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ABSTRACT

This study was conducted to determine differences between: (1) supervisors' ratings of instructional competencies of education majors and non-education majors in a semester of student teaching; and (2) evaluations by education majors and non-education majors of their morale during a student teacher program. Data were collected during one semester from 82 student teachers and their supervisors participating in a competency based program for secondary level teachers. University supervisors were required to evaluate their student teachers on two scales. One rated the instructional effectiveness of the student teacher, while the other rated two curricular units developed and implemented by the student teacher. All student teachers completed "weekly reflection sheets," providing information on their activities and their feelings of confidence or lack of confidence for each week. Findings revealed that non-education majors were rated significantly higher on instructional competencies during the first curricular unit, although this trend reversed itself during the second unit. Differences in morale ratings between the groups were minor, and both groups displayed a common pattern; there was a drop in morale about 2 weeks into the experience, followed by a subsequent rise in self confidence. (JD)

Quantity of Professional Education Coursework Linked with Process Measures of Student Teaching

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Abstract

An ongoing research program has revealed differences in performance among learners depending on the academic major (education vs. non-education) of the student teachers. These findings have stimulated this inquiry. This investigation, conducted with data from 82 student teachers, was conducted to determine whether differences occur among morale self-ratings and supervisor ratings of instructional skill performances by education majors and non-education majors. Results from this investigation revealed no differences between morale self-reports of majors and non-majors. Conversely, instructional skill performance ratings by university supervisors were found to be statistically different for three of six evaluations over the course of the student teaching experience for majors and non-majors.

Using learner cognitive attainment as a measure of teaching ability dates to the turn of the present century with the scientific management movement in American education. Some time later, interest heightened regarding student learning as a consequence measure in student teaching. This interest is exemplified by Wittrock (1962) who assessed the impact of student teachers on the cognitive attainment of their learners by telling the teaching candidates their grades in student teaching depended on the performance of their learners. He found this strategy produced high learner cognitive performances at the expense of heightened anxiety among student teachers operating under this grading convention. More recently, Denton, Kracht and McNamara (1980) examined the influence classroom teachers exert on learner attainment of law-related content. Using three different conceptual models as basis for their analyses, results were reported that teachers exert substantial influence on the congitive attainment of their learners. These results with inservice teachers subsequently stimulated a similar line of inquiry with preservice teachers.

Preservice research, sponsored by the Instructional Research Laboratory of the College of Education at Texas A&M University, has been conducted to examine a number of evaluation concerns associated with teacher education. One group of investigations have focused on consequence measures for student teaching. In particular, these studies have examined whether cognitive measures of learners of student teachers hold promise as criterion variables for professional field experiences (Denton & Norris, 1979, 1981; Denton & Tooke, 1982; Denton, Morris, & Tooke, 1982). Results from these investigations indicate some academic characteristics and behaviors of student teachers account for variations in the performance of their learners. For example,

time allocated for instruction, individual classroom teaching styles, and whether the student teacher was an education major were found to be variables that accounted for variation among the levels of learner performance among the student teachers. An unexpected finding from this research has been the phenomenon that the academic major of the student teacher appears to account for variation in cognitive attainment of learners of those student teachers. To illustrate, a modest correlation (r_{pbi} = .23) was determined between the academic major of the student teacher and cognitive attainment values of their learners on the second unit taught by the student teachers. Further examination of the data revealed that learners of education-majors attained higher average cognitive attainment values ($\bar{x}$ = 69.0) than learners of non-education majors ($\bar{x}$ = 58.9). These values were somewhat surprising because cognitive attainment means associated with unit one for the two groups of learners were nearly equivalent, 67.6 and 67.3 for learners of education majors and non-majors, respectively (Denton & Norris, 1979).

Another evaluation concern of the aforementioned research effort is the supervisory rating scale. Nearly fifty years ago rating scales and checklists became popular devices among supervisors for evaluating the effectiveness of teachers. These instruments, referred to as high inference scales, can: easily be adapted to a particular program, provide a means of providing numerical values of qualitative ratings, provide a summary or overall evaluation of in-class observations and serve to provide a written record that an evalution has been conducted. Conversely, these instruments have been criticized for their susceptible validity because the judgements recorded may reflect impressions of the person rather than assessment of the individual's teaching skills. While concern over the use of these instruments is of long standing (Jayne, 1945), student teaching programs have continued to depend heavily on these scales to provide accountability evidence that their student teachers are being

visited, supervised, and evaluated.

