AN EVALUATION OF THE EFFECTIVENESS OF TWO

METHODS OF INSTRUCTION IN TEACHER EDUCATION

DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
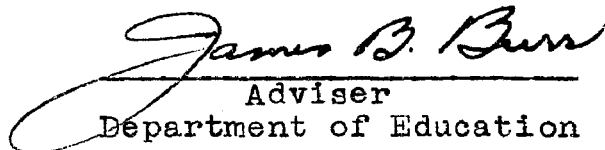School of The Ohio State University

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CHAPTER I

PROBLEM ORIENTATION

Origin of the Problem

It is hoped that this preliminary discussion will serve as an orientation both to reflective thinking which generated the enthusiasm for the study and to the significance of such an investigation in the field of teacher education. Curiosity is a laudable motive, but it does not guarantee the worthwhileness of an investigation involving considerable time and effort. In order to establish significance it is necessary to support one's curiosity by an acknowledged awareness found in the literature and by a recognized relationship to the fundamental goals of teacher education.

Unless a student coordinates his research efforts with an established ongoing research program, it is quite natural that challenging ideas should arise from personal curiosity which has been nurtured by reflective thinking, readings, and professional experiences. One major source of motivation for this study grew out of the following maize of reoccurring questions.

Why is there a break in the continuity between the thinking and writing of educators about unit teaching and the actual unit teaching behavior exhibited in the elementary classrooms? Could part of this inconsistency be localized in the process of transfer of verbal understandings to teaching behaviors? Can integration of pre-service and in-service experiences be fostered by means of an instructional approach on the college level? From these many-faceted queries two areas of attention emerge for consideration. One revolves around the identification of unit teaching in terms of teaching behaviors. The second focus of attention pertains to an instructional approach on the college level designed to promote a higher level attainment and transfer of these desirable teaching behaviors. A network of baffling questions encompasses each sphere of consideration.

In regard to identifying unit teaching behaviors, one wonders whether effective unit teaching behaviors can be observed, identified, and categorized. Current writings and investigations indicate a concern about the identification of effective teaching behaviors.[1] Yet no published material

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[1] Edith Merritt, "Critical Competencies for Elementary Teachers" (unpublished Ph.D. dissertation, Stanford University), 1955.

Melvin Golden, "Behavior Related to Effective Teaching" (unpublished Ph.D.

(available for library use) ventures a job analysis yielding characteristic differences between unit teaching from what might be labeled "effective teaching." Thus the aforestated question becomes crucial to an inquiry implicating unit teaching behaviors.

The second area of focus is equally challenging. Suppose that it is possible to identify unit teaching behaviors. Would a change in the formulation of objectives from subject matter (verbal behavior) to teaching behaviors (operational behaviors) demand or call for a change in teaching procedures on the college level? Will conventional instructional methods promote operational objectives? Does the directness of experience in a professional course directly influence teaching behaviors in the elementary classroom? Do elementary teachers feel more secure in exploring unit teaching if they themselves have experienced this method of teaching? Can some student teaching problems be traced to the fact that students experience one system of instruction and attempt to teach by another? On the college level, does a transfer of desirable outcomes from

dissertation, University of Wisconsin), 1957

Harold Mitzel and Edwin Wandt, "Plan for a Program of Research," Studies of Teacher Behavior. Publication 21. Division of Teacher Education of the Four Colleges of the City of New York, 1954.

New England School Development Council. Teacher Competence and its Relation to Salary (Cambridge, Massachusetts: Spaulding House, 1956).

the college classroom to the elementary classroom result

from building attitudes toward the behavior through vicar-

ious experiencing or through direct experiencing of the

outcomes? How can a course be made sufficiently concrete

to grow out of students' past experiences and give direction

in future teaching situations?

As a review of the literature reveals (chapter III),

these perplexing questions of transfer and directness of

experience for the attainment of higher level teaching com-

petency have not entered experimental considerations on the

college level. Is a student's verbal behavior indicative

of his operational behavior in a classroom teaching situa-

tion? Are paper and pencil tests which verbally measure

knowledge accurate indicators of actual teaching competence?

Is it realistically feasible to teach the same course by two

distinct methods? Can one course experience be sufficient

to change behavior which has been the result of many years

of subject-centered experiences? What experiences which

students have in a course devoted to unit teaching (Educa-

tion 517, The Ohio State University) play a significant part

in determining teacher convictions and practices?

The paucity of organized or summarized experimental

research involving instructional methods and teaching be-

haviors lends little direction in the entertainment of these

problematic questions. Yet it is evident from the literature

that this dearth is not caused by the absence of the problem. Educators are cognizant of the need, the difficulties involved, and the urgency of continuous experimentation.

Significance of the Problem

Teacher educators recognize the problem. Educators have verbalized about instructional concerns through yearbooks and publications of national professional organizations. Reference to instructional methods and the directness of experience appears repeatedly in the thinking of the contributors to Improving Instruction in Professional Education. Throughout this yearbook an undercurrent of a striving to functionalize professional courses keeps bubbling to the surface:

> Accepted theories of learning, thinking, and problem solving should undergird our teaching of students so that their own learning experiences demonstrate how they can use theories in their own teaching.[2]

> The improvement of instruction in professional education focuses primarily in the ability of teachers to improve learning conditions for the students so that the students gain more in their ability to become effective teachers than they would have gained had previously used patterns of instruction been in operation.[3]

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[2] Association for Student Teaching and National Society of College Teachers of Education, Improving Instruction in Professional Education, Thirty-seventh Yearbook (Iowa: Wm. C. Brown Co., Inc., 1958), pp. 6-7.

[3] Ibid., 12-13.

The whole of chapter IV is a summary of authentic accounts of current teaching methods which are being used in teacher education institutions throughout the country. These accounts of experimentation support the contention that educators recognize the instructional challenge for direct experiences and are striving to rally experimentally. Of the two dozen or so practices enumerated, a cursory description of a pertinent reference might serve as an illustration of the instructional activities taking place.

> Betty Sue Dunlap instructs students at the Southern Oregon College of Education in a general methods course which encompasses both social studies and elementary science in recognition of the fact that the two areas are not only closely interrelated but also may be fused or correlated in the elementary school. College students are taught content, method, and techniques on a unit basis somewhat comparable to the approach they themselves may subsequently use with children.[4]

It was proposed in this publication that the most serious deterrents to the use of good teaching methods could stem from the professional courses that prospective teachers experience.

> It seems fitting then to propose that this has happened because of one or more of the following reasons: (1) that the instructor of the education class never completely convinced the prospective teacher of the real worth of the instructional procedure under discussion, (2) that the instructor of the education class did not demonstrate in his own classroom the instructional procedure

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[4] *Ibid.*, 42.

under discussion, and (3) that no effort was
made to provide the student with an opportunity
to try out the instructional procedure under
discussion.[5]

First, we __must apply__ to our __teacher-preparation
programs__ the same principles that we are trying
to __teach__ our students to apply in their classrooms.
As long as all we do is __talk__ about "inquiry,"
individual differences, joint planning, coopera-
tion, etc., they are not going to know what we
mean by these terms.[6]

Florence Stratemeyer's two chapters in __Teacher
Education for a Free People__ delve into the perplexing
problem of instruction in teacher preparatory programs.
In regard to the place of courses dealing with method in
professional education she raises several inquiries.

Should such courses deal with general methods
as specific methods of a particular field of in-
struction? . . . . Will the prospective teacher
be prepared to meet teaching problems when the
content of the professional education stresses
method of teaching or should the emphasis be on
the nature of human development, learning prin-
ciples, and acquaintance with instructional
materials?[7]

Stratemeyer is also alert to the educator's respon-
sibility to make some decisions as to the readiness of
students and the directness of experience on the college

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[5] __Ibid.__, 48.

[6] __Ibid.__, 97.

[7] Donald Cottrell (ed.), __Teacher Education for a
Free People__ (Oneonta New York: The American Association
of Colleges for Teacher Education, 1956), p. 66.

classroom level. "How are student needs and readiness for a particular type of activity--direct or vicarious-- determined?"[8]

> Can vicarious experiences alone give adequate meaning to ideas? Will a curriculum whose content is primarily subject matter selected in terms of logical relationships and development of a field provide meaningful experiences for prospective teachers? What is the student's role in selecting, planning, carrying out, and evaluating his college experiences?[9]

American educational research organizations acknowledge the problem. Although these yearbooks, discussed above, are perhaps the most recent expressions of professional concern about teaching methods, the problem can be substantiated by other authoritative research organizations.

In response to a felt lack of research direction, the American Association of Colleges for Teacher Education and the American Educational Research Association created in 1951 a committee (Roben Maaske, Lester Anderson, Earl Armstrong, Orvil S. Barr, and Max Goodson) to study the problem of needed research in teacher education. It was the thinking of the committee that a compilation of

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[8]
Ibid., p. 70.

[9]
Ibid., p. 82.

tentatively formulated research problem titles in teacher
education made available to graduate students, bureaus of
education, and educational leaders would assist materially
in stimulating research studies and projects. This group
felt that the pressing need in teacher education was for
research that deals with fundamental problems and issues
that evaluates "principles in operation" rather than sur-
veys of current practices.[10]

The efforts of this committee were consummated in
a report which categorized 574 research problem titles into
five broad areas. One area enveloped curriculum and in-
struction. Several suggested titles bear a relationship
to the proposed problem:

1) Rationale of direct experience in teacher education
2) Consistencies and inconsistencies between that
   which is known to represent progressive method-
   ology and current practices in teacher education
   institutions
3) Effectiveness of pre-service and education as
   measured by classroom effectiveness of graduates
4) Evaluation of cooperative planning procedures
   as lectures in teacher education courses
5) Identification of the most effective instruc-
   tional procedures in professional courses
6) Democratic vs. authoritarian teaching, the effect
   on teaching activities of beginning teachers.[11]

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[10] American Association of Colleges for Teacher
Education, Needed Research in Teacher Education (New York:
the Association, 1954), p. 9.

[11] Ibid., pp. 45-46.

The Encyclopedia of Educational Research presents
a resume of the fragmentary experimental research in
college methods of teaching over a score of years. It then
suggests that further experimentation should involve "a
critical appraisal of existing conditions and an evaluation
of innovations in curriculum and method, some of them being
designated as 'experimental plan' or have been adopted
without appraisal before or after installation."[12]

In the conclusion of a recent summary of research
publications the awareness of and the urgency of the problem
is succintly stated:

> The most serious lack of research in the
> improvement of teaching is in the area of evalu-
> ation of teaching. This is basic to the entire
> process of improvement. Until more is known
> and greater agreement exists on the outcomes of
> teaching and the means by which these outcomes
> are to be measured, the programs for improving
> teaching will remain on an untenable basis.[13]

Higher education is alert to the need. From a peru-
sal of Current Issues over the past ten years it is possible
to discern an unrest within higher education as well as
teacher education and research organizations regarding the
evaluation of classroom instruction. Even though the offi-
cial resumes of the major addresses or group reports of

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[12] Walter S. Monroe (ed.), Encyclopedia of Educa-
tional Research (New York: The Macmillan Co., 1952), p. 277.

[13] Richard Drake and Anthony De Iulio, "Improvement
of Instruction." Review of Educational Research, XXIV,
No. 4, 310.

the National Convention on Higher Education have appeared

under various titles (Current Problems in Higher Education,

Current Trends in Higher Education, and Current Issues in

Higher Education), one section of each publication deals

with the area of teaching methods in an apparent striving

to accept the invitation for experimentation and improve-

ment. It is not the purpose of this introduction to review

specific approaches but to validate the thesis that the

literature bears out the quest for quality teaching. The

titles of the contributions together with a reference to

the contributor appear sufficiently self-explanatory to

strengthen the position.

1948 - Evaluation and Improvement of Teaching in Service.
       P. E. Weaver, 123-131

1949 - Faculty Services and Their Evaluation, part I,
       Ralph Collins, 163-108; part II Judson Ward, 109-114

1950 - Evaluating the Services of the Faculty Member
       Section A. Donald Mackenzie, 145-150
       Section B. Donald F. Drummond, 150-156
       Section C. Robert D. Clark, 156-161
       Section D. Reverend Tasch, 162-170

1951 - Appraising and Rewarding Teaching Effectiveness.
       Ottis Richard, 194-198

1952 - Implications for Administration, Curriculum, and
       Instruction (Enrollment Trends) - Arthur Adams, 41-42

1953 - How Can We Work More Effectively for Improvement
       of Instruction. Bernice Crantate, 237-241

1954 - What does Recent Research Suggest Concerning
       College Teaching Methods. Herbert Thelen, 308-312

1955 - How Can Institutions Evaluate the Effectiveness of Teaching and Other Services. Robert C. Pace, 223-229

1956 - Maintaining and Improving the Quality of Instruction in Light of Rapidly Increasing Enrollment. Alvin Eurich, 10-17
Efficient and Effective Teaching. Warner G. Rice, 17-21
Improvement of Instruction: Effective Practices: Evaluation Implications from Research for Instruction and for Instructional Programs. Lester Anderson, 162-167

1957 - What Teaching Devices and Techniques will be Most Effective in the Improvement of Instruction.
C. R. Carpenter, 188-191

Research studies point to the continuing problem. The conclusions in recent doctoral studies give added significance to the problem of college instructional methods and the transfer from theory to practice in actual elementary classroom situations.

