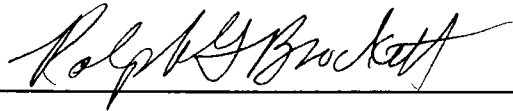


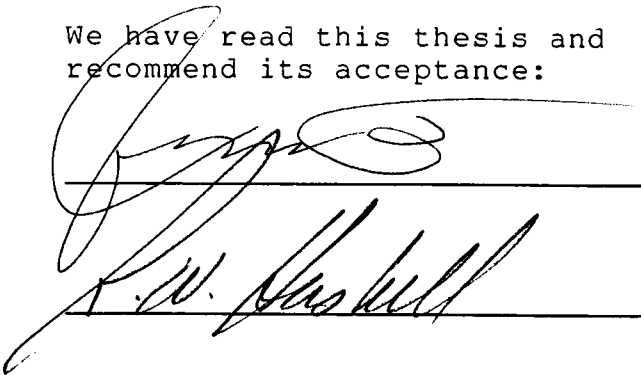
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I am submitting herewith a thesis written by Pattie S. Boring entitled "Classroom Learning Environment and Student Achievement in an Enlisted Professional Military Education Environment." I have examined the final copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Technological and Adult Education.



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CLASSROOM LEARNING ENVIRONMENT AND STUDENT ACHIEVEMENT IN
AN ENLISTED PROFESSIONAL MILITARY EDUCATION ENVIRONMENT

A Thesis

Presented for the

Master of Science

Degree

The University of Tennessee, Knoxville

Pattie S. Boring

December 1993

DEDICATION

This thesis is dedicated to my husband Ray and three sons Jared, Kyle, and Seth who have sacrificed a lot yet continued to love and support me.

This thesis is also dedicated to Dr. Roger Haskell who not only taught me, but challenged me and made me believe "I could." He encouraged me and never lost patience in my struggle to learn.

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This thesis began as a simple proposal to fulfil the requirement of a research class. Sometime during this class, however, an excitement and challenge grew that made me believe I could actually succeed in writing a thesis. With absolutely no intention of initially accomplishing a thesis during the fall 1992 semester to now, I would like to thank some of the significant people who have contributed in this endeavor.

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ABSTRACT

This study examined the difference in academic performance between two groups of enlisted Professional Military Education (PME) students attending the Noncommissioned Officer Academy (NCOA). One group consisted of students who perceived their actual learning environment to be very similar (congruent) to their ideal learning environment. The other group consisted of students who perceived their actual learning environment to be very dissimilar (divergent) to their ideal learning environment. In addition age and gender differences were compared for both groups.

The subjects of this study were initially 74 enlisted Air Force sergeants. Each participant completed the Ideal and Actual Versions of the Adult Classroom Environment Scale (ACES) as well as a pre-test and four evaluations. These four evaluations corresponded to the pre-test and served in combination as a post-test.

The difference in the ACES Ideal and Actual version total scores was used to establish one group of students who perceived their learning environment as congruent ($n=27$) and another group who perceived their learning environment as divergent ($n=18$). Students whose score difference was a half standard deviation more or less on either side of the mean were not used for the purposes of this study ($n=29$).

To compare the academic performance of the congruent and divergent groups and because there was a significant difference in pre-test results between these two groups, an analysis of covariance was used. The results revealed that there was no significant difference in the academic performance of students who viewed their learning environment as congruent when compared with the performance of their counterparts who viewed their environment as divergent. In addition age and gender were not significantly different for either group.

Conclusions drawn from such a small sample size seem precarious at best, but the fact that both groups' academic performance was nearly identical may be attributed to the educational process employed at the Professional Military Education Center. This process involves a criterion-referenced approach with a dedicated instructor staff. It is suggested that this study be replicated using a larger sample size and a different educational setting in which perhaps a criterion-referenced approach is not used.

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CHAPTER I

Introduction

Hiemstra (1991) stated that when "learning" is associated with "environment," various meanings are conjured up in the minds of the adult educator. Some immediately think of the learning climate, the physical environment, the psychological or emotional climate, or the social setting. For purposes of this study, the classroom environment was viewed as the psychosocial atmosphere of the classroom defined in terms of the perceptions of the instructors and/or students in that environment. Moos (1979) referred to the learning environment as the "personality" of the classroom formed by the interactions of its participants. However, regardless of what image is created in one's mind or how "classroom environment" is defined, most would agree that the classroom environment is an integral component of effective instruction.

Although the classroom environment is an important consideration for adult educators, little is actually known about the adult classroom environment. Until recently, the primary educational classroom environments studied were elementary and secondary school settings (Darkenwald, 1987). With the increased focus on adult education, a challenge exists for researchers to provide more

information that will assist educators working with the adult segment of society. Recent research also indicates that additional information is needed to assist in designing and planning for change in adult classroom environments (Sullivan, 1989).

The need for more information on adult classroom environments is not limited to the civilian sector. The Department of Defense conducts the world's largest adult education activities (Veeman and Singer, 1989), and recently there has been an increased emphasis in the United States Air Force in Professional Military Education (Buckley, 1993). It is important to note that not all training/education in the military is like "basic training" - the image that most people have in their mind when they think about a military environment. Just as in the civilian community, there are distinctions made in the Air Force between training and education (Buckley, 1993). Military members engage in both, however, at different times distributed throughout their careers.

There are basically two aspects of an enlisted individual that training and education attempt to develop: technical and supervisory. The technical aspect begins to be developed when enlisted personnel are sent to their first technical training school immediately after graduation from Basic Military Training. Here individuals are "trained" in a specific technical job or specialty.

Air Force members below the rank of sergeant are primarily in training status striving for technical competence; however, the longer a person remains in the military service the more likely he/she will enter into a supervisory role.

As the person moves up in the rank structure, his/her position begins to take on more leadership/supervisory responsibilities. This is the point in which professional military education (PME) attempts to develop the supervisory aspect of the military member. Air Education and Training Command (AETC) officials have stated, however, that the enlisted force structure had two groups of people: "those who concentrated heavily on education, and those who ran up the training ladder without much desire for or opportunity to attend professional military education classes" (Buckley, 1993, p. 24). In an effort to create a better balance and therefore more effective technician and leader, the Air Force has recently initiated mandatory courses, alternating technical training and professional military education, for promotion eligibility. General Henry Viccelleo Jr., the AETC Commander, stated, "One of the thrusts is to tie our training and our education programs together better than we have in the past" (Buckley, 1993, p. 14).

Initially a person enlists and attends basic military training which emphasizes discipline and followership. The

person then immediately attends a technical training school which teaches the basic skills required of a selected job or specialty. These schools can range from a few weeks to several months in length. Somewhere around the four year mark and prior to promotion to E-4/sergeant, the individual must attend the Airman Leadership School (ALS). ALS is the first level of PME and is a mandatory, four-week-long, in-residence course. The ALS focus is on educating the young, soon-to-be sergeants and noncommissioned officers (NCOs) on total quality principles with an emphasis on communicative skills necessary for effective supervision. Once promoted to E-5/staff sergeant as a first-line supervisor, job competency is still paramount. It is time to refocus on the technical aspect of the job and work on skill-level training; the individual returns to a technical training school. Once achieving this skill-level training and possible eligibility for promotion to E-6/technical sergeant, the individual must continue to prepare for future supervisory/managerial responsibilities. Here, the second-level of PME becomes mandatory: the NCO Academy (NCOA). The NCOA is a six-week-long, in-residence course that focuses on preparing Air Force supervisors to more effectively meet the demanding responsibilities of their positions. The NCOA has specific learning objectives built into the standardized curriculum and critical competencies which must be passed for Air Force supervisors to graduate.

Upon successful completion of the NCOA and with supervision now the primary focus, the individual is still required to maintain competency at his/her particular specialty; it is time again for skill-level training. This cycle of alternating technical training and professional military education continues throughout an enlisted member's entire career (Buckley, 1993). As one can see, training and education are important Air Force objectives which are analogous to the concept of lifelong learning (Veeman and Singer, 1989). "One of the Air Force's goals is to make education, training, and promotion opportunities more equal and well-rounded for all members from basic training to retirement" (Buckley, 1993, p. 15).