Given these aforementioned findings, the extant data from which these results were derived, and the concern with high-inference evaluation instruments, this inquiry was conducted to determine whether differences occur across supervisor ratings of instructional skills performance by education majors and non-education majors. In addition, weekly morale self-ratings were also compared for these two groups of student teachers.

These objectives stated as research questions become:

1. Do differences occur when supervisor ratings of instructional skills are compared between student teachers majoring in education and those not majoring in education?
2. Do differences occur when student teacher morale self-ratings are compared between student teachers majoring in education and those not majoring in education?

ORGANIZATION OF INVESTIGATION

Program Description

This investigation was conducted in an Educational Curriculum and Instruction department. The teacher-preparation program which participated in the investigation is a competency-based program for secondary-level teachers fashioned around a diagnostic-prescriptive model of instruction (Armstrong, Denton, & Savage, 1978). This model illustrates teaching as a series of events requiring five distinct sets of instructional skills: (a) Specifying Performance Objectives, (b) Diagnosing Learners, (c) Selecting Instructional Strategies, (d) Interacting with Learners, and (e) Evaluating the Effectiveness of Instruction.

The culminating experience in the preparation program is a full-semester, full-day student teaching program with twelve semester hours being awarded for successful completion of the experience. During this course, each student teacher is required to develop and implement two instructional units

each requiring approximately two weeks to complete. The instructional units are to include: performance objectives, a diagnostic pretest to determine if prerequisite knowledges and skills are present, instructional strategies addressed to each performance objective, and criterion-referenced instruments. These units must be approved by the classroom supervising teacher and the university supervisor prior to implementation. Some time ago, a multi-stage evaluation system was established to monitor the development and implementation of this competency-based program (Denton, 1977). Evaluation of student teachers in this system includes supervisor ratings based on in-class observations and ratings of instructional materials produced by the student teacher. Generally six supervisor visits are completed during a semester. These visits are recorded as ratings on an Evaluation Profile instrument. It may be of significance that the final evaluation for each student teacher recorded on this instrument represents a consensus rating resulting from a three-way conference between the student teacher, the classroom supervisor, and the university supervisor. In addition, a Curriculum Context Checklist for rating the components of each instructional unit is completed by the university supervisor. Two of these forms are completed during the field experience. These rating scales provided the dependent measures for research question one in this study.

Student teachers, also are requested to contribute to the formative evaluation process by completing weekly reflection sheets throughout the semester. These self-report sheets solicit an assessment of their morale and factors influencing the rating. Values gleaned from these sheets provided the dependent measures for research question two in this study. In addition, summative procedures are conducted by student teachers at the conclusion of each unit, and summaries of learner performances are recorded on Summary

Evaluation of Unit Forms. Values for this form are obtained as student teachers retain the unit test responses of learners after providing feedback to them regarding their performances. Copies of these instruments are available in ERIC (Denton & Norris, 1979).

The aforementioned learner performance data were subsequently used to develop a criterion-referenced summary on each learner and summarized as group values for each student teacher. Subsequent analysis of these data revealed differences in performance among learners depending on the major of the student teacher (Denton & Norris, 1979; Denton & Tooke, 1982) which in turn, stimulated this inquiry.

METHODOLOGY

Sample

Information from 82 secondary-level student teachers and 9001 learners taught by these student teachers comprised the total sample for this data base. Fifty-six of these student teachers were education majors while the remaining 26 candidates were teacher certification students majoring in other colleges. The student teachers were supervised by five university supervisors over the course of five semesters (i.e., Spring 1978 - 7 student teachers, Fall 1978 - 18 student teachers, Spring 1979 - 19 student teachers, Fall 1979 - 9 student teachers, Spring 1980 - 29 student teachers). The total number of secondary-level student teachers numbered 291 during this period (Spring 78 - 68, Fall 78 - 64, Spring 79 - 52, Fall 79 - 52, Spring 80 - 55). Participation of student teachers in this inquiry was based on whether their university supervisors were actively involved in the research program.