Alice Scofield observed, interviewed, and distributed questionnaires to the elementary graduates from Stanford University over a five-year period to determine the relationship between methods advocated in a language arts course and those actually used in classroom practice. She concluded that the teachers are using only some of the methods advocated in the teaching of language arts. Not one of the suggested methods was being used regularly by 90 per cent of the teachers.[14]

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[14]
Alice Scofield, "The Relationship Between Some Methods of Teaching Language Arts as Advocated in Methods Courses and as Practiced in the Classroom" (unpublished Ph.D. dissertation, Stanford University, 1955), 167 pp.

In a similar study Charles DeWitt investigated the relationship between theory and practice in the teaching of social studies in the elementary school. Sufficient evidence was found to support the hypothesis that a large amount of lag exists between theory and practice in the teaching of social studies in the elementary school. The least amount of lag exists in the area of the organization of content. Generally, there is not a large amount of lag in regard to the objectives for social studies. It is in the area of method that theory is the farthest behind practice.[15]

Anthony Milanovich made a survey to determine the extent to which the experience unit is used in the public schools of a New York county which employs 1,200 elementary teachers. After establishing 15 criteria of an experience unit, he made a random survey of every eighth teacher. He concluded that even though elementary teachers in this county are well prepared and have attended school recently, the term "unit teaching" is almost meaningless.[16] The

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[15] Charles DeWitt, "The Extent of the Relationship Between Theory and Practice in the Teaching of Social Studies in the Elementary School" (unpublished Ed.D. dissertation, University of Maryland, 1957).

[16] Anthony Melanovich, "A Critical Study of the Experience Unit in Elementary Education with Special Reference to the Elementary Schools of Erie County, New York" (unpublished Ph.D. dissertation, The Ohio State University, 1952), pp. 245-248.

studies by Scofield, DeWitt, and Milanovich tend to indicate that there is an apparent educational lag between theory and practice in teaching behaviors.

In a follow-up study of the difficulties encountered by beginning teachers Evans concludes that the subjects were inadequately equipped with professional skill. Many of the problems cited show a lack of mastery of the technique of teaching which might be alleviated through more intensive professional training.[17]

U. S. Office of Education does not give top priority to the problem. To say that all literature reveals the significance of the problem is a misnomer. It is well known that Congress in 1954, through Public Law 531 authorized cooperative research in education. It was to be administered through the Office of Education which has the authority to enter into contracts as jointly financed cooperative arrangements with universities, colleges, and state educational agencies for the conduct of research in the field of education.

In the light of the thinking of educators, national organizations, and stated research needs in higher education,

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[17] Zelia Evans, "A Study of Difficulties Encountered by Selected Student Teachers and Beginning Teachers of the Elementary Division of Alabama State College with Implications for Teacher Education Programs (unpublished Ph.D. dissertation, University of Michigan, 1955).

it is somewhat disconcerting to review the reactions of the
U. S. Office of Education in regard to the selection of the
cooperative research projects. The 61 projects approved by
the Advisory Committee of the Office of Educational Research
deal with causes of juvenile delinquency (3), education of
mentally retarded (36), student retention (5), school
staffing (9), population mobility (1), and miscellaneous
(4).[18]

The Office of Education through the division of
Higher Education in the fall of 1957 did undertake a study
which is intended to give some direction to the problem
of staffing the nation's colleges and universities. It
would be a distortion of the facts to say that instructional
problems are being entirely ignored. Marion Folsom in
referring to the problems of Higher Education has recorded
quality teaching as one dimension of the challenges facing
Higher Education:

> By this dimension I mean the degree of success
> with which knowledge, mental training and skills
> are imparted by the instructor and acquired by
> the student. Many factors are involved in the
> quality of education--the caliber of teaching,
> methods of instruction, physical facilities and
> support and encouragement of education by the
> home and by the community.[19]

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[18] Herbert Conrad, "Projects Under the Cooperative
Education Research Act" (Public Law 531). Higher Education,
XIII No. 9 (May 1957), pp. 166-170.

[19] Marion Folsom, "The Three-Dimensional Problem of
Higher Education," Educational Record, 38, No. 1 (January
1957), p. 7.

However, it seems logical to assume that quality of classroom instruction is considered important by the Office of Higher Education but has not been given priority listing as have the problems of supply and demand, certification, objectives, curriculum organization, or recruitment and selection. Yet several basic conditions can hardly be ignored: (1) The organization and goals of a pre-service program may look excellent on paper but its achievement depends to a large extent on the creativity and quality of classroom instruction. (2) No matter what degree of selection is possible, teacher education has the responsibility for using the most effective instructional approaches for developing competency. (3) The professional growth that occurs between selection and certification is to some extent the result of direct instruction and that this growth is fostered or impeded by classroom instruction.

Thus from the literature the need for research involving instructional methods is generally recognized as significant. In the light of the foregoing references, it is possible to generalize about the significance of the writer's recurring questions and curiosity in publications of professional organization, in authoritative research sources, in the follow-up studies concerning the relationship of theory and practice, and in the inconclusive data of previous experimental studies of instructional methods (further discussion in chapter III).

The problem is related to the goals of teacher

education. Establishing the importance of a problem requires a relating of the proposed research project to the fundamental goals of teacher education. The ultimate goal is pupil achievement of the stated educational objectives. How can this goal be tangibly and functionally approached? Teacher education assumes the responsibility for the immediate goal of developing teaching competencies which it is believed will be a means of achieving the ultimate goal.

Teaching competency or way of behaving is interpreted as an understanding of and skill in teaching procedures which can be observed, identified, and measured in terms of teaching behavior. Each professional course has a responsibility to contribute to the competency of prospective teachers. It can be further reasoned that the quality and nature of the learning experiences in the course have a relationship to the achievement of this competency goal. An appraisal of two methods of instruction for the purpose of developing a higher level of competency becomes vital to the fuller realization of the immediate goal of teacher educators.

Teacher education has found itself in somewhat of a professional dilemma. There is agreement on the necessity of professional courses to assist pre-service teachers to perform various skills related to the education of children.

With regard to teaching professional courses there is no
such agreement. As there is no general appraisal, local
studies become almost mandatory as a starting point.

Within the framework of personal curiosity, a
recognized need for experimental research in instructional
approaches, and the responsibility of teacher education for
the development of teaching competency, the problem must be
identified and delimited. The broad problem area involves
experimentation to determine the effectiveness of two
methods of instruction in attaining desired behavioral out-
comes which may promote a higher degree of integration be-
tween pre-service and in-service experiences of prospective
teachers. The problem might be further narrowed to experi-
mentation in one professional course oriented toward devel-
oping teaching competency in social education. If one is
concerned with operational evidence and transfer of verbal
to operational behaviors, then effectiveness can not only
be judged at the end of the course but must be followed
through to on-the-job teaching in student teaching.

In previewing the organization of the written study,
the ensuing chapters relate to the following progression:
Chapter II - brief analysis proposed study; Chapter III -
the historical perspective as background; Chapter IV - the
development of the experiment; Chapter V - the treatment and
interpretation of the data; Chapter VI - summary, findings,
and productive avenues for projective thinking.

CHAPTER II

ANALYSIS OF THE PROPOSED STUDY

In the previous chapter the general problem area was identified and acclaimed as significant for investigation. In this chapter the problem which was identified is further analyzed into constituent elements so that the research will be given structure and direction. It was thought that the working outline for the problem would have more meaning if it were preceded by a discussion of the experimental approach. Methods of Research and Educational Research and Appraisal were the two sources which guided the thinking leading to the organization of the study.[1]

Nature of the Experimental Method

What does the experimental method of research involve? Experimentation is one way of securing evaluative information concerning the desirable or undesirable effects

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[1] Carter V. Good and Douglas Scates, Methods of Research (New York: Appleton-Century-Crofts, Inc., 1954), II, 33-103, VII, 691-720.
Arvil S. Barr, Robert Davis, and Palmer Johnson, Educational Research and Appraisal (Chicago: J. B. Lippencott Co., 1953).

of instruction upon pupil behavior. The ultimate aim is to gain new knowledge of the underlying conditions basic to the growth of pupils and to determine the ways in which the school can promote effective development. This method is not intended to give simply a descriptive picture of status or a chronicle of normal growth. It is expected to reveal causal relationships. When one is dealing with human beings it is almost impossible to equate all the variables and to declare that a given factor is the cause. This jump from a two-variable relationship to the infinitely complex relationships was accommodated by the concept of probability. Causal relationships are thus referred to in the analysis of the data as probability. The investigator cannot determine causes but can only predict (to a certain degree) that a certain cause will produce a certain effect.

If the experimental method is to become a valid basis for inferencing causal relationships, it requires certain principles of planning, executing, and interpreting the evidence.

Briefly, the experimental method is based on problem solving-identification of problem, development of hypothesis, formulation of assumptions, clarification of vocabulary, design for testing the hypothesis, and interpretation of the findings which gives direction to action in dealing with the identified problem. Commonly included in this

approach is the use of control and experimental groups which are equated in terms of variables and are representative samplings of a larger population. With conditions controlled as carefully as possible, the experimental factor is varied for one group. The difference between the mean gains in achievement of the two groups is calculated as an index of the relative effectiveness of the two methods of instruction.

The hypothesis is a shrewd guess which limits the area of investigation, has a selecting function for the activities used in carrying on the experiment, and a directing function in the interpretation of the data. As a formal approach, the use of the "null" hypothesis has become more common in educational, psychological, and social research. According to this procedure one assumes that no significant difference or relationship exists and then seeks to ascertain the improbability of the null hypothesis.

The formulation of the assumptions represents fundamental tenets which the investigator accepts for the on-goingness of the particular inquiry. To the extent that certain of the assumptions are open to question, in the same measure the results of the study are subject to challenge.

For mutual understanding it is often necessary to clarify technical vocabulary and key concepts which have an important emphasis in the study. The term "research design" might refer to the total analysis of the problem. In this study it is the plan devised to test the hypothesis. This scheme indicates the relationship between the selection of the criterion (educational objectives), the activities of the population subjected to the two "treatments" (course experiences), and the measurement of growth in relation to the criterion.

It could be within the scope of this discussion to include tentative conclusions or to delve into the statistical approach for analyzing the data. For the purpose of this analysis one obvious tentative conclusion is embodied in the null hypothesis. It is recognized that the research design and statistical analysis are not independent problems, but rather they are dependent on each other. A discussion of the methods used in the statistical analysis of the data will be reserved for chapter V. This delay is for the purpose of avoiding repetition. It was also thought that the abstract computations would be given more meaning if the statistical techniques are functionally described as they are used to analyze the actual data accruing from the study.

With the preceding consideration of the experimental method as background, the following working outline

represents an analysis of the proposed problem and proce-

dures used in attacking the problem.

Working Outline for the Problem

A. Statement of problem--A study to evaluate the effectiveness of two methods of instruction in teacher education in attaining certain desired behavioral outcomes.

B. Null hypothesis--There is no significant difference in the verbal or operational attainment of the stated behavioral outcomes between a student group which experienced one method of instruction as opposed to a student group which experienced another method of instruction.

Analysis of the null hypothesis led to certain pertinent questions which the experimental procedures were organized to answer--
1. Were the two sections taught differently?
2. Was each method effective in relation to pre- and post-test evidence?
3. Was one method significantly more effective than the other in the attainment of verbal behaviors?
4. Was there a significant difference in the observed operational behaviors that can be attributed to teaching method?

C. Assumptions
1. Education is for the purpose of changing behavior toward desired outcomes.
2. There is a direct relationship between teaching competency and the pupil achievement of the educational objectives.
3. Teacher education is concerned with developing teaching competency in the several areas of growth one of which is social education.
4. An understanding of social education in the elementary school and a method of realizing the purposes of social education are the unique contribution of Education 517 to the pre-service professional growth of prospective teachers.
5. Unit teaching is an accepted approach to planned social education in the elementary school.

6. Teaching competency in the area of social education can be defined operationally as a core of unit teaching behaviors which become the desired outcomes for Education 517.

7. In an experimental study of two methods of instruction, it is possible to control or to make randomly operative most relevant variables except teaching method so that there will be no systematic bias in the findings.

D. Clarification of terms

1. Evaluation is a process of determining the extent to which the desired outcomes have been achieved. This process includes: the formulating of objectives, the providing of learning experiences where the objectives can be experienced, the securing of instruments to measure growth, the gathering of evidence, the appraising of the evidence in light of the objectives, and the planning for further realization of the desired goals.

2. Effectiveness connotes the relationship between the method of instruction and the extent to which the desired outcomes (teaching behaviors) have been achieved.

3. Method of instruction is an orderly procedure for approaching the teaching-learning process for the attainment of the desired goals.

4. Behavior is the observable activity of an individual.

5. Desired behavioral outcomes are behaviors in relation to the goals of instruction.

6. Unit concept refers to an organization of content and activities which involves a sequence of teaching behaviors to be identified in detail as the desired behavioral objectives (chapter IV).

