better. So if you move the Math Emporium, it would be a lot more helpful. **(HWM)**

I mean, that's what I liked about the Math Emporium. And sometimes I didn't really like being up there a lot. Because it was a hassle a lot of times to go out and take the bus. Catch the bus, go out there, be there for a couple of hours. I didn't mind it very much, but a lot of people didn't like it very much. Because a lot of the stuff you did there, you could do at home with your computer, which was a good thing. **(BM)**

Although participants across all groups were dissatisfied with the Math Emporium for a variety of reasons, most of them emphasized the drawbacks of the ME's off campus location, and the resulting additional travel time needed to access its services.

Peer Interaction Factors

This section is a presentation and discussion of the peer interaction factors that participants identified as helpful and not so helpful to their freshman year academic performance. The first section presents the peer interaction factors that participants identified as having enhanced their academic performance during their freshman year, and the second section identifies and discusses the peer interaction factors they said were not particularly helpful.

Helpful Peer Interaction Factors

The peer interaction factors identified by participants as helpful are: (i) knowing people in the same major; and (ii) engaging in study groups. Students described helpful peer interactions as the personal contacts that made it possible for them to interact productively with fellow engineering students. They said these contacts resulted in easy access to fellow engineering students in their halls, and particularly with upper-class students with whom they could consult and network about schoolwork. In addition, this interaction also made it possible for female and Black engineering students to know other same gender and/or same race students. Participants described how they utilized these relationships with fellow engineering students in a variety of academically enhancing ways. Thus, they perceived these relationships as having a positive influence on their freshman year academic performance.

Knowing People in Major- Residence Halls, Networking, Upper class students, Males and

People with Whom to Relate

According to all participants, knowing people in the same major entailed contacts and relationships with students in the same class, with upper class students in the same major, as well as with fellow engineering students with whom they lived in the residence halls. There appeared to be certain interactions that were specific to certain participants. Examples of these include female engineering students' relationships with male engineering students and with fellow female engineering students, and Black engineering students' relationships with fellow Black engineering students. These relationships were described by participants as positively influencing their academic performance in a variety of ways.

Participants said that, in general, knowing fellow engineering students provided them with ready access to a knowledgeable set of people with whom they could network and consult about schoolwork. According to students, networking and consulting refers to the practice of getting together to discuss class related activities such as assignments and projects. They reported that it was both convenient and supportive to have fellow engineering students living in the same residence hall because of the ease of getting together with them to do schoolwork. This residence hall networking is believed by participants to have contributed to their academic performance, because the opportunity for collaborative work made learning easier and faster. The following statements illustrate the perceived helpfulness of knowing fellow students, which made networking and consulting possible:

> My experience was pretty positive as far as that. I moved in to XXX, which was an all-male dorm. It's quiet, it's small. So I got to know a lot of people and found out people that were in similar majors. Like a friend down the hall was a math major who helped me through my math course load. I didn't really have much of the problems of having to get used to

college, 'Oh you're coming to college.' You know, I found people who would help me out. **(LWM)**

I played XXX in my freshman year. It wasn't so much that I had friends that I met through there that were in my class, because a lot of the kids in XXX were upperclassmen. But it was nice because there were a number of engineers on the team and they were all in different disciplines, so it was kind of nice to be able to talk to them, especially when I was a GE trying to figure out which major I wanted to get into. I'd talk to them to see what classes they had to take, what interests they had, and see if I matched up with anything they were talking about. That sort of helped me get into mechanical engineering. **(HWM)**

But it was really nice to get to know people in your classes that way so that when I did need help, I had friends that I knew that I could call and ask for help. I think that was the best thing I got out of group work was just meeting people and knowing names. Because you've got so many classes with so many people. **(LWF)**

They allowed you to network, get other people in the class that you could probably contact while you're at home with some homework doing problems you don't understand. **(HBF)**

It's always nice to have a couple of engineering students on your hall or your dorm. That's helped out a bunch for me. I'd go out and whoever was still up at 4:00 a.m. and still doing their homework. And that helped out a lot actually. Some of the girls on my hall, we would always get together out in the hallway when we really didn't understand something. But yeah, study groups, those were the biggest help. **(UWF)**

Knowing upper-class students was another relationship paradigm that participants reported positively influenced their freshman year academic performance. Students noted that it was beneficial to know students who had gone through what they experienced during their freshman year, because it provided them with the opportunity to learn how to look at problems from different perspectives. They also said that their practice of combining different problem-solving techniques contributed to better exam performance. The perceived usefulness of techniques learned from upper class students is illustrated in the following statements:

Like they said, the ability to network with upperclassmen was one thing you could do as a freshman coming in. Either knowing people or getting to meet people through organizations. Classes can get hard pretty quickly. Like problems here can get hard, call people up or something. **(BM)**

And it really helps to have a friend who has been there, done that, and knows a little bit of the tricks because it's just nice to go 'I'm doing this problem. I'm stuck on this part. I just need to prove this and this.' And he goes, 'Oh, oh, oh.' He works at it a little bit and then he goes, 'Oh you should just do this.' And then you can take it from there, and you're like, 'Ah!' It's just nice to have someone who's been there and can give you that little bit of insight. Whether or not it's physics, math, statistics, whatever in engineering. But it's nice to have someone who's been there and done that. **(LWF)**

As stated above, participants mentioned that knowing fellow engineering students also afforded them access to students of the opposite gender and students of the same ethnicity. Female students in particular added that their relationships with male students positively influenced their freshman year academic performance because it gave them much quicker access to students with whom to consult, network, and form study groups. It should also be noted that the females felt precluded from doing collaborative work in their residentce hall due to the small number of female engineering students in their college. However, their proactive approach to learning is demonstrated in their actively seeking academic support irrespective of the gender of the students with whom they found to do schoolwork. The perceived helpfulness of studying with students of the opposite gender is illustrated by the following statement:

And then once I started to talk to more people and realize who else had to do the same physics problems as me. Like I went over to XXX and there were like 90% of the guys on this one hall were all doing the same physics homework the night before it was due. And I was like, I need to do this too. And so we'd all like pull together. And I just thought it was like 'Wow, there's no one on my hall doing physics problems today. So I'm just going to come over here,' because there's like 20 people to help me. So it was helpful once you start to realize that. **(LWF)**

Along similar lines, Black students mentioned that knowing and networking with other students of the same ethnicity positively influenced their academic performance because it provided access to people with who they could relate, and subsequently form study groups. The following statements clearly illustrate this point:

> I think that helped me a lot in one way because there were so many people I could relate to and all of us were in General Engineering so it wasn't like we were broken up in Electrical Engineering or CPE. We were all the same, so we were taking the same basic classes, chemistry, calculus, whatever, we just worked together. And I think that helped me a lot. Everybody in the group was Black. Everybody is also going to be able to relate to somebody of your color, same circumstances, everything. **(LBF)**

> I just think the key to making it here is networking. I DEFINITELY think that nothing other than exactly ----If there's nothing else that I learn from here, I know how to network. Wherever I go, you need to always find somebody that you can relate with, and to network. If I had to make it alone---I don't what I would do. I probably couldn't handle it. I mean because I know I have friends. I know I have people I can call on that will understand it, that will explain it to me or people to call me. It's like this big study system. It's like we're all here for one common goal. We need to work together to get it done. **(HBF)**

Low and high academic performers and Black male participants particularly emphasized the positive influence of knowing fellow engineering students. During the focus group discussions they frequently referred to fellow students as a source of academic support. White female low academic performers most frequently stated that studying with students of opposite gender positively influenced their freshman year academic performance. Correspondingly, the Black participants spoke often about the benefits they derived from studying with fellow Black engineering students. The fact that engineering is a non-traditional major for females and Blacks makes this a noteworthy finding.

During the focus group discussions with Black students, it became apparent that identifying fellow Black students with whom to relate was very important to them due to their enrollment in a predominantly White institution. They utilized their relationships with fellow

Black Engineering students for both emotional and academic support. They made contacts with fellow Black students primarily through their participation in the OMEP's BEST support groups. The Black participants had to have been active participants in their learning process for such relationships to have positively influenced their academic performance. This finding reinforces DeSousa and King's (1992) finding that Black students are capable and willing to take advantage of the available resources to enhance their academic performance when encouraged, despite the isolation and alienation of being in a predominantly White institution. Another observation related to this finding is that male participants did not identify any advantages of studying with females; nor was there any mention of Black and White participants studying together. It is not known whether this is unique to the participants of this study or a prevalent occurrence within the College of Engineering.

Study Groups

Participants across all groups said that forming study groups or studying in groups as a result of interacting with fellow students had a positive influence on their freshman year academic performance. According to participants, study groups involved working collaboratively with fellow students on schoolwork. Participants said that they derived various benefits from participating in study groups. Students believed studying in groups made learning easier, improved their course grades, made it possible to receive feedback from peers about their writing skills, made studying and learning faster through a team effort, made it possible to have material explained from a different perspective, learned from helping fellow students, provided different ways of solving problems, and helped in preparing for tests. In particular, participants said that studying in groups made learning easier, because it provided them the opportunity to work collaboratively with fellow students on difficult material instead of struggling by

themselves. They indicated that they saved time doing work this way, and that it improved their

exam performance. Moreover, although they would be involved in a study group for a specific

class, students indicated that they would frequently consult with each other about other classes.

Thus, the helpfulness of study groups was a relatively expansive working focus, rather than

relegated to a single topic or focus. A participant explains how study groups made learning

easier:

> The other thing is also studying in groups. I know in EF both semesters
> we were stuck in these study groups and they helped me out a lot, not only
> in that class, but you also had contacts for your other classes. You could
> talk to the same kids and say, 'Well, how are you doing in calculus? Do
> you understand this because I need help with it.' And you know they'd
> talk to you about other classes. And it ended up working really well. You
> end up getting help other than from the professor, from other people who
> might have a different idea of how to do it. And then they also, maybe
> their way is a little bit easier. Just another opinion. Definitely when you
> have 2 minds together rather than one, you get a lot more out of it. I
> mean, if you don't understand something, then maybe the person who
> you're working with or the group of people can fill you in and help you
> out. **(HWF)**

Overall, participants said that studying in groups with fellow students was critical to their

freshman year academic performance. In fact, one student directly attributed an improved

second semester performance to his participation in study groups. The following statement

clearly illustrates participants' perceived helpfulness of study groups to improved academic

performance:

> I think group work, working with people, getting in groups is the key. I
> think a lot of professors sort of put a little emphasis on working in groups,
> especially in EF, you know, study groups and things like that, because it's
> not really a violation of the honor code. You're still learning and stuff.
> Working with other people is the key. And in the second semester it was
> shown, because I did really well in the second semester and we worked in
> groups the whole time. **(LWM)**

Echoing this statement, several students noted that their participation in a study group organized for an English class afforded them a peer-review opportunity for their papers, which was instrumental to their good performance in that class. As one student summarized:

> Well, I know my first semester, Freshman English class. We had a really tough professor. He expected us to write like English majors, he treated everybody like they were English majors. He expected you to be a great writer when he read your paper. And not many of us were all freshman English students. So what I did, I started a little workshop thing within the class that we'd meet a week before papers were due, or a couple of days before a paper was due. And we'd just go over each other's papers and proof read it. And actually I think it helped a lot of people. I mean, I started getting A's on my papers after that. And so did a lot of other people. So I think that helped a lot. Again, it's going back to that thing with groups. **(LWM)**

Participants also noted that learning was enhanced through their participation in study groups because poorly understood material could perhaps be better clarified by a fellow student. In fact, several students reported that having material explained during study groups made learning difficult material easier. The following statements illustrate the helpfulness of having material explained by study group members:

> But classes such as lecture classes, like biology, I've come to the conclusion that that is when you need to get in groups and terminology. For example in trying to learn what carbohydrates mean, 'Carbohydrates mean this, this, this, this, this.' And saved me time instead of flipping through the book, reading something I still don't know what that it means. Somebody can say, well this is what it means. We're on the same level kind of that sort. **(HBF)**

> The people that I studied with actually taught me the most, especially my first semester EF when they were willing to include me in part of the group and they were willing to catch me up where I was deficient. That's where I really learned the most. I definitely think that studying with peer helped the most, definitely. **(UWF)**

Moreover, students who participated in study groups stated that they retained important information more readily from having explained the material to fellow group members. In short, they indicated that they had to know the material well to be able to explain it to group members.