It is important to note that the major of the student teacher was not known by the university supervisor during the field experience. In addition, a contigency table, was developed and statistically tested to determine whether

student teachers were evenly distributed across university supervisors with respect to their academic major. This comparision was not statistically significant, indicating expected numbers of student teachers of each category (majors and non-majors) were, in reality, assigned to each university supervisor. Even though these precautions were taken, certainly no claim can be made that findings from this inquiry will generalize to other settings.

In order to enroll in student teaching, each candidate in this sample had met the following criteria: (a) had attained senior standing, (b) had attained a minimum grade-point ratio of 2.25, (c) had completed at least 75 percent of the coursework required for two teaching fields with a minimum grade-point ratio of 2.25, (d) at least one semester prior to student teaching had fulfilled all requirements (i.e., a statement of personal commitment, three letters of recommendation, successful completion of an English proficiency examination) for admission to the teacher education program, and (e) had completed ten hours of professional education coursework.

In contrast to the commonalities among majors and non-majors, the most pronounced difference between individuals majoring in education and non-majors seeking teacher certification while completing degree requirements in agriculture, liberal arts, or science were the required semester hours of professional education coursework. Non-majors completed 22 semester hours of professional education coursework, organized into four courses [general teaching methods (3 hrs.), educational psychology (3 hrs.), teaching field methods (4 hrs.), student teaching (12 hrs.).] Majors completed the aforementioned courses and five additional courses totaling 34 semester hours, i.e., introduction to secondary education (1 hr.), early field experience (2 hrs.), subject matter of teaching (3 hrs.), preparation of instructional materials (3 hrs.), and adolescent psychology (3 hrs.).

Instruments

Three scales were used in obtaining measures of the various dependent variables in this investigation. The following briefly describes these instruments. An Evaluation Profile was employed to obtain the variables, associated with the instructional effectiveness of the student teacher as perceived by the university supervisor. This instrument is completed on a biweekly basis by the university supervisor. The scale, consists of twenty-eight Likert type items divided into two categories, i.e., instructional competencies (20 items), and personal and professional competencies (9 items). The following listings under instructional competencies were not included in the analysis, self-evaluation, and overall rating for teaching a two week unit. These items were omitted because neither item was directly linked with other components in the teacher preparation program. Conversely, with the exception of these two items, scale items are referenced to performance objectives in the student teaching program. Further, with the exception of the two items, instructional skills addressed on this instrument are compatible with the skills and knowledges stressed in the diagnostic-prescriptive model of instruction, on which this program is based. The supervisor has the choice of marking one of five categories ranging from excellent to inadequate. If the skill is not observed or not applicable to the classroom situation the supervisor has the option of marking N/A. The alpha coefficient, $\alpha = .94$ determined for this instrument suggests a high degree of internal consistency among responses to the various items.

A second rating scale, the Curriculum Context Checklist, is used to provide university supervisor ratings of the two curricular units developed and implemented by the student teacher. Values from this scale provide data for the planning effectiveness of the student teacher. This instrument

contains a 5 choice scale identical to the scale of the evaluation profiles. Individual items of this instrument identify components of the curriculum unit e.g., general goals, focusing generalizations, concept list, diagnostic component. Values for planning effectiveness obtained from this instrument were analyzed in relation to research question one of this inquiry.

Teaching candidates contributed to the data base of this inquiry by an instrument which serve formative evaluation functions for the candidate and provides time ordered data for programmatic research. This instrument the Weekly Reflections Sheet requests students teachers to estimate the percent of time they have spent during the preceding week observing, planning, assisting, team teaching, and/or assuming full responsibility. In addition, candidates assess their morale and provide a written rationale for the rating. Morale is described on the instrument in the following manner. "Morale refers to your mental and emotional condition with regard to your performance of the required tasks during student teaching. High morale is characterized by enthusiasm, confidence, a sense of accomplishment ... Low morale is characterized by a lack of absence of these feelings " Candidates have the choice of marking one of five categories from low to high.