7. Social education is the process of developing social understandings related to democratic citizenship. Social education is broader than a curriculum area. Due to the nature of the experiences, content, and materials involved in the social studies, it has become the core of the planned attempt to provide opportunities which promote social learnings.

8. Professional education is that portion of the program of teacher education that is explicitly planned as preparation for competency in a teaching position.

9. Teaching competency as the ability to do something involves an understanding of social education and observable proficiency in classroom teaching behaviors.

E. Recognition of variables
  1. Intelligence of the two groups
  2. Motivation of the two groups
  3. Skill and zeal of instructor
  4. Student teaching situation
  5. Observation, interpretation, and judgment of the observers.

F. Research design
  a) Formulation of educational objectives in terms of desirable unit teaching behaviors (criterion).
  b) Specification of population - two sections of Education 517 involving a total of 70 to 80 juniors and seniors in the College of Education.
  c) Pre-test at the beginning of the course to determine the student's expectations as to the role of the teacher in unit teaching (verbal behavior).
  d) Course experiences exposing the specified population to two methods of teaching.
  e) Post-test at the end of the course to compare with understanding on the pre-test at the beginning of the course.
  f) Student analysis of course procedures to confirm or reject the position that the courses were taught differently.
  g) Student reactionnaire to obtain the extent to which the students thought the teaching method was effective in realizing the desired objectives.
  h) A follow-through of selected students from each section during student teaching to observe the extent to which the unit teaching behaviors (criterion) were operative. A rating scale to record judgments was to be used by the cooperating teacher, college supervisor, student, and in 10 cases the investigator.
  i. After student teaching the students again evaluate the effectiveness of the course in light of the student teaching experience.

G. Statistical methods
  1. Central tendency and variance.
  2. "t" test of significance.
  3. Correlation.
  4. Regression.
  5. U test of significance.

H. Methods and sources for gathering data
        1. Observation - anecdotal records
        2. Pre- and post-test
        3. Observation - rating scale
        4. Survey of literature
        5. Opinion of practitioners
        6. Minnesota Teacher Attitude Inventory
        7. College records
        8. Student analysis
        9. Student reactions

Researcher's Responsibility

The researcher has accepted the responsibility to analyze the verbal and operational outcomes of two instructional approaches for the purpose of testing the null hypothesis. The organization of this research is not designed to divide the analysis into two separate studies involving the two experimental groups. Rather attention is focused on the two groups as each is related to the experiment and the resulting verbal and operational outcomes. It was thought that this approach would provide continuity, permit immediate comparison, and avoid repetition.

The statement of the problem implied that the researcher must assume some responsibility for determining the effectiveness of two instructional procedures. The problem of assessing effectiveness is explored in the treatment of the data (pages 154-156, 200-201).

Factors Basic to Potential Limitations and Strengths

During this process of analysis the planner antici-
pated blocks which would potentially limit the value of
the study. Simultaneously potential strengths emerged as
the experimenter consciously sought to minimize potential
limitations in the overall experimental scheme.

Obligations to students. There are important limit-
ing factors attached to this problem which are inherent to
the experimental approach. It must be accepted that the
students and their learning are the first obligation of the
College of Education. This will limit extremes in instruc-
tional activities. Students cannot spare much time from
regular curricular activities for research purposes. This
limits the number of instruments that can be used with stu-
dents for measuring outcomes. It is also presumptuous to
expect a university to alter its registration or student
teaching procedures for individual experimental purposes.

Control of variables. Carter V. Good is of the
opinion that the experimental method in which an experimen-
tal group is compared with a control group by holding all
influences constant except one has serious limitations. In
a yearbook of the American Educational Research Association
he made two observations:

> First, it has been impossible to recognize let
> alone control, all the important factors influencing
> the learning of individuals as they participate in

groups. Second, it has isolated a single factor
and treated it as if it were meaningful even
when withdrawn from the configuration which
alone makes it meaningful.[2]

This criticism of the experimental method is a valid
argument supporting the inherent limitations of this pro-
cedure. However, it is possible to recognize certain known
variables which influence the learning process and the stu-
dent teaching situation. In educational experimentation
the characteristics that require consideration include in-
telligence, previous achievement, motivation, and current
level of understandings. An attempt was not made to control
the variables but statistically to make provision for com-
paring the intelligence (Ohio State Psychological Examina-
tion), cumulative point hour, motivation (Minnesota Teacher
Attitude Inventory), knowledge of unit teaching (pre-test),
and student teaching situations in regard to the two
groups. By this procedure it is possible to determine
whether any significant differences among known variables
exist between the groups. It is hoped that the treatment
(the experimental factor) will have meaning as it is re-
lated to the known variables existing within the group.

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  Carter V. Good, "Application of Research Findings
Concerning Instructional Procedure to the Fields of Edu-
cation, Psychology and Teacher Training," American Educa-
tional Research Association, Report, 1935, p. 215.

Personal bias and teaching skill of the instructor.
It appears reasonable that the effectiveness of a method
may be conditioned to such an extent by the instructor's
confidence, skill, and enthusiasm that the method itself
is a minor factor in the teaching success. Having one in-
structor teach the two sections, as a way of minimizing
teacher ability and personality factor, has its question-
able aspects. Even if both sections are taught by the
same person it does not negate the possibility of personal
bias or skill in teaching by one method nor does it guar-
antee that both sections will be taught differently - yet
equally well. Role continuity and consistency are diffi-
cult. This block was not removed but lead to development
of several procedures to overcome the potential defect.

A course outline (chapter IV) for each of the two
sections was checked with class logs (Appendixes B and C
for each section). At the end of the quarter the students
were given an opportunity to appraise the degree to which
certain teaching procedures had been evident during the
course. A student reactionnaire recorded judgments of
instructional effectiveness in each section. Because
unit teaching was not the conventional procedure used
in this course, a pilot plan for one quarter preceded
the experiment. During this trial period the experimental
approach was tried to acquaint the investigator with the

feasibility of the approach and needed revisions. Thus some of the weaknesses in this approach were corrected before the two methods were compared. It might be accurate to assert that a personal bias toward a particular method was not a crucial factor; but the potential ability of the investigator to teach college students was a crucial factor in as much as her previous teaching experiences had been on the elementary school level. This inexperience might be counterbalanced by having no established teaching procedures for the course and possessing a background of professional experiences on the elementary level from which to draw in teaching a course dealing with teaching social studies in the elementary school.

Length of the experiment. It must be recognized that this course affected a small segment of the student's learning experiences. Exposure to unified teaching for one quarter is rather a short period of time to influence the long series of preceding classroom experiences which probably emphasized content acquisition.

Subjectivity in the construction and use of appraisal mediums. An inquiry involving teaching behaviors necessitates obtaining or constructing measuring instruments so that observations may be converted into value judgments. In human experimentation the element of subjectivity is inescapable to some degree.

Subjectivity is evident in the construction of the instrument, in the interpretation of the tool by the users, and in the judgment of the observer as to the extent of the behavioral evidence. In as much as instruments to appraise the established criterion did not appear to be available in the Buros' Mental Measurements Yearbook or the test samples in the Bureau of Education Research, it was necessary to build adequate instruments (situational test and rating scale).[3] The obvious dilemma is either to construct an instrument which lacks validity and reliability or to use a commercial tool which does not measure the established criterion. The process by which these measurements were formulated will be fully discussed in chapter IV. The criterion evolved from the recalled unit teaching experience found in the literature validated by the opinions of a practitioner's panel. The panel procedure for verifying the criterion identified by the researcher is subject to debate. The length of a questionnaire does not necessarily guarantee the completeness of the instrument. The fact that the panel reacted favorably might indicate an unwise selection of practitioners or a lack of critical analysis on their part. On the basis of this thinking a rating scale

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[3] Oscar Buros, Fourth Mental Measurements Yearbook (New Jersey: Gyphon Press, 1953).

was prepared to appraise the operational evidence of the criterion in the student teaching situation. It was hoped that the relation of the appraisal structure to the criterion will give some basis for judging the adequacy of the tool. By having three and in some cases four people observe the same student teacher, it was thought possible to get a rather objective profile of the denotable teaching behaviors. A situational test was constructed to measure the pre- and post-verbal behaviors of the students. Anonymous student analysis and reaction forms were used as an objective approach in assessing the differential in teaching methods and the student's opinion as to the objectiveness of course procedures.

It was the aim of the experimental design to make the study self-contained. The experiment should be capable of providing its own evidence as the basis for interpretation, making it unnecessary to rely on evidence from other experimentation to accept or reject the null hypothesis.

Sampling procedures. One central problem was obtaining an unbiased sampling. If a sample is to be unbiased, the units of the sample must be selected by some process which is independent of the characteristics of the individual.

Grouping students at random from the same population to constitute the experimental and control groups affords

a basis for avoiding bias. The two groups represent all
the students taking Education 517 during one particular
quarter.

In order for an estimate of sampling error to be
made available a minimum of at least two sampling units
must be obtained from the subjects being sampled. The
units used for this purpose were the recorded O.S.P.E. and
cumulative point hour of each student together with the
scores from the Minnesota Teacher Attitude Inventory and
Pre-test. A comparison of the two groups with some 500
recent elementary graduates on the O.S.P.E. and cumulative
point hour established the representativeness of the random
sampling. The representativeness of the groups make it
possible to make generalization for a larger population.

In weighing the factors that can be either poten-
tial limitations or strengths, the investigator must anti-
cipate and make provision for an adequate treatment of
variables, objectivity in the selection of criteria and
construction of measuring instruments, a representative
sampling, and the zeal and skill of the instructor to
teach by two different methods. These factors can become
limitations or strengths depending on the ingenuity of the
researcher in analyzing and structuring the experimental
approach.

CHAPTER III

HISTORICAL PERSPECTIVE

It would be to the investigator's advantage to organize his study in such a way that it would have the scientific quality of being self-contained. This potential strength should be cited with some caution for fear that closure may limit its historical perspective. From the viewpoint of historical progression in experimental inquiry, the experiment should not be an entity in itself. Ideally, experimental research becomes progressively productive as it bears a relationship to those efforts which anti and post date it.

Unfortunately many studies were isolated pieces of research that tended to be repetitive, unsummarized, and at times unattainable. However, such rationalizing did not alleviate the investigator's responsibility to search the literature for related information. The development of a historical perspective gave the researcher an opportunity to make a careful assessment of the progress human inquiry has made in the direction of an adequate solution to the problem. In addition to appraisal and direction the researcher had a basis for identifying features of the current study which may extend research understandings.

To be consistent with the thinking in chapter I, it
will be necessary to review the literature in dichotomous
areas of activity; namely, the identification of effective
unit teaching competency with respect to demonstratable
classroom teaching behavior, and experimentation involving
instructional methods on the college level.

Research Related to the Identification of Teaching Behaviors

The available literature was devoid of any organized
effort to identify unit teaching competencies. Hence the
direction for this study inevitably came from more general
approaches to identifying effective teaching behavior. No
little has been recorded concerning the need for objective
and reliable criteria of teaching competence. To merely
review and summarize verbal consternation about the present
dilemma would give little positive direction in the develop-
ment of a research criterion. Rather it was the intention
to review verbal and experimental attempts which lent visi-
bility for further research in the identification of effec-
tive teaching behaviors.

The Commonwealth Teacher Training Study of 1927 has
become a 'landmark' study in educational research. It was
the purpose of this three year endeavor to arrive at a
comprehensive description of teacher traits and teacher
activities that might provide a basis for determining the
content and organization of professional courses.

(A discussion of personality traits is beyond the limits of this perspective as attention is focused on teaching behaviors.) The first step in preparing a complete list of teacher activities was to review the literature. In addition to a nucleus of 6,000 activities referred to in the literature, 6,054 teachers in summer schools (1925) enumerated 211,890 activities.[1] The primary classifications consisted of seven main divisions of activities: classroom instruction, class management, supervision of extra-classroom activities, relationships with school staff, school community, professional advancement, and school plant and supplies. This classification was then evaluated by 650 teachers, principals, and supervisors who represented varying grade levels and communities. Teacher educators and persons connected with experimental schools participated in this evaluation which was intended to rate the frequency, the importance, and the learning difficulty of the activities. The data were to be used by instructors in teacher training institutions in selecting material for professional courses. This study is the first recorded attempt to identify and evaluate teaching behaviors. One hundred and

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[1] W. W. Charters and Douglas Waples, The Commonwealth Teacher Training Study (Chicago: University of Chicago Press, 1929), pp. 3-50, 77-136.

twenty-two specific teaching behaviors were identified and classified under classroom instructional activities.[2]

After the Commonwealth Study the identification of teaching behaviors seems to be associated with research and discussion relating to teacher effectiveness. A thread of continuity running through the more recent attempts to identify teaching behaviors may be traced to the thinking of a committee of the American Educational Research Association.