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Thus, participants believed the process of explaining material to study group members was believed by participants to have reinforced their own learning and retention of material. The following statements clearly illustrate this point:

> I know I really know a topic if I can explain it to somebody else. I mean that helps a lot that I have a lot of friends in EE and CPE. If they'll come to me for help, if I can sit down and explain the topic to them, like we'll be studying for a test and if I can sit down and explain the topic to somebody else, it means that I have it really set it in my mind. I know what's going on and it's OK for me in my mind that I can sit down and do the problems. You know, if I can explain it to somebody else and help THEM through it. **(HWF)**

> And after that, then people come to our room and we go over problems. What helps me better is like when I have to explain to them the problem and how you went ahead and solved it. What my processes to solve the problem were. So that's what I did. I definitely think that studying with peer helped the most, definitely. If people are asking you for help and you're helping them that helps reiterate it your mind. It gives you a better understanding of it. Because you can't teach unless you know. **(HWF)**

Studying in groups was believed by participants to have helped their academic performance by providing them with different problem solving techniques. They added that learning material was made easier through the availability of fellow students with whom they could combine their own problem solving techniques with different ways of deciphering problems. The following statement illustrates this point:

> I found that working in groups helped a whole lot. Because sometimes, especially now, in engineering. It's like if you work in groups, you have like more than one person, which is more than one idea, which can solve the problem faster and you are closer to the right answer. So I think working in groups helped a lot. That way it's actually more efficient. **(BM)**

Students also reported that studying in groups was helpful in preparing for tests because it made it possible for them to identify the material that they perhaps had not sufficiently learned.

The following statements illustrate participants' perceived helpfulness of study groups in test preparation:

> I know I really know a topic if I can explain it to somebody else. I mean that helps a lot that I have a lot of friends in EE and CPE. If they'll come to me for help, if I can sit down and explain the topic to them, like we'll be studying for a test and if I can sit down and explain the topic to somebody else, it means that I have it really set it in my mind. I know what's going on and it's OK for me in my mind that I can sit down and do the problems. You know, if I can explain it to somebody else and help THEM through it. **(HWF)**

> Yeah, I agree. It was studying with my friends or whoever else I could study with. It was usually right before tests is when things would click. And that's usually when I learned the most. Because I didn't learn in class. **(UWF)**

> Well, I guess as far as activities, probably what helped me the most was studying in groups, I guess. I guess studying in groups is about the only real activity that I did a lot of, the only thing that maybe I can say helped me quite a bit. Of course, you can sit there at your desk alone for 6 hours a night before a test and gawk at a book. But that's all I can say, helped me. **(HWM)**

All participants, regardless of academic achievement, emphasized the critical importance of studying in groups for their freshman year academic performance, especially when they were experiencing learning difficulties. However, forming study groups seemed to be most important to the low and high academic performers, as well as to the Black male participants. No matter the gender, race, or academic achievement level, the participants all spoke emphatically about the importance of study groups as a source of academic support. And it was evident that it required a group of involved students to organize and participate in study groups. Thus, this is an indication of the active participation of these students in the learning process. Furthermore, this is consistent with the current literature that collaborative work by students enhances the mastery of difficult course material (Hrabowski & Maton, 1995).

Not so Helpful Peer Interaction Factors

This section presents the findings and a discussion of the peer interaction factors that participants perceived as not being so helpful to their freshman year academic performance. The peer interaction factors identified by participants as not-so-helpful are: (i) difficulty coping with distractions from peers; (ii) difficulty getting along with roommates; and (iii) not connecting with fellow students.

Students indicated that certain contacts and relationships with fellow students had a negative influence on their academic performance. These problematic situations include trying to cope with distractions from other students, as well as with the difficulties that arose from unsuitable roommates. They also reported that their inability to establish meaningful relationships with fellow students had a negative impact on their freshman year academic performance.

Difficulty Coping with Distractions from Peers

Moreover, participants said that they had difficulty early on juggling schoolwork and participating in social activities with fellow students In fact, students reported that participating in too many activities with other students sometimes made it difficult to complete school work because they could not focus on their work. Parties seemed particularly problematic for those students who had difficulty turning down invitations. In fact, attending parties on a somewhat regular basis was identified by several students as having had a negative influence on freshman year academic performance. They explained that going to parties made it difficult for them to stay focused, resulting in them falling behind in their schoolwork. Participants also believed that their associations with students who frequented parties and other late-night outings made it difficult for them to attend classes on a regular basis. The following participants' statements

illustrate the perceived negative influence of coping with distractions from peers who partied on

a regular basis:

> Well, the thing that I had to adjust to when I got here was like the distraction available. I come from a little bitty town in XXX. A real small high school, and there isn't a lot of stuff going on. You know, you can really keep at your work and things and like that. And when I got here, I got put in XXX and it was a zoo. There was so much stuff going on and so many things going on in the college in general. You know, parties everywhere and just all kinds of stuff, and it was really easy to kind of lose focus. So that's kind of what happened for a while. And I had to try and stay away from all the distractions in order to get things accomplished. **(LWM)**

> I'd say definitely the type of people you live with or hang out with, just because I think it's hard to do well living in a dorm because there's constantly like 10-15 guys coming out and trying to get to go get into some mischief. And so I have a problem with that -- usually taking me away from my studies and do whatever. And a lot of times I'll stay out or staying up real late and then waking up and it's hard to get up and go to class. And even when you do make it to class, you'll sit there and be just incoherent. There's a lot of distractions just because there's so many people. **(UWM)**

> I actually came to school here with one of my best friends from back home. She came in as University Studies and I came in as Engineering and our work was completely different in every way…. Every day we would go out. We have freedom, you don't have a curfew, and things like that. And all these new people and things like that. I don't know, I partied way too much first semester. She wasn't very agreeable as far as like staying focused on my studies. She was like, 'Come on I'm going out. Come with me.' So partying was a big thing…(UWF)

> There was so much stuff going on and so many things going on in the college in general. You know, parties everywhere and just all kinds of stuff, and it was really easy to lose focus. So that's what kind of happened for a while. And I had to try to and stay away from all of that distractions in order to get things accomplished. (LWM)

With regard to living in residence halls, students observed that their freshman year

academic performance was negatively influenced by some of the contacts and relationships they

established with certain residence hall students. In particular, these students said their own

performance was negatively impacted through their association with roommates who

procrastinated, watched excessive TV, or attended many parties. Participants also reported that

rooming with a non-engineering student could be a disadvantage because of the fact that other

academic disciplines tended to demand less of their students. Thus, non-engineering students

tended to have more time on their hands for watching TV, attending parties and other such

extracurricular activities. Unfortunately, some of the students interviewed for this study were

tempted to do the same, which made them fall behind in their work, which resulted in below

expectation performance. The following statements illustrate this point:

> My roommate was as wild as can be. And it sort of that rubbed off on me to
> a degree. Whenever she procrastinates, I do. And she watches TV. It's her
> TV. She's in control of it and I can't do anything to stop her. And I feel like
> – I don't want to be really mean about it. I feel like a little confined.
> Whereas if I had an engineering person who was going to be working and
> more dedicated than that – that would help me A LOT. It really would help
> me a lot, because I would be in a situation where I would be more willing to
> do my work. I'm kind of distracted. **(LWF)**

> Most of my really close friends aren't engineers, so that was hard at first to
> make the adjustment. I did go to a lot of parties and stuff my freshman year,
> first semester at least. And to just kind of make the balance when they're not
> on the same course load as you, is hard, but it would be so easy to be so
> many. . . I think that's the difference between a lot of the girls in engineering
> and a lot of the guys. For all the girls I know because of who's on your hall,
> you're more likely to make girl friends who ARE different majors. So you
> do have a social life. Whereas the guys – every hall you go on this campus
> that is a guys hall, you can bet that a good percentage of them are in
> engineering. So it's easy for them to get sucked in with each other, and then
> they have these friends, but they have no social life together. **(LWF)**

> My roommate was a I don't want to say a party-animal, but her whole
> college life was about student relationships and friendships. She would talk
> on the phone, she'd talk on the computer and she'd make sure she went out a
> few nights a week. And at first it was really intimidating. I was like, I have
> work to do and I can't … I love her to death and she's an awesome girl. At
> first it was hard to adjust because … but it was also hard to adjust to the
> whole college lifestyle. **(LWF)**

> I actually came to school here with one of my best friends from back home.
> She came in as University Studies and I came in as Engineering and our work
> was completely different in every Everyday we would go out, we have

freedom to do whatever we liked, you don't have a curfew, things like that. And all these new people and things like that. I don't know, I partied way too much first semester. She wasn't very agreeable as far as like for my studies. She was like, 'Come on I'm going out. Come with me.' And I tried really hard. First three weeks I was really a hard-core student. I did my work because I was all psyched up to be in college because I wanted to do really well. So partying was a big thing, and actually the guy that I dated for a semester was an engineering student and that kind of helped. But when things got rocky – relationships really do have a really big impact on your academic performance" **(UWF)**

The negative influence of peer interaction in the form of distractions from fellow students was primarily mentioned by unsuccessful academic performers. Even though it sometimes became a problem for low and high academic performers, as well as for Black male participants, these students adjusted to these distractions by choosing to associate with people who had similar educational goals and aspirations.

Difficulty Getting Along with Roommates

Roommate difficulties were also perceived as negatively impacting freshman year academic performance. One participant said that she did not get along with her roommate because of their different sleep patterns, in addition to the fact that her roommate always had people in the room. Their different sleep schedules were a source of conflict because when she wanted to study, her roommate wanted to watch television or listen to music, or vice-versa. In addition, she reported that her roommate's steady stream of visitors made it difficult for her study in the room -- so much so that she often could not even access her room for the books that she needed to study for tests. The following statement illustrates the impact of her difficulties with getting along with her freshman year roommate:

Also my roommate just wasn't making things easier, oh boy she was definitely difficult to get along with DEFINITELY. We seem to have a different sleep schedule, which meant that we always had to try to be quiet around each other. And she would constantly have people over…And it just that there was nothing I could say to her because she had such an attitude about everything. It was just 'This is what I'm doing. I don't care

about you.' I couldn't really study at all in my room because I was almost afraid to go into my room, most times because of the people she would have in there. I ended up going to other people's rooms and just could not do any work in there. I mean I didn't have any of my studying materials there or anything. It would just be, 'Well, when can I go back to my room?' I need to study, I have a test tomorrow, I left my book in there and I can't go back for awhile. **(UWF)**

Not Connecting with Fellow Students

Although meaningful relationships with other same-discipline students were reported to be beneficial for many students, some participants observed that their inability to establish relationships with fellow engineering students had a negative influence on their academic performance during their freshman year. In particular, they noted that not establishing relationships with fellow engineering students made it impossible to participate in study groups. Thus, these individuals did not have a core peer group with whom they could study, network or consult. They complained that as result of not knowing fellow engineering students with whom they could study, they struggled with or failed to complete homework assignments involving material they did not understand. The following statements clearly illustrate this point:

> My freshman year I really would have benefited a lot from study groups. But I really do feel like I was all alone, and I knew a couple of other girls. Like the girl that ended up being my best friend was an engineer, but she was in all the classes that I couldn't take my first semester. So she was ahead of me already. I didn't know anybody that was in the same boat so it was really hard for me to meet people that I could study with. **(UWF)**

> I think my biggest problem was I didn't go anywhere. I just couldn't find anyone to work with. I didn't know where to go and I really didn't feel like I had anywhere to turn, so I didn't. If I couldn't do it on my own, it didn't get done. **(UWF)**

The unsuccessful academic performers were the only participants who mentioned difficulty getting along with roommates as a negative influence on their freshman year academic performance. They added that they felt helpless about their living arrangements and did not

know what to do about the situation -- another indication of this group's difficulty in seeking assistance to remedy difficult situations. Moreover, the unsuccessful students were also the only group to cite not knowing fellow students with whom to form study groups as a negative influence. This is an indication of their lack of integration into the community in which they were trying to function (Tinto, 1993). This group of participants had not established relationships with fellow students from whom they could draw emotional or academic support.

