

**The Persistence of African-American Males in the College of Engineering at
Virginia Tech**

by

James L. Moore, III

Dissertation submitted to the faculty of the Virginia Polytechnic Institute and
State University in partial fulfillment of the requirements
for the degree of

Doctor of Philosophy

in

Counselor Education

APPROVED:

Thomas Hohenshil, Co-Chair

Jimmie Fortune, Co-Chair

Bevlee A. Watford

Claire Vaught

Octavia Madison-Colmore

June 14, 2000
Blacksburg, Virginia

Keywords: **Persistence, Engineering, African-American males, Retention, Academic
Success**

THE PERSISTENCE OF AFRICAN-AMERICAN MALES IN THE COLLEGE OF ENGINEERING AT VIRGINIA TECH

by

James L. Moore, III

Counselor Education Program Area
Virginia Polytechnic Institute and State University

Thomas Hohenshil & Jimmie Fortune
Committee Co-Chairs

Abstract

This study was designed to explore, identify, and examine how African-American males were able to persist in the College of Engineering at Virginia Tech. The findings were used to gain insight to how some African-American males persevere in engineering disciplines and others do not. In addition, the study was designed to better understand the institutional barriers that were perceived as having to overcome in order to persist as an engineering student and to pinpoint the factors that most influenced their decision to pursue engineering. It was also intended that this study would provide the groundwork for the development of a conceptual model that would have implications for recruiting, retaining, and graduating African-American males. Such a conceptual model would complement existing literature related to academic success and achievement in higher education.

The primary sources of collecting data were focus groups, individual interviews, and biographical questionnaires. These research methods allowed African-American males to share their stories and experiences in their own words. A total of 42 African-American males participated in the study. The participants were divided into five sample-groups: (1) *Ultimate-Persistent Group*, African-American males who were

former engineering students but who had already graduated with an engineering degree from Virginia Tech; (2) *Exemplary-Persistent Group*, African-American male engineering students who were categorized as juniors and/or seniors with a 2.5 QCA or higher; (3) *Satisfactory-Persistent Group*, African-American male engineering students who were categorized as juniors and/or seniors with a 2.0 – 2.5 QCA; (4) *Unsatisfactory-Persistent Group*, African-American male engineering students who were categorized as juniors and/or seniors with less than a 2.0 QCA; (5) *Non-Persistent Group*, African-American males (former engineering students) who left engineering but were classified as juniors and/or seniors based on the number of years enrolled in the university. Data were analyzed using the grounded theory method.

The findings of the study clearly indicated that a number of factors influenced these African-American males' interest and skill development in math, science, and engineering. Such salient factors were family members, teachers, role models, science and math programs, and participants' genuine interests in such subject areas. In many ways, the factors that were identified as influencing these African-American males' decision to pursue engineering were also identified as being instrumental in helping them persist in engineering. More specifically, these factors were the following: commitment to engineering, familial support, integration in the social and academic environment, connection or link with academic resources, clear goals with a realistic plan of action, regular interaction with African-American and non-African-American peers, both politically and academically sound, and a sense of racial identity. When these factors were low and/or absent, the researcher discovered that these African-American males had more difficulty persisting and were more likely to transfer out of the College of

Engineering. This was especially the case for the *Unsatisfactory Persistent Group* and *Non-Persistent Group*.

Similar to Delores Scott's (1995) findings, those African-American males who did persist and/or graduate stated that they were determined to succeed in engineering so they could prove to those individuals, who doubted they could be successful in the College of Engineering, that they would get their engineering degrees. This underpinning of determination served as motivation for many of the sample groups, such as the *Ultimate-Persistent Group*, *Exemplary-Persistent Group*, and *Satisfactory-Persistent Group*.

Dedication

There are always so many people to thank whenever one undertakes a venture of this magnitude, but I cannot think of anyone more deserving than my wonderful, loving, and supportive parents. In a symbolic way of appreciation, I would like to dedicate my dissertation to both my dad and mom – Mr. James L. Moore, Jr. and Mrs. Edna M. Moore.

Acknowledgements

First and foremost, I would like to thank the Almighty God for bestowing so many blessings in my life. I could not have completed this dissertation without His guidance. I would like to also express my gratitude to a number of people who have helped me along the way, whether directly or indirectly, in the completion of this dissertation. Words can never express how much I appreciate your encouragement and support.