During the annual meeting of this association in 1950 the committee (A. C. Barr, Burley Bechdolt, Warren Cone, N. L. Gage, Jacob Orleans, H. H. Remmers, and David Ryan) was established to study the criteria of teacher effectiveness.[3] The committee functioned on the thesis that a conceptual formulation of effectiveness not an operational definition must precede any systematic research of teacher effectiveness on an operational basis. It was postulated that effectiveness could be discerned in the areas of pupil achievement, development and execution

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[2] Ibid., pp. 257-261

[3] Arvil S. Barr et al., "Report of the Committee on the Criteria of Teacher Effectiveness," Review of Educational Research, XVII, No. 3 (June, 1952), pp. 238-262.

of school policy, and school-community relationships. The committee clarified its position by stating that the pupils' achievement of educational objectives was the basic dimension of teacher effectiveness. This achievement could be measured by means of objectively tested or observed performance or through subjective evaluations. The teacher's demonstration of effectiveness (behaviors) could be measured by evaluative judgments of various persons.[4]

About a year later the Journal of Educational Research published the second report of this committee. Again the committee reiterated its former thesis that pupil change was the ultimate criterion. "The task of research on teacher effectiveness is to discover teacher dimensions (behaviors and characteristics) which are related to the criterion."[5] The committee felt that information regarding teacher dimensions would be of value to supervisory personnel, teacher educators, and teacher selection programs. Teacher behaviors should be investigated at different levels of experience; teachers in service, persons who have completed professional programs, and prospective

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[4] Ibid., pp. 258.

[5] Arvil S. Barr et al., "Second Report of the Committee on the Criteria of Teacher Effectiveness," Journal of Educational Research, XLVI, No. 9 (May, 1953), pp. 646.

teachers in training. Since teaching is a multi-dimensional process, it was felt that educators should seek an inter-disciplinary approach in formulating hypotheses and research procedures. No research design was formulated by this committee.

The Division of Teacher Education Office of Research and Evaluation of the four colleges of the City of New York recognized the importance of teacher performance and planned to conduct a series of studies which follow the general suggestions advanced in the preceding reports of the Committee on Criteria of Teacher Effectiveness of the American Educational Research Association.[6] These studies will include (1) definition and measurement of criteria relevant to the goal of education; (2) identification and measurement of teacher behaviors which are related to the defined criteria of educational goals; (3) study of the complex array of personality variables, classroom dynamics and environmental factors which are hypothesized as influencing teachers' classroom behaviors.

A second bulletin was published which refined two techniques for observing teachers' classroom behaviors.[7]

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[6] Harold Mitzel and Edwin Wandt, op. cit., p. 3.

[7] Harold Mitzel and Donald Medley, "The Refinement of Two Techniques for Observing Teachers' Classroom Behavior," Studies in Teacher Behavior. Division of Teacher Education Office of Research and Evaluation. Research Series No. 28 (October, 1955), 41 pp.

This study was part of the development of observational techniques to be used in a longitudinal program of studies in teacher performance. Cornell's technique for recording teachers' and pupils' classroom behaviors, and Withall's technique for classifying teachers' verbal behavior were explored as two promising techniques for obtaining behavioral data.

Harold Mitzel, Director of the Office of Research and Evaluation for the Colleges of New York City, has proposed a general and rather involved scheme of approaching the total problem of teacher effectiveness. In his scheme he recognized that one of the four variables in assessing effectiveness is teacher behavior in the classroom. Six observers working in teams of two made two half-hour visits to the classrooms of 49 beginning teachers (graduates of the Colleges of New York City 1953-54). A total of 588 half-hour classroom visits were made with observations recorded by a modified Cornell technique. The children were also tested in order to relate teaching behaviors to pupil growth. The detailed behavioral records for the 49 teachers are being analyzed and classified into meaningful descriptive dimensions.[8] No report has been published to date.

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[8]Harold Mitzel, "A Behavioral Approach to the Assessment of Teacher Effectiveness." 6 page mimeographed report from the Office of Research and Evaluation, Division of Teacher Education (New York: Feb. 19, 1957).

The thinking of the American Educational Research Committee and the action of the Colleges of New York City are reinforced in the literature. In a review of 30 studies related to the evaluation of teacher competence Ackerman pointed out two realities. In each study an attempt was made to evaluate teacher effectiveness by use of the criterion of pupil change. The observation of classroom behavior becomes a crucial step in the entire process of identifying teaching competency.[9]

The critical incident technique was used by Edith Merritt in determining critical competencies in the teaching of arithmetic, reading, and social studies. One hundred and twenty-six graduates in elementary education at San Francisco State College reported descriptions of effective and ineffective incidents in their own teaching. From the 230 reports of effective and ineffective teaching 504 behaviors were abstracted and classified into curriculum areas.[10]

More recently in the New England School Development Council's project to define teacher competence the critical

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Walter Ackerman, "Teacher Competence and Pupil Change," Harvard Education Review, XXIV, N. 4 (fall, 1954), pp. 273-89.

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Edith Merritt, op. cit.

incident technique was used as a basic research tool. By means of individual and group interviews, several experts collected accounts of incidents of outstandingly effective or ineffective teacher behavior as reported by 198 principals, supervisors, administrators, and teachers. Five hundred and eighty-eight incidents of effective and four hundred and forty-three incidents of ineffective teacher behavior were assembled. The data were classified into five broad areas of behavior that could be expected of teachers. It was the opinion of the committee that a teacher should be expected to exhibit behaviors in the areas of effort and interest, adaptability and planning, techniques of teaching, personal characteristics of the teacher, and influence of the teacher on pupils and others.[11]

As the literature suggested, the identification of teaching behaviors has been directly related to the criterion of effectiveness and pupil achievement. Teaching competency must be based on an ultimate criterion (change in pupil behavior toward desired goals) and an immediate criterion (demonstration teaching behaviors supposedly leading to behavior change). This challenge was dual in nature: first, the identification of teaching behaviors

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[11]
New England School Development Council, op.cit.

that were assumed to be desirable; second, the verification of these behaviors as being related to pupil achievement. Once this relationship has been established it will be possible to measure effectiveness indirectly by the demonstration of certain teaching behaviors. In grappling with the first step, several researchers have used variations of the critical incident technique. This technique was developed by John Flanagan as a "procedure for gathering certain important facts concerning behavior in defined situations."[12]

In general, the critical incident technique is not a single rigid set of rules governing such data collection. It is rather a flexible set of principles that must be modified and adapted to meet the specific situation at hand. Qualified observers record a functional description of activity (incident) specifying precisely what is necessary if the activity is judged successful or effective. Critical incidents represent only raw data which must be tabulated and classified into some framework so that the information will become useful in defining the requirements of an activity.[13]

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[12] John Flanagan, "The Critical Incident Technique," Psychological Bulletin, LI, No. 4 (July, 1954), p. 335.

[13] Ibid., pp. 327-358.

A brief reflection on the preceding studies revealed that some research action has been directed to the identification of teaching behaviors. In the Commonwealth Study a review of the literature noting teaching activities was verified by a large number of teachers attending summer schools. The designated behaviors were classified into seven areas of activity. Mitzel in directing the research for the Colleges of New York City used six teams of two persons to observe 49 teachers during two, half-hour intervals. The Cornell technique of using a score card and checking observed behaviors at 5-minute intervals was used. No report has been published as to the nature or classification of observed behaviors.

The critical incident technique as used by Merritt involved teachers' reports as to what they considered to be effective and ineffective incidents. Effective and ineffective behaviors were then abstracted from the incidents and classified into behaviors relating to certain curriculum areas. Another variation of Flanagan's technique was used in the New England School Development Council project. "Research experts", by using individual and group interviews, obtained incidents of highly effective and ineffective behaviors. These behaviors were classified into areas of expected teacher behaviors. Whether researchers have approached the problem of identifying teaching behaviors

by classroom observations, a validated survey of the liter-
atures, written reports from selected teachers, or the
interview method, observation of the actual classroom
teaching situation by qualified observers and recalled in-
cidents by teachers or supervisors appeared to be promis-
ing means of identifying teaching competency.

Experimental Studies Related to Methods of Instruction on
the College Level

As noted in the beginning of this chapter a review
of the literature must encircle a second area of activity--
instructional experimentation on the college level.

The literature on the subject of college methods of
instruction was found to be replete with theoretic discus-
sions and treatments. In 1928 Carter V. Good assembled a
bibliography of 245 references on college teaching from
the educational literature for the preceding 10 years.
However, only about six references were cited which in-
volved controlled experimentation.[14] This bespeaks of the
volume of recorded opinions in comparison to the less
common experimental evidence.

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[14]
    Carter V. Good, "Bibliography on College Teaching
with Special Emphasis on Methods of Teaching." Studies in
Education, Sixteenth Yearbook of the National Society of
College Teachers (Chicago: University of Chicago Press,
1928), pp. 66-96.

The aim of this retrospective review was not to set up criteria and judge the value of previous studies but rather to present objectively what has been recorded in the literature. It was hoped that a large compilation of studies, with compensating strengths and weaknesses, might serve as an accurate historical perspective of the progress human inquiry has made in the investigation of instructional procedures.

Studies were selected that involved two or more methods of teaching on the college level in controlled experimentation. The related studies extended beyond the area of teacher education for two reasons. Very little experimental evidence was available implicating instructional procedures in professional courses. All experimental research relating to teaching methods on the college level will have implications for teacher education.

To facilitate clarity and progression of experimentation, the reviewer decided to organize this unwieldy mass of material chronologically within a basic framework. The captions of the outline, or framework, were intended to serve as a guide in the selection of data that were thought to be pertinent in developing a historical perspective related to the proposed problem. If the specific date of the experiment was not recorded, the publication date was used as a time indicator. The cardinal number in the first column will facilitate references to specific studies in the subsequent discussion of general observations.

Year	Who, Where, Sampling[*]	Purpose	Teaching Methods	Findings
1924 1.	Charles Bane University of Iowa 83 students History of Education	To discover whether lecture or class discussion was more effective way to encourage retention of subject matter	Lecture vs. class discussion - student kept account of readings - objective immediate and delayed tests - 26 pairs of students - same instructor	Lecture more effective for immediate recall - discussion more effective for retention of subject matter - discussion averaged 70 pages more readings
1925 2.	E. C. Beck Nebraska State Teachers College 1925-73 students, 1926-66 students Freshman Composition	To compare the efficiency of the conference and non-conference methods of teaching Freshman Composition	Conference vs. nonconference - pre-& post-test - no text - weekly themes - procedure same except for student readers who met with instructor and with each student 15 min. per week	Both 1925 and 1926 experiments indicate that conference method was "truly better" for freshmen than the nonconference method
3.	Norma Scheidemann University of Iowa 231 students Elementary Psychology	To determine measurable difference of achievement in elementary psychology as a result of two methods of instruction	1)Lecture conference - 6 weeks unit outlines of lectures and required preparations - 2 lectures + 1 conference group weekly. 2)Individualized instruction - voluntary conference - no lectures - 2 hrs. study in classroom weekly - unit outlines - different instructors - objective tests.	No difference in relative effectiveness of two methods

[*] Reference sources are cited in bibliography

Year	Who, Where, Sampling	Purpose	Teaching Methods	Findings
4.	Donald Barnes University of Oregon 413 students – 3 quarters English History	To throw some light on the value of quiz sections in the teaching of history	1)Lecture – 3 lectures per week (3 hours credit) 2)Lecture and quiz – 3 lectures + 1 quiz session to straighten out unclear points (4 hours credit) – same instructor – objective test	Mean gain of 2.17 in favor of lecture – does not support the value of quiz session or extra credit hour
5.	Victor Morris University of Oregon 2 sections of Principles of Economics	To improve teaching methods in Principles of Economics by teaching 2 sections by different methods	1)Lecture – instructor featured topical order of text assignment 2)Problem project – lecture eliminated – material presented through specific economic problems	Superior gain for problem project – neither method better adapted to students with below average I.Q. than to students above average
6.	R. D. Davis University of Oregon 2 sections for 2 quarters Unified Math	To determine the relative effectiveness of 2 different methods in the teaching of an elementary course in college math	1)Lecture-recitation – lectures, textbook assignments daily – portion of each class devoted to discussion 2)Individual supervised – class period used for supervised study closed with student summary, same text, instructor – final examination	Difference not clearly established 2) more effective if criterion is standardized test and less effective if criterion is instructor's grades

Year	Who, Where, Sampling	Purpose	Teaching Methods	Findings
1928 7.	Howard Longstaff University of Minnesota 990 control 750 experimental General Psychology 2 quarters	To determine the effect of method on the achievement of students and on student attitudes	1)Lecture quiz - lecture to 300 to 500 students twice a week by senior professor, 1 period quizzing and discussion by assistants - 30 to 60 in group 2)Lecture - lecture twice a week - pre-and post-tests - matched pairs	With respect to final both grade methods are equally effective No difference in student attitudes between the 2 methods employed
8.	Mary Shirley & Kate Hevner University of Minnesota 226 students 6 classes Elem. Lab. Course in Psychology	To evaluate a project method of teaching by comparing 2 groups taught by this method with 2 groups taught by same instructors under same conditions by routine method	1)Project method - routine experiments done to collect material to be used later in own projects - projects reported to class 2)Routine method - performed assigned experiments - objective exams and questionnaires used as measures for both methods	1) consulted student's interest and gave student satisfaction - no difference in amount learned or effectiveness with superior, average or inferior students
1929 9.	A. R. Eikenberry Manchester College 125 students in 3 sections Introductory Psychology	To develop experimental instructor attitude - to evaluate a library method of teaching - to encourage wider reading	1)Control - lecture, discussion, recitation + outside reading, 6 objective tests given both classes 2)Experimental - 6 problems given to students, written reports before class discussion - library period with instructor available	Median for experimental group exceeds that of control group - students favor experimental method and want to try it again