As can be seen in this section, even though most participants thought interacting with fellow students was helpful, it was sometimes perceived as a hindrance by others. The low and high academic performers and Black male participants acknowledged that the type of students with whom one chooses to associate can influence one's academic performance. The students whose interaction with fellow students negatively influenced their freshman year academic performance obviously interacted with students who, like themselves, did not have good study habits or skills, and who also did not place a high priority on their academic performance. This finding is consistent with the literature that the likelihood of peer interaction exerting a positive influence on a student's academic performance is to some extent based on the educational values of the peer group or the peers with whom he or she interacts (Pascarella & Terenzini, 1991). It also reinforces the finding that the student's peer group is a strong source of influence on growth and development during the undergraduate years (Astin, 1984, 1993b).

Faculty Interaction Factors

This section is a presentation and discussion of the faculty interaction factors that participants said were helpful and not so helpful to their freshman year academic performance. Faculty interaction factors identified by participants as helpful to their freshman year academic performance are: (i) professors' teaching styles; and (ii) meetings with professors for advising

during their office hours. The not so helpful faculty interaction factors identified by participants are: (i) professors' teaching styles and attitudes; and (ii) not using office hours.

Helpful Faculty Interaction Factors

The helpful faculty interaction factors are defined as the contacts with professors inside and outside of the classroom that participants perceived as helpful to their freshman year academic performance. These include professors' teaching style, as well as meetings with professors for advising and using their office hours.

According to participants, the teaching styles that exerted a positive influence on their academic performance were those that made it possible for them to learn material through hands on activities. Students also spoke positively of professors who encouraged them to work in groups, and who sufficiently stimulated their interest in the material for them to learn. They said that meetings with professors were beneficial because such informal associations helped them feel more comfortable and confident in their classes. Participants said that professors with effective teaching styles had a positive influence on their freshman year academic performance because they made it possible for students to better understand course materials. Participants also said that meeting with their advisors helped them to register for appropriate classes.

Professors' Teaching Styles

Participants reported that professors whose teaching styles included the use of group design projects to teach concepts positively contributed to their academic performance because it helped them to learn the material more quickly and retain information more efficiently. The design project, a course requirement, entailed the practical application of material presented in class, which was frequently reported to have made it possible for students to have hands-on experience with material. Participants also noted being divided into groups for their design

project made it possible for them to know fellow students with whom they could establish

contacts and relationships. Such contacts, they added, made it possible for them to become

familiar with fellow students with whom they could consult or network about their classes or any

others concerns they had about their major. Participants also said that the use of group work as

part of professors' teaching styles made it possible for them to learn how to work in a team

setting, which would likely be important in the workplace.   The following participants'

statements clearly illustrate this point:

> Going back to the group work, I liked anything hands-on, especially with the group work. It just made everything more interesting. Once again, the design project, we tried to build our project, which was going to be a cup that we could drink from without tipping it. And it just made you think a lot more when you're trying to build it, for example, about what had to be done, that we wouldn't have noticed things. I don't think we would have noticed as much if hadn't tried to build it ourselves. That was just the best experiences, playing around with it and seeing how things worked. That was a lot of fun. **(HWF)**

> Second semester EF, Engineering Fundamentals. The professors there were just excellent for me and they helped, really encouraged me into my field and stuff like that. Got me really interested in engineering…..Especially getting us into groups. That was pretty, you know, helped me learn. If I had trouble I'd go to my group members and they'd help me out, pretty good stuff there. **(LWM)**

> Another point that was brought up is getting in groups. I like the second semester EF project because it was kind of mandatory. You had to get into a group and you HAD to do it that way. I think if that would have been done earlier — the fact that it was made mandatory, made it a little bit easier because you don't naturally... You don't really think you have time to go out and meet people. You're trying to get adjusted, to get settled. You don't really go out and look for people in your major. ….the fact that it was assigned made it a lot easier to do because you had to do it. You had to go out and meet people and it made it a lot easier to do., because it wouldn't be something that I'd really do on my own. It's like going to seek out people to form like a study group, which is something I would never have thought of before. Because I never needed to do it in high school. **(LWM)**

Participants said they found professors' teaching style helpful to their academic performance when they presented material in such a way as to stimulate their interest in the subject. It was believed by some participants that a professor's engaging teaching style could transform an otherwise boring course into an important learning opportunity, which often resulted in improved class performance.   This point is illustrated in the following statements:

> Oh yeah. If the teacher is going to be boring, then you're just going to sit back. But if he's like a I'd like to say a militant kind of person go up there and he would lay it down. ………I don't think I'll ever forget him. I also had another teacher named XXX, actually. He's a XXX teacher. He was something else too. They were exciting teachers. They were wild, I'll tell you that. They were great. **(BM)**

> He was a XXX teacher. At first, I came in not very interested in XXX. But the way he taught it, you know, he showed us things, and he introduced it in a different manner, a more exciting manner. And that changed my perception of what he taught right here, XXX. And I came in with a fair attitude towards it, but after that I came out with an appreciation for it. They were able to hold my attention and to get interested. They were captivating, I'd say. I mean, I'd be in all my classes and stuff like that, but they were just different from anything I've ever seen in high school and here, so far, even to this day. **(BM)**

The positive influence of professors' teaching styles on academic performance was primarily emphasized by low and high academic performers, as well as by the Black male participants in this study. The teaching style of a professor who required a design project was described as effective because of the hands-on learning opportunity provided through such an assignment. They added that by completing the design project they had an opportunity to apply the material presented in class, which also served as an assessment of a participant's knowledge of the material. In the focus group discussions, students said that they had to understand the concepts well enough to be able to complete their design projects, indicating their active participation in the learning process.

Professors' Advisory Role

Participants said that their meetings with professors for advising had a positive influence on their academic performance. According to one of the students, her professor offered her critical academic support after her poor performance during the first semester. This participant said that she was very discouraged by her poor performance in the first semester and indicated that she would not have returned to school without the encouragement of this particular teacher, who also happened to be her academic advisor. She said that it was due to her professor's help that she was able to take courses that were not overwhelming, and thus to perform at level whereby she could remain in school. Her perceived helpfulness of her professor in assisting her with registering for classes is illustrated in the following statement:

> Really, my first semester of my freshman year – It really screwed me over bad. Like it put me on academic probation. It totally discouraged me. I wanted to… I didn't even want to come back the second semester. I wanted to get out of engineering as fast as I could. I went and saw my advisor and he helped out a lot. He was my EF professor and he's a really nice guy who's always been helpful from the very beginning. I was definitely fortunate to have him as my advisor and he has helped out a lot. And my second semester of my freshman year, I didn't really take any engineering courses. Because it was running me ragged. **(UWF)**

The positive influence of a professor/advisor was reported by an unsuccessful academic performer, who described this instructor's advising style as caring and supportive. During the focus group discussion this student revealed that she felt comfortable interacting with this professor, and believed that she owed her being able to remain in the program to his guidance regarding appropriate course selection.

This, then, is an indication that this participant must have been sufficiently impressed with her advisor to remain in the program. This corroborates Pascarella and Terenzini's 1991 finding that a student's out of class interaction with faculty contributes to his or her persistence in college.

Professors' Office Hours

According to participants, professors' office hours are times designated specifically by professors to meet with students outside of the classroom. Participants said that their contacts with professors during their use of professors' office hours helped their freshman year academic performance in various ways. In particular, they noted that office hours provided an opportunity to have poorly understood material explained and clarified, which was believed by participants to have facilitated their learning of the material. The participants said the opportunity to have material explained during their use of office hours on an individual basis was especially helpful for their larger classes where they could not have their individual questions answered. They also reported that a professor's accessibility and availability to offer academic support made their learning faster and easier. In some cases, students noted that having a professor confirm that they were on the right track with their work, helped in building their confidence in learning the material. The following statements exemplify how participants perceived the effect if their use of professors' office hours on their learning:

> Yeah, it was lot less painful to enter into a dialog with your professor than to sit and try to do it on your own because the book doesn't give you answers. The book has the information but it's up to you to find your answers. If you talk to the professors and say, 'Well, Is this right?' Well, you're almost right, you're just wrong on this point.' It's a lot faster and easier to learn things than to try to figure it all on your own. **(LWM)**

> Second semester XXX was my beast of burden. I understood like the concepts made a lot of sense, but going to my professor really helped out. He was very personable. Like he worked better with a small group of people than he did with a large group. He translated much better and made sure that if you didn't understand it, and you did not understand when you left, then he'd even like follow up in class. He's be like 'Oh yeah, I know some people have been having problems with this.' And he'd like really work it out **(HWF)**

> But the one that stuck out in my mind. You said, when we go to see teachers. Freshman year I had a lot of trouble in XXX, first semester, because I had never ever had a course that was that hard for me. So, we

would go a lot… Like I didn't understand it when he would say it in class – I think partly because it was 8:00 in the morning and my brain was just not on. So, the problem was that the professor didn't make sense to me in class, but when we would go to see him, he was extremely helpful. He was real nice, and he really made sure that you understood what you were doing before you left his office. **(HWF)**

Students also reported that using a professor's office hours afforded them the opportunity to know their instructors on a more personal basis. In addition, participants stated that their use of office hours helped them in preparing for tests by obtaining their professors' guidance on what to focus on in preparation for tests.   The following statements clearly illustrate this point:

I also liked the fact that a lot of my professors, like my first semester especially, I got a lot of really friendly professors who were very helpful. I could go to office hours. You know, they had like 6 or 7 a week, and so it was really helpful for me to be able to go in and say, 'OK, well I didn't get the individual attention I needed in class.' But I could go outside of class, you know, if I was self-motivated I could go outside of class and talk to my professor if there was anything I needed to clarify. **(HWF)**

I would have to say for myself, I find it pretty good to go in and see your professor, especially if you're in a bigger class. Because I know that helped me out in XXX and XXX. I'd go in and get help with them and I've never had a professor who really didn't help me out. They'd always lead me in the right direction, especially around test time. Um, if they know your face and you come in for a little extra help, I think you always get a positive effect from that, knowing them. They do help you out, lead you in the right direction, maybe tell you what to study more than others, if you do know them. Because I know my XXX professor, I was in there usually once a week and he really helped me out. And I think that greatly helped, just going in to see him. It helped my grades. **(HWM)**

I find it pretty good to go in and see your professor, especially if you're in a bigger class. Because I know that helped me out in calculus and physics. I'd go in and get help with them and I've never had a professor who really didn't help me out. They'd always lead me in the right direction, especially around test time. Um, if they know your face and you come in for a little extra help, I think you always get a positive effect from knowing them. They do help you out, lead you in the right direction, may be tell you what to study more than others. **(HWM)**

And I was like, OK, well I'll just go see the professor and maybe I can, first of all, understand what I'm missing, and then also maybe get help from here on out. And I went in that week and found out that there was a

good 20, 25 other people that go in there and had the same problem. In fact, the professor ended up moving his office hours from his office to classroom, just so he could fit everybody in there. It was basically a homework help session. He would go over all the problems and tell you how to do it and then basically you just write down what you wrote down off the board, make sure you understood it and turned it in. My grades went up from there. **(HWM)**

As noted above, students said their use of office hours provided them the opportunity to get to know their professors better, which made it easier to communicate with them about any problematical aspects of class. Thus, they felt at ease in asking for clarification about material not understood, which made learning the material far less stressful because they did not have to struggle with the material on their own. Participants believed that their use of office hours facilitated their learning, while at the same time provided them the opportunity to develop relationships with their professors. Consequently, they found learning less stressful and felt more comfortable in their classes. This point is illustrated in the following statements:

Yeah, I agree a lot with XXX. I think a lot of it is self-motivated. Say, like your professor could have 8 million office hours during the week, and if you don't go – then that's not going to help you personally. Like going to office hours – like I probably could have struggled through my classes and taught myself the material, but it made the learning experience much less stressful. It made me feel more like I was competent in what I was trying to do. **(HWF)**

Again, getting to know your professors. I know that's been an IMMENSE help to me. Like I can actually go and talk to my professors and say 'Hi so-and-so, it's nice to see you.' And it makes me feel much more comfortable in class so I can learn better. **(HWF)**

All participants believed that interacting with their professors was critical to their freshman year academic performance. However, low and high academic performers and Black male participants mentioned more the positive influence of using professors' office hours on their academic performance. The unsuccessful academic performers, on the other hand, discussed how the use of office hours would have helped their freshman year academic

performance. Thus, the difference between these groups does not concern the benefits of using a professor's office hours, but rather on whether or not they acted on their good intentions. Low and high academic performers and the Black male participants discussed their use of office hours as a source of academic support. These participants took the initiative to take advantage of their professors' office hours, and thus could be considered proactive in their learning. They expended effort in independently interacting with their professors both inside and outside of the classroom. This finding reinforces other studies that have associated a student's effort in interacting with professors outside the classroom with enhanced learning outcomes (Pascarella & Terenzini, 1991). Furthermore, this finding corroborates Astin (1993b) who reports that talking or interacting with faculty outside of the class has been found to influence students' satisfaction with their college experience.