Problem

Whether one focuses on civilian or military classroom environments, some educators are attempting to change their classroom environments to align them more closely with their students' ideal or preferred classroom environment (Hiemstra, 1991). Obviously an attempt to change a classroom environment presumes that some known benefits should result from that planned change. A benefit that one would assume is improved student performance; however, only one previous study was found by this researcher in which students' actual and preferred classroom environments and their academic achievement were investigated (Fraser and

Fisher, 1983). Since Fraser and Fisher's research was conducted using the Classroom Environment Scale (an instrument not designed specifically for adult classroom environments) and with a sample of eighth and ninth graders, more information is needed in an adult education classroom setting to determine if there is a significant difference between adult students' perceptions of their classroom environment and their academic achievement. This information may prove useful in helping plan for more effective classroom change.

Purpose of Study

The purpose of this study was to determine if there is a significant difference between students' perceptions of congruent and divergent classroom environments and their academic achievement in a Noncommissioned Officer Academy (NCOA) setting.

Demographic data were collected for two reasons. First, the demographic data were used to accurately describe the sample used in this study. In addition, the demographic data were used to test two hypotheses related to age and gender.

Definitions

For purposes of this study, a **classroom environment** is defined as the psychosocial atmosphere or "personality" of the classroom formed by the interactions of its

participants (Moos, 1979). A **congruent classroom environment** is a setting in which students perceived their ideal classroom environment and their actual classroom experience to have been very similar. A **divergent classroom environment** is a setting in which students' perceptions of ideal and actual classroom environments were very dissimilar.

Rationale and Hypotheses

The major hypothesis tested in this study was as follows:

There is a significant difference in the academic performance of students who view their learning environment as congruent when compared with the performance of their counterparts who view their environment as divergent.

This hypothesis seemed plausible in light of Fraser and Fisher's (1983) research in which student achievement for eighth and ninth graders was related to a "person-environment" fit. In addition to examining academic performance and because previous research had not focused on age and gender issues, the following secondary hypotheses were also tested:

There is a significant difference in the ages of students who view their learning environment as congruent when compared with the ages of students who view their environment as divergent.

There is a significant difference in the gender of students who view their learning environment as congruent when compared with the gender of students who view their environment as divergent.

These latter two hypotheses are important issues particularly in light of the attention focused on the increasing age of the U.S. population, increasing numbers of adult students in the classroom environment, and possible learning differences between males and females (Sullivan, 1989).

Significance of the Study

The results of this study, in general, add new knowledge to the relatively limited body of literature on adult classroom learning environments. In addition to providing data helpful to those involved in planning for and implementing adult classroom changes, this information may be useful to program planners and instructors interested in improving adult students' academic performance.

The significance of this study, however, is not limited to civilian adult education/learners. With the increased focus on education in the United States Air Force, the results of this study provide insight into the adult learning environment specifically in a professional military education setting and may provide answers to questions on how to increase the effectiveness of the military adult learner.

Assumptions

The following assumptions underlie this research project:

1. Students' responses for their ideal learning environment would be similar to other NCOA students' preferences.
2. The learning environment created in the sampled NCOA class would be similar to other NCOA environments.
3. Students' academic performance would be similar to other NCOA students' academic performance.

Limitations

The following limitations existed for this study:

1. Because of the unique nature of this military educational environment and relatively small size of the class, it seems inappropriate to generalize the results of this study to other adult classes, particularly in different educational settings.
2. Because of the design of this study and the requirements imposed by the NCOA curriculum, there was no way to control the pre-test effect. It is not known what effect the pre-test had on student achievement.

Conclusion

Chapter I introduced the adult classroom environment as a topic of interest to civilian and military educators and briefly discussed the problem and purpose of this study. In addition, some definitions were provided to

assist in understanding the three hypotheses to be examined. This chapter concluded with the significance of this study, its assumptions, and its limitations. Chapter II will provide the review of related literature. Chapter III will outline the methodology used in this study. Chapter IV will discuss the data analysis and findings, and Chapter V will provide some conclusions and recommendations for future research.

CHAPTER II

Review of Related Literature

The research problem of this study required a search of the literature on studies which assessed the impact of the classroom social environment. The following review of literature provides a theoretical rationale to support the hypotheses posed in this study. To provide a theoretical structure, the following areas will be discussed: relationship between classroom climate and noncognitive outcomes, relationship between classroom climate and student absences and grades, alternative uses of classroom environment scales, the Adult Classroom Environment Scale (ACES), and attempts to change the adult classroom environment.

Assessment of Classroom Climate and Noncognitive Outcomes

Over the years, numerous research studies have been done examining the classroom learning environment. Rudolf Moos was the leading researcher on classroom environments in school settings in the 1970s (Darkenwald, 1989), and he developed a very popular instrument used in classroom environmental research: The Classroom Environment Scale (CES). Using the CES and two matched samples of 18 classes each from an overall sample of 250 high school classes in the United States, Trickett and Moos (1973) investigated

the relationship between classroom climate and learner satisfaction and moods. The results of their study indicated that high satisfaction was associated with high support, innovation, and rule clarity. High security scores were related to a perceived emphasis on involvement, affiliation, and teacher support. Feelings of anger correlated with low teacher support and a lack of order and organization. These findings indicated that the relationship dimensions, particularly teacher support, were closely related to noncognitive outcomes of learner satisfaction and mood.

Moos (1978), using a sample of 200 junior and senior high school classes, investigated the effect of classroom climate on both student and teacher satisfaction moods and perceived learning. In general both teachers and students were more satisfied in innovation rather than control-oriented classes. Both these studies, by Trickett and Moos (1973) and Moos (1978), suggested that classroom climate and several noncognitive outcomes were related.

Classroom Climate and Student Absences and Grades

For many educators, cognitive and behavioral outcomes are more important than noncognitive outcomes. Understanding this, Moos and Moos (1978) studied the relationship between climate and behavioral outcomes of student absences and grades. Using data from a representative sample of 19 high school classes, classes with higher average final

grades were rated higher on the four relationship dimensions of involvement, affiliation, teacher support, and rule clarity. These classes were rated lower on student perceptions of teacher control. In addition, student perceptions of high competition and teacher control and teacher perceptions of low teacher support were related to higher absenteeism. This research suggested the possible importance of considering climate as a mediator of both absences and grades. It also suggested that gains on standardized achievement tests were more likely to occur in classes with warm and supportive relationships where emphasis was placed on specific academic tasks and a clearly defined and structured setting.

Alternative Uses for Classroom Environment Scales

Fraser and Fisher (1983) were the first to provide an example of how classroom environment scales could be used to assess the relationship of students' preferred environment, actual environment, and learning outcomes. Using a sample consisting of a representative group of 116 eighth and ninth grade science classes in Australia, their research involved the use of the CES to measure student perceptions of actual and preferred classroom environments in a person-environment fit study to determine whether classes achieved affective and cognitive outcomes better when the actual classroom environment matched that preferred by the class. Overall, their findings suggested

that actual-preferred congruence (or person-environment fit) at the class level could be as important as the nature of the actual classroom environment in predicting class achievement. The implication of these findings was that class achievement might be enhanced by "attempting to change the actual classroom environment in ways that make it more congruent with that preferred by the class" (Fraser and Fisher, 1983, p. 311). Their research also suggested that environment scales may be useful in measuring learner preferences for different environments and perhaps in designing appropriate environments to aid achievement.

Adult Classroom Environment Scale (ACES)

With some researchers, such as Moos (1974) and Fraser and Fisher (1983), suggesting that classroom environment scales may be useful in changing climates to suit the desires of students, it was not until 1987 that an instrument was designed to specifically assess adult classroom environments. In a study by Darkenwald and Gavin (1987), the CES was used to predict dropout from GED preparation classes. The results revealed that only one of seven CES subscales was associated with dropout. Darkenwald and Gavin concluded that an adult version of the CES or a new instrument was needed for assessing adult classroom environments (Brockett and Darkenwald, 1987).