ANALYSIS AND FINDINGS

Given the nature of the research questions for this inquiry and the unbalanced sample sizes of majors and non-majors, data were treated descriptively for both research questions. However, non-parametric sign tests were applied to a variety of comparisons to determine whether either group, majors or non-majors, produced a greater number of high ratings.

Question One - Planning effectiveness of the student teachers are summarized in table 1. The sign test comparing the mean ratings of the various curricular

Place table 1 about here

components between majors and non-majors did not yield a significant difference. In fact, exactly half of the mean ratings favor each group. Examining the ratings across units by majors and non-majors reveal that without exception non-majors received higher ratings on their initial unit; majors on the other hand, received higher ratings on their second instructional unit for 3 of the 6 components. In general, little variation in planning effectiveness ratings were found to occur across the units regardless of the student teacher's major.

Assessing the student teacher's competence in implementing the plan was accomplished through six classroom visits and corresponding evaluations. Summaries of the instructional competence ratings across the six evaluation visits are presented in table 2. In addition, graphic displays of these data

Place table 2 and figure 1 about here

are presented in figure 1. These numerical and graphical presentations reveal a number of trends across the evaluation visits. First, higher ratings occurred across all instructional competencies for both majors and non-majors as the student teaching experience progressed. Second, differences in supervisor ratings between majors and non-majors tended to be small. Third, sign tests revealed a significant number of higher ratings for evaluation visits 3 and 4 for non-majors while majors attained a significantly greater number of more favorable ratings for evaluation visit 6. The sign tests for the remaining evaluation visits (1, 2, and 5) did not produce a significantly greater number of more favorable ratings for either group of student teachers. Fourth, the range in ratings across the six evaluation visits of 1.3 $\pm$ .2 for majors and non-majors was observed for the 18 instructional competencies. This observed range of mean values represents 32 percent of the possible range of scores, reflecting the degree of discrimination exercised by the supervisors

in rating the student teachers.

Visual examination of the graphs in figure 1 reveal similar slopes for the plots of majors and non-majors across the instructional competencies examined. Yet 15 of the 18 graphs reveal one or more intersections of the curves of majors and non-majors. These intersections, as perceived by the university supervisor, indicate uneven progress in mastering instructional competencies, such as, use of lesson plans, diagnostics used, and introducing and concluding lessons. The three instructional competencies whose graphs did not include intersections are use of duplicating equipment, use of audio-visual equipment, and clarity of directions. Non-majors attained higher ratings than their counterparts across all ratings of the competencies, use of duplicating equipment and use of audio-visual equipment while majors attained uniformily higher ratings on the skill, introducing and concluding lessons, than did their non-major colleagues.

Question Two - Weekly self-ratings of morale by student teachers are reported in table 3 and figure 2. Similar to the supervisory ratings, the morale ratings

Place table 3 about here

across both majors and non-majors gradually increase over the course of the semester. Both groups of student teachers report lower morales during the early weeks of the experience. However, figure 2 reveals that non-majors appear to move through the self-doubt period slightly sooner than majors (weeks 3, 4, 5 for non-majors and weeks 4, 5, 6 for majors). A sign test comparing the morale ratings of both groups of student teachers across the fifteen week semester failed to produce a significant finding since eight self-ratings of morale were higher for majors compared to seven ratings favoring non-majors.

Place figure 2 about here

Examining figure 2 for other patterns reveals a "leveling period" between the eighth and tenth weeks, followed by higher ratings for the final weeks of the experience. The pattern occurs for both majors and non-majors. Thus, while these are minor variations the overall trends are similar among weekly morale ratings between student teachers who are majors in education compared with those who are majoring in other colleges (agriculture, liberal arts and science).