Year	Who, Where, Sampling	Purpose	Teaching Methods	Findings
10.	Gertrude Shipley Maxwell Training School 383 students - 2 semesters - 13 groups Principles of Education	To determine if 1 of 3 periods were devoted to small group study and discussion it would reduce extra class study and yield academic results as measured by objective tests	1)Discussion - 3 weekly discussions of syllabus topics 2)Small group discussion and guided study - 2 periods discussion + 1 period group (5 or 6) study or discussion	Experimental group did as well as control group on objective tests - students favored 2) for personal values and reduction in extra class study
11.	Howard Taylor Oregon University 177 students in 3 sections General Psychology	To get evidence of the feasibility of such programs of study	1)Lecture -(2 sections 37 & 104) conventional lecture procedure 2) 1 section of independent study (36) - no lectures - students reported to reference library - work from syllabus - instructor available - capable students chosen - 3 instructors involved	Independent study was little handicapped by loss of lecture - important factor is the student and what he does with his time
12.	Harold Tuttle Oregon University 123 students 43 pairs Educational Psychology	To determine whether lecture plus quiz was more or less effective than project plan in which the student worked out his conclusions unaided by lecture	1)Lecture-quiz - 2 lectures + 1 quiz a week 2)Project method - met 3 times a week, syllabus of 16 topics divided among 4 committees - group reports growth measured by a test	2) appeared better for students of superior intelligence than for those of lesser ability - difference of 5.3 favored 2) and students favored 2)

Year	Who, Where, Sampling	Purpose	Teaching Methods	Findings
1930 13.	Clyde Gwinn Middle Tenn. State Teachers College 98 students College English	To determine relative effectiveness of Question and Answer vs. Lecture Method in Teaching a Unit of College English	1)Q & A - restricted to asking and answering of questions by students and teacher - outline followed 2)Lecture - telling or demonstrating lesson without seeking student reactions Pre-& post-tests - one instructor selected by questionnaire	Students of average I.Q. profited more from 1) Superior and lower I.Q.'s seemed to acquire more by 2) Immediate learning and retention higher under 2)
14.	H. H. Remmer Purdue University 1134 students 584 pairs Elementary Psychology	To measure relative achievement, effort, and attitudes of students under 2 different methods of instruction and to determine instructional costs of each method	1)Lecture - 125 students, 3 times a week 2)Recitation - 35 to 40 students, 3 times a week 3)Lecture-recitation - 150 to 170 for lectures twice a week + 4 recitation groups once a week	Learning of abler students about equal Students favor 2) but 1) and 3) save $2,500 to $3,000 per semester
15.	Clarence Smeltzer Ohio State University 3 exp. and 3 control sections Educational Psychology	To evaluate an attempt to involve not only teaching method but motivation and individual differences	1)Experimental - work of week discussed Tues., Wed., and 1 hr. on Thurs. followed by objective test which was graded on Thurs. - A & B's excused on Fri. Mon. the remainder had review retest on Mon. Handled by "interview" method 2)Formal lecture - not organized into units - all students came Fri. & Mon. - no interviews	Adjustment of course to individual differences, motivation & orientation with reference to progress & difficulties does have a distinct effect on learning

Year	Who, Where, Sampling	Purpose	Teaching Methods	Findings
1931 16.	Albert Brown University of Iowa 60 exper. 120 students 30 exper. 30 control Psychology Course	Measure the value of a set of procedures believed suitable to a large group by comparing the achievement of large group with small group - taught by usual type procedure	1)Guide sheet study units (1 large & 1 small section) - guide sheet each day with small squad discussion (5) for 25 min. then whole group discussion by instructor 2)Lecture-discussion, according to instructor's concept of the method- equated groups by placement tests	Large experimental excelled control and small experimental Students liked large section study units
17.	Genevieve Ryan George Washington University 110 students Educational Psychology	To study relative values of independent study and class instruction at college level - to discover when exemption from class is advisable - to ascertain the efficiency in relation instructor time	1)Independent study - no class attendance - freedom to consult instructor in conference 2)Class instruction - class 2 hours a week, both sections had same tests and guide sheets	Students on all levels of intelligence profit from 1) 1) required less student time Achievement of control group (2) higher but required more time
18.	J. L. Shannon Indiana Teachers College 71 students Principles of Secondary Education	To get some facts to support or reject the present criticism of the lecture method of college teaching	Lecture vs. library assignment - 4 topics - group 1 was sent to library for topics 1 and 3 and lectured to for 2 and 4 - procedure in group 2 was reversed, objective test followed each topic - same instructor	Lecture method was superior especially with less able student

Year	Who, Where, Sampling	Purpose	Teaching Methods	Findings
1932 19.	J. R. Gerberich, K. Warner University of Arkansas 110 students American National Gov.	To determine relative instructional efficiencies	Lecture vs. discussion, the discussion was designed to integrate subject matter without recourse to formal lecture - pre and post tests	Superiority of above average in lecture and below average in discussion - lecture superior as means of liberalizing thinking
1933 20.	George Hartmann Penn State College 2 sections Elem. Educ. Psychology	To determine the effect of difference in teaching time upon student ability in an academic subject	One class met 3 hrs. wk., the other met 2 hrs. + 1 hr. for outside reading - same books, experiments, syllabus and pre- and post-tests	No statistically significant differences were detectable
1934 21.	Stephen Corey University of Nebraska 165 students Freshmen Orientation Course	To judge the effectiveness of two methods of teaching on ability to recall subject matter	Lecture vs. reading - same material, one in printed form and the other lecture - no note taking - similar groups (O.S.P.E.) - same test given immediately after lesson and 14 days later	Immediate recall is better for reading than lecture - no significant difference after delay - upper quartile (O.S.P.E.) do better on reading than lecture
22.	Edward Greene University of Michigan 648 students over 6 yr. period Elementary Psychology	To determine effectiveness of 3 ways of presenting material to college students	Lecture, guided reading, and unguided reading with and without notes--lecture and guided reading used questions and same material - immediate and delayed tests, equated groups	On both the immediate and delayed recall tests, the guided reading was superior to either of the other methods

Year	Who, Where, Sampling	Purpose	Teaching Methods	Findings
1936 23.	William Bernard Taylor University 46 sophomores Educational Psychology	To determine the effectiveness of 2 different methods on two classes and on the same class situation	1)Lecture - met 3 times a week 2)Group study - met with instructor once and then in groups of 3 to 5 twice a week - procedure reversed after 8 weeks - objective exams	Difference was so small that it failed to demonstrate the superiority of one method over the other
24.	Edward Degering Purdue University 465 students 4 groups Chemistry	To determine the effectiveness of two methods of teaching organic chemistry	Laboratory work vs. lecture demonstration - same material covered and same quizzes used	Demonstration method is as effective as laboratory method and costs about 1/5 as much
1939 25.	Thomas Steen Columbia Junior College 59 students Psychology	To determine whether individual laboratory method of teaching physiology is measurably superior to lecture-demonstration method	1)Lecture-demonstration - met 3 times a week 2)Individual Laboratory - met twice a week for lecture - one 3 hour period for individual laboratory - same instructor	1) definitely superior method in the case of high ability students - students of limited ability profited from 2)
1940 26.	Kenneth Clark Ohio State University 2 classes Educational Psychology	What method of teaching is more effective in relation to academic achievement and social objectives	1)Lecture-discussion - emphasis on achievement 2)Laboratory workshop program - emphasis on socialization in committees and informal classroom atmosphere - factual tests + observations + test of campus information	Superiority of 1) in achievement - superiority of 2) in socialization but doesn't affect student's behavior outside class

Year	Who, Where, Sampling	Purpose	Teaching Methods	Findings
27.	Leslie Zeleny Minnesota State Teachers College 5 experiments 68 prs. Sociology Course	To discover if greater participation in group method does make more change in personality than traditional class instruction	1)Student led discussion (divided into groups of 5) 2)Traditional lecture-recitation - same instructor, Bernreuter Personality Inventory - measured verbal participation	Slightly more knowledge acquired by 1) - also more social adjustment, social responsibility, and student preference
1941 28.	John Barnard New York University 382 students 6 sec. Science Course	To compare lecture-demonstration vs. problem solving method in respect to achievement in (1) specific information, (2) generalization, (3) scientific attitudes and (4) problem solving skills	1)Lecture-demonstration - conventional approach 2)Problem solving - students encouraged to formulate major problems and to carry out learning activities to solve problems	1. 1) superior especially low for I.Q. 2. neither superior 3. 2) superior - especially low I.Q. 4. 2) superior - especially high for I.Q.
29.	Mark Karp N.J. State Teachers College 92 students 4 sec. English Composition	To evaluate 2 methods of teaching college freshmen the mechanics of English Composition	1)Individualized - 3 times a week for 10 minutes with instructor 2)Group instruction - 3 times a week for 50 minutes - Cooperative English Test, forms P, O.	Both groups made reliable gains - higher I.Q. made greater gains in 1) while lower I.Q. profited in 2)
30.	Paul Rickard Northwestern University 144 students 3 sec. Fundamentals of Speech	To determine the effectiveness of group discussion in the teaching of factual content	1)Discussion with instructor leader, 2)Discussion with student leader, and 3)Discussion and lecture alternating - textbook - pre- and post-test - several instructors	1) and 2) superior to 3) - 1) superior to 2) - discussion method has greatest superiority in case of inferior student

Year	Who, Where, Sampling	Purpose	Teaching Methods	Findings
1942 31.	Paul Kahn College of City of New York 80 students College Biology	To compare relative effectiveness of the individual demonstration and individual laboratory methods with respect to acquisition and retention of factual information	1)Individual laboratory - student experimented 2)Individual demonstration - instructor experimented - immediate and delayed test	2) superior as to acquisition and retention of subject matter - 2) favored by lower I.Q. and science majors
32.	Herbert Thelen Oklahoma Agr. & Mec. College 60% of freshmen Freshmen Chemistry	To describe a correspondence between modification of instruction and modification of outcomes - to formulate a general theory of science education	Both sections had two 1 hour lectures-pre-med-post test 1)Control - laboratory period - review and quiz 2)Experimental - no manual and students wrote up experiments	No difference in results under the two methods - correspondence between nature of learning experiences and consequent learning
1945 33.	John Hohlfeld Ursinus College Pa. 134 students 56 prs. Freshman Spanish	To evaluate the relative effectiveness of learning the Spanish language by two procedures of teaching	1)Textbook method - analyzed language according to grammatical logic 2)Oral-aural-analyze language according to function - used audio visual aids	Both made significant gains - oral aural abilities of experimental group showed increases over control

Year	Who, Where Sampling	Purpose	Teaching Methods	Findings
1946 34.	Harold Guetzkov University of Michigan 865 students Introductory Psychology	To evaluate three methods of teaching in terms of their effectiveness to obtain course objectives	All students had one general lecture weekly + 2 meetings involving 1)Recitation drill - instructor dominated - quiz each meeting 2)Group discussion - instructor created atmosphere - explored questions from readings 3)Tutorial - no class - instructor available for conferences - wrote occasional papers - objective examination	No difference between 3 teaching methods from the point of view of educational outcomes
1948 35.	Morton Asch Mohawk College 124 students 4 sec. General Psychology	To evaluate the overall effectiveness of non-directive teaching as to (1) knowledge of subject matter, (2) social attitudes, (3) emotional adjustment	1)Directive method - reading assignment with lecture - teacher directed discussion 2)Non-directive method - student wrote 1 reaction weekly on any subject - no quizzes - grade determined by student - 4 sections had examination - one instructor	1. Significant at 5% level in favor of 1) 2. No significance - both groups improved on Social Distance 3. Significant improvement in 2) on Minnesota Multiphasic P. I.
36.	Clifford Bush Syracuse University 12 sections General Education Course	To discover whether words and their meanings can be taught in a general education course, by what method, and what factors are related to vocabulary growth	1)Isolated word attack 2)Direct attack - in context 3)Directed reading 4)No vocabulary taught as such - pre- and post-test - groups equal in ability	Students deficient in reading skills do gain in vocabulary as result of taking remedial work - no definitely superior method - group 2 had highest mean gain