In response to the perceived deficiencies of the CES with adults and the need to assess adult classroom

environments, Darkenwald (1987) set out to develop an instrument specifically for assessing the adult classroom environment. An initial pool of several hundred items was generated using interviews with 28 teachers of adults and 35 adult students, reviews of other environment instruments, and brainstorming in which each member of the research team wrote 25 items. These items were then evaluated by the whole group with redundant and inappropriate statements being eliminated. A panel of nine doctoral students in adult education and two faculty members then rated the remaining 159 items. Eighty-nine items were retained and then classified into seven dimensions: Involvement, Affiliation, Teacher Support, Task Orientation, Personal Goal Attainment, Organization and Clarity, and Student Influence. This preliminary 89-item version of the ACES was then pilot-tested with 220 adult students from a variety of settings. It was subsequently reduced to the current 49-item ACES questionnaire with seven items for each of the original seven dimensions. Three forms or versions of ACES were produced: Student Ideal, Student Actual, and Teacher Actual. The three forms are identical except for minor changes in tense and directions to respondents (Darkenwald, 1987).

Using these newly developed forms, Darkenwald (1987, 1989) conducted research on a heterogeneous sample of 55 adult classes to compare Student Ideal, Student

Actual, and Teacher Actual classroom environment ratings. Darkenwald's sample included 308 students attending special credit-bearing courses in a community college located in a depressed urban area, 156 students in an evening MBA program from a large state university, and 266 students in vocational or personal enrichment classes from a large community adult school located in a middle class municipality. From these schools 16 teachers, 5 teachers, and 25 teachers were selected, respectively to complete the Teacher Actual version. Of the total 730 students, a random sampling procedure was used in which 355 students completed the Student Actual version and 375 students completed the Student Ideal version.

Results indicated that a hierarchical pattern existed in which Student Ideal was the highest, Teacher Actual was next, and Student Actual was lowest with the exception of Affiliation and Teacher Support. It appeared from the findings that teachers tend to exaggerate the extent of student involvement and their own supportive behaviors. It was concluded that teachers are unaware of the type of social environment students actually experience. In addition, findings from this research revealed what students wanted most in a learning environment was involvement, teacher support, task orientation, and organization and clarity. However, what students encountered was different, and discrepancies between students' and teachers' ratings

of the actual classroom environment were also different (Darkenwald, 1987). Darkenwald's research, using the ACES, supported earlier research conducted by Fraser and Treagust (1986) who, using a much-revised version of the CES, studied seminar-type classes in Australian universities. They reported that both students and instructors preferred a more favorable classroom environment than the one that was actually present, and instructors viewed the classroom more positively than their students. Sullivan's research (1989), which also used the ACES, will be discussed later in this review of literature.

Attempts to Change the Adult Classroom Environment

With research identifying differences in preferred and actual classroom environments and Fraser and Fisher's research (1983) suggesting that changes in classroom environment might be worthwhile, Sullivan (1989) and other researchers (DeYoung, 1977) attempted to modify the adult classroom environment. DeYoung's (1977) research consisted of two phases. In the first phase, a short form of the real and ideal versions of the CES was given to an undergraduate social psychology class for educators. About halfway through the academic quarter, discrepancies between student perceptions of the real environment and their preferred environment were identified and used to restructure the course for a subsequent class. In the second phase of the research, students attending the

restructured course were given the short form of the real and ideal CES. Results from examining the student characteristics and mean scores revealed that positive changes could be made in the environment.

Sullivan (1989), using an experimental design, conducted research on 56 different community college evening credit class teachers and 1127 adult students. She administered the Teacher Actual and Student Actual versions of the ACES on the second week of classes. Before the fourth week, she then provided a two-page report to the 28 teachers in the experimental group. During the fourteenth week of classes, Sullivan again administered the Teacher Actual and Student Actual versions of the ACES. Attempting to change the learning environment through the use of feedback, Sullivan (1989) found that the classroom environment did not change after simply providing the teachers with a written feedback report.

Research noting discrepancies between preferred and actual environments (Darkenwald, 1987; Fraser and Treagust, 1986; DeYoung, 1977) and attempts to change the adult classroom environment (DeYoung, 1977; Sullivan, 1989) suggest that some benefit would be achieved by changing the actual adult learning environment and aligning it more closely with the student's ideal environment. The cited research in this review seems to suggest that an improvement in performance would result as students'

preferred and actual environments become more congruent. Previous studies attempting to modify the adult classroom environment were done without clearly understanding the ramifications or benefits of such a change in an adult setting. The review of this literature provides a theoretical rationale to support the hypotheses posed in this present inquiry.

Summary of Review of Related Literature

The review of literature reveals that two classroom environment scales have been used to investigate classroom learning environments. The Classroom Environment Scale (CES), developed by Rudolf Moos, was the leading instrument used in school settings. It was found to be inappropriate for assessing adult classroom environments (Darkenwald, 1987), and in 1987 Darkenwald and colleagues developed the Adult Classroom Environment Scale (ACES) which specifically focused on the adult learning environment (Darkenwald, 1987). Both the CES and ACES allowed an ideal learning environment to be compared with an actual classroom environment. Researchers, using the ACES or a much-revised version of the CES, then began to discover discrepancies between these ideal and actual environments (DeYoung, 1977; Fraser & Treagust, 1986; and Darkenwald, 1987). These discrepancies laid the foundation for researchers who attempted to change the adult learning environment by trying to align students' preferred environments with their

actual environments (DeYoung, 1977; Sullivan, 1989).

Although yielding inconclusive results, these researchers assumed that changing an actual learning environment, to align it more with a student's ideal environment, would be worthwhile. Although research at the primary and secondary educational levels did indicate cognitive and noncognitive benefits (Moos & Trickett, 1974; Moos & Moos, 1978), this assumption in an adult setting has been left without investigation or challenge and provides the theoretical structure for this study.

CHAPTER III

Methodology

This chapter will establish the NCOA setting and describe the subjects involved in the study. It will also discuss the instruments used to collect the data as well as the procedures used, study design, and data analysis.

Setting

The NCO Academy (NCOA) is the second level of professional military education received by noncommissioned officers. It is designed primarily to provide E-6/technical sergeants with the quality education they need to more efficiently and effectively fulfill their responsibilities. It is distinctive from training in that the NCOA does not attempt to provide any technical expertise. The NCOA is a 219-hour course divided into three curriculum areas. The instructional time spent in each particular curriculum area is shown as a percentage in parenthesis: The Military Citizen (25%), Supervision (50%), and Communication (25%). The curriculum is primarily guided discussion in which students are actively involved in the learning process; very few classes are presented in a lecture format. Total Quality Management is a major theme and is intrinsically meshed throughout the course. The NCOA curriculum is accredited through the Southern

Association of Colleges and Schools and is worth 11 semester hours (USAF Enlisted PME Support Center, 1993).

The instructor corps consists of a team of ten instructors who were all "hand-selected" for their experience and potential to perform in this special duty position. The instructors have all attended the USAF's six-week-long Academic Instructor School and average approximately three years instructional experience. All instructors maintain at least the rank of E-6/technical sergeant with one-third possessing the rank of E-7/master sergeant.

Subjects

This research project involved subjects from an intact, six-week-long NCOA class which consisted of a total of 96 students. Of these 96, seven reported late (after the initial survey was administered) and therefore were not provided an opportunity to participate in this study. Of the 89 students who were available, 83% (n=74) volunteered and satisfactorily completed both Adult Classroom Environment Scales: Ideal and Actual Versions (ACES-I and ACES-A).

Table 1 provides the following demographic data which describe the sample of 74 NCOA students who participated in this study:

Seventy-six percent of the NCOA students were male (n=56), and their mean age was 34.8 years with a range of 26 to 51 years. Subsequently, 24% (n=18) were female, and

Table 1: Frequencies and percentages for demographic characteristics of initial 74 students participating in this study.