DISCUSSION

This inquiry was conducted to determine whether differences in instructional skill and unit development ratings by supervisors and morale ratings of student teachers are different given the academic major of the teaching candidate. The initial research question of this inquiry led to the examination of supervisory ratings of the unit components developed by the student teachers. While no overall differences were found between student teachers majoring in education and their counterparts not majoring in education, examination of the data revealed that when intragroup comparisons were made non-majors consistently received their best marks on the initial unit and lower ratings on the second unit. Conversely, majors tended to receive higher intragroup ratings on the second unit. These observations are compatible with the findings reported elsewhere (Denton & Norris, 1979; Denton & Tooke, 1981; Denton, Morris & Tooke, 1982) that learners of student teachers achieved nearly the same percentage of curricular objectives in unit one, regardless of the student teacher's academic major. For unit two, however, performance on the percent of unit objectives achieved was substantially higher for learners of student teachers majoring in education. The similar ratings and nearly equal learner performance on unit one among majors and non-majors appear to verify the assumptions that university supervisors perceived and rated the planning capabilities of student teachers without regard to their academic major of the student teacher. However,

the modest improvement of ratings of majors and the concomitant higher cognitive performance among their learners coupled with the converse situation with non-majors (slightly lower ratings and lower cognitive attainment values of their learners) in unit two suggest a relation between these indicators of the teaching candidate's competence. It is encouraging that these trends of the supervisory ratings parallel the trends observed in learner cognitive attainment. Yet an explanation of these observed trends is not clearly evident. Perhaps majors earn higher ratings because of higher quality plans, which in turn positively influence learner attainment. This explanation would be compelling, had the ratings for instructional planning of non-majors been substantially lower than corresponding ratings of majors, but this was not the case.

The reported relation of learner cognitive attainment to the major of the student teacher appears to be slightly linked to instructional planning but other variables such as teaching competencies ratings and morale also may influence this relation. Supervisor ratings regarding the instructional competencies of student teachers followed a similar pattern to the instructional plan ratings of majors and non-majors. That is, non-majors were rated significantly higher on the program's instructional competences during unit one compared to student teachers majoring in education. However, this trend reversed itself during unit two with majors receiving a significantly greater number of higher skill ratings than their counterparts not majoring in education. These observations and a casual examination of the data presented in figure 1 indicate gradual improvement in skill performances across the student teaching experience. Again a slight but perceptible link between supervisory quality ratings of instructional competence and learner cognitive attainment was found to occur. Whether the modest differences in instructional skill ratings combined with the trends observed for instructional planning explain the cognitive attainment

advantage observed for learners of majors is open to question. However, it is encouraging that these supervisory ratings provide a logical basis for the difference in learner cognitive attainment of student teachers with different academic majors.

The second research question of this inquiry addressed the equivalence of self-report morale ratings between student teachers of different academic majors. In general, morale of the student teachers improved during the course of the field experience. Differences in morale ratings between student teachers majoring and not majoring in education were minor, yet both groups displayed a common pattern regarding morale (self-confidence, satisfaction, sense of accomplishment) during the experience. The drop in morale about 2 weeks into the experience likely was due to their apprehension of filling the role of teacher since at that time they were preparing to teach their first unit. As the planning effort converged with the implementation of the initial unit somewhere between the fourth and eighth weeks of the semester morale (self-confidence) began to improve perhaps because they were experiencing first-hand their ability to cope, even enjoy the challenge of teaching. This satisfaction with teaching then plateaued for about three weeks, and again improved for two or three weeks. While it may be coincidental, the plateau period corresponds with the time period in the experience devoted to reflecting, and evaluating their performance on the initial unit and subsequent planning for unit 2. The subsequent gain in self-confidence again co responds to the implementation of the second unit. Thus, it appears morale (self-confidence) was dependent to some extent on whether they were actually responsible for teaching. The only difference between majors and non-majors was the occurrence of these periods, and even here the phases did not differ by more than a week.

Perhaps what has influenced supervisory ratings, and learner cognitive

attainment is perserverance and experience. Student teachers majoring in education are provided with constructs associated with teaching through required coursework for at least 6 and possibly 7 semesters of the 8 semester program. Non-majors on the other hand, rarely enroll in education coursework for more than three semesters including the semester of student teaching. It is conceivable, that majors in education through additional experiences, such as the early field experience, understand that teaching is an iterative process while non-majors "psych-up" for the event of teaching unit one then experience a "let-down" when called upon to develop and implement a second unit. This explanation, if valid is consistent with the slightly favorable status non-majors appear to enjoy regarding supervisory ratings through the early part of the experience and the subsequent shift in ratings favoring majors at the conclusion of the experience. Additional support for this explanation rests with the observation that supervisory perceptions and ratings tend to be supported by reported shifts in learner cognitive attainment across the experience. Thus, this inquiry lends empirical support to the current emphasis, in some quarters of teacher education, that the preparatory period for becoming a teacher should be extended.