Year	Who, Where, Sampling	Purpose	Teaching Methods	Findings
37.	Volney Faw Lewis & Clark College 102 students General Psychology	To determine the amount and kind of classroom participation resulting from 2 kinds of teacher-student relationships in classroom discussion groups	The 102 met 2 periods as a whole for lecture and 2 periods in 3 different discussion groups (student centered, instructor centered, alternation of 2 methods) - same instructor	Student centered approach significant at 5% level for intellectual growth - it was favored by students and led to greater student participation
38.	Greta Delong Wayne University 358 students How to Study Course	To obtain evidence of the relative effectiveness of 5 commonly used methods of aiding students to improve their study skills	1) No training 2) Distribution of literature 3) 1 lecture + literature 4) 15 lectures 5) 15 laboratory type lessons 6) 15 dull lessons on the improvement of reading skill	4) and 5) were most effective - students reported suggestions about note taking, review, and test-taking were most helpful
1949 39.	William Coleman Ohio State University 152 students Study Skills (Ed. Psy.)	To examine the effectiveness of brief training in study skills and underlining and outlining together with factors retarding improvement	1) Control - no training 2) Experimental groups met once a week, one group underlined and one outlined	Brief training resulted in greater gains for 2) - no significant difference between underlining and outlining
40.	Rudolph Corvini Church Related Liberal Arts College 52 freshmen Reading Program	To devise a pattern for the evaluation of reading improvement and to test the self administering technique	Both experimental and control groups had 3 weeks of word attack and skills then self administering group had 5 weeks of practice exercises - evaluation included 7 tests of significants between and within the groups	Short term exposure to self-administering technique resulted in no lasting improvement or changes in scholastic ability

Year	Who, Where, Sampling	Purpose	Teaching Methods	Findings
41.	Arthur Delong University of Michigan 4 sections Social Science	To determine effectiveness of two methods of teaching social science with respect to developing social attitudes, stimulating interest, and encouraging class participation	1)<u>Subject matter</u> - information in terms of students' future needs 2)<u>Interests method</u> - information in terms of students' present needs and abilities - measuring tools, scale of beliefs, observations, content examinations, course rating scales	2) is superior to method 1) but its superiority is dependent on the ability of the teacher to teach by method 1)
42.	George Fersh New York University 92 students Introductory Social Studies	To obtain a scientific evaluation of the degree to which a newly developed course based on problems approach was achieving objectives	<u>Traditional vs. problems approach</u> - pre- or post-tests designed to measure social beliefs, social values and ability to interpret data	Problems approach showed significant gains in social beliefs and values
43.	Ewell Fowler Eastern Illinois State College 90 students Industrial Arts	To ascertain the relative effectiveness of operation sheets and process models in teaching benchwork on college level	1)<u>Operation sheets</u> - job assignments found in books 2)<u>Process models</u> - job assignments keyed to 3 dimensional process models showing sequential order of the operations involved	Operation sheets superior in regard to acquiring information and skill in laboratory work and instructor time - no difference in regard to economy of materials

Year	Who, Where, Sampling	Purpose	Teaching Methods	Findings
44.	Ray Maize University of Purdue 149 students - 2 sections English Composition	To determine which method (1) teaches students habits of language application (2) requires more effort on the part of the instructor - to discover factors related to success course	1)Language by experience - more written themes (26), read by committee, class work dependent on needs 2)Grammar drill - textbook drill and weekly theme read by instructor (14) - pre-mid and post-test - equated by ACE and original theme	1) showed significantly larger gains on all measures except vocabulary - changes for low-level students slight by both methods
1950 45.	Russell Jenkins Michigan State 224 students 8 sections Written & Spoken English	To discover relative effectiveness of two methods of teaching skills and knowledge of communication within limits of Basic III course objectives	1)Traditional - instructor dominated lecture, question and answer period 2)Counselor-advisor - instructor as resource person, created learning situations, group work	No significant difference attributed to method - 2) showed slight gain in speech skills - 1) showed slight gain in writing skills
46.	Barry Jensen Miami University 115 students 44 prs. Elementary Psychology	To study efficacy of methods of instruction in relation to objectives other than knowledge (interests) and to devise a means of evaluating progress in terms other than knowledge	1)Independent study - students given outline and opportunity for conferences 2)Class attendance - lectures	No significant differences attributed to method - no difference in progress between under and over achievers - 2) required more instructor time

Year	Who, Where, Sampling	Purpose	Teaching Methods	Findings
47.	Theodore Landsman Syracuse University 126 students Human Development and Learning	To determine the differences between 2 types of teaching in respect to (1) knowledge (2) personality development (3) student preference	1)Student centered - begin with students, create atmosphere, attendance voluntary - mid test not scored - used for study purposes 2)Syllabus centered - weekly assignments measured results by M.T.A.I., Rorshach, and autobiography	No significant difference between the methods in regard to knowledge, personality development, or student preference
48.	Robert Maurer California Polytechnic College 33 students 11 prs. Remedial Reading	To determine the nature and extent of the differences that result from individual and group training in reading	1)Individual - class lectures + individual practice with SRA Reading Accelerator 2)Group - lectures on advantages of efficient reading + reading improvement courses	1) had advantages both emotionally and in terms of reading results
49.	Maurice Richards University of Missouri 6 sections Mechanical Engineering	To discover the effect of emphasing time in the teaching of engineering drawing	Time (experimental factor) used in twofold manner - instructor emphasized the importance of time in making drawings and premiums based on the quantity of work done	No significant difference in technical information - slight drawing skill in favor of 'time' group and students favored this approach
50.	Shirley Ullman New York University 150 freshmen Freshman Reading Course	To compare effectiveness of two different reading training methods upon college freshmen	1)Reading rate controller - instrument 2)Speeded reading - without instrument - 5 weeks training 3)Control Group - no instruction - pre- and post-tests	1) produced genuine gains in rate and comprehension and was superior to 2) - both 1) and 2) made greater gains than 3)

Year	Who, Where, Sampling	Purpose	Teaching Methods	Findings
51.	Irwin Wladaver New York University 2 sections 46 prs. Descriptive Geometry	To evaluate the relative effectiveness of two major systems - plane-trace and edge-view	Place-trace vs. edge-view - 3 quizzes + final objective examination	Edge-view system had more favorable effect than plane-trace on student learning
1951 52.	Duncan Gillies San Francisco State College Home & Family Living	To determine if different method of teaching the course lead to differential amounts of change in behavior	1)Conventional lecture 2)Seminar - students presented the material 3)Combination of lecture, discussion, guest speaker, audio visual, and problem solving pre- and post-test - Bell Adj. Inventory Mooney Check List + student evaluation	Changes in behavior took place but no one method was definitely superior - 2) seemed slightly superior
53.	Richard Husband Iowa State College 1700 students 6 quarters Elementary Psychology	To compare large lecture and small lecture - discussion method of teaching	1)Large lecture - 140 to 320 students 2)Small lecture - lecture + group discussion, quizzes and final examination - same instructor	1) averaged 3 points higher than 2) for six quarters
54.	Donald Johnson Michigan State College 62 students matched in 4 sections Beginning Psychology	To study the effectiveness of democratic leadership	1)Lecture-discussion - groups 2)Democratic - instructor recognizes expressed needs of group - listens and clarifies - decreases leadership role - students decided class procedures, pre- and post-measurement of democratic attitudes and achievements	Democratic attitudes did not change significantly in any of the classes - high achievers rejected the democratic process and focused upon objective of making good grades

Year	Who, Where, Sampling	Purpose	Teaching Methods	Findings
55.	John Mason Michigan State College 171 students Biological Science	To discover relative effectiveness of the scientific thinking and descriptive method of teaching in lectures and laboratory sessions	1)Scientific thinking - mimeographed lectures and guide used in laboratory period designed to teach habits of thinking 2)Descriptive method - lectures stressed facts and principles of science- demonstrations in laboratory	Both methods effective in teaching factual content - 1) was more effective in teaching certain abilities inherent in scientific thinking
56.	Wilbert McKeachie University of Michigan About 240 students General Psychology	To see if the prediction that students anxiety is heightened or reduced by the instructors' teaching behaviors	1)Discussion - instructor was chairman and summarizer - monthly essay test 2)Study-tutorial - instructor brought references and encouraged students to work at own pace - took 4 week mid-term 3)Recitation - brief lecture - mostly questions and answers - weekly test	Students preferred 3) - scores on examination for 3) were significantly higher than 2) - while anxiety is motivating force, it inhibits performance if it cannot be resolved
57.	Harry Ruja San Diego State College 190 students 4 sec. Introduction to Philosophy General Psychology	To measure instructional outcomes in regard to mastery of knowledge, emotional and social adjustment, and attitude toward instructor	1)Lecture - continuous discourse by instructor 2)Discussion - inter-change of questions and answers by students - pre- and post-tests	1) superior for subject matter mastery - 2) superior for learning names in class and attitude toward instructor

Year	Who, Where, Sampling	Purpose	Teaching Methods	Findings
58.	Gerald Wieder Brooklyn College 4 groups Psychology	To study effectiveness of methods of teaching in modifying attitudes associated with racial, religious, and ethnic prejudice	1)Non directive - used some group therapy 2)Lecture-demonstration 3)Control - no instruction - 3 objective examinations, same instructor - used Calf. Pub. Opinion Study	No significant difference on objective tests for 1) and 2) - 1) effected social attitudes and increased self insight more than 2) or 3)
59.	Lauren Wispe Harvard University 160 students 8 sec. Elementary Course in Social Relations	To find out general effects of directive and permissive teaching, the reactions of students, and variables related to student examination performance	1)Directive - subject centered, highly structured 2)Permissive - student centered, informal - 8 instructors and 2 observers categorized aspects of behavior in each section - pre- and post- content test	Students preferred 1) in preparation for examinations - 1) was more suited to lower I.Q. - students who chose 1) appeared insecure and dependent
1952 60.	Lua Bartley University of Michigan 72 students Beginning Tennis	To determine difference in amount of learning in tennis when 2 different methods were used	1)All instruction on the tennis court 2)Uses classroom and court alternately 3)Control - no instruction, growth measured by 4 skill tests and 1 content test	No significant difference between 1) and 2) on final scores yet 1% level of significance between 1) and 2) as opposed to 3)
61.	Robert Bills University of Kentucky 52 students General Psychology	To discover whether there is a difference in student understanding as a result of lecture-discussion or student-centered method	1)Lecture for entire semester 2)Lecture first half and student centered the second half - 4 objective tests	Same amount of textbook material learned - 2) produced more positive student attitudes and student preference

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62.	Lorraine Gibb and Jack Gibb University of Colorado 912 students 11 sec. General Psychology	To determine the effects of the use of "participative action" as a teaching device in the first course in psychology	1)Participative action - extensive use of buzz session 2)Lecture discussion - instructor played diminishing role in decision of groups and gave experience in group goal setting	No difference in content acquisition - 1) was superior in regard to role flexibility, self insight, leadership and likeability ratings
63.	Gerald Haight and Warren Schmidt Springfield College 110 students in 3 course sequence in Psychology	To determine whether teacher or group centered classes are preferable for learning of content when students choose method and one class is not required to take examinations	1)Teacher-centered, instructor presents material - initiates questions and evaluates students 2)Group centered - instructor moderates the discussion- shares with student responsibility for discussions and evaluations - Harrock-Troyer Test given after 3 quarters	When student chooses the method of instruction and when the group centered class is not required to learn subject matter for examination there is no significant difference between classes or knowledge of subject matter at the end of 3 quarter sequence
64.	Roy Nelson Colorado A & M 116 sections Public Speaking	To compare 4 methods by measuring changes in speaker confidence, critical thinking and communication effectiveness as rated by 3 judges	1)Speeches are progressively more difficult 2)All argumentative speeches 3)Variety of speeches 4)Same as 1 except all students restricted to same topics	Gains for each of 4 methods was statistically significant for all three criteria

Year	Who, Where, Sampling	Purpose	Teaching Methods	Findings
65.	Ralph Wichstrom University of Iowa 27 students 2 groups Physical Education	To determine whether the whole method or the whole-direct repetitive method was more effective in teaching tumbling stunts	1)Whole method - stunt demonstrated and then described in detail - demonstrated again 2)Whole-direct repetitive - first part demonstrated and described - everyone practices - repeat for 2nd and 3rd parts	1) was superior to 2) for teaching tumbling stunts both on elementary and intermediate levels of difficulty
1953 66.	John Smith Ohio State University 178 students 6 sec. Educational Psychology	1)To evaluate the course outcomes 2)To determine the relationship of instructional activities to outcomes 3)To identify student traits related to course outcomes	Lecture vs. non lecture - 3 sections received a series of 9 lectures from senior professor while other 3 sections had usual discussion with graduate assistants - pre- and post-tests used student attitude survey and teachers' Self-Analysis Checklist	No discernible differential consequences of two methods - cum. pt. hr. and pre-test were found to have highly stable relationship with post-test - positive relationship between class rank and achievement
1954 67.	Albert Eglash Michigan State College 2 sections Introductory Psychology	To compare group discussion and lecture methods with reference to achievement and student reactions	1)Discussion - groups of 6 which decided topics and evaluations - instructor's role was one of listening 2)Lecture - conventional instructor dominated - same reading assignment and examination	Achievement on course content was not significantly different - morale of lecture class was significantly higher than that of discussion group