Not so Helpful Faculty Interaction Factors

Participants who stated that they did not find certain contacts inside and outside of the classroom with professors helpful to their freshman year academic performance specifically stated a professor's teaching style and attitudes both inside and outside the classroom as the principal deterrents. Participants also noted that their inability to establish meaningful contacts with professors outside the classroom resulting in their not using office hours, which had a negative influence on their freshman year academic performance.

Professors' Teaching Styles and Attitudes

Participants said some professors' teaching styles and attitudes inside and outside of the classroom negatively influenced their freshman year academic performance. In particular, they cited a professor's unaccommodating teaching styles and attitudes, especially when questioned about difficult material. Students who cited this as a negative factor indicated that some

professors' presentation style made it difficult to understand material presented in their classes, which resulted in feelings of frustration and discouragement. Many participants also reported that professors would sometimes not answer their questions, which led them to believe that these instructors were trying to "weed out" students from the college. The following statements illustrate the perceived negative influence of professors' teaching styles on some students' academic performance:

> But I didn't like the first semester EF course too much at all. I thought that was kind of a negative thing. I just thought it was way too much junk. I didn't think it was useful. It didn't tell me anything about what I was going into, and it just really felt like they were trying to bring me down. **(LWM)**

> Actually I'm not impressed with a lot of professors that I've had so far. I don't know, my first semester engineering, or first year engineering professors, I guess they were doing what they were supposed to. But I think the idea of the program is to be really hard on you and drive people away. But I thought they were trying too hard. It was ridiculous how you know, you'd ask them a question and they wouldn't answer it. And it just seemed ridiculous to me, I thought. **(LWM)**

> It was very stressful, sitting in class and not knowing what the man is saying. And he would just go off on tangents and just talk about NOTHING. Nothing about the topic, or if was explaining something, he would put like a football or something scenario to the problem. I don't know what he was talking about. And like it was so funny because, luckily, I had other people in my class that I knew from XXX. And it was nice knowing that they didn't know what was going on, either. **(HBF)**

Another important aspect of a professor's teaching style that participants said negatively influenced their freshman year academic performance was the lack of feedback from an instructor about a student's work. Students said that some professors would not routinely collect and grade homework, which made it difficult to assess how they were performing on a day-to-day basis. And as previously discussed, this random homework collection pattern sometimes resulted in the students not doing the work at all, which again negatively influenced their freshman year academic performance. The following statement illustrates this point:

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> I thought EF was horrible, the homework, and the way they start off. Well, we never went over homework or anything like that, or problems with homework until our class complained enough to our professor. Homework was horrible. **(UWF)**

Several participants also reported that some professors' negative attitudes toward them during their office-hours was not helpful to their freshman year academic performance. In particular, these students were put off when they were referred to their books for clarification of poorly understood material, instead of being offered individualized help at the time. They found such impersonal brush-off responses discouraging because they felt that the professor did not care enough to ascertain and discuss the nature of their problem. They also said that some professors' responses to their questions indicated that they thought them to be stupid, as evidenced by the fact that a professor would indicate he was "surprised" by a student's query. A professor's inaccessibility was also mentioned as a detrimental "attitude." In fact, several students indicated that some professors responses' to their inquiries about their office hours indicated that they were not welcome in their offices. They said such response discouraged them from using their office hours at all. The feelings of unapproachable attitude among some professors in the College of Engineering unfortunately carried over to other professors in other disciplines, whether or not they actually exhibited those behaviors. Some students admitted that their negative experiences within their discipline made them feel discouraged about using professors' office hours in classes outside the College of Engineering. This point is clarified in the following statements:

> Well, the first thing that sticks out in my mind is failing EF. BIG, BIG F. And I still can't understand why my teacher failed me. As much as I tried; as much as I went to his office and said, 'I don't understand this.' The questions I asked were never answered. I mean he was NEVER helpful in his office. More 'Go read the book.' And the book is not that helpful. For me it was not helpful for me, at all. And when I'd go to him, it wasn't any help. **(HBF)**

Basically, I agree with everything that has been said before. Like going to your professor and the problem with that is as a freshman, you don't know anything. Like you don't know where to go to get help on a subject. Or like, I know several times in my freshman year, I didn't have any female teachers. I had all male teachers. And sometimes I don't know if it's because they're lacking on communication skills or personal skills or what it is, but you go to their office, and they make you feel stupid. So then you don't want to go back again because they just put you down when you were in there once, you don't want to go back to them. And if you don't know any other teacher that's teaching that discipline that you can ask, then you're kind of like stuck. If you go in their office and they have like a negative attitude towards you, then you're not going to want to go back to see them again. And some of them I don't even think they realize that they're doing it, but I think they should make a conscious effort to help their students if they're really want them to succeed. And my impression from the school is that it seems like a lot of professors don't care whether or not you're learning the material or not. **(LBF)**

Well my thing is, if you're going to their office, you're already going out of your way to get help from them. And if they're going to put you down or make you feel like you're not worthy to be in their office, then you're not going to want to go see them again. And that can also make you not want to go see your other professors in your other subjects that you might need help in. **(LBF)**

My XXX teacher, he practically didn't show interest at all in the class. He was just there to give some example problems on the board and you either got it or you didn't. I mean, he was very strict on office hours, you know. It wasn't like you could just go up and say, "Hey, can we talk about something?" He wasn't very open and responsive to helping you if you had some problems. I wound up on academic probation. **(UWM)**

All participants mentioned the negative influence that some professors' ineffective teaching styles and negative attitudes inside and outside of the classroom had on their freshman year academic performance. It was disappointing to learn that some professors made students feel that their questions were not worthy of a response, particularly in light of the work of Pascarella & Terenzini (1991), who maintain that the quality of a student's perceived relationship with a faculty member has been associated with positive educational outcomes. Thus, the need to improve a student's interaction with faculty outside of the classroom cannot be overstated,

since some participants perceived their interaction with faculty as not helpful to their freshman year academic performance.

Not Using Office Hours

Students indicated that not having established contact with their professors by not using office hours had a negative experience on their freshman year academic experience. Even though they were experiencing difficulty with course material, many participants admitted that they did not take the initiative to use office hours, and thus missed the opportunity to have material explained or clarified. Several students indicated that if they had used office hours, they probably would have performed better in classes. This point is illustrated in the following statements:

> And also I had absolutely no communication with my EF professor. So I think better communication with him might have helped things a lot. **(UWF)**

> Well, one thing that I DIDN'T do that I wish I had done was to go see professors. Like, I have this problem. For some reason I just don't like going for extra help. It's like a personal problem I guess. It's like an admission of failure or something, and I have a real problem with that. And I wish I had more ability to do that. I know it would probably help. **(LWM)**

The negative impact of not using office hours was mentioned by some low academic performers and by nearly all the unsuccessful academic performers, who spoke at length about how they could have benefited from talking more with their professors during their posted office hours.

Chapter Six

Discussion, Implications and Conclusion

This study has examined the academic activities that impacted the 1997-98 freshman year academic performance of students in the Virginia Tech College of Engineering. All the participants interviewed for this research were full-time, second-year students enrolled during the 1998-1999 academic year.

This study was motivated by the reported declining enrollment and attrition rates in engineering programs throughout the nation. A recent statistic indicates that of all the students who begin their college careers as engineering majors, only 44 percent of them actually graduate with engineering degrees (Astin, 1993a). This phenomenon is of particular interest due to the highly selective and competitive nature of most engineering programs. On the national level, students accepted into engineering programs have combined average SAT scores of 1100 (Ludwig, 1995). This apparently contradictory data (distinguished high SAT scores/low college of engineering graduation rates) stimulated this study to investigate the following research questions:

1. Which academic activities do students consider as important to their academic performance?

2. Which academic support services do students consider as important to their academic performance?

3. Are there academic performance level-related differences in students' perceptions of the impact of various academic activities in which they are involved, relative to their academic performance?

4. Are there academic performance level-related differences in students' perceptions of impact of the academic support services they use, relative to their academic performance?

5. Are there gender-related differences in students' perceptions of the impact of various academic activities in which they are involved, relative to their academic performance?

6. Are there gender-related differences in students' perceptions of impact of the academic support services they use, relative to their academic performance?

7. Are there race-related differences in students' perceptions of the impact of various academic activities in which they are involved, relative to their academic performance?

8. Are there race-related differences in students' perceptions of impact of the academic support services they use, relative to their academic performance?

The data for this study were gathered via 9 focus group interviews, which were conducted during the spring semester of the 1998/1999 academic year. Participants were divided into groups based on their academic performance levels, gender, and race. There were 34 participants in the study. Six students were considered unsuccessful academic performers with below 2.00 GPAs; 12 were identified as low academic performers with GPAs below 2.7 but not less than 2.00; and 14 were considered to be high academic performers with GPAs of 2.7 and above. Categorized by race and gender, there were 25 White students and 9 Black students; and equal numbers of males and females (17 each)

The data collected were analyzed mechanically and supplemented electronically. The mechanical process involved content analysis and constant comparative process. The electronic supplement involved the use of the NUD*IST program. The data collection and analysis involved the following steps or stages: (1) data were collected from an interview conducted during focus group discussions in combination with an open-ended follow-up questionnaire, (2) debriefing meeting between moderator, co-moderator and note taker were held to share impressions, discuss emerging patterns, and review the open-ended questionnaire, (3) meetings

between the co-moderator and the note-taker were held to compare notes, reconcile differences and develop a brief summary report, (4) the resulting transcripts were repeatedly read until they were clearly understood, (5) the tapes were reviewed several times; (6) emerging patterns were identified; (7) emerging patterns were categorized according to similarities and overlaps; and (8) overlapping categories were merged to create three broad and inclusive themes. These themes describe the factors that were identified as contributing to academic performance.

Discussion

Effort and Involvement

Participants across all groups believed that effort and involvement factors were important to academic performance. The effort and involvement factors most frequently mentioned and emphasized by participants as impacting their freshman year academic performance are: doing homework and completing assignments (such as doing assigned reading and doing problems), attending help sessions, and adopting better time management skills. Other effort and involvement factors reported as impacting academic performance encompass the academic support services used by participants. These include: the Writing Center, tutorial services, the Office of Minority Engineering Programs (BEST and WEST), CAEE study retreat, and the Math Emporium. Overall, there were more similarities in the effort and involvement factors that were implemented by Black male participants, and the low and high academic performers than by the unsuccessful academic performers. All participants acknowledged the fact that they lacked adequate study habits and skills, and were initially resistant to having to actually set time aside to study at the beginning of the academic year. This was due to their experiences in high school of performing at relatively high levels with little or no effort. In short, these students had difficulty accepting having to study routinely to earn good grades. However, the Black male participants

and the low and high academic performers adjusted their study habits because they quickly realized that more effort would be required to achieve their academic goals.

Overall, the discussions regarding effort and involvement factors among the Black male participants, and the low and high academic performers were from a positive perspective in terms of how these factors were applied and how they helped their freshman year academic performance. Homework and assignments were completed far more regularly by the Black male participants and the low and high academic performers than by the unsuccessful academic performers. In fact, they routinely did homework and completed assigned tasks whether or not they were collected or graded. Homework and assignments were regarded by these students as providing the opportunity to reinforce their understanding of material presented in class and in assessing how much of the material has been learned. They reported doing homework for the sake of learning -- not because it was required. These attitudes represent their active participation in the learning process by the fact that they completed their assigned reading to enable them to better understand the material. Moreover, they did problems on their own so as to be able to apply material presented in class. They also participated in optional class activities by attending help sessions, which were seen as another opportunity to reinforce their comprehension of material already presented in class, as well as to have concerns about material explained and clarified, and to prepare for tests. After below expectations performance at the beginning of the year, referred to as a "wake up call" by Black male participants and the low and high academic performers, they made the decision to manage their time, thus making their academic goals a priority. Due to their proactive work habits and attitudes towards their academic goals they were able to better adjust to college academic demands by prioritizing and

consciously setting time aside to study or do school work. These proactive attitudes support the work of Pascarella &Terenzini (1991.