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Table 1

Sign Test of Curriculum Context Checklist Component Ratings Among Student Teachers Majoring and Not Majoring in Education

Component	Major (A) $\bar{x}$	Non-major (B) $\bar{x}$	Sign *	Test
Unit 1				
Content Generalizations	3.24	3.23	A	N.S.
Performance Objectives	3.59	3.75	B	
Diagnostic Pretest	3.17	3.27	B	
Remediation Plans	2.24	2.19	A	
Instructional Strategies	3.07	3.15	B	
Summative Evaluation Plan	3.20	3.50	B	
Formative Evaluation Tests	3.57	3.23	A	
Unit 2				
Content Generalizations	3.42	3.17	A	N.S.
Performance Objectives	3.78	3.63	A	
Diagnostic Pretest	2.87	3.00	B	
Remediation Plans	2.06	2.17	B	
Instructional Strategies	3.20	3.08	A	
Summative Evaluation Plan	3.09	3.42	B	
Formative Evaluation Tests	3.54	3.17	A	

A = $\bar{x}$ majors > $\bar{x}$ non-majors

B = $\bar{x}$ non-majors > $\bar{x}$ majors

Table 2

Sign Test of Supervisory Evaluation Profile Ratings Among Student Teachers Majoring and Not Majoring in Education

Instructional Competencies	Eval. Visit 1			Eval. Visit 2			Eval. Visit 3			Eval. Visit 4			Eval. Visit 5			Eval. Visit 6		
	$\bar{X}_M$	$\bar{X}_{nm}$	Sign*	$\bar{X}_M$	$\bar{X}_{nm}$	Sign*	$\bar{X}_M$	$\bar{X}_{nm}$	Sign*	$\bar{X}_M$	$\bar{X}_{nm}$	Sign*	$\bar{X}_M$	$\bar{X}_{nm}$	Sign*	$\bar{X}_M$	$\bar{X}_{nm}$	Sign*
Use of Lesson Plans	4.04	3.83	A	4.31	4.11		4.26	4.44	B	4.56	4.47	A	4.73	4.75	B	4.83	4.92	B
Use of Performance Objectives	3.37	3.21	A	3.79	3.62	A	4.10	4.06	A	4.46	4.50	B	4.68	4.74	B	4.79	4.76	A
Diagnostics Used	-	-	-	-	-	-	4.08	4.22	B	4.55	4.57	B	4.86	4.87	B	4.63	4.48	A
Remediations Used	-	-	-	-	-	-	4.00	4.34	B	4.09	4.30	B	4.50	4.31	A	4.65	4.53	A
Mastery of Content	3.78	3.90	B	3.83	3.76	A	3.94	4.21	B	4.29	4.57	B	4.52	4.69	B	4.71	4.84	B
Use of Duplicating Equipment	4.00	4.00		4.54	4.62	B	4.48	4.94	B	4.50	4.71	B	4.73	4.93	B	4.80	5.00	B
Use of A-V Equipment	-	-	-	-	-	-	4.00	4.16	B	4.21	4.35	B	4.47	4.82	B	4.76	4.83	B
Introducing and Concluding Lessons	3.18	3.40	B	3.29	3.69	A	3.81	3.89	B	3.83	4.14	B	4.30	4.31	B	4.58	4.40	A
Instructional Strategies Used	3.39	3.59	B	3.40	3.59	B	3.85	3.79	A	4.08	4.17	B	4.65	4.56	A	4.91	4.68	A
Variety of Presentations Modes Used	3.38	3.50	B	3.59	3.78	B	4.03	4.32	B	4.25	4.14	A	4.55	4.60	B	4.77	4.72	A
Sensitivity to Attending Behavior of Learners	3.00	3.33	B	3.38	3.47	B	3.75	3.74	A	4.08	4.07	A	4.36	4.06	A	4.38	4.24	A
Clarity of Directions	4.00	3.83	A	4.31	4.06	A	4.16	4.16	A	4.42	4.29	A	4.70	4.69	A	4.83	4.76	A
Use of Different Types of Questions	3.40	3.54	B	3.35	3.67	B	3.78	3.47	A	3.81	4.33	B	4.26	4.27	B	4.48	4.56	B
Use of Reinforcement Techniques	3.35	3.24	A	3.41	3.65	B	3.88	3.89	B	4.04	4.07	B	4.26	4.57	B	4.56	4.48	A
Ability to Clarify Values	3.38	3.40	B	3.21	3.50	B	3.79	3.93	B	4.09	4.00	A	4.07	3.93	A	4.50	4.35	A
Classroom Management	3.35	3.22	A	3.52	3.67	B	3.65	3.79	B	4.08	4.14	B	4.35	3.94	A	4.36	4.20	A
Use of Tests	-	-	-	3.91	3.83	A	4.05	4.47	B	4.36	4.59	B	4.80	4.93	B	4.83	4.80	A
Ability to Evaluate Effects of Lesson	-	-	-	-	-	-	3.86	4.25	B	4.18	4.56	B	4.73	4.57	A	4.85	4.68	A
Sign Test			N.S			N.S.			SIG			SIG			N.S.			SIG