Year	Who, Where, Sampling	Purpose	Teaching Methods	Findings
68.	Albert Felano Penn. State 300 students 12 sec. Mathematics 55	To fill the gap in research as to what constitutes effective math instruction	Methods differed in amount of student participation (1) involved <u>student as listener</u> (2) involved <u>student as participant</u> - measured by examination	Average achievement of 2) surpassed average achievement predicted for them - 2) is not clearly superior but nothing is lost in its use
69.	Owen Stallard Purdue University 130 men 3 sec. Beginning Speech	To discover if the use of the magnetic tape recorder would improve the effectiveness of the vocal delivery in the extemporaneous speaking situation	1)First 15 min. of 2nd and 6th speeches were secretly recorded 2)First 1 1/2 min. of 2nd and 6th speeches recorded secretly - 3rd, 4th, 5th speeches recorded and played back 3)Same as 2 except instructor offered criticisms	Growth in articulation favored 1) - use of tape recorder did not increase effectiveness of vocal delivery in extemporaneous speaking
70.	Gustave Timmel Cornell University 2 sections Mental Hygiene	To discover whether change in personal adjustment occurs as result of course in mental hygiene - to determine effectiveness of project and lecture methods of instruction	<u>Lecture vs. project instruction</u> - Minnesota Personality Scale used in pre- and post-test - one instructor	No significant gain in personal adjustment - neither lecture or project method when used by same instructor is superior in achieving improved personal adjustment

Year	Who, Where, Sampling	Purpose	Teaching Methods	Findings
71.	Richard Warren Purdue University 2 sections 2 semesters Elementary Physics	To study the effect of a variation in the proportion of lecture-demonstration to recitations in teaching elementary physics	1) 1 lecture demonstrations to 4 recitations 2) 2 lecture demonstrations to 3 recitations	Equally effective for average ability students - superior students preferred 2) while it was unpopular with low I.Q.'s
1955 72.	Monica Bainter University of Wisconsin 2 sections Physics 150	To ascertain the effectiveness of traditional and problem solving technique in physic laboratory designed for prospective elementary teachers	1)Traditional - scientific apparatus used according to a manual procedure 2)Problem solving - orderly method of applying inductive and deductive reasoning to problems - verbal and performance tests	Neither 1) or 2) superior in teaching facts, generalizations, or laboratory skills - 2) was superior in helping the student to apply the principles of physics in interpretation of social and physical phenomena
73.	Harold Burke Boston University 250 students Freshman Orientation Course	To discover the effectiveness of two methods to help students to adjust to college living and to augment educational vocational planning	1)Group centered - small work groups of 4 to 7 students, course content and plans communicated through a steering committee 2)Instructor centered - he sets goals - no evaluation encouraged	Teaching methods have limited effect on adjustive behavior - causal factors in college adjustment appear not to rest in instructional methods

Year	Who, Where, Sampling	Purpose	Teaching Methods	Findings
74.	Francis Deigman Boston University 130 students Psychology Course	To determine effectiveness of 2 different discussion methods on student's learning of psychology and in bringing about changes in emotional adjustment	1)Student centered discussion - students initiate and carry on discussion topics 2)Teacher centered discussion - instructor chose topics - both 1) and 2) met for one weekly lecture - observers rated verbal behaviors	Follow-up test one semester later reveal no significant difference between 1) and 2) - method 1) was rated higher by the students
75.	William Farquhar University of Minnesota 6 sections How To Study Course	To compare 3 methods of teaching in terms of knowledge of course material, student change in report of behavior, and student preference	1)Student-centered - emphasis on emotional aspects - student committees 2)Instructor centered - emphasis on intellectual aspects - lectures 3)Eclectic-dual emphasis - class recordings checked and student rated roles of instructor	No difference in method as to student preference and final examinations - students who preferred 2) increased their self ratings on Survey of Study Habits and Attitudes
76.	John Krumboltz University of Minnesota 6 sections How To Study Course	To discover whether different motivational outcomes were associated with 3 different methods of instruction	Same as preceding experiment as both researchers used same instructional techniques	On motivational outcomes students in 3) scored highest and 1) lowest - liking for a course seemed to have little relationship to motivational outcomes

Year	Who, Where, Sampling	Purpose	Teaching Methods	Findings
77.	F. G. Macomber Miami University Several University Departments	To determine effectiveness of television lectures in large class as opposed to small class lecture discussion procedures	1)Closed circuit television - lecture large group 2)Small group - lecture discussion	Other things equal - students prefer small group sections - acquisition of subject matter not adversely effected by television lecture
78.	Ralph Norman University of Minnesota 56 students Engineering Drawing	To determine the effectiveness of 2 methods of instruction with reference to orthographic drawing, instrument drawings, and free hand drawings	1)Students learned orthographic principles through free hand and then proceeded to instrument drawing 2)Students made all their drawings with drawing instrument	Test at end of experiment was significant at 1% level in favor of 1) - students who learned principles of orthographic drawing through free hand drawing were not penalized with respect to instrument drawing
79.	Martin Slomowitz New York University 52 graduate students Counseling Psychology	To compare the personality changes and content achievement gains that occurred in a non directively-oriented setting with those of a problem oriented setting	Non directively oriented vs. problem oriented group - 2 instructors - pre- and post-test of content also used Rorshach Test	Content achievement was significant but not significantly different - personality changes were minor - no significant relationship between achievement and personality changes

Year	Who, Where, Sampling	Purpose	Teaching Methods	Findings
80.	John Ward Minnesota University 2 sections Physical Science	To compare subject matter achievement under two different methods	1)Lecture-demonstration - instructor assumed all responsibilities for procedures 2)Group - students shared in formulating objectives, activities and grading paper and pencil tests	1) produced more immediate results with respect to understanding principles - 2) produced longer retained understanding - upper and lower I.Q. preferred 1) while middle I.Q. favors 2)
1956 81.	Rolf Larson University of Connecticut 4 sections of juniors Educational Psychology	To determine whether 2 methods of teaching were equally effective in aiding pre professional teachers in changing their attitudes toward children	1)Teacher dominated lecture method 2)Student centered experience centered method - pre- and post use of M.T.A.I. - 2 instructors each teaching 1) and 2)	All 4 sections, regardless of teacher, gained significantly on M.T.A.I. - neither method appeared superior
82.	John Johnston University of Missouri 106 students 38 prs. General Electricity	To ascertain the relative superiority of teacher demonstration and shop activities in teaching of general electricity	1)Teacher demonstration vs. 2)Shop activity - same informational content and instructor - used Remmers Scale for Measuring Attitude Toward any School Subject	1) was superior for acquiring information and cost less - 2) was superior in terms of instructor effort - no difference in terms of attitude toward subject

Year	Who, Where, Sampling	Purpose	Teaching Methods	Findings
83.	Christopher Rafter New York University 47 students Physical Science	To compare two teaching methods on basis of written achievement and problem solving behavior - to gain insight into the thought processes-problem solving	1)Lecture demonstration - formal discussions and demonstrations related to principles inherent in the course 2)Problem solving - cooperative planning of experiments related to life situations - 18 class discussions taped	2) appeared superior irrespective of science background and I.Q. - 4 or 5 months of guidance were necessary before students could independently solve problems
1957 84.	George Alterman New York University 2 sections Physics	To determine the comparative effectiveness of 2 methods of presenting physics principles on the ability of students to apply the principles	1)Theory - to demonstration - start with statement of principle and proceed to illustrate and apply 2)Demonstration to generalization - analyze applications and then formulate theory - 4 pre- and post-tests	2) superior to 1) only with students of little background in physics - ability to recall facts is highly correlated with ability to apply principles to new situations
85.	Cecil Callarman Oregon State College 42 students 3 quarters Secretarial Science	To determine whether 2 methods of teaching beginning shorthand produce different results	1)Writing approach - practice, exactness and copying 2)Reading approach - emphasis on reading plates	Both methods produced satisfactory results - neither superior in transcription accuracy or dictation speed

Year	Who, Where, Sampling	Purpose	Teaching Methods	Findings
86.	John Driscoll Pennsylvania State University 293 students Survey Course in Education	To discover whether illustrated T.V. lecture was as effective as lecture discussion	1)Lecture-discussion - 5 classes 2)Visual method - 24 in small group - 123 in large class - T.V. twice a week supplemented by motion pictures once a week - pre- and post-test on course material and U.T.A.T.	2) produced higher mean gain on final, and marked change in attitude - 2) was also favored by the student
87.	Earl Hepler University of Missouri 6 sections Engineering	To ascertain the relative effectiveness of 2 methods of teaching involving the sequential presentation of orthographic projection and pictorial representation	1)Orthographic projection followed by pictorial presentation 2)Reverse of No. 1	1) was superior to 2) in the teaching of engineering drawing
88.	Eckhart Jacobsen State Teachers College Massachusetts 2 matched sections Technical Drawing	To compare the effects of competitive learning experiences and cooperative learning experiences related to achievement in technical drawing	1)Competitive vs. 2)Cooperative (no description given) - one instructor compared achievement and student attitudes	No difference in acquisition of information or skill in technical drawing - greater achievement in problem selection by 2)

Year	Who, Where, Sampling	Purpose	Teaching Methods	Findings
89.	Edward McClarty San Francisco State 2 sections of Psychology 2 sections of Economics	To determine the relationship of auding ability and achievement	1)Lecture - television in home and on college campus 2)Group discussion and lecture in regular classroom	No relationship between auding ability and achievement - relationship between auding ability and understanding of concepts - 2) with sufficient time for group interaction was preferred to 1)
90.	Kenneth Olson Northern State Teachers College 2 sections Biological Science	To determine effectiveness of 2 methods in recall application of biological facts and use of some inductive aspects of scientific thinking	1)Student centered vs. 2)Teacher centered roles in selecting objectives, content, class activities, and evaluation were differentiated	Both groups increased significantly in subject matter and scientific thinking - 2) slightly superior to 1) with respect to subject matter gains
91.	Hayden Smith University of Michigan 216 students 12 sec. Introductory Education	To study 2 different methods of instruction in producing favorable attitudes toward specific subject areas (U.N.E.S.C.O. in Mexico)	1)Documentary film and discussion 2)Lecture based on same context of film 3)No stimulus - pre and post use of Remmers Scale	No significant difference in amount of attitude shift between 1), 2), and 3) but carefully planned instruction tended to produce more favorable attitudes
92.	Sidney Yudin New York University 2 sections College of Education	To evaluate the effectiveness of core and conventional content centered instruction in the improvement of critical thinking	1)Experience-centered - core method of subject grouping and method 2)Conventional separate subject approach - pre and post use of Watson Glaser	No difference between the two groups as measured by Watson Glaser test

General Observations

Recent interest in experimental research. Reviewing this thirty-three year span of experimentation the research- er noted that 57 of the 92 studies had been made in the past ten years. The 1930's were plateau years as far as the exploration of instructional methods on the college level was concerned. Why this recent renascence of interest in instructional investigations? Several factors may have abetted this pace phenomenon. College instruction has been under vocal criticism from educators and laymen. However, this has seemed to be a prerogative of our American culture and has consistently reoccurred in the literature, espec- ially since the middle twenties. During the middle twenties the influence of John Dewey had fomented into college teach- ing with resulting controversy over the lecture versus the discussion method of instruction. Thus criticism of in- struction has been a continuous factor rather than a recent development.

Perhaps the statistical techniques of R. A. Fisher have done more to revive valid experimentation than any other catalytic agent. His statistical variance and covar- iance method of predicting probability and causal relation- ship of more than one variable has permitted research de- signs to enter the multi-variable realm in human experimen- tation.

<u>Methodological orientation of recent studies</u>. Pedagogical studies in recent years have been somewhat differently oriented from earlier ones. Many of them (35, 37, 41, 46, 47, 54, 58, 59, 61, 62, 67, 73, 74, 79, 81, 83, 90) have been influenced by the research in nondirective (client centered-Rogerian) therapy. The interest and activity in 'group-dynamics or human relations' (Lewin, Lippitt and White) have promoted reorientation in research in educational dynamics. In general, somewhat greater attention than has been true in the past is given in these more recent studies to personality changes in students associated with a given teaching method.

While research in the middle twenties directed attention to the lecture versus discussion, investigations in the forties and fifties have been reopened under instructor-centered versus student-centered procedure with conceptual and methodological improvements in research designs. As will be noted, the teaching methods are labeled and combined in various ways. Usually these methods involved lecture, discussion, laboratory experiences, individualized study, or a combination of procedures. Yet they seemed to have in common the desire to break away from traditional instructor dominated classroom to situations encouraging greater student participation and responsibility.

Subject matter goals. Even though this recent
trend involved experimenting with shifting control in the
classroom, the desired outcomes were still chiefly con-
cerned with the mastery of subject matter. This is revealed
in the stated purpose of the experiment and the selection
of the appraisal instruments which measure the acquisition
of knowledge (facts and principles).

Concentration of experimentation in psychology
courses. The concentration of recorded experimentation in
psychology courses (33 studies) as compared with the rela-
tive paucity of experimentation in professional courses
(4 studies) was rather noticeable. This was not too sur-
prising in as much as psychology endeavors to comprehend
human behavior and behavioral changes. Yet it seemed para-
doxical that while professors of education have been
accused by their critics of having overly emphasized
"method" as a field of teaching, they have seemed to do so
little experimenting with "methods" of teaching their own
subjects. Actually the written record would seem almost
unrepresentative. It is probably a reasonable assumption
that a number of conscientious educators are constantly
seeking to improve their teaching procedures but their
efforts are not published as formal definitive research.