Characteristic	Frequency	Percent	Cumulative Percent
<u>GENDER</u>			
Male	56	75.7	
Female	<u>18</u>	<u>24.3</u>	
TOTAL	74	100.0	
<u>AGE</u>			
25-29	10	13.5	13.5
30-34	25	33.8	47.3
35-39	28	37.8	85.1
40 and older	<u>11</u>	<u>14.9</u>	<u>100.0</u>
TOTAL	74	100.0	100.0
Overall Mean Age = 34.8			
Male Mean Age = 34.8			
Female Mean Age = 34.7			
<u>RACIAL AFFILIATION</u>			
Caucasian	56	75.7	75.7
African American	6	8.1	83.8
Hispanic	5	6.8	90.6
American Indian	4	5.4	96.0
Other	<u>3</u>	<u>4.0</u>	<u>100.0</u>
TOTAL	74	100.0	100.0

Table 1: (cont.)

Characteristic	Frequency	Percent	Cumulative Percent
<u>EDUCATION</u>			
High School/GED	46	62.2	62.2
Associates	24	32.4	94.6
Bachelors	<u>4</u>	<u>5.4</u>	<u>100.0</u>
TOTAL	74	100.0	100.0
<u>MARITAL STATUS</u>			
Married	52	70.2	70.2
Single	11	14.9	85.1
Divorced	<u>11</u>	<u>14.9</u>	<u>100.0</u>
TOTAL	74	100.0	100.0
<u>RANK STRUCTURE</u>			
Staff Sergeant	12	16.2	16.2
Technical Sergeant	60	81.1	97.3
Master Sergeant	<u>2</u>	<u>2.7</u>	<u>100.0</u>
TOTAL	74	100.0	100.0
<u>MILITARY STATUS</u>			
Technician	22	29.7	29.7
Traditional Guard	20	27.0	56.7
Regular Active AF	18	24.3	81.0
Active Guard/Res	<u>14</u>	<u>19.0</u>	<u>100.0</u>
TOTAL	74	100.0	100.0

Table 1: (cont.)

Characteristic	Frequency	Percent	Cumulative Percent
<u>TOTAL YEARS IN SERVICE</u>			
5-9	8	10.8	10.8
10-14	35	47.3	58.1
15-19	25	33.8	91.9
20 and over	<u>6</u>	<u>8.1</u>	<u>100.0</u>
TOTAL	74	100.0	100.0
MEAN = 14.1			

their mean age was 34.7 years with a range of 26 to 43 years. The mean age for the entire group (n=74) was 34.8 years. Although the students' ages ranged from 26 to 51, the majority (72%) of students (n=53) were between 30 and 39 years of age.

Approximately 76% of the students (n=56) were Caucasian, 8% (n=6) were African American, 7% (n=5) were Hispanic, 5% (n=4) were American Indian, and 4% (n=3) classified themselves as other.

Five percent (n=4) had at least a Bachelor's degree, 33% (n=24) had at least an Associate's degree, and all others, 62% (n=46), had at least a high school diploma or GED. In addition, 70% (n=52) of the students were married with 15% (n=11) either single or divorced.

The rank structure of the class consisted of staff sergeants (E-5), technical sergeants (E-6), and master sergeants (E-7). Staff sergeants are still primarily responsible for the technical aspects of their speciality training but are beginning to supervise others. Technical sergeants are heavily involved in supervision and are less involved with the technical aspects of their jobs. Master sergeant responsibilities are almost entirely supervisory in nature. Eighty-one percent (n=60) of the students were technical sergeants, 16% (n=12) were staff sergeants, and 3% (n=2) were master sergeants.

The military status or classification of students varied with 30% (n=22) being Technicians, 27% (n=20) being Traditional Guardmembers, 24% (n=18) being Regular Active Air Force, and 19% (n=14) being Active Guard/Reserve (AGR). The total military time in service ranged from 7 to 27 years. The mean total military time was 14.1 years with 81% (n=60) of the students between 10 and 19 years total time in service.

Perhaps as important as the demographic data on the sample of 74 students is the demographic data on the two groups compared in this study. Table 2 provides the comparisons between the congruent and divergent groups of students on several demographic variables. For instance the congruent group consisted of 74% (n=20) male students as opposed to 72% (n=13) in the divergent group. Conversely, there were 26% (n=7) female students in the congruent group compared to 28% (n=5) in the divergent group. The congruent group's mean age was 34.6 years compared to 37.1 years in the divergent group.

In the congruent group, approximately 59% (n=16) of the students were Caucasian, 7% (n=2) African American, 11% (n=3) Hispanic, 15% (n=4) American Indian, and 7% (n=2) classified themselves as other. The divergent group, however, consisted of 94% (n=17) Caucasians with the remaining 6% (n=1) classified as other.

Table 2: Frequencies and percentages for demographic characteristics of the congruent and divergent groups compared in this study.

Characteristic	Congruent Frequency/Percent	Divergent Frequency/Percent
<u>GENDER</u>		
Male	20/ 74.1	13/ 72.2
Female	<u>7/ 25.9</u>	<u>5/ 27.8</u>
TOTAL	27/100.0	18/100.0
<u>AGE</u>		
25-29	3/ 11.1	2/ 11.1
30-34	8/ 29.6	7/ 38.9
35-39	13/ 48.2	6/ 33.3
40 and older	<u>3/ 11.1</u>	<u>3/ 16.7</u>
TOTAL	27/100.0	18/100.0
Mean Age for Both Groups = 35.6		
Congruent Group's Mean Age = 34.6		
Divergent Group's Mean Age = 37.1		
<u>RACIAL AFFILIATION</u>		
Caucasian	16/ 59.3	17/ 94.4
African American	2/ 7.4	0/ 0
Hispanic	3/ 11.1	0/ 0
American Indian	4/ 14.8	0/ 0
Other	<u>2/ 7.4</u>	<u>1/ 5.6</u>
TOTAL	27/100.0	18/100.0

Table 2: (cont.)

Characteristic	Congruent Frequency/Percent	Divergent Frequency/Percent
<u>EDUCATION</u>		
High School/GED	15/ 55.6	12/ 66.6
Associates	11/ 40.7	5/ 27.8
Bachelors	<u>1/ 3.7</u>	<u>1/ 5.6</u>
TOTAL	27/100.0	18/100.0
<u>MARITAL STATUS</u>		
Married	21/ 77.8	12/ 66.6
Single	2/ 7.4	2/ 11.1
Divorced	<u>4/ 14.8</u>	<u>4/ 22.3</u>
TOTAL	27/100.0	18/100.0
<u>RANK STRUCTURE</u>		
Staff Sergeant	4/ 14.8	5/ 27.8
Technical Sergeant	21/ 77.8	13/ 72.2
Master Sergeant	<u>2/ 7.4</u>	<u>0/ 0</u>
TOTAL	27/100.0	18/100.0
<u>MILITARY STATUS</u>		
Technician	7/ 25.9	6/ 33.3
Traditional Guard	4/ 14.8	4/ 22.3
Regular Active AF	10/ 37.1	3/ 16.6
Active Guard/Res	<u>6/ 22.2</u>	<u>5/ 27.8</u>
TOTAL	27/100.0	18/100.0

Table 2: (cont.)

Characteristic	Congruent Frequency/Percent	Divergent Frequency/Percent
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<u>TOTAL YEARS IN SERVICE</u>		
5-9	4/ 14.8	1/ 5.6
10-14	12/ 44.5	11/ 61.0
15-19	9/ 33.3	4/ 22.3
20 and over	<u>2/ 7.4</u>	<u>2/ 11.1</u>
TOTAL	27/100.0	18/100.0

Mean Years in Service for Both Groups = 13.7

Congruent Group's Mean Years in Service = 13.7

Divergent Group's Mean Years in Service = 13.8

Approximately 4% (n=1) of the students in the congruent group had at least a Bachelor's degree, 41% (n=11) had at least an Associate's degree, and all others, 55% (n=15), had at least a high school diploma or GED. In the divergent group, however, 5% (n=1) had at least a Bachelor's degree, 28% (n=5) had at least an Associate's degree, and 67% (n=12) had at least a high school diploma or GED. In addition, married students accounted for 78% (n=21) of the students in the congruent group as compared to 67% (n=12) in the divergent group. Conversely 22% (n=6) of the remaining students in the congruent group were either single or divorced, and 33% (n=6) of the remaining students in the divergent group were either single or divorced.