In contrast, the unsuccessful academic performers did homework and completed assignments only when they expected them to be collected or graded by their professors. Thus, not doing homework and completing assignments had a negative influence on their freshman year academic performance. They reported being frustrated by doing homework assignments that were not collected and/or graded because it failed to provide any feedback. Thus, these unsuccessful performers did not see any point in doing the work at all. This is an indication of their ineffective study habits and study skills, inadequate academic goals, and their overall difficulty in adjusting to academics on a college level. Unfortunately, even when these students realized what they needed to do to realize their academic goals, they chose not to.   For example, they did not attend required classes or optional help sessions. Because academic goals did not seem to be a priority, they did not consciously schedule time to study, or generally put much time into studying. When they fell behind in schoolwork they did not use available academic resources -- they simply gave up completely.   Sadly, their inability to adjust to college academic demands, as well as the difficulty they experienced in taking action to mitigate their academic situation, sometimes resulted in emotional paralysis, and depression.

Most of the academic support services that were utilized were found to be helpful, with the possible exception of the Math Emporium. Interestingly, most White male low and high academic performers did not seem to be aware of many of the academic support services available on campus.

A noteworthy finding was the difficulty that White male low academic performers and unsuccessful academic performers had accepting the fact that they needed to seek external help. They did not want to appear as lacking the ability to "make it" in the College of Engineering.

The Black participants and the White female low and high academic performers were the most cognizant of the academic support services available to them during their freshman year. This was due to their participation in OMEP's BEST and WEST groups, which were reported to have provided the academic and social support to facilitate their freshman year academic adjustment. They also attributed their success and persistence in the College of Engineering to their participation in OMEP groups. With regard to the Writing Center, most of the students interviewed were familiar with this facility and agreed that it was a useful resource in improving writing skills and grades in their English classes. The Study Retreat, an intensive weekend study session offered by the CAEE and utilized mostly by Black participants, was universally found to be an important and useful opportunity to get away and study. However, the Math Emporium was found to have been helpful in doing homework and group work by some participants, but was consider to be not especially helpful by others. Those who did not find it helpful did not like the off-campus location. In addition, the Math Emporium classes were computer-driven and had no instructor assigned to them. Thus, when problems arose students had difficulty identifying someone to assist them.

A major distinction observed from these findings is the level to which students implemented the various effort and involvement factors according to their academic performance level. The Black male participants and the low and high academic performers discussed these effort and involvement factors as being critical to achieving their academic goals; they were also markedly proactive in their learning. They consciously described how and why they

implemented these effort and involvement factors, and how they enhanced their academic performance. For example, they realized they needed to keep up with work to accomplish their academic goals and they made the necessary adjustments to do so. They chose to become involved in the learning process by doing both assigned and non-assigned tasks, and by utilizing the resources that they were aware of, despite their initial reluctance to accept the fact that they had to put more effort and time into schoolwork to accomplish their academic goals. This reinforces Astin (1984; 1993b)'s findings that students who are more involved in the learning process are more academically successful.

In clear contrast, the unsuccessful academic performers discussed effort and involvement factors from the perspective of how implementing more of these factors would have been helpful to their freshman year academic performance. An absence of self-discipline was acknowledged as the primary reason for their failure to employ these effort and involvement activities. In short, they took full responsibility for their failure to seek help, and blamed themselves for their poor academic performance. In addition, they reported a sense of shame, and felt that they had disappointed themselves and their families, especially in light of how well they had previously performed in high school. They admitted that their level of academic performance was a reflection of the limited effort they put into their academic endeavors. This finding is consistent with the literature that learning outcomes are directly proportional to the level of effort and participation in the learning process (Astin, 1984; 1993b; Pace, 1984; Pascarella & Terenizini, 1991).

What makes some students decide to become involved in the learning process while others choose not to? Even though all participants realized the fact that they would have to increase their efforts to meet the amplified academic demands of college vs. high school, the low

and high academic performers made the decision to make the necessary changes, while the unsuccessful academic performers did not.

As stated earlier, the unsuccessful academic performers reported personal problems and depression as contributing to their compromised level of participation in the learning process during their freshman year. One of these participants indicated being aware of resources, but chose not to get help due to feelings of discouragement and resignation. Specifically, he referred to feelings of "helplessness" and "hopelessness" as reasons for not seeking external help. This further demonstrates that academic performance is not determined by intellectual factors alone (Pascarella &Terenzini, 1991).

Surprisingly, what has not been well addressed in the literature is the extent to which a student's academic performance is impacted by personal and psychological problems. A noteworthy finding is the unsuccessful academic performers' emphasis on the role of personal problems and depression in their inability to make decisions and take action to remedy academic impediments. Needless to say, all students experience ups and downs, but at what point do they impact academic functioning? Unlike the unsuccessful academic performers, the Black male participants and the low and high performers realized and acted upon the need to make work- and intervention-related adjustments to achieve their academic goals, thus exhibiting their proactive approach to learning.

Peer Interaction

All participants mentioned peer interaction factors as being an important source of academic support during their freshman year. Participants repeatedly referred to "study groups" "networking" and "knowing other students" as positively influencing their freshman year academic performance. The helpfulness of peer interaction factors was based on how contacts

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and relationships with fellow students were utilized. Those who expended positive effort into their contacts and relationships with fellow students derived benefits from them, a concept, which reinforces Astin's findings (1984, 1993b). For example, students who participated in study groups reported positive learning effects simply from having had the opportunity to explain poorly understood material to their peers, not to mention having had material clarified for them. Furthermore, many students indicated that they also often prepared for study group sessions in advance so they could contribute more effectively to the discussions. This proactive approach to learning was primarily exhibited by the Black male participants and the low and high academic performers. Students who took the time or made the effort to get to know their fellow students mentioned study groups as having been a critical component of their academic performance during their freshman year. The repeated mention of "study groups" as a source of academic support is consistent with the research that has linked collaborative study with facilitating the mastery of difficult course material, and subsequently has been positively linked to strong academic performance, (Goodsell, Maher, Tinto, Smith & MacGregor, 1992; and Hrabowski & Maton, 1995).

What makes some students choose to study in groups? How do students arrange study groups? The unsuccessful academic performers cited difficulty in identifying fellow students with whom to form study groups as a hindrance to their freshman year academic performance. Their inability to establish meaningful contacts and relationships with fellow students precluded their taking advantage of valuable peer networking and consulting opportunities. Consequently, when homework assignments were not understood, these students tended not to seek external help; they simply did not complete the work, which resulted in poor performance in some

classes. This is an obvious indication of this group's general lack of integration into the larger university community (Tinto, 1993).

Black male participants and high and low high academic performers stressed the importance of the influence of being around peers with the same work habits. Their ability to maintain focus and stay motivated was attributed to associating with fellow students with good work habits. One White male high academic performer noted he was positively influenced by associating with a fellow student who "was a complete workaholic and was always on my case." The ability to stay current with course requirements was also enhanced by like-minded fellow students, as indicated by one high academic performer: "I think it's good to be with people who are thinking about work when you're not, to keep reminding you that you do have work to do." This is a reinforcement of Astin's (1993b) assertion that student peer groups are a major contributor to their growth and development during the undergraduate years. Those students who were able to maintain scholastic focus tended to associate with peers with similar aspirations and academic goals, as suggested by Pascarella & Terenzini, (1991). In addition, being around peers with similar goals not only facilitated the learning process, but also augmented their acquisition of interpersonal skills, as well as self-confidence -- both of which helped make it possible for them to realize their academic goals during their freshman year.

Despite the encouraging benefits of peer interactions as mentioned above, some students reported that peer interaction factors negatively influenced their academic performance. These negative influences were primarily reported by low and unsuccessful academic performers. However, at some point during their freshman year, the low academic performers seemed to be able to reprioritize their goals away from interacting with insufficiently motivated peers and back to making their academic goals a priority. On the other hand, the unsuccessful

academic performers mentioned digressing and procrastinating when they participated in study groups. Others mentioned succumbing to "peer-pressure" by watching television, partying on weekdays and staying out late. One participant mentioned difficulty in getting along with a roommate who had a different sleep schedule and a frequent stream of dorm-room visitors, making it impossible for her to do schoolwork in her room. This unsuccessful academic performer said she felt helpless and did not know where to go or who to ask for help in coping with her roommate conflict. It is obvious that these students were associating with peers who did not take their academic pursuits seriously, as well as had different academic aspirations. Thus, the quality of peer interaction and the extracurricular activities that students choose to participate in do influence a student's academic performance, as suggested by Pascarella and Terenzini, (1991).

Faculty Interaction

The views among participants concerning faculty interaction factors were mixed. Contacts with professors were deemed helpful at times, and not-so-helpful at others. Despite the mixed nature of their contacts with professors, participants still considered them to have been important to their freshman year performance. These contacts were discussed in the context of professors' teaching styles, and their meetings with them during their use of office hours and advising for course selection. The utilization of faculty interaction for academic success was most practiced by Black male participants, as well as by low and high academic performers.

Contacts with professors whose teaching styles were effective were considered helpful because it made it possible for students to better assimilate the material presented in class. Some professors' teaching styles were found to have been sufficiently exciting and captivating as to stimulate participants' interest. Such teaching styles were reported to have made it possible for

participants to perform at above-expectation levels in classes that were initially thought to be boring or difficult. Another factor related to a professor's teaching style is assignments that provided opportunities to reinforce learning outside of the classroom. Group design projects assigned by some professors were considered to have been helpful in the practical application of the material presented in class. Working on design projects also provided the opportunity to learn how to work in teams and facilitated contacts with fellow students with whom relationships were established that made it possible to form study groups.

The use of professors' office hours was considered as a source of academic support during their freshman year. Some professors were very supportive, flexible and accessible to students -- sometimes to the extent that "office hours" became help sessions. The students who used office hours were sufficiently involved in the learning process to effectively use these out-of-class professor contacts to benefit their academic performance -- especially since they were not required. This corroborates the findings of Pascarella and Terenzini, (1991) who believe that a student's interaction with faculty significantly influences his or her learning outcomes and intellectual development. In addition, professors were found to be encouraging during course selection by suggesting classes that would boost GPA, and thus enable their advisees to remain in the program.

As stated earlier, all the students experienced some form of ineffective teaching styles and negative attitudes from their professors during their freshman year. These factors, however, had the most negative influence on the academic performance of the unsuccessful academic performers. Some professors' ineffective teaching styles and negative attitudes in the classroom and during office hours were not only considered as "not helpful," but were even thought to be a deliberate attempt to "weed out" marginal performers. Students who complained of this

mentioned their difficulty with understanding and following some professors' presentations, as well as a professor's reluctance or outright refusal to answer questions or clarify concepts. Some professors' responses to some questions indicated to them that they were not worthy of being in the program for even asking in the first place, and thus were considered a negative attitude. Their experiences with such professors discouraged some students from communicating with them at all, which sorely compromised their active involvement in the learning process. The inflexibility and inaccessibility of some professors was considered to have limited the unsuccessful academic performers' ability to maintain beneficial contacts with them. This finding was disappointing, especially with regard to students who chose to make the effort to interact with professors, but were rebuffed, or at the very least disappointed in the interaction. There is a significant body of literature that supports the notion that students who take time to communicate with their professors tend to perform at a higher academic level (Pasacarella and Terenzini (1991). In short, students considered their interactions with professors to be a very important source of academic support. Thus, every effort should be made to encourage and improve these types of in-class and out-of-class interactions. This reinforces Pasacarella and Terenzini (1991)'s report that students' perceived quality of relationships with faculty is associated with educational outcome. What makes some professors supportive more than others do?