Much of my success and accomplishments can be attributed to my parents. I consider this recent accomplishment – an endeavor that both my parents and I achieved. Daddy – I would like to thank you for instilling in me an unwavering work ethic of excellence and persistence. I am eternally grateful to you for tolerating nothing short of educational excellence. Mama - I would like to thank you for teaching me the “vision” or shall I say God’s plan. I will always be eternally grateful to you for teaching me this concept of purpose and giving back. From an early age, you told me that I have three names: (1) the one I was born with (e.g., Moore); (2) the one that my parents gave me (e.g., James L. III); and (3) the last one I would have to make for myself. I intend on making a name that you and Daddy will be forever proud of. Again, thanks Dad and Mom!

Third, I would like to thank my younger two siblings, Torre and Shalonie Moore, for their unwavering support and encouragement. I really appreciate your sacrifices over the years. Fourth, I would like to thank my “significant” other and closest friend, Darlene Eberhardt for her love, patience, understanding, and support she provided before and after the dissertation process. Fifth, I would like to take this opportunity to express my

appreciation to my wonderful dissertation committee – Drs. Thomas Hohenshil, Jimmie Fortune, Beville A. Watford, Claire Cole Vaught, and Octavia Madison-Colmore. I am forever indebted to each of you for your support, advice, guidance, and patience throughout the dissertation process. I considered all of you models of excellence and professionalism. Sixth, I would like to thank my great-grandmother, Maggie “Mother” Edwards and grandparents, Big Mama (Greer, SC), Big Mama (Lyman, SC), and Papa (Lyman, SC). Seventh, I would like to thank Dr. James Scott King of Delaware State University for encouraging me to pursue the doctorate degree and helping me get through the process. I consider you as a “second” father and mentor. Eighth, I would like to thank my favorite aunt and uncle, Frances and W.C. Anderson, for always encouraging and supporting me. Ninth, I want to thank the following family members, friends, colleagues, and special acquaintances – Dr. Lee Jones, Dr. Carlous Caple, Dr. Adam Kantrovich, Dr. Michael Herndon, Dr. Sherry Watt, Vicki Meadows, Rodney Pulliam, Dr. Lance Brown, Jonathan Davis, Richard Fifer, Shannon Arnold, Roslyn Swigget, Ed McPherson, Jay Glover, Elvin Taylor, Cheryl Seals, Sandra Griffith, Paige Smith, Rodrick “Hot Rod” Seals, Mrs. Sara Wheeler, Aunt Jeanette Benson, Tom White, Dr. Leslie Graham, Dr. John McFadden, Dr. Mary Howard-Hamilton, Dr. Wayne Scales, Aunt Gladys Peake (deceased), Dr. Glenda Scales, Dr. Hayward Farrar, Dr. Delores Scott, Dr. Barbara Pendergrass, Cathy Lewis, Dr. Randy Grayson, Kellie Ross, Reggie Scott, B.T. Hawes, Wanda Peake, Mike (OMEP workstudy), Kent Anderson, Dr. Gary Burgess, Dr. Larry Moore, Aunt Ann Smith (deceased), Uncle Tutie (deceased), Freddie Scott, Marc “Dre” Still, Philip Anderson, Coach Willie Bee, Uncle Robert Miller (deceased), Marc “Stump” Johnson, Coach Harold McManus, Coach Bill Collick, Coach

Freddie Coan, Coach June Wingo, Jermaine Anderson, Morris Hicks, Jr., Aunt Gwen, Uncle Kurt (deceased), Coach Charles Staggs, Joanne Smith, Ms. Stroble (deceased), Brenda Kerns, Nita Chambers, Willie “Rueban” Scott, Neon Chapman, Kurt Dickson, Brenda Story, Ms. Dot, The Moore Extended Family, The Miller Extended Family, The Anderson Family, The Johnson Family, and The Scott Family. Tenth, I would like to personally thank the Office of Minority Engineering Programs and all the engineering students for allowing me to work with them over the years. Eleventh, I would like to thank all of the African-American males, who participated in this study, for helping me complete my dissertation. Last but not least, I would like to thank my predecessors for making sacrifices in order that I might be able to pursue a doctorate at a predominately white institution like Virginia Tech.