The rank structure of the congruent group consisted of 15% (n=4) staff sergeants, 78% (n=21) technical sergeants, and 7% (n=2) master sergeants. The rank structure of the divergent group consisted of 28% (n=5) staff sergeants, 72% (n=13) technical sergeants, and no master sergeants.

The military status of students varied between the congruent and divergent groups. In the congruent group, 37% (n=10) were Regular Active Air Force, 26% (n=7) were Technicians, 22% (n=6) were Active Guard/Reserve (AGR), and 15% (n=4) were Traditional Guardmembers. The divergent group consisted of 33% (n=6) Technicians, 28% (n=5) AGR, 22% (n=4) Traditional Guardmembers, and 17% (n=3) Regular

Active Air Force. The total military time in service averaged 13.7 years for both groups combined. The mean for the congruent group was 13.7 years, and the mean for the divergent group was 13.8 years.

Instrumentation

This study used two instruments and a demographic questionnaire to collect data. The two instruments are discussed below.

Adult Classroom Environment Scale. The Adult Classroom Environment Scale (ACES) developed by Darkenwald (1987) was designed as a self-administered, forty-nine item instrument that measured seven dimensions of a positive or growth-enhancing adult classroom social environment: Involvement, Affiliation, Teacher Support, Task Orientation, Personal Growth, Attainment, Organization and Clarity, and Student Influence.

Three forms of ACES were produced: Student Ideal (ACES-I), Student Actual (ACES-A), and Teacher Actual. Ideal referred to the preferred environment for learning; actual referred to the environment as perceived by either the student or teacher. These three forms are identical except for changes in tense and directions to respondents.

The ACES was developed by Darkenwald (1987) because the previous Classroom Environment Scale (CES) (Moos, 1979), which was the leading instrument in measuring environments in school settings, was found to be inappropriate

for assessing adult classroom climates (Darkenwald, 1987). To develop the ACES, an initial pool of several hundred items was generated from semi-structured interviews with 28 teachers of adults and 35 adult students, reviews of other environment instruments, and brainstorming by members of the research team who each wrote 25 items. After each item was evaluated by the whole group, 159 remained. These items were then rated by a panel of experts consisting of nine doctoral students in adult education and two faculty members. Their review resulted in a preliminary 89-item version of the ACES. This version was pilot-tested with 220 adult students and subsequently reduced to 49 items, seven for each of the seven dimensions. The 49 items were then randomly assigned to the questionnaire (Darkenwald, 1987). A Likert format was used with items worded both positively and negatively, and each item assigned a point value of one to four, respectively, based on the response received: Strongly Disagree, Disagree, Agree, and Strongly Agree. Negatively worded items were scored in reverse order.

Cronbach's alpha was computed for each subscale of each of the three ACES forms. Subscale reliabilities ranged from barely satisfactory (.58) to very high (.89). Full-scale reliabilities were all .90 or above. A claim of content validity seemed tenable in light of the thorough and systematic fashion in which the scale items were

selected and refined. In addition, there was evidence of ACES' discriminant and criterion-based validity. (Darkenwald, 1987). Even though seven dimensions were available, only a total scale score was used in this research. It is important to note to anyone interested in using the seven dimensions that Langenbach and Aagaard (1990) conducted a study to explore the factor structure of the ACES. The Student Ideal version of the ACES was administered to 449 adult students from a variety of educational settings and then a factor analysis was performed. The seven dimensions of the ACES were not entirely supported. The Affiliation dimension did hold together well. The dimensions of Teacher Support and of Organization and Clarity largely maintained their item integrity; however, the other dimensions of Task Orientation, Personal Goal Attainment, Student Influence, and Involvement did not remain intact. Copies of the ACES (Student Ideal and Student Actual) used in this study are provided in Appendices B and C.

The United States Air Force (USAF) NCOA Test. The USAF NCOA test instruments were developed, by a team consisting of 17 curriculum experts, in order to measure the academic performance (level of learning) of adults receiving NCOA curriculum instruction. This curriculum-expert team developed the lesson objectives, measurable samples of behavior, and test items. Initially the testbank consisted of approximately 500 test items. Each

item was evaluated by an additional panel of four test-item experts. Using an indepth two-page checklist, each question was reviewed for its sample of behavior, level of learning applicability (validity), and good test question mechanics. Two 173-item test versions were developed, and between October and December 1992, four different NCOA schools ran both these test versions. Test item data were collected and analyzed, and two new test versions (A and B) resulted, each with 154 test items. The Kuder-Richardson reliability rating for the initial 173-item test was .73; for this research project, the new test version A with 154 test items was used with a Kuder-Richardson reliability rating of .72. A copy of the USAF's NCOA test used in this study is not provided due to USAF policy.

Design and Procedure

This research was an expo facto study designed primarily to explore the relationship of students' perceived congruent versus divergent classroom environments to their academic performance (McMillian and Schumacher, 1984). The research design is illustrated in Figure 1.

On the first day of NCOA Class 93-6, the Student Ideal version of the ACES/ACES-I (Appendix B) was distributed to the entire student body. An "informed consent" cover letter (Appendix A) which explained this research project and requested support accompanied each ACES-I. Students who voluntarily agreed to participate in this research

O_I	O_{PRET}	X	O_{POST}	O_A
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O_I = Ideal version of ACES administered
 O_{PRET} = Pre-test administered
 X = Instruction
 O_{POST} = Post test administered
 O_A = Actual version of ACES administered

Figure 1. Research Design.

project signed the "informed consent" cover letter, completed the ACES-I, and returned both to this researcher. In addition to completing the ACES-I the first day of class, each student was also administered the "A" version of the USAF NCOA pre-test.

Throughout the NCOA's six-week instructional period, four summative evaluations were administered as specific curriculum was presented. These four evaluations corresponded to the pre-test and served in combination as a post-test. To complete the data-gathering process the Student Actual version of the ACES/ACES-A (Appendix C) was administered to those students who initially volunteered to

participate and who also completed the ACES-I on the first day of class.

Data Analysis

In order to test the primary hypothesis, each student's total ACES score was determined by taking the difference between the ideal and actual measurement scores. To create two distinctly different groups, students with total score differences which were one-half standard deviation or more above the mean were designated the congruent group (n=27). Students with total score differences which were one-half standard deviation or more below the mean were designated the divergent group (n=18). The group of students whose total score difference fell in the middle group were not used for the purposes of this study (n=29). Mean achievement test scores for each of the two groups were calculated for the pre-test and post-test scores. To determine student achievement for each of the two groups and because of a difference in pre-test mean scores, an analysis of covariance (ANCOVA) was used to analyze the post-test mean scores with the pre-test mean scores serving as the covariate.

To test the secondary hypothesis on age differences, the mean age for each group was calculated, and a t-test was performed. To test the secondary hypothesis on gender differences, the ratio of males to females was calculated for each group and compared.

CHAPTER IV

Data Analysis and Findings

The descriptive statistics used to summarize the demographic data collected on the sample were manually tallied. However, the Kwikstat software program and Statistical Analysis System (SAS) were used to analyze the data collected in reference to the classroom environment, academic performance, age, and gender. Because this was an exploratory study and to minimize the risk of Type II errors, the level of significance was set at .05

Hypothesis on Academic Performance Differences

The major hypothesis tested in this study, stated in null form, is as follows:

H₀: There is no statistically significant difference in the academic performance of students who viewed their learning environment as congruent when compared with the performance of their counterparts who viewed their environment as divergent.