Despite some of the negative comments that were recorded, some participants attributed their level of academic performance to their lack of contacts with professors. The unsuccessful academic performers' frequent absences from class made it difficult for them to communicate with their professors. Due to their failure to establish some sort of pedagogical relationship with their professor in class, e.g., through their active participation, they felt they could not meet with

their professors before or after class, or during office hours to negotiate their work, ask for explanations or clarification of material not understood. Thus, assignments that were not well understood were simply not completed. This, unfortunately, is an obvious indication of the lack of a proactive approach to their own learning. The unsuccessful academic performers' difficulty in communicating with professors, and its subsequent impact on their academic performance, is consistent with the literature that a student's interaction with a professor outside the classroom contributes to his or her ability to become more comfortable and productive within the classroom environment (Endo & Hapel, 1982; and Pascarella & Terenzini, 1991).

How can students be encouraged students to use professors' office hours?

The findings of this study support the literature report that a student's learning is a function of his or her level of involvement or effort. This notion certainly explains the various differences according to academic performance level. This study has demonstrated that a student's involvement in the multiple areas of academic involvement, peer interaction, and faculty contacts do impact academic performance. Simply stated, those students who expend effort in these areas are more likely to perform at a higher academic performance level.

Answers to Questions Addressed by Study

While Chapters Four and Five have presented detailed findings of this study, the following section is a presentation of the questions and answers that guided this study.

1. Which academic activities do students consider as important their academic performance?

2. Which academic support services do students consider as important to their academic

   performance

3. Are there academic performance level-related differences in students' perceptions of the impact of various academic activities in which they are involved, relative to their academic performance?

4. Are there academic performance level-related differences in students' perceptions of impact of the academic support services they use, relative to their academic performance?

5. Are there gender-related differences in students' perceptions of the impact of various academic activities in which they are involved, relative to their academic performance?

6. Are there gender-related differences in students' perceptions of impact of the academic support services they use, relative to their academic performance?

7. Are there race-related differences in students' perceptions of the impact of various academic activities in which they are involved, relative to their academic performance?

8. Are there race-related differences in students' perceptions of impact of the academic support services they use, relative to their academic performance?

1. Which academic activities do students consider as important their academic performance?

This study definitively identified the academic activities that second-year engineering students perceived as important to their freshman year academic performance. Based on the findings of this study, nine factors were determined as important to freshman year academic performance: (i) involvement; (ii) use of resources; (iii) course activities (iv) learning techniques; (v) homework approach; (vi) scheduling; (vii) interacting with other students; (viii) contact with instructors; and (ix) responsibility for work. These factors were further collapsed into the three themes of (i) effort and involvement; (ii) peer interaction and (iii) faculty interaction.

The findings of this study further clarify the role of specific academic activities implemented by students on their academic performance. All participants believed that effort

and involvement (doing homework and completing assignments, doing assigned reading, attending help sessions and using available resources), peer interaction (knowing fellow engineering students, participating in study groups, and networking), and faculty interaction (effective teaching styles, use of professors office hours, and effective faculty advising) factors were important to academic performance.

The following involvement and effort factors were primarily mentioned and emphasized as positively influencing academic performance by the participants of this study.

1. Doing homework and completing assignments (which includes doing assigned reading and solving problems) made it possible to follow lectures in class, reinforced understanding, retention and the ability to apply material presented in class, and enabled students to perform better on tests.

2. Time management was considered crucial to being able to keep up with the schoolwork characteristic of most, if not all the engineering disciplines. Good time management was also mentioned as important to being able to participate in extracurricular and/or social activities and still keep up with schoolwork.

3. Attending help sessions provided opportunities for individual interactions with professors that were not possible in larger classes. Help sessions made it possible to have poorly understood material explained and clarified.

4. The Writing Center helped improve writing skills resulting in better performance in English classes.

5. Tutorial services provided individualized instruction and opportunities to ask for clarification of material not well understood.

6. Participation in OMEP programs (BEST and WEST) provided academic and social support. The social support received from participating in WEST made it possible to meet fellow female engineering students in class and in the residence hall. This social support included building confidence that made it possible to participate in largely all-male classes without feeling self-conscious, and to persist in the program; academic support was in the form of providing contacts with fellow female engineering students with whom they formed study groups.

7. Participation in the CAEE Study Retreats provided a conducive study environment making it possible to focus on school and get caught up.

8. The Math Emporium provided an environment in which to do assignments and projects and receive assistance.

The following effort and involvement factors were identified by participants as not-so-helpful:

1. Not doing homework: unsuccessful academic performers reported not doing homework because the work was not routinely collected or graded. Since they were not receiving any feedback they saw no use in doing homework, and as such they were always unprepared for and did poorly on tests.

2. Not attending classes: unsuccessful academic performers' practice of being absent from class resulted in not learning the material, having difficulty doing homework, failing classes, and being placed on academic probation;

3. Not attending help sessions: unsuccessful academic performers believed that attending help sessions would have remedied their academic difficulties because they would had the opportunity to have material not understood explained and clarified.

4. Poor use of time: Not making time to study, coupled with spending too much time on social and extracurricular activities, resulted in falling behind, always playing catch up, and not learning the material well enough to succeed on tests.

5. Not using resources when needed: Participants believed they did not receive the assistance that could have alleviated their academic difficulties

6. The Math Emporium: even though it was found to be helpful by some participants, others found the off-campus location more of a hindrance.

The peer interaction factors that were perceived as helpful are:

1. Knowing fellow engineering students provided access to people to with whom to network and consult;

2. Relationships with fellow engineering students made it possible to form study groups, which were helpful in learning material and in preparing for tests;

3. White females found that studying with males (before meeting fellow female engineering through their participation in WEST) was helpful to learning the material;

4. Black male and female participants were able to establish relationships with fellow Black and female engineering students through their participation in BEST and WEST, which made it possible to identify people with whom to relate and to form study groups.

The following peer interaction factors were reported as not helpful:

1. Low and unsuccessful academic performers had difficulty coping with distractions from fellow students who did not take work seriously, partied and stayed out late during the week, all of which made it problematical to focus on school work.

2. Roommate mismatches made it difficult for the unsuccessful academic performers to focus on schoolwork.

3. Not establishing relationships with fellow engineering students precluded some unsuccessful academic performers from participating in study groups, which they believed would have enhanced their academic performance.

Faculty interaction factors that were reported as helpful are:

1. Professors' effective teaching styles made it possible to understand material, apply material learned, and stimulated their interest in classes and improved performance in those classes.

2. The use of professors' office hours was a source of academic support because it provided opportunities to have material not understood explained and clarified.

Faculty interaction factors that were deemed not-so-helpful are:

1. Ineffective teaching styles made it difficult to understood material;

2. Professors' negative attitude of not answering questions in class or during office hours was seen as not supportive, as well as a way to "weed out" students from the program; professors' negative attitudes also discouraged some participants from using their office hours all together.

3. Unsuccessful academic performers believed that not using office hours had a negative influence on their academic performance because they did not have the opportunity to have poorly understood material explained and clarified.

The influence of these factors on a student's academic performance was based on his or her approach to them as a result of their personal work habits and attitudes towards their

academic goals. Hence, for example, not doing homework negatively impacted academic performance, versus the positive influence of doing homework and completing assignments.

2. Which academic support services do students consider as important to their academic performance?

The findings identified a number of academic support services that were considered important and not important to students' academic performance. The identified helpful support services are: (i) tutorial services; (ii) the Writing Center; (iii) CAEE programs-(Study Retreats and Mentoring); OMEP support programs (BEST and WEST); and the Math Emporium. Participants who used these services found them to be largely quite helpful, except for the Math Emporium on which opinion was mixed (primarily as a result of its off-campus location).

The White male low and high academic performers had little or no opinions concerning available support services because they had not used them. The White male high academic performers' obstacle to using them was mainly due to not being aware of their existence, while the White male low academic performers' said that it was a combination of not being aware of their existence, and apparent reluctance to using them. The White male low academic performers were concerned as being seen as lacking the ability to succeed in engineering if they use the services -- even though some were aware of these services.

3. Are there academic performance level-related differences in students' perceptions of the impact of various academic activities in which they are involved, relative to their academic performance?

There were no differences in the perceptions of the impact of various academic activities on academic performance based on academic performance level. All participants believed that effort and involvement, peer interaction and faculty factors were all important to academic

performance. There were, however, differences about the participants' approach to these factors, which was based on their personal work habits and attitudes towards academic goals. The Black male participants and low and high academic performers participated more than the unsuccessful academic performers in the learning process by doing homework, completing assigned reading, and attending help sessions. Establishing helpful contacts with fellow students and professors were utilized more by the Black male participants and the low and high academic performers than by the unsuccessful academic performers.

4. Are there academic performance level-related differences in students' perceptions of impact of the academic support services they use, relative to their academic performance?

As stated earlier, the findings on the academic support services used by participants were inconclusive due to the fact that many participants were not aware of the availability of many of these services. When used, however, there were no marked differences in students' perception of the impact of the academic support used on academic performance. However, it was intuitively concluded that White male low academic performers were resistant to using academic support services so as not to be seen as lacking the ability to succeed in their engineering discipline. Their resistance to using academic support services could be a reflection of the competitive nature of programs within the College of Engineering.

5. Are there gender-related differences in students' perceptions of the impact of various academic activities in which they are involved, relative to their academic performance?

As stated earlier, all participants believed that the three themes of effort and involvement, peer interaction, and faculty interaction were important to their freshman year academic performance. Although there were no gender-related differences in the perception of the impact of effort and involvement, peer interaction and faculty interaction, there were marked differences

in the students' approach to the various factors. Both the female and male participants who

viewed the learning process in a proactive way and implemented these factors reported that they

positively impacted their academic performance. Conversely, those who did not take a proactive

approach to learning reported that not implementing these factors negatively influenced their

freshman year academic performance. A noteworthy finding was the ease with which males

identified fellow students with whom they could study. The females, on the other hand, had

difficulty locating other female engineering students with whom to study and network, except for

those individuals who met them through their participation in WEST. The Black participants

also reported meeting fellow engineering students with whom they studied through their

participation in BEST groups.

6. Are there gender-related differences in students' perceptions of impact of the academic

support services they use, relative to their academic performance?

There were no gender-related differences in the perceptions of the impact of the academic

support services used by students. Again there were no conclusive findings due to the fact that

not all students were aware of many of the available resources. However, the females were more

aware of the available academic support services because of their participation in OMEP's

WEST groups. The females found the groups to be a source of academic and social support. In

fact, they found their participation in the program so helpful that they wished it had been offered

for the entire freshman year instead of just for the fall semester.

7. Are there race-related differences in students' perceptions of the impact of various

academic activities in which they are involved, relative to their academic performance?

There were no race-related differences in students' perceptions of the impact of the

various academic activities in which they were involved during their freshman year. Although

both Black and White students believed that the three factors were important to academic

performance in college, they implemented these factors differently, as mentioned above.

8. ***Are there race-related differences in students' perceptions of impact of the academic***

support services they use, relative to their academic performance?

There was no race-related difference in students' perceptions of the impact of the

academic support services they used on their academic performance. Participants who used

academic support services reported positive outcomes with regard to their academic performance

during their freshman year. There were, however, differences on the awareness of available

academic support services. The White male low and high academic performers were less

knowledgeable about the available support services than were the Black and White female

participants. For example, many of the White male low and high academic performers reported

not being aware of most of the support services on campus. The White females and Black

participants were more aware of the available academic support services because of their

participation in OMEP' BEST and WEST. Again, the differences exist in the student's approach

to and utilization of these factors, as mentioned above. These findings have several implications

for policy and practice at Virginia Tech.

Implications For University Policy and Practice

1. This study has shown doing homework to be a critical academic involvement activity. A

   way to encourage students' development and maintenance of this academic involvement

   activity is to increase the amount of feedback given to students by professors by their grading

   homework more often. Large classes could be assigned graduate assistants to help with

   homework grading, which would help monitor students' performance in the program, and

prevent them from falling behind and not becoming overwhelmed with trying to master often difficult material at the end of the semester.

2. Due to the positive influence of supplemental instruction, such as tutorial services or help sessions, students were better able to ask questions and interact more productively with professors. The College of Engineering should consider formal supplemental instruction for the large preparatory courses. Such supplemental instruction should be made a full-fledged part of such classes. For example, one-hour credits could be attached to those classes, which participants could earn via regular attendance.