Table of Contents

Abstract	ii
Dedication	v
Acknowledgements	vi
Tables of Contents	x
List of Tables	xiii
CHAPTER I – INTRODUCTION	1
Purpose of the Study	5
Research Questions	6
Assumptions	6
Limitations	7
Definitions	7
CHAPTER II – LITERATURE REVIEW	9
Psychosocial-Developmental Characteristics of African-American Males	9
Under-Representation of African-American Males in Higher Education	13
Pre-Enrollment Characteristics	17
Campus Environment	23
Motivation and Persistence	28
Math and Science	33
Retention and Academic Support Programs	36
Parental and Familial Support	41
Qualitative Methodology and Research	44
CHAPTER III – METHODOLOGY	51
Campus Setting	51
Sample Selection	54
Sample Techniques	56
Data Collection	59
Data Analysis	61
Trustworthiness of Study	62
CHAPTER IV – RESULTS OF STUDY	65
Overview of Data Analysis	65
Arrangement of Findings	66

Review of Sample Groups	67
An Overall Thematic Analysis	67
Social Environment Within the College of Engineering	68
Factors that Impact Decision to Major in Engineering	73
Childhood Environment	76
Factors of Persistence	79
Factors for Success	82
Personal Characteristics	84
Ultimate-Persistent Group and Biographical Questionnaires	87
Exemplary-Persistent Group and Biographical Questionnaires	89
Satisfactory-Persistent Group and Biographical Questionnaires	92
Unsatisfactory-Persistent Group and Biographical Questionnaires	95
Non-Persistent Group and Biographical Questionnaires	98
Ultimate-Persistent Group and Thematic Summary	116
Exemplary-Persistent Group and Thematic Summary	118
Satisfactory-Persistent Group and Thematic Summary	121
Unsatisfactory-Persistent Group and Thematic Summary	123
Non-Persistent Group and Thematic Summary	125
 CHAPTER V – SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS	 129
Summary of Findings	129
Research Question (1)	129
Research Question (2)	131
Research Question (3)	131
Research Question (4)	132
Research Question (5)	133
Research Question (6)	134
Research Question (7)	135
Research Question (8)	136
Conclusions	136
The Impact of Early Exposure to Math and Science	137
Perceptions of Virginia Tech and its College of Engineering	137
Obstacles in the College of Engineering	138
Academic Achievement in the College of Engineering	138
Recommendations	139
Recommendations for Parents	139
Recommendations for High School Officials	140

	Recommendations for Practice/Policy in the COE	140
	Areas for Future Research	141
REFERENCES		144
APPENDICES		167
Appendix 1	Request to Institutional Review Board	167
Appendix 2	Letter to Prospective Participants (EPG, SPG, USPG, & NPG)	169
Appendix 3	Letter to Prospective Participants (UPG)	170
Appendix 4	Letter with Information (UPG)	171
Appendix 5	Letter with Information (EPG, SPG, USPG, & NPG)	172
Appendix 6	Virginia Tech's Informed Consent Form	173
Appendix 7	Biographical Questionnaire (EPG, SPG, & USPG)	175
Appendix 8	Biographical Questionnaire (NPG)	180
Appendix 9	Biographical Questionnaire (UPG)	185
Appendix 10	Follow-up Letter for Focus Group Interviews	190
Appendix 11	Follow-up Letter for Individual Interviews	191
Appendix 12	Focus Group Guide (EPG, SPG, & USPG)	192
Appendix 13	Focus Group Guide (UPG)	194
Appendix 14	Focus Group Guide (NPG)	196
Appendix 15	Individual Interview Guide (EPG, SPG, & USPG)	198
Appendix 16	Individual Interview Guide (UPG)	200
Appendix 17	Individual Interview Guide (NPG)	202
Appendix 18	Instructions to AOL Instant Messenger™	204
Appendix 19	Focus Group Follow-Up	206
Appendix 20	Individual Interview Follow-Up	207
Appendix 21	Thank-You Letter	208
VITAE		209

List of Tables

Table 1	Data for Engineering Cohorts	53
Table 2	Required Characteristics of Sample	56
Table 3	Data Sources for Research Questions	64
Table 4	The Emerging Themes and Sub-Themes for the Study	68
Table 5	Biographical Questionnaire Data for Ultimate-Persistent Group	101
Table 6	Biographical Questionnaire Data for Exemplary-Persistent Group	104
Table 7	Biographical Questionnaire Data for Satisfactory-Persistent Group	107
Table 8	Biographical Questionnaire Data for Unsatisfactory-Persistent Group	110
Table 9	Biographical Questionnaire Data for Non-Persistent-Persistent Group	113
Table 10	A Conceptual Model of Persistence	143