After collecting ACES data at the beginning and conclusion of the course (ideal measurement and actual measurement), each student's total ACES score for each measurement was determined. Then, by taking the difference between the two measurements (ideal and actual) each student's (n=74, Total Score Difference was determined. Although the range of scores was 0 to 43, the mean for the Total Score Difference was 14.72 with a standard deviation

of 11.32. To create two distinctly different groups which could be analyzed, students with total score differences which were one-half standard deviation (5.65) or more above the mean (9.06) were designated the congruent group (n=27). This group represented students whose ideal and actual scores were most similar. Students with total score differences which were one-half standard deviation or more below the mean (20.38) were designated the divergent group (n=18) and represented those students whose ideal and actual scores were most dissimilar. The group of students whose Total Score Difference was between 9.06 and 20.38 was not used for the purposes of this study (n=29).

After determining the congruent and divergent groups, mean achievement test scores for each of the two groups were calculated for the pre-test and post-test scores. The results are depicted in Table 3. The congruent group's pre-test mean score was 92.70 with a standard deviation of 12.35 and a range of 73 to 121. The divergent group's pre-test mean score was 82 with a standard deviation of 19.68 and a range of 40 to 118. The congruent group's mean post-test score was 132.93 with a standard deviation of 5.76 and a range of 120 to 143. The divergent group's mean post-test score was 134.11 with a standard deviation of 7.81 and a range of 118 to 148. A test for heterogeneity of slopes revealed that pre-test slopes were equal ($p > .59$), and because a t-test on the pre-test mean scores revealed a

Table 3: Congruent and divergent group pre-test and post-test mean achievement test scores.

Group	Size	Pre-test Mean Score	S.D.	Post-test Mean Score	S.D.
Congruent	27	92.7	12.35	132.9	5.76
Divergent	18	82.0	19.68	134.1	7.81

significant difference between the two groups ($t=2.05$, $p<.05$), an analysis of covariance (ANCOVA) was used to analyze the post-test mean scores with the pre-test mean scores serving as the covariate. As Table 4 depicts, ANCOVA revealed a significant relationship ($F=5.10$, $p>.03$) between the pre-test and post-test. However, ANCOVA revealed no significant difference ($F=1.72$, $p>.20$) in the academic performance of students who viewed their learning environment as congruent when compared with students who viewed their learning environment as divergent, and therefore the major hypothesis failed to be rejected. There was no significant difference in the academic performance of students who view their learning environment

Table 4: ANCOVA data on the academic performance of the congruent and divergent groups.

Source	DF	Type III SS	F	p
Group	1	69.46	1.72	.20
Pre-test	1	205.86	5.10	.03
Error	42	1693.77		

as congruent when compared with the performance of their counterparts who view their environment as divergent.

Although there was a failure to reject the primary hypothesis, it appeared through simple observation of pre-test and post-test mean scores that the divergent group may have learned more than the congruent group. A t-test performed on the academic gain scores (difference between pre-test mean scores and post-test mean scores) for the congruent and divergent groups revealed a significant difference ($t=-2.39$, $p>.02$) in the measured amount of learning between students who viewed their learning environment as congruent when compared to students who viewed their environment as divergent. Even though this

finding is beyond the scope of this study, this researcher found it significant enough to report.

Hypothesis on Age Differences

A secondary hypothesis is as follows:

H₀: There is no statistically significant difference in the ages of students who viewed their learning environment as congruent when compared with the ages of students who viewed their environment as divergent.

The mean age for each group was calculated. The results are depicted in Table 5. The mean age for the congruent group (n=27) was 34.59 with a standard deviation of 5.19 and a range of 26 to 51. The mean age for the divergent group (n=18) was 35.22 with a standard deviation of 4.71 and a range of 28 to 47. A t-test on the mean ages revealed no significant difference ($t = -.41$, $p < .68$) in the ages of students who viewed their learning environment as congruent as compared to those who viewed it as divergent. This hypothesis, therefore, failed to be rejected. There was no significant difference in the ages of students who view their learning environment as congruent when compared with the ages of students who view their environment as divergent.

Hypothesis on Gender Differences

To determine if there was a significant difference in the gender of students who viewed their learning environment as congruent when compared with the gender of students who viewed their environment as divergent, the

Table 5: Data from t-test on age differences between the congruent and divergent groups.

Group	Size	Mean Age	S.D.	t	p
Congruent	27	34.6	5.19	-.41	.68
Divergent	18	35.2	4.71		

percentages of males to males and females to females were calculated for both groups. The results are depicted in Table 6. For the congruent group the ratio was 74.1% (n=20) males to 25.9% (n=7) females. For the divergent group the ratio was 72.2% (n=13) males to 27.8% (n=5) females. Because of the low number of females, further statistical analysis was not conducted, and the hypothesis was not tested as proposed in Chapter I. However, from observation there appears to be no significant difference in the gender of students who viewed their learning environments as either congruent or divergent.

Table 6: Gender comparisons between the congruent and divergent groups.

Group	Size	Total Number of Males	Percent of Males	Total Number of Females	Percent of Females
Congruent	27	20	74.1%	7	25.9%
Divergent	18	13	72.2%	5	27.8%

CHAPTER V

Conclusions and Implications

Although the findings of this study revealed that there were no significant differences in the academic performance, age, or gender of students who perceived their learning environment as congruent when compared with the performance of their counterparts who perceived their learning environment as divergent, all conclusions and implications should be viewed as tentative, particularly in light of the small sample size used in this study.

These findings, however, do present an area that needs further consideration by those adult educators who are interested in creating "preferred" learning environments for their adult learners. Additional consideration is indicated because this study's finding is contradictory to the research which indicates that students perform better when learning in an environment they prefer (Moos and Moos, 1978; Fraser and Fisher, 1983).

Implications

It is important again to reiterate that the lack of significance of a person-environment fit to academic performance should be viewed as tentative. However, two possible reasons may help explain why no significant

difference was found: criterion- versus norm-referenced environment and instructor focus on more deficient students.

The first possible reason that there was no significant difference in the academic performance of learners in the congruent group when compared to the divergent group is that the NCOA operates more in a criterion- versus norm-referenced environment. One objective of the NCOA is to improve the effectiveness of Air Force supervisors, and to help meet this objective there are specific learning objectives outlined. The curriculum and instructor staff work together to teach to some well-defined levels of learning which have numerous samples of behaviors, exercises, and formative quizzes. This researcher considers the NCOA as more of a criterion-referenced environment because minimal attempts are made to rank order or distinguish between or among students.

Because this research revealed that Air Force students, regardless of their perceived learning environment, learned equally well, the results of this research attest to the success of the NCOA curriculum and instructor staff. In addition, this research does provide some evidence, however limited, that a primarily criterion-referenced approach can be equally successful when working with students who perceive their environments as either congruent or divergent.

Another possible reason for the lack of a significant difference in the academic performance, however, helps

explain the significant difference in learning gain scores between the congruent and divergent groups is that the instructors may have inadvertently focused their attention on the group of students who initially appeared to need more help. This focus then would have been on the students in the divergent group whose pre-test mean score was significantly below that of the congruent group. This explanation concerning instructor focus is speculation, but raises an interesting idea that may even be limited to a particular type of setting/institution. In fact, this speculation runs counter to a previous report which indicated that when a (child) learner is presumed to be gifted, average intelligence, or slow, this presumption affects how the learner is treated; those who do well academically are the ones encouraged and expected to succeed (Tobias, 1989).

It appears, based solely on the findings of this study, that if adult educators are interested strictly in the academic performance of their learners, academic performance may not significantly change by creating an academic environment which is "preferred" by the learner. Perhaps many adult educators have falsely assumed that the adult learner would academically perform better in an environment they preferred. This research, however, indicates that this may not necessarily be true and highlights, perhaps, the "adaptability" of the adult student to learn within a range of environments.

Suggestions for Future Research

Darkenwald (1987) discussed the need to understand better how the learning environment affects an individual's behavior, and Sullivan (1989) stated that "Adult education research has only recently focused on adult classroom social environments to determine if they meet the needs of adult learners." This study was the first to examine whether there was a difference in the academic performance of adult students who perceived their learning environments as either congruent or divergent.