3. The results of this study identified obstacles that prevent some students from taking advantage of the available support services. These services would be more effective in enhancing students' academic performance if students are made aware of them, probably through announcements/hand-outs by professors in class. One suggestion is to have faculty discuss the available resources and their benefits periodically during the semester. An in-depth discussion of on-campus resources could be scheduled for two weeks after classes begin, two weeks before the first large exam, and again after midterm grades have been returned to students.

4. Due to some students' resistance to using support services, faculty endorsement of these services by publicizing them would encourage such students to avail themselves of the available resources. This could perhaps involve professors' recommendation of students as tutors in these programs, inviting tutors to their classes to tell students about the benefits of their services, and periodic student-endorsements of the benefits of these resources.

5. OMEP's BEST and WEST groups for minority and women engineering students have been providing support (academic and social), counseling, tutoring and mentoring, and have been

successful in easing these students' adjustment to college. Some participants mentioned that they would have liked to continue in their groups during the second semester. Perhaps these support groups programs should be continued, and expanded beyond the first semester to the spring semester -- and even for the entire second year when many engineering students get very discouraged to the extent of not persisting in the program.

6. Due to the pervasive resistance among White male low academic performers and unsuccessful academic performers to use academic support services, as well as the general lack of awareness of these services among the White male high academic performers, the College of Engineering should establish inclusive support groups for all incoming students that would provide them the necessary academic and social support to enhance their academic performance.

7. The importance of academic skills (good study skills and study habits) to academic performance should be stressed to students and their parents during orientation. All incoming students' study skills and study habits should be assessed at the beginning of the semester, and monitored all through the first semester by advisors or counselors in the College of Engineering.

8. Due to the fact that most students accepted into the College of Engineering achieved success with relatively little effort in high school, they do not seem to have developed good study skills and study habits. All incoming students should be required to take a freshman seminar or orientation class that would help them learn how to actively participate in the learning process by focusing on the development of good study skills and habits. Such a program would project the College of Engineering as a supportive college committed to the success of all engineering students.

9. All incoming engineering students should be informed of the rigorous nature of their chosen discipline at the time of orientation. This could go a long way to help incoming students realize the need to adjust their study habits and approach to academics.

10. The participation in study groups was mentioned as a helpful source of academic support for all students. This developmental need of students can be enhanced with faculty involvement by consciously connecting students for more collaborative work.

11. Because of the difficulty that female engineering students had in locating other females with whom to form study groups, serious consideration should be given to helping them make contacts with fellow female engineering students in the residence halls. This will provide an opportunity for student affairs practitioners and academic affairs to work together. This can be in the form of living arrangements that would make it possible for them to reside in the same dormitories, thus providing them easy access to other female engineering students, and to work proactively against distractions from non-engineering students. If this is not possible, perhaps names could be posted with majors in the resident halls.

12. Lack of contacts with professors was found to have negatively influenced students' academic performance. Others mentioned the negative attitudes of some professors as not helpful to their academic performance. Effort should be made to enhance the quantity and quality of faculty-student interaction. Perhaps faculty would benefit from interpersonal workshops and instructional methods training, especially for those teaching freshmen.

13. Faculty would benefit from seminars and training workshops on teaching freshmen classes or introductory freshmen classes so as to familiarize themselves with them the developmental needs of freshmen. Such programs should be mandatory for new hires and voluntary for existing faculty members.

Recommendations for Further Research

1. As indicated by the findings in this study, the level of participation in the learning process seemed to be influenced by professors' teaching style as reflected in professors' interest and enthusiasm for the subject. Further investigation into the effects or relationships between teaching style and students' active participation in the learning process is recommended.

2. This study was limited to one institution of higher education, further research can investigate how faculty are viewed by engineering students in other institutions.

3. Few studies have been conducted on gender differences with regard to study approaches. There were no marked gender or race-related differences in this study, which could be explained by the fact that the participants were engineering students who have always been high achievers. More extensive research is needed to examine this.

4. Further investigation is needed to determine what propels some students to become involved in academic activities while other do not.

5. A longitudinal study of the academic involvement of these students is suggested. As these students progress in the engineering program, it would be interesting to find out if there are continued differences in their academic involvement, their academic performance and their persistence in the program.

6. This study included a small sample from the College of Engineering. Due to the sample size, a quantitative replication of this study is recommended for the larger student population to determine if the findings are indicative of the general student population at Virginia Tech. Data from a quantitative study will make it possible to plan more inclusive interventions for students within other academic disciplines.

7. The unsuccessful academic performers attributed their low level of academic performance to their difficulty in making decisions to effect necessary changes such as attending classes, help sessions and using resources (which was exacerbated by personal problems and depression). Investigation to gain a better understanding on the effect of personal and psychological problems on academic performance would be helpful in designing interventions for such students.

8. In view of the importance attached to study groups and the small number of Black students in the College of Engineering, it is important that Black and White students study together. However, there was no mention of Black and White students participating in the same study groups. A study to investigate the interaction of Black and White students in the College of Engineering would help in improving the climate and the nature of their interactions.

Conclusion

These findings indicate the need for early intervention programs and strategies designed for freshmen engineering students in order to impress upon them the need to immediately cultivate good study habits and learn academic involvement strategies that will led to academic success. There is also a pressing need for academic administrators to intervene and regularly monitor the academic progress of these students in order to reinforce the critical success factors identified, especially for those who would otherwise fall through the cracks in terms of academic success. Although it is acknowledged that not every student who initially enrolls in engineering will be successful -- with or without intervention -- measures should be taken to enhance the overall success rate of students in the engineering program. Due to the decisive impact of these factors on academic performance, it is recommended that they serve as guidelines in assessment

and intervention planning for engineering students who present with academic difficulties to counselors. Finally, these findings suggest the need to design intervention programs that will strengthen the factors that have been identified as helpful to students, as well as mitigate those factors that have impeded students' progress as freshmen in the College of Engineering.

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Appendix A: Contact Script

Hello, My name is Charlotte Amenkhienan. I am a Ph.D. Candidate in Counselor Education, in the College of Human Resources and Education. I am calling to request your participation in my research for my dissertation. My dissertation is about academic experiences at Virginia Tech-what students perceive as helpful to their studies. The objective is to identify the specific learning activities and academic support services that second-year-engineering students perceive as having impacted their freshman year academic performance. The setting is an informal discussion among your peers.

Your participation and input are very important to my research and dissertation. For participating in the research you will be given a $10.00 compensation as well as food and soft drinks for a 90-minute discussion. Are you interested in participating in a focus group?

Appendix B: Sample Letter of Invitation to Focus Group Participants

Thank you for agreeing to participate in the focus group discussion to be held in Hancock Hall. Please contact me as soon as you get this letter if the time and place are not convenient for you so we may arrange a better time.

As mentioned during our phone conversation or in the e-mail message, this research is designed to assess the impact of specific learning activities and academic support services on students' academic performance. Our discussions will involve a very small number of people. As such, the success of the research is dependent on your discussing issues openly and frankly. The information gathered from the interviews will be helpful in improving the academic experience of students in the College of Engineering and academic support services provided by the University.

The interview will last about 90 minutes to 2 hours. Food and soft drinks will be served and you will be given a $10.00 compensation for your participation in the research at the end of the discussion.

Thanks once again for agreeing to participate in this research. Your help in giving us or helping us get a better understanding of students' academic experiences may be a rewarding experience. A copy of general information regarding the research is attached for your information. If you have concerns before the scheduled interview, please feel free to contact me at (540) 231-6557. I look forward to seeing you.

<u>General Information for Participants</u>

1. The group discussions are designed to find out from students the specific learning activities and strategies that they view as having had the most impact on their academic success. Another objective of the study is to find out from students the academic support services provided by the University that they perceive as having the greatest impact on their academic performance.

2. It is suggested that participants dress comfortably for the discussion. Casual clothing is encouraged.

3. The environment will be relaxed and supportive.

4. The group members will all be undergraduates.

5. Everything discussed will be strictly confidential. All members are to maintain this CONFIDENTIALITY.

6. If, for some reason, you are unable to attend the interview session, or you have questions, PLEASE contact Charlotte Amenkhienan at 231-6557 at work and at 552-5605 at home.

7. Your participation in this project is greatly appreciated.

Appendix C: Reminder Script

Hello, this is Charlotte Amenkhienan calling to thank you very much for your willingness to participate in my research and in the focus group discussion. I want to remind you that the discussion will be held on-----at------ in Hancock Hall. For your participation you will receive a $10.00 compensation. Food and soft drinks will also be served. I am looking forward to meeting you at the discussion. Please feel free to call me at 231-6557 if you have any questions.

Appendix D: Virginia Tech Informed Consent for Participants of Research Projects

Title of Project: Virginia Tech Engineering Sophomores' Perception of the Impact of Freshman Year Academic Involvement Activities, and Use of Academic Support Services on Academic Performance-Implications for Counseling

Principal Investigator: Charlotte A. Amenkhienan, Ph.D. Candidate, EDSP
Dr. Claire Cole Vaught, Chair

I. PURPOSE OF RESEARCH

This research is being conducted as part of the requirements for a Ph.D. The objective is to identify specific learning activities that engineering sophomores implemented and the academic support services that they used during their freshman year, which they perceive as affecting their academic performance. The purpose is to generate information that will guide counselors in their intervention planning when working with engineering freshmen experiencing academic difficulties.

II. PROCEDURES

During the focus interviews you will be interviewed by skilled moderators, assisted by the principal investigator. As participants in this research you will be asked to participate in a discussion with help of a series of questions, and specifically to relate your experiences of the learning activities that you implemented and academic support services that you used during your freshman year, which you perceive as affecting your academic performance. Following the group discussions, you will also be asked to fill out an open-ended questionnaire that will provide you the opportunity to add to what was said during the interview, or to correct information you provided earlier.

It is very possible that you may feel some discomfort discussing such a sensitive issue as academic performance depending on your level of comfort with your GPA. The groups will consist of students from your freshman class and from your college in the University. Eight group interviews will be conducted. The groups will be (a.) African-American females and males (b) Caucasian females and males. You will be placed in groups with similar students.

III. **RISKS AND BENEFITS OF PARTICIPATION IN THIS PROJECT**

Your participation in this project will help the university get a better understanding of the learning activities, resources, services and programs that students perceive as affecting their academic performance.. It is hoped that your participation in this project will (1) assist the University in its efforts to strengthen and augment those successful programs and activities, and (2) give you the personal satisfaction of making a difference by helping to identify learning activities and academic support services that improve students' academic performance. However, this benefit is not guaranteed. There are no known risks associated with this study. Participants that are believed to need advising or personal counseling will be referred to appropriate resources.

IV. **COMPENSATION**

For complete participation in the project you will receive $10.00 compensation immediately following the interview.

V. **EXTENT OF ANONYMITY AND CONFIDENTIALITY**

The researcher will at no time release names or any other identifiable information regarding the participants.   If information were released, pseudonyms would be used. The audio tapes will be erased, and transcripts will be shredded one year after completion of the study. Participants are expected to maintain confidentiality regarding discussion that occurs during the focus group interview.

VI. **FREEDOM TO WITHDRAW**

You are free to withdraw from this research project at any time during the process.

VII. **APPROVAL OF RESEARCH**

This research project has approval from the Institutional Review Board for Research Involving Human Subjects at Virginia Polytechnic Institute and State University, and the Department of Educational Leadership and Policy Studies in the College of Human Resources and Education.

VIII. **SUBJECTS' RESPONSIBILITIES**

I agree to participate in this study. I understand that complete confidentiality is necessary in order to maintain the integrity of the group, and respect for other participants.

IX. **Subject's Permission**

I have read and understand the informed consent form and the conditions for this project. I understand my responsibility in the focus groups, and my questions and concerns have been answered and addressed. I voluntarily agree to participate in this project.

