

CHAPTER III

METHODOLOGY

This chapter describes the methods and procedures used in conducting this study. Seven sections are included: (a) research questions; (b) hypotheses; (c) participants; (d) instrumentation; (e) data collection; (f) independent and dependent variables and (g) data analysis.

Research Questions

This study is to determine; (a) the current advising African American and White students in the College of Engineering at Virginia Tech are perceiving; prescriptive versus developmental; and (b) what the preferences are for advising of African American and White students in engineering; prescriptive versus developmental. This study will specifically examine the comparison between race, gender, classification, grade point average (GPA), and major. The following research questions were addressed:

1. What is the difference between the kind of advising engineering students are currently perceiving based on race, gender, classification, GPA, and major? (Prescriptive or Developmental)
2. What is the preference for advising for engineering students based on race, gender, classification, GPA, and major? (Prescriptive or Developmental)

Hypotheses

1. There is no significant difference between the style of academic advising currently perceived by African American and White engineering students.
2. There is no significant difference between the style of academic advising that African American or White engineering students prefer.

Participants

The population for this study was undergraduate African American and White students ranging from freshman to seniors who were enrolled in the College of Engineering at Virginia Tech in the Spring of 2002. The survey was administered via the Internet. Permission to conduct the study was approved by the Institutional Review Board to Conduct Research Involving Human Subjects, The College of Engineering and the Office of Minority Engineering Programs (OMEP). The survey that was administered via the Internet was E-mailed to 3,885 ($n = 217$ African Americans and $n = 3,668$ Whites) undergraduate engineering students. Four hundred and two (10.3%) undergraduate engineering students replied and participated in the study on-line. Of these, 29 were disqualified, either because they failed to complete the instrument on-line correctly or they submitted a duplicate entry. Of the remaining 373 (9.6%) usable entries, this represents 61% ($n = 132$) of the African American engineering students and 6.6% ($n = 241$) of the White engineering students. A total of 265 ($n = 93$ African Americans and $n = 172$ Whites) males participated in the study along with 108 ($n = 39$ African Americans and $n = 69$ Whites) females.

Instrumentation

Crookston (1972) presented two advising styles—prescriptive advising, which is primarily focused on formal academic matters, and developmental advising, which reflects a concern for the student's total education. Efforts to evaluate what happens in academic advising led to the development of the Academic Advising Inventory (AAI) by Winston and Sandor (1984a). See Appendix 10. The AAI addressed the research questions and identified the current perceptions and preferences of academic advising for

African American and White engineering students in this study. The AAI was also available in measuring the comparison between race, gender, classification, GPA, and major.

The AAI is a four-part instrument that measures the level of prescriptive or developmental advising perceived by students and student satisfaction with advising. The AAI was found to have a high construct validity and reliability. Reliability and validity of test items are based on studies published in the test manual for the AAI by Winston and Sandor (1984a). It appears that the AAI is relatively homogeneous and stable enough for use with a diverse group of students. The questions were derived from an eight-member panel of advising experts nationally. The alpha coefficient for the Developmental-Prescriptive Advising scale was found to be .78, as measured using Cronbach's alpha. These results were derived from data gathered from over 600 largely traditional postsecondary students at five geographically diverse colleges and universities (Winston & Sandor, 1984a).

Part I, the Developmental-Prescriptive Advising (DPA), (items 1-14) consists of 14 pairs of statements. See Appendix 10. This section is used to measure the nature of the advising relationship that the student currently perceives they are experiencing with their academic advisor. Paired statements are shown of examples of topics and concerns addressed when the advisor-advisee is engaged. Each pair represents a continuum between the two contrasting student-advisor behavior styles and attitudes perceived by students as prescriptive or developmental (Winston & Sander, 1984a). Subjects were asked to choose one of the two statements that most accurately describes the academic advising they have received throughout this year on an eight-point continuum. Low

scores (14 to 56) indicate that *prescriptive* advising is prevalent, while high scores (57 to 114) indicate *developmental* advising is evident between the student/advisor relationship.

Part II, Satisfaction with Advising is a scale that measures several dimensions of satisfaction with service received during the academic year. These sections include (a) overall satisfaction, and (b) accuracy of information provided. Students respond to each item using a four-place Likert-type scale, choosing either strongly disagree, disagree, agree, or strongly agree.

Part III, the Developmental-Prescriptive Advising or the "Ideal Advisor" section is another 14 item pair of statements for the student to indicate how they view their ideal academic advisor. This section measures the students' preference for a particular advising style, one of the paired statements represent developmental advising and the other prescriptive. This scale indicates the students' preference in regards to the nature of the advising relationship between the advisor and advisee. A score 14 to 56 implies a preference for *prescriptive* advising, while a score between 57 to 114 indicates a preference for *developmental* advising.