Until this type of research is replicated with larger sample sizes and in different educational settings, the findings must be viewed as tentative. It is suggested that a variety of educational environments be investigated to determine if academic performance will be significantly different when comparing two groups of students who perceive their learning environments as either congruent or divergent. Although research of this nature provides limited insight, it can serve as a stimulus for additional areas of investigation. Future research, using larger samples, may consider focusing on comparing differences in academic performance, not only between groups that perceive their learning environments as congruent or divergent, but also between criterion-referenced and norm-referenced environments.

Additional research may want to investigate the speculation that instructors may focus, unintentionally

perhaps, their instruction on students who appear more in need of help. This type of study might challenge Tobias' report (1989) which indicated that teachers provide preferential treatment to the academically talented students versus the slower performers.

Of interest to note is that this research, perhaps falsely, assumed the ideal measurement taken at the beginning of the course was static. An interesting question now is, "Did the divergent group's preference for the ideal learning environment change over the six-week time frame so that the divergent group was not really in fact divergent at the end of the course?" It is speculation that another administration of the ACES Ideal version at the end of the course might yield different results from the initial administration at the beginning of the course. Future research might investigate if learners' ideal preferences for particular learning environments are determined by the successes or failures of their most recent learning experiences. In other words, how "stable" are learners' preferences for particular learning environments? Are their ideal preferences dynamic? Does this stability or lack of stability in preferences for learning environments vary among different groups of learners?

Additional research may want to investigate some of the demographic differences between the two groups as well as the significant difference in pre-test mean scores. Of

interest might be to examine more closely how race, educational level, and military status influence adult learners' academic performance and/or perceptions of their environment. In addition, research may want to investigate the adult learners' adaptability to learn or their strategies for successful learning.

Research of the nature provided in this study only attempts to answer a specific question in regard to the adult learner. Obviously, along with providing a possible answer, many more questions begin to appear that present opportunities for additional research. Additional research will provide more information, just as this study did, that will help adult classroom environments be better understood.

LIST OF REFERENCES

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- Brockett, R. & Darkenwald, G. (1987). Trends in research on the adult learner. In R. Brockett (Ed.), New Directions for Continuing Education, 36. San Francisco: Jossey-Bass, 29-39.
- Buckley, M. (1993, August). Refocusing on careers. Sergeants, pp. 14-55.
- Darkenwald, G. (1987). Assessing the social environment of the adult classes. Studies in the Education of Adults, (UK), 127-136.
- Darkenwald, G. & Gavin, W. (1987). Dropout as a function of discrepancies between expectations and actual experiences of the classroom social environment. Adult Education Quarterly, 37, 152-163.
- Darkenwald, G. (1989). Enhancing the adult classroom environment. In E. Hayes (Ed.), Effective Teaching Styles. San Francisco: Jossey-Bass, 67-75.
- DeYoung, A.J. (1977). Classroom climate and class success: a case study at the university level. Journal of Educational Research, 70, 252-257.
- Fraser, B. J. & Fisher, D. L. (1983). Use of actual and preferred classroom environment scales in person-environment fit research. Journal of Educational Psychology, 75, 303-313.
- Fraser, B. & Treagust, D. (1986). Validity and use of an instrument for assessing classroom psychosocial environment in higher education. Higher Education, 15, 37.
- Hiemstra, R. (Ed.) (1991). Creating environments for effective adult learning. New Directions of Adult and Continuing Education series, 50, Summer 1991.
- McMillan, J. H. & Schumacher, S. (1984). Research in Education: A Conceptual Introduction. Boston: Little, Brown and Company.
- Moos, R. H. & Moos, B. S. (1978). Classroom social climate and student absences and grades. Journal of Educational Psychology, 73, 595-604.

- Moos, R. H. (1978). A typology of junior high and high school classrooms. American Educational Research Journal, 15, (1), 53-66.
- Moos, R.H. (1979). Evaluating Educational Environments: Procedures, Measures, Findings and Policy Implications. San Francisco: Jossey-Bass.
- Sullivan, E.A. (1989). Effects of student feedback to teachers on the psychosocial environment of the adult classroom. Unpublished doctoral dissertation, Rutgers University.
- Tobias, S. (1989, September). Good students are given the tools for achieving success - poor ones are left to their own devices. Psychology Today, pp. 55-60.
- Trickett, E.J. & Moos, R.H. (1973). The social environment of junior high and high school classrooms. Journal of Educational Psychology, 65, 93-102.
- USAF Enlisted PME Support Center. (1993). NCO Academy Course Synopsis. (Available from CPD/PMN, 25 LeMay Plaza South, Maxwell AFB, AL 36112-6335).
- Veeman, F.C. & Singer, H. (1989). Armed forces. In S. B. Merriam & P. M. Cunningham (Eds.), Handbook of Adult and Continuing Education. San Francisco: Jossey-Bass, 344-355.

APPENDICES

APPENDIX A
INFORMED CONSENT COVER LETTER



DEPARTMENT OF THE AIR FORCE
DETACHMENT 10, PROFESSIONAL MILITARY EDUCATION CENTER
MCGHEE TYSON ANG BASE, TN

FROM: PMEC/CCNE
200 Briscoe Drive
McGhee Tyson Air Base, TN 37777-6216

5 April 1993

SUBJ: Informed Consent - Classroom Environments on Student Performance in
an Enlisted Professional Military Education Environment

TO: Members of Class 93-6

1. I am collecting data on the classroom environment at the NCO Academy, and I hope you'll help. I know many of you would agree that creating an effective learning environment is essential for good education, and therefore it's important we know what kind of environment we're creating here at the Academy. Although this study may have no direct benefits to you at this time, it may improve the Academy for future students.
2. I am conducting this research as a graduate student enrolled in Technological and Adult Education at the University of Tennessee. The purpose of this study is to examine the relationship between the classroom learning environment and academic performance. If you'd like to participate, I'll need your help twice: the first day of class and some time during the final week of instruction. Each time will take about 10 minutes and will consist of answering some questions about the classroom environment.
3. There are no known risks to this research and your participation is completely voluntary. Please rest assured that your identity will be kept confidential. I will be the only individual to have access to the data you provide about the classroom environment and only group results will be reported. Your individual questionnaires will be stored in a cabinet in my home and destroyed after one year. Performance results will be safeguarded in accordance with Air Force regulation and performance data will also only be reported as a group; individual performance will not be disclosed.
4. If you have any questions about this research, either now or later, please feel free to contact me at the above address or call commercial (615) 985-3516. Remember, your participation in this study is voluntary, and you may refuse to participate. In addition, you may withdraw at any time during this class without any repercussions.

Pattie S. Boring
PATTIE S. BORING, MSgt, USAF
Instructor, Education Section

**Informed Consent - Classroom Environments on Student Performance in an
Enlisted Professional Military Education Environment**

I have read and understood the explanation of this study and agree to participate.

Name (Please Print)

Date

Signature

APPENDIX B
ADULT CLASSROOM ENVIRONMENT SCALE
(ACES-I)

ADULT CLASSROOM ENVIRONMENT SCALE
Form I - Revised

Directions. Picture your ideal class -- one that you'd really like to be in. What would it be like? What kind of things would go on in the class?

The purpose of this questionnaire is find out what your ideal or preferred class would be like. This is not a test. There are no right or wrong answers. Please give us your honest opinions -- your answers are confidential and your instructor will not see them. (Note: Remember, we are not interested in your opinions about the class you are now attending. We want to know about your ideal class.)

We thank you in advance for taking the time to complete this questionnaire carefully. Your opinions are most important and will help improve future courses. For each of the statements below, go through the following steps:

- Read the statement carefully and decide how well it describes your ideal class. (The word "class" can refer to any type of educational activity; it can be a course workshop, seminar, etc.)
- Indicate your opinion by circling one of the choices provided. Be sure that you circle only one choice for each statement. (It is alright to alter your choice if you change your mind.) Be sure to circle a choice for each and every statement; please do not leave any blanks.