A = $\bar{X}$ majors > $\bar{X}$ non-majors

B = $\bar{X}$ non-majors > $\bar{X}$ majors

Table 3

Sign Test of Morale Rating Comparisons
Among Student Teachers' Majoring
and Not Majoring in Education

Week	Majors (A) $\bar{X}$	Non-majors (B) $\bar{X}$	Sign *
1	3.80	4.00	B
2	4.14	3.96	A
3	4.09	3.79	A
4	3.90	3.88	A
5	4.00	3.65	A
6	3.87	3.96	B
7	4.16	3.88	A
8	4.06	4.32	B
9	4.06	4.22	B
10	3.95	4.22	B
11	4.21	4.19	A
12	4.43	4.58	B
13	4.58	4.67	B
14	4.54	4.40	A
15	4.74	4.69	A

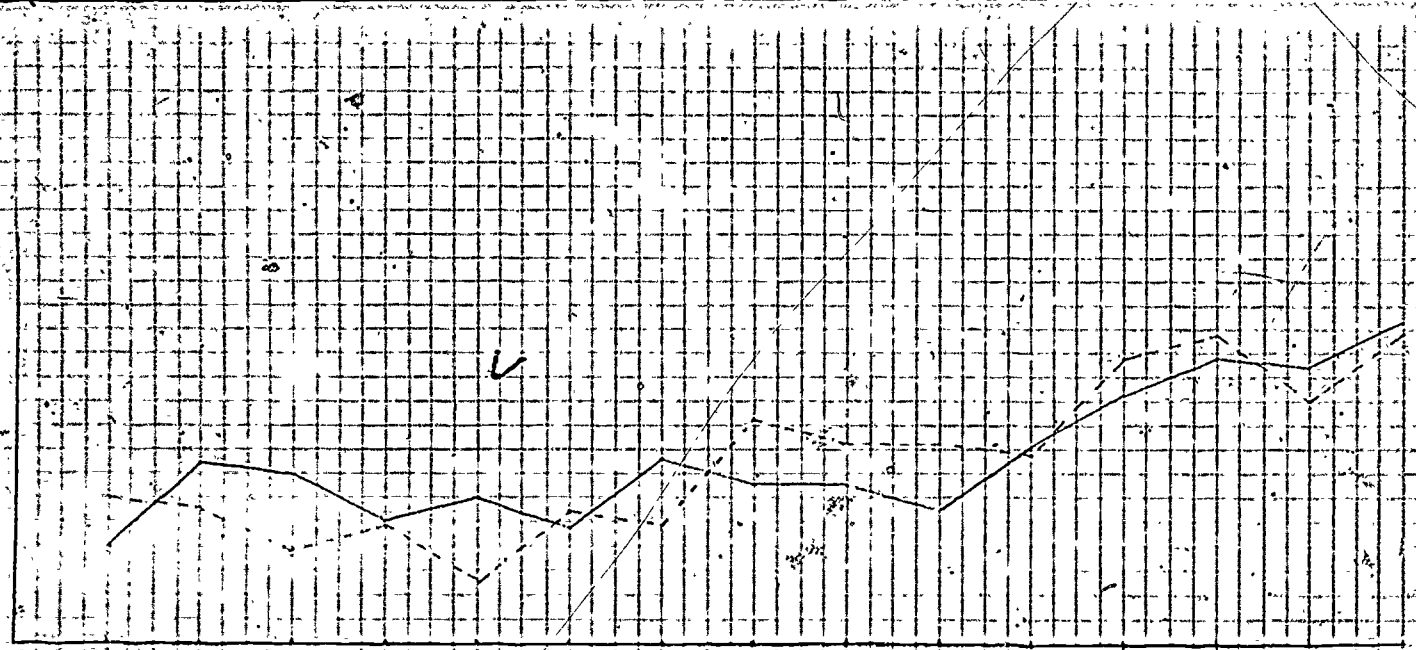
* A = $\bar{X}$ majors > $\bar{X}$ non-majors