_____

Participant's Signature

Should I have any questions about this research or its conduct I may contact:

Charlotte A. Amenkhienan   231-6557

Appendix E: Focus Group Moderators and Note-Taker with Perception of Freshmen Academic Involvement Activities, and Use of Academic Support Services on Academic Performance

TRAINING OUTLINE

Date: February 17, 1999

Time: 6 pm – 8 pm

Location: 240 McComas Hall

Objectives: 1. To describe the study

                       2. To explain the methods and procedures

                       3. To assign and explain roles

                       4. To answer questions about concerns

                       5. To present and discuss schedule

                       6. To desensitize participants to possible biases

Trainer: Charlotte A. Amenkhienan (Principal Investigator)

6:00 pm

I.   **Introductions**

Trainer

1. Round Robin – (Have participants introduce themselves)
2. Overview of training session
3. Distribute Training Packet

6:10 pm

II.   **Overview of study**

1. Summary of Study
2. Study Methodology

6:15 pm

III.   **Study Participants**

1. Identification of Participants

 2. Recruitment of Participants

6:20 pm

IV. **Conducting Focus Groups**

 1. Moderator role and responsibility

 2. Note-taker role and responsibility

 3. Schedule of Focus Groups

V. **Review of Focus Group Agenda**

 1. Refreshments for participants

 2. Welcome and Opening Comments

 3. Collect Consent forms

 4. Conduct Focus groups

 5. Have participants Complete Follow-up Questionnaire

 6. Identify Participants to do member-check-Review Focus Groups Analysis Report

 7. Have participants sign for compensation

 8. Refreshments for participants

VI. **Review of Focus Group Interview Guide**

 1. Compensation of Participants

 2. Question and Answer

 3. Closing Remarks and Distribution of Incentives

 4. Dismiss Participants

 5. Debriefing with Moderators and Note-Taker

 6:45 pm

VII. **Closing Remarks**

 Contact Information

 Other

 Refreshments

Appendix F: Interview Guide

Freshman year Academic Experience

1. Which academic experiences during your freshman year at Virginia Tech really stand out for you?

    Probe:

What are examples of those experiences?

a) How did they contribute to your freshman year academic performance?

b) How has your academic performance been impacted by your freshman year experience?

Academic Involvement

2. What to you is academic involvement?

    (a) What activities would you consider as academic involvement?

       Probe:

       Which of those activities have you personally implemented?

    (b) In what ways did those activities impact your freshman year academic performance?

Learning Activities

3. Describe specific learning activities that helped you learn the most during your freshman year?

Use of Academic Support Services

4.Which of Virginia Tech's academic support services did you use during your freshman year?

       Probe:

(a) In what ways did those academic support services contribute to your academic performance?

(b) What other resources would have been helpful to your academic performance during your freshman year?

5.What non-academic factors do you think contributed to your academic performance?

Probe:

In what ways did those factors contribute to your academic performance?

6. Overall, what would you say is responsible for your present level of academic performance?

Appendix G: Open-Ended Questionnaire

Part I

This questionnaire is to supplement the information generated from the focus group interview. You are asked to please take a few minutes to complete it. Part I is designed to provide personal information about you and your academic experience prior to enrolling at Virginia Tech. In Part II you are to list 3 things that most contributed to your academic performance at Virginia Tech, whether they were or were not discussed during the group interview you attended.

Name_____

Department_____

Social Security Number_____

Sex_____

Race_____

What is your combined SAT score?_____

What was your high school ranking?_____

How many years of mathematics did you have in high
school?_____

How many science courses did you take in high
school?_____

How much experience did you have with a computer software "language" prior to coming to Virginia Tech?

A Lot_____Little_____None at all_____

Based on your high school background how did you expect to perform academically at Virginia Tech or what kind of GPA were you expecting?

_____

What is your understanding of academic involvement?

_____

Based on your understanding of academic involvement, would you say you have been academically involved as for it to impact your academic performance?

A Lot_____Little_____None at all_____

Open-Ended Questionnaire

Part II

Directions: Please list the 3 academic involvement activities that most contributed to your academic performance during your freshman year as an engineering freshman at Virginia Tech. Use brief phrases to indicate how they contributed to your academic performance.

Item I_____

Explain how it contributed to your academic performance_____

_____

Item II_____

Explain it how it contributed to your academic performance_____

_____

Item III_____

Explain how it contributed to your academic performance_____

_____

Appendix H: Introductory Comments

Good evening and welcome to tonight's session. Thank you for taking the time to participate in our discussion on the learning activities and academic support services that students perceive as impacting their academic performance. All the questions asked will be related to personal experiences with learning activities implemented and the academic support services used during your freshman year and how you perceived them to have impacted your academic performance. Whatever information you share is very important and will help us gain a better understanding of the things that are helping students succeed academically. As students in the University, you are in the best position to tell us how you feel about learning and the support services provided.

We are asking you during this discussion to provide us with information that will help the university identify the specific learning activities and academic support services that contribute to academic performance. During the discussion I encourage you to be honest and open in expressing your opinions. I want you to know that in situations like these, there are no right or wrong answers, but instead, you will have different views of issues. I encourage you to share your opinions if they are different from others.

It is important that we go over some ground rules before we begin. If you are not sure of a question, please feel free to ask for clarification. Since this discussion is being taped, it is very important that you speak up and that we talk one at a time, so that we can get all of the information being gathered. It is also important that you do not engage in side conversations so that everyone may have an opportunity to be heard.

Everything that is being discussed here is confidential; and I ask you to please keep it that way. Whatever is discussed here should not be shared with others in identifiable format. The names reported in the research will be aliases . The tapes will be destroyed after the data analysis.

Again, I encourage you to be open in sharing your learning experiences, negative or positive. The negative experiences are the most helpful in studies like these. Now, to enable you to feel more comfortable with each other, I would like for you to introduce yourselves to each other.

Appendix I: Request To Institutional Review Board To Conduct Research Involving Human Subjects

Justification of Project

This research is being conducted with the objective of identifying the specific learning activities that engineering sophomores implemented and the academic support services that they used during their freshman year, which they perceive as having affected their academic performance. The purpose of the study is to generate information that will guide counselors in their intervention planning when working with engineering freshmen experiencing academic difficulties. It is hoped that the information generated from this study will also contribute to a better understanding of the theory of student effort. The proposed methodology, if successful, will serve as a model for other colleges in the university, and hopefully other universities in addressing students' academic performance. Finally, the information generated by this study will contribute to strengthening Virginia Tech's programs, resources and services for student success.

Procedures

This study will involve human subjects from the College of Engineering, who were freshmen during the 1997/998 academic year, and who are currently enrolled full-time sophomores. The list of eligible prospective students will be obtained from the College of Engineering.

The interviews will be conducted by skilled moderators assisted by the principal investigator. The analysis will be done by the principal investigator and assisted by an experienced protocol analyst. The reason for involving the analyst is to add objectivity to the data analysis, thereby increasing the trustworthiness of the results.

This research will involve African-Americans, (males and females) and Caucasians (males and females), with GPA's ranging from 2.7 to 2.00. Due to the sensitive nature of the topic, (i.e. academic performance in a university setting) homogeneous groups will be used for each group reflecting race, gender and academic performance level.

The first group will consist of Caucasian male students with below 2.7 GPA to 2.00, the second will be African-American males with the same GPA until all groups are conducted

reflecting race, gender and different levels of academic performance. It is estimated that about 64 students will be needed to conduct the 8 focus groups interviews required for the study.

Students will be contacted by phone to determine their appropriateness and to request their participation in the study. Upon agreeing to participate in the study, the students will be sent a follow-up letter and general information about the study.

The research will involve the following steps:

- Focus groups interviews: to be conducted by skilled moderators using the attached question guide.
- Opening comments: to be read at the beginning of each session to welcome the participants and inform them of how the discussion will be conducted.
- Questions and Responses: participants will be asked to respond to the questions by relating their own individual experiences.
- Follow-up Questionnaire: participants will be asked at the end of the session to respond to open-ended questionnaires enabling them to expand on the information already provided, to add what they forgot, and also to correct interpretations of their responses during the group discussion.

Risks and Benefits

No risks are anticipated for participation in this study. There are possible benefits, however. Among them is the intrinsic satisfaction of providing information that will strengthen the type of academic support services provided to enhance students' academic performance, as well as the personal satisfaction of possibly contributing to the success of future engineering students. These benefits, however, are not guaranteed.

Extent of confidentiality

The researcher will at no time release the names or any other identifiable information regarding the participants. The audio-tapes will be erased, and transcripts will be shredded one year after the completion of the study. Participants are expected to maintain confidentiality about discussion that occurs during the focus group interview.

Informed Consent

The consent form is attached.

Vitae

Charlotte A. Amenkhienan

Staff Counselor
Cook Counseling Center
240 McComas Hall (0108)
Virginia Tech
Blacksburg, VA 24061
540-231-6557
e-mail: camen@vt.edu

EDUCATION

Ph.D. September 2000, Counselor Education, Virginia Polytechnic Institute and State University (Virginia Tech), Blacksburg, Virginia.

MA.Ed., Counseling and Student Personnel, May 1991, Virginia Polytechnic Institute and State University (Virginia Tech), Blacksburg, Virginia.

M. Ed., Educational Administration and Supervision, December 1981, University of Mississippi, University, Mississippi.

B.A., Education, June 1980, University of Benin, Benin-City, Nigeria, Thesis: *Survey of Attitudes Toward Adult Education in Oredo Local Government Area of Bendel State.*

EXPERIENCE

Teaching Experience
Adjunct Faculty Radford University, Department of Counselor
Multicultural Counseling

Guest presenter-Counseling Special Client populations, taught by Joan Looby, July 1993; Principles and Practices of Counseling, taught by Dr. T. Hohenshil, Aril 1996, Counseling Techniques, taught by Dr. H. Getz, September 1997.

Staff Counselor, University Counseling Services, Virginia Tech, Blacksburg, Virginia, July 1991 to present.
- Provide career, academic and personal counseling to students.
- Coordinate Study Skills program.
- Teach study skills sessions.
- Administer and interpret career assessment inventories.

- Assess students' learning skills using diagnostic instruments.
- Plan and implement interventions for students' specific needs.
- Present Study Skills outreach programs to the university community.

Graduate Assistant, Dean of Students Office, Virginia Tech, Blacksburg, Virginia, Fall-Spring 1991
- Coordinated, monthly Black Student Advisory Committee meetings to gain information on student needs and provide results to office of Multicultural Affairs.
- Served as liaison to academic support services-tutoring and peer group leader programs.

Internships, University Counseling Services, Virginia Tech, Blacksburg, Virginia, Fall 1990 to Spring 1991.
- Provided academic career and personal counseling to students.
- Taught Study Skills sessions.
- Presented Study Skills outreach programs.

Graduate Assistant, Office of Vice President for Student Affairs, Virginia Tech, Blacksburg, Virginia, Fall 1989 to Summer 1990.
- Editor of Division of Student Affairs Newsletter.
- Served as a liaison to the units within the Division wrote reports and served on various Student Affairs committees.

Reserve Assistant, McConnel Library, Radford University, Radford, Virginia, September 1988 to summer 1989.
- Entry of reserve materials into the LS/2000 OCLC computer system.

Secondary School Teacher, Anglican Girls' Secondary School, Benin City, Nigeria, 1978 to 1980.
- Taught classes in government and history.
- Advised students on career options, courses, dormitory rules and regulations, and academic and personal matters.

Administrative Assistant, Financial Aid Office, Ministry of Education, Benin City, Nigeria, November 1973 to September 1976.
- Processed short listing of aid applications, calculated needs assessment to determine eligibility and completed required forms and documentation related to budgeting.

PROFESSIONAL AFFILIATIONS
- American Counseling Association.
- Association for Multicultural Counseling and Development.

CONFERENCE PRESENTATIONS AND ACTIVITIES

- Presentation: Co-Presenter: "Facilitating Transition After Rape; A Group Counseling Model," National Convention of the American College Personnel Association, San Francisco, California, March 1992.

- Presentation: Co-Presenter: "Reducing and Resolving Rape Trauma Through a Sexual Assault Survivors Group," Seventh Annual Conference of Virginia Counseling Center Staff, University of Richmond, Richmond, Virginia, May 1992.

- Presentation: "Helping College Attention Deficit Disorder (ADD) Students Realize Their Educational Goals," Tenth Annual Conference of Virginia Counseling Staff, George Mason University, Fairfax, Virginia, May 1995.

- Participated in Cultural Competency Training Program, Virginia Tech, facilitated by Aaron B. Stills, Ph.D., Associate Professor, Howard University, 1993.