Part IV, Demographic items were used to gain information about the students and the type and frequency of advising currently received and preferred. Students provided information about: (a) race, (b) gender, (c) classification, (d) major, (e) grade point average, (f) amount of time spent in advising, and (g) total number of advising sessions participated in during the current academic year. Certain parts of section IV were used in making group comparisons.

Data Collection

The AAI was administered via the Internet to two sets of undergraduate engineering groups, African Americans and White students at Virginia Tech. The AAI takes approximately 20 minutes to complete on-line. Both groups of undergraduate engineering students were sent an E-mail explaining the intent of the researchers study. Within the body of the E-mail, the URL web address link was available for the students to click on to take them directly to the consent form that was posted online. After reading the consent form and agreeing to participate in the study, the student acknowledged by clicking on the hyperlink "I AGREE," that linked them directly to the AAI on line at a URL web address.

The AAI was first administered via the Internet to the entire African American undergraduate engineering population of 217 students. A follow-up E-mail through the Office of Minority Engineering Programs on-line Newsletter from Dean Watford, from the College of Engineering was sent out as well to encourage the African American students to complete the survey online. Out of 217 African American students, there were a total of 146 (67%) replies. After the first day the AAI was sent out via the Internet, there were a total of 65 (30%) responses from the African American student population. On the second day there were an additional 18 (*11.8% of the remaining students who had not completed the survey the first day) responses. The AAI was sent out a second time through E-mail on the third day to the African American student population to encourage them to complete the survey on-line.

The AAI was next sent out to the White undergraduate ($n = 3,668$) engineering students about a week after the African American engineering students because of an

administrative delay. There were a total of 256 (7%) responses. After the first day of sending out the E-mail to request that the students participate in the study there were a total of 112 (3%) responses. On the second day there was a total of 71 (*2% of the remaining students who had not completed the survey the first day) responses. The White engineering students were sent another E-mail on the third day to encourage them to complete the AAI survey on-line.

Data from both groups was collected from the students who completed the survey via the Internet. The data from the AAI was downloaded from the server into an Excel file and transferred into Statistical Package for Social Sciences (SPSS 10.1) for analysis.

Independent and Dependent Variables

For the data analysis, the independent variables for this study were the demographic groups from which the subjects were drawn; race, gender, classification, GPA and major. The dependent variables were identified as the style of academic advising (prescriptive or developmental) either perceived or preferred as indicated by the scores on the AAI.

Data Analysis

Data was analyzed using SPSS 10.1 for Windows. Descriptive statistics and frequencies were conducted on all participants, and demographic information was reported on race, gender, classification, major, and GPA. Chi Square test for independence was also used to analyze relationships between races, gender, classification, major, and GPA. All Chi Square tests were considered significant at

$p < .05$. Descriptive statistics were also used to identify advising style perceived and advising style preferred by participants.

The major hypothesis stated there would be no difference in the current advising style perceived and there would be no differences in advising style preferred between African American and White engineering students. Hypotheses also stated there would be no differences in advising perceived and preferred in relation to gender, major, classification, and GPA. Independent sample *t*-test were used to test differences in advising style perceived and advising style preferred between African American and White students. Levine's test for Homogeneity of variance was used to test if variances are equal, and both the Levine's test and *t*-test was significant at $p < .05$. Independent sample *t*-test was used to test differences in advising style received and advising style preferred between African Americans and Whites.

There are 12 different engineering majors. A two-way Analysis of Variance (ANOVA) was used to test if advising style received and advising style preferred is different among the 12 majors. The significance level was .05. Tukey's posthoc multiple comparisons was used to test which majors differ from each other, and differences between majors were justified by a $p < .05$.

Two-way ANOVA was also used to test differences whether advising perceived and advising style preferred were different between classification (freshmen, sophomore, junior, and senior). In order to employ Tukey's posthoc multiple comparison, analysis of variance must be significant at $p < .05$. Tukey's posthoc comparisons was used to test classification differences, and all *t*-test were significant at $p < .05$. Two-way ANOVA was also used to see if there were differences in advising style perceived and advising style

preferred among the different categories of GPA. Significance level was set at .05, and if there was significance Tukey's posthoc multiple comparison test was used to test which categories differed from each other.

The survey consisted of additional questions regarding advising style as it relates to engineering. Descriptive data and frequencies were used to explain this data. Comparisons were made between African American and White students. The comparisons between the groups were satisfaction with academic advising and whether they had received accurate information. Students chose either strongly disagree, disagree, agree, and strongly agree. Comparisons were also made on communication, relationship with advisor, time spent with advisor, and length of sessions. Independent sample *t*-tests were used to analyze whether African American and White students differed on their responses to these questions.

Summary of Chapter

In conclusion, this study was conducted to examine the current advising perceived by African American and White students in the College of Engineering, as well as research the preferences for advising (prescriptive or developmental) between the two groups. This chapter has described the methods, participants, procedures and analysis used in this study. Collecting the data in the manner described in this chapter was found sufficient to answer the research questions and hypotheses posed in this study. In the following Chapter Four, the results obtained from this research are presented.