B = $\bar{X}$ non-majors > $\bar{X}$ majors

Group A = 8 means

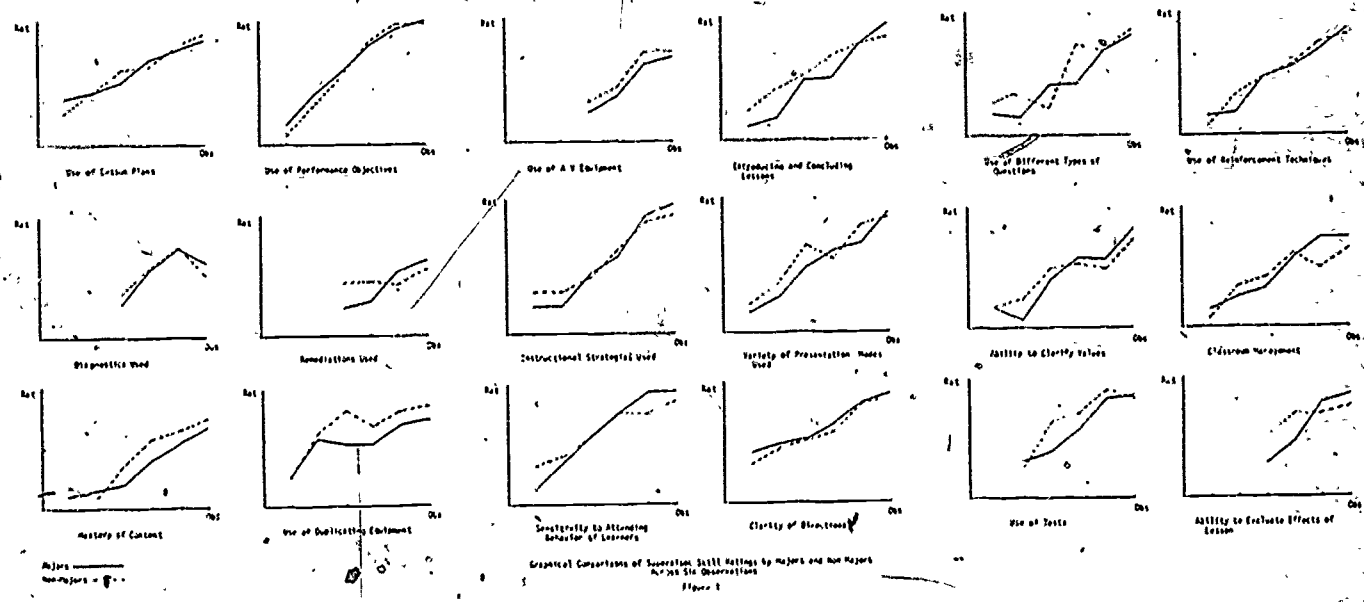
Group B = 7 means

8/15 = not significant



Graphical Comparison of Weekly Morale Ratings by Majors and Non-Majors

Figure 3



Graphical Comparisons of Supervisor Skill Ratings by Majors and Non Majors Across Six Observations

Figure 1