DOES THE STATEMENT DESCRIBE YOUR CLASS?

<u>STATEMENTS</u>	1	2	3	4
1. Students help to decide the topics to be covered in class	1	2	3	4
2. The class is flexible enough to meet the needs of individual students	1	2	3	4
3. The teacher comes to class prepared	1	2	3	4
4. Students are often bored in the class.	1	2	3	4
5. The teacher seldom talks about things not related to the course	1	2	3	4
6. Many students think that the class is not relevant to their lives	1	2	3	4

Strongly Disagree
Disagree
Agree
Strongly Agree

DOES THE STATEMENT DESCRIBE YOUR CLASS?

STATEMENTS				
	Strongly Disagree	Disagree	Agree	Strongly Agree
7. Students often ask the teacher questions	1	2	3	4
8. The students in the class work well together	1	2	3	4
9. Learning objectives were made clear at the start of the course	1	2	3	4
10. The teacher makes all the decisions in the class	1	2	3	4
11. Most students enjoy the class	1	2	3	4
12. The teacher expects every student to learn the exact same things	1	2	3	4
13. Students in the class can select assignments that are of personal interest to them	1	2	3	4
14. The teacher makes little effort to help students succeed	1	2	3	4
15. The teacher talks down to students	1	2	3	4
16. Students regularly meet assignment deadlines	1	2	3	4
17. Students often share their personal experiences during class	1	2	3	4
18. Students often discuss things not related to course content	1	2	3	4
19. Activities not related to course objectives are kept to a minimum	1	2	3	4
20. Most students look forward to the class	1	2	3	4

DOES THE STATEMENT DESCRIBE YOUR CLASS?

<u>STATEMENTS</u>				
	1	2	3	4
21. Most students in the class pay attention to what the teacher is saying	1	2	3	4
22. The class is well organized	1	2	3	4
23. The teacher encourages students to do their best	1	2	3	4
24. Students do a lot of work in the class . .	1	2	3	4
25. A few students dominate the discussions in the class	1	2	3	4
26. The class lacks a clear sense of direction	1	2	3	4
27. The subject matter is adequately covered	1	2	3	4
28. The teacher sticks to the lesson plan regardless of student interest	1	2	3	4
29. Most students take part in class discussions	1	2	3	4
30. Students do not know what is expected of them	1	2	3	4
31. The students in the class learn little from one another	1	2	3	4
32. Most students in the class achieve their personal learning goals	1	2	3	4
33. The students in the class enjoy working together	1	2	3	4

Strongly Disagree

Disagree

Agree

Strongly Agree

DOES THE STATEMENT DESCRIBE YOUR CLASS?

<u>STATEMENTS</u>	Strongly Disagree Disagree Agree Strongly Agree			
	1	2	3	4
34. The teacher cares about students' feelings	1	2	3	4
35. The teacher tries to find out what individual students want to learn	1	2	3	4
36. Getting work done is very important in the class	1	2	3	4
37. Students participate in setting course objectives	1	2	3	4
38. The class is more a social hour than a place to learn	1	2	3	4
39. The teacher rarely dominates classroom discussion	1	2	3	4
40. The teacher respects students as individuals	1	2	3	4
41. Learning activities follow a logical sequence	1	2	3	4
42. Students seldom interact with one another during class	1	2	3	4
43. Students have the opportunity to learn at their own pace	1	2	3	4
44. The teacher likes the students in the class	1	2	3	4
45. Students in the class feel free to disagree with one another	1	2	3	4
46. Friendships have developed in the class	1	2	3	4

DOES THE STATEMENT DESCRIBE YOUR CLASS?

<u>STATEMENTS</u>	1	2	3	4
47. Students feel free to question course requirements				
48. The teacher cares whether or not the students learn				
49. The teacher seldom insists that you do things his or her way				

Strongly Disagree
Disagree
Agree
Strongly Agree

-
50. What is your sex? (circle number):
- 1 Female
2 Male
51. What is your age? (write in number of years) _____ years
52. What is your race? (circle one number)
- 1 African American; 2 American Indian; 3 Asian American;
4 Caucasian; 5 Hispanic; 6 Other (specify) _____
53. What is your highest educational credential? (circle one number)
- 1 No credential; 2 High school diploma; 3 Associate degree;
4 Bachelor's degree; 5 Graduate degree
54. What is your current marital status? (circle one number)
- 1 Single 2 Married 3 Divorced 4 Widowed
55. What is your military status? (circle one only)
- 1 Active Duty Air Force; 2 Active Duty Guard/Reserve (AGR);
3 Technician; 4 Traditional Guard;
5 Other (describe) _____

56. What career field are you in? (circle one number)

1 Maintenance; 2 Electronics; 3 Administration;

4 Other (describe) _____

57. What is your total military time? (write in number of years) _____ years

58. What is your rank? (circle one number)

1 Staff Sergeant; 2 Technical Sergeant; 3 Master Sergeant

59. What is your legal state of residence? (write in response) _____

THANK YOU FOR YOUR COOPERATION

APPENDIX C
ADULT CLASSROOM ENVIRONMENT SCALE
(ACES-A)

ADULT CLASSROOM ENVIRONMENT SCALE
Form A - Revised

Directions: The purpose of this questionnaire is find out what your class is like. This is not a test. There are no right or wrong answers. Please give your honest opinions about the class you are attending now. Your answers are confidential--your instructor will not see them.

The questionnaire will take you about 10 minutes to complete. We thank you in advance for taking the time to complete the questionnaire carefully. Your opinions are most important and will help improve future classes.

For each of the statements below, go through the following steps:

- Read the statement carefully and decide how well it describes the class you are now attending. (The word "class" means whatever type of educational activity you are presently involved in; it can be a workshop, seminar, etc.,
- Indicate your opinion by circling one of the choices provided. Be sure that you circle only one choice for each statement. (It is okay to cross out a choice if you change your mind.) Be sure to circle a choice for each and every statement; please do not leave any blanks.

DOES THE STATEMENT DESCRIBE YOUR CLASS?

<u>STATEMENTS</u>	1	2	3	4
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6. Many students think that the class is not relevant to their lives	1	2	3	4

Strongly Disagree
Disagree
Agree
Strongly Agree

DOES THE STATEMENT DESCRIBE YOUR CLASS?

<u>STATEMENTS</u>				
	1	2	3	4
				Strongly Agree
			Agree	
		Disagree		
	Strongly Disagree			
7. Students often ask the teacher questions	1	2	3	4
8. The students in the class work well together	1	2	3	4
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Strongly Disagree

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Agree

Strongly Agree

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<u>STATEMENTS</u>	Strongly Disagree	Disagree	Agree	Strongly Agree
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THANK YOU FOR YOUR COOPERATION

VITA

Pattie S. Boring was born in Rapid City, South Dakota, on October 11, 1959, and graduated from Lyman High School, Longwood, Florida, in 1977. In 1983, she earned an Associate degree from the Community College of the Air Force in Intelligence Analysis and a Bachelor of Science degree from the University of Nebraska in Omaha. In 1992, she earned a second Associate degree from the Community College of the Air Force in Instructor of Technology, and is completing an Adult Education Master's degree from the University of Tennessee in Knoxville.

Pattie S. Boring enlisted in the United States Air Force in June 1979. However, in May 1989 she separated from the Regular Active Air Force and joined the Tennessee Air National Guard. In March 1990, she returned to active duty with the Professional Military Education Center (PMEC), McGhee Tyson Air Base, Tennessee where she is currently an instructor assigned to the Noncommissioned Officer (NCO) Academy. Her military schools and honors are numerous with her two most recent awards being the PMEC Instructor of the Year - 1992 and Outstanding Senior NCO of the Year (1993) for the Air National Guard.

Pattie S. Boring is the daughter of Mr. and Mrs. William V. Parrish of Ocala, Florida, and she is married to Ray H. Boring of Maryville, Tennessee. They have three children: Jared, Kyle, and Seth.

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