Experimental findings. An inspection of the find-
ings showed that the difference between the measured results

of the various methods of instruction were generally small and unreliable. In 51 studies there was no significant difference between the methods in terms of the stated criterion. The control method appeared significant in 21 cases, while the experimental method attained superiority in 15 cases. It was not discernable in 4 instances which was the control and which was the experimental procedure. This rough tabulation may represent other misinterpretations of method or procedure, but it does indicate that current data as to the relative effectiveness of teaching methods are rather inconclusive. Since the lecture procedure was the most frequent control method and the acquisition of knowledge the most frequent criterion, it might be possible to infer that the lecture method is superior to the student centered method for the acquisition of facts.

Student preference. Although this review indicated that one method is not definitely superior to another method, it was interesting to note student preference. Students preferred the experimental method (9, 10, 12, 14, 16, 22, 27, 31, 37, 49, 61, 74, 86) more frequently than the control method (56, 59, 77, 89). It was indicated (71, 80) that superior students prefer the lecture method and reject the democratic process (54). Wispe (59) found that the less able as well as superior students preferred the conventional approach. The rationale behind the choice was

not recorded and perhaps not investigated. Student prefer-
ence may be attributed to the novelty of a current fad in
instruction. Students may believe that other personal
values should be gained in addition to subject matter.

    Relation of method to student ability. The level of
confusion was raised as an attempt was made to analyze
effectiveness in relation to levels of student ability.
Morris (5) Shirley (8) and Ryan (17) found that all levels
of ability learned about the same under the varying methods.
Shannon (18) Barnard (28) and Wispe (59) found the lecture
superior for the less able while Warner (19) and Stein (25)
called attention to the fact that the abler students pro-
fited more from lectures. On the other hand Gwinn's (13)
findings pointed out that both superior and inferior profit
from the lecture method. It was stated that the upper
quartile students benefit from reading (20) and individual-
ized study (29). For the lower quartile students the group
method (29) and discussion method (30) seemed more effec-
tive. Research evidence tended to indicate that no one
method had a monopoly on pedagogical wisdom in all teaching
situations or with all human temperaments. From the re-
searcher's point of view, the most positive conclusion was
the clear indication that further research can proceed in
this area without serious (if any) loss to students who
have the fortune or misfortune to be the "guinea pigs."

Concern for operational outcomes. Operational out-
comes have been explored in the teaching of physical educa-
tion (60, 65) and in engineering drawing courses (77, 88).
Only one study (72) is directly concerned with experimenta-
tion in the preparation of prospective elementary teachers.
Farquhar (75) and Krumboltz (76) followed through course
instruction to appraise change in study behaviors as re-
ported by students.

Sources of related studies. The majority of the
studies reported have been isolated, individual research
efforts. Much productive effort has been lost because of
a lack of cataloguing and summarizing. Duplication of re-
search may have been avoided if these and other unattainable
studies could be organized so as to serve as a springboard
for further investigation. Roughly two-thirds of the re-
ported studies are doctoral dissertations. This bringing
together of isolated investigations provided a basis for
asserting that there is a respectable body of knowledge in
the field. It also supports the observation that these
findings have been unknown and unproductive in the profes-
sional literature regarding instructional improvement.

Quality of related research. While acknowledging
the quantity of experimental research, the quality of this
body of knowledge may lead to scepticism as to its value.
Usually the studies were short-term efforts. Only one (63)

involved a modified longitudinal approach. Some of the
studies (22, 85) were repeated for more than one quarter
but with different students. About one-half of the inves-
tigations were restricted to small, heterogeneous, and un-
representative samples with limited significance. The
definitions of method of teaching varied according to the
interpretation of the investigator. Thus the experimental
factor became a variable rather than a constant throughout
research studies. If the experimental factor were more
closely defined, the findings could be interpreted with
more precision. In some instances measuring instruments
may have been subjectively biased in the direction of what
the experimenter wanted to prove.

Another factor confounding the results was the
'grade' to the goal-striving American student. If the
getting of a good grade depends on the acquisition of knowl-
edge then this grade motivation may induce the acquisition
of knowledge independent of the teaching method. In only
two studies (35, 63) was it specifically noted that the
course grade would not be influenced appreciably by the
final examination.

In general the studies did not interact with each
other; they did not fall into any recognizable progression
of research. Rather than pushing forward in terms of method
identification and research design, there seemed to be a

spreading out of experimentation into various subject matter fields.

In the light of the inconclusive findings and apparent shortcomings, it might be said that the reviewed experimentation has added little to our understanding of the teaching learning process. In spite of obvious defects previous research studies did reveal numerous attempts to solve the instructional problem and in so doing it provided direction in planning further studies. It no doubt has made a contribution in helping educators to think more critically and perhaps even to reorient their own classroom procedures.

Potential Contributions of This Study

The current investigation appeared to push beyond this historical perspectus in several spheres of activity:

1) It was an effort to evaluate the effectiveness of methods in a professional course in elementary education. Nowhere in the literature was there found a similar study in teacher education.

2) Teaching behaviors were set up as educational objectives.

3) These teaching behaviors were appraised verbally by a pre- and post-test and operationally by follow-through observations in student teaching.

4) An attempt was made to identify and categorize unit teaching behaviors from the recalled experiences of

teachers. This approach is based on the assumption that teachers who wrote up previous unit experiences voluntarily had felt some degree of success with this method of teaching. It was also assumed that this voluntary evidence of teacher satisfaction was a key element in identifying teaching effectiveness.

5) It was concerned with the <u>directness of experience</u> as a factor in raising the level of transfer from the theory of the college classroom to the application in the elementary classroom situation.

6) It represented an endeavor to validate difference in teaching procedures by means of the students' perception of the procedure.

These potential contributions required pioneering into fertile but complex areas which involved considerable speculation and the following of unvalidated directional hunches. The investigator would feel a sense of satisfaction if this study proved to be a logical approach to the total problem and provided a basis for more educated hunches and refined procedures in future related investigations.

CHAPTER IV

THE EXPERIMENT

The format of this chapter was planned to present
a brief overview of the total experimental activities and
then to give specific consideration to the identification
of the population, to the development of the criterion, to
instructional differentiation, and to the construction of
appraisal mediums. This arrangement is not in order of
time occurrence. In reality, the development of the cri-
terion, instructional procedures, and appraisal measures
anteceded the carrying on of the experiment. It was
generalized that an overview of the experiment would add
continuity to a more detailed description of specific
phases of the experimental process.

Overview of the Experiment

The Elementary Education Staff Area in the Depart-
ment of Education at The Ohio State University granted the
investigator permission to explore the proposed problem
in two sections of Education 517 during the Winter Quarter
of 1958 with a subsequent student teaching follow through
in the Spring Quarter. (The purpose of Education 517 in
the pre-service program of prospective elementary teachers

has been referred to in chapter I relative to the goals of
teacher education and then further amplified in the assump-
tions elaborated in chapter II.)

Actually the total experiment extended over a period
of three quarters. During the first quarter (fall, 1957)
of the sequence the investigator taught one section of
Education 517 as a 'pilot plan' or 'trial run' with intent
of probing the feasibility of the unit approach in the
teaching of the aforementioned course. (Unit teaching will
be defined sequentially and behaviorally in the development
of the criterion.) An eight-week unit, based on student's
questions, was developed around the problem of identifying
the teacher's role in unit teaching. Similar pre- and
post-situational tests were administered to measure the
student's understanding of unit teaching. The students did
not analyze or react to the teaching procedures in a written
form but a verbal reaction was invited at the last class
session.

During the Winter Quarter a total of 77 students
were registered for the two sections of Education 517, 39
in one section (0) and 38 in section (1). ((0) and (1) are
arbitrary designations for what might be considered the
control (0) and experimental (1) sections.) It was rather
unusual that each section was scheduled to convene from 8
to 10 on alternating days. No classes were regularly

scheduled on Friday, since the students in both groups were required to participate 12 hours in the public schools. Group (0) experienced a more conventional lecture-discussion type of teaching procedures while in group (1) an effort was made to provide direct experience with unit procedures. Early in the Winter Quarter the two student populations were identified by obtaining estimates of selected learning variables: intelligence, achievement, motivation, and pre-course understandings of unit teaching. Growth in verbal understandings was measured by an identical pre- and post-situational test. At the completion of the course experience, each student was given an opportunity to analyze the frequency of certain instructional procedures and to react to the effectiveness of these procedures as he perceived them. The anonymity of the student was secured by having both the analysis and reactionnaire unsigned.

A follow through of 22 students (10 from section (0) and 12 from section (1)) in student teaching ensued during the Spring Quarter. Twenty-two students were involved because that number of students did student teaching the Spring Quarter. It was reasoned that more intensive observation of a few students by the observer would produce more accurate judgments of unit teaching competency. In as much as the classroom teaching situation provides the focal point wherein the training of the teacher is translated

into action, this follow through was an opportunity to observe and to estimate unit teaching behaviors operationally. Realizing that student teaching situations vary from room to room, the researcher undertook to appraise the situational differences that may effect unit teaching by means of an open-ended check list to be completed by the college supervisors and the investigator. A rating scale, based on the educational objectives for Education 517, facilitated the evaluation of operational evidence of unit teaching behaviors as judged by the college supervisor, cooperating teacher, the student teacher, and in 10 cases the investigator. In addition to a self-evaluation, the student teachers verbally reacted again to the effectiveness of Education 517 in light of their student teaching experience.

The researcher observed 10 students for a half morning once a week. Not only was the investigator interested in gaining operational evidence of unit teaching behaviors but also in gaining insight into potential blocks to unit teaching. To facilitate the latter purpose anecdotal accounts of each visit were recorded.

Identification of the Sample Population

The obtaining of an unbiased, similar, and representative population should receive careful thought in the

research planning. Such a sample population is crucial
for drawing inferences about the experimental results. In
a university the magnitude of Ohio State it would be highly
impracticable to alter registration or program procedures
to pre-select comparable groups. Even if it were feasible
to hand pick and pair each group of subjects, the subtle
range of learning variables possessed by each individual
would make overall homogeneity and unreality. Because of
the difficulties and limitations involved in selecting and
pairing individual subjects, total groups were identified
in terms of certain learning characteristics that were
thought to bear a relationship to performance on the ex-
perimental criterion.

A randomized control process of grouping was chosen
as a logical way to avoid bias and to statistically control
learning variables between the two groups. Randomization
consists in drawing individuals from the same population to
constitute the experimental and control groups. It is based
on the assumption that differences between the groups with
respect to learning characteristics will most likely not
exceed a chance amount. No attempt was made to select or
control the student population. The two sections of Educa-
tion 517 represented all the students registered for this
course the Winter Quarter of 1958. Each group supposedly
typified a cross section of students that might be taking
the course during any given quarter.

Even though randomization is reportedly an accepted approach to obtaining an unbiased sampling, the researcher had the responsibility of identifying the composition of each group in order to substantiate his position that only chance learning differences exist between the two groups.

Age and class rank were not thought to be significant learning factors. A hasty examination of the sample population showed only a slight variation in age and class rank between the two groups. Group (O) numbered 26 juniors and 11 seniors whereas group (1) counted 24 juniors and 12 seniors. An age accounting revealed that the ages in group (O) ranged from twenty to thirty-five with the following distribution: 12 - age 20, 15 - age 21, 7 - age 22, 1 - age 27, and 1 - age 35. The ages in group (1) varied from 20 to 37 in the following spread: 12 - age 20, 16 - age 21, 3 - age 22, 2 - age 23, 1 - age 27, and 1 - age 37. With respect to age and class rank, the two groups appeared to be equalized to the extent that further attention was not given to these potential learning variables in this teaching-learning situation.

The personnel files in the College of Education Office served as the source of O.S.P.E. scores and cumulative point hour ratios. This information was recorded as indices of intelligence and achievement. Student motivation was measured by responses on the Minnesota Teacher

Attitude Inventory. A favorable critique in Buro's _Fourth_
Mental Measurements Yearbook[1] supported the selection of
this inventory. This instrument was recommended by the
Student Personnel Office in the College of Education as the
best commercial instrument available to assess motivation.
A situational test based on problematic unit teaching sit-
uations was formulated for the purpose of appraising pre-
course understandings of unit teaching.

The four selected learning variables (intelligence,
achievement, motivation, and pre-course understandings)
were analyzed graphically on a cumulative percentage curve
and more abstractly with respect to the mean and standard
deviation for each variable. It was thought that a visual
plotting of the distribution would supplement and give
meaning to the rather abstract mathematical computations.
One advantage of the cumulative frequency curve was the
possibility of directly comparing two groups with different
N (number) on the same graph. In the construction of the
following tables the percentages were laid out on the
horizontal axis and the class intervals of the scores on
the vertical axis. The curve was determined by the points
at the upper limit of the class interval indicating cumula-
tive frequency in the interval and below. For example,

_____

[1]Buros, op.cit., pp. 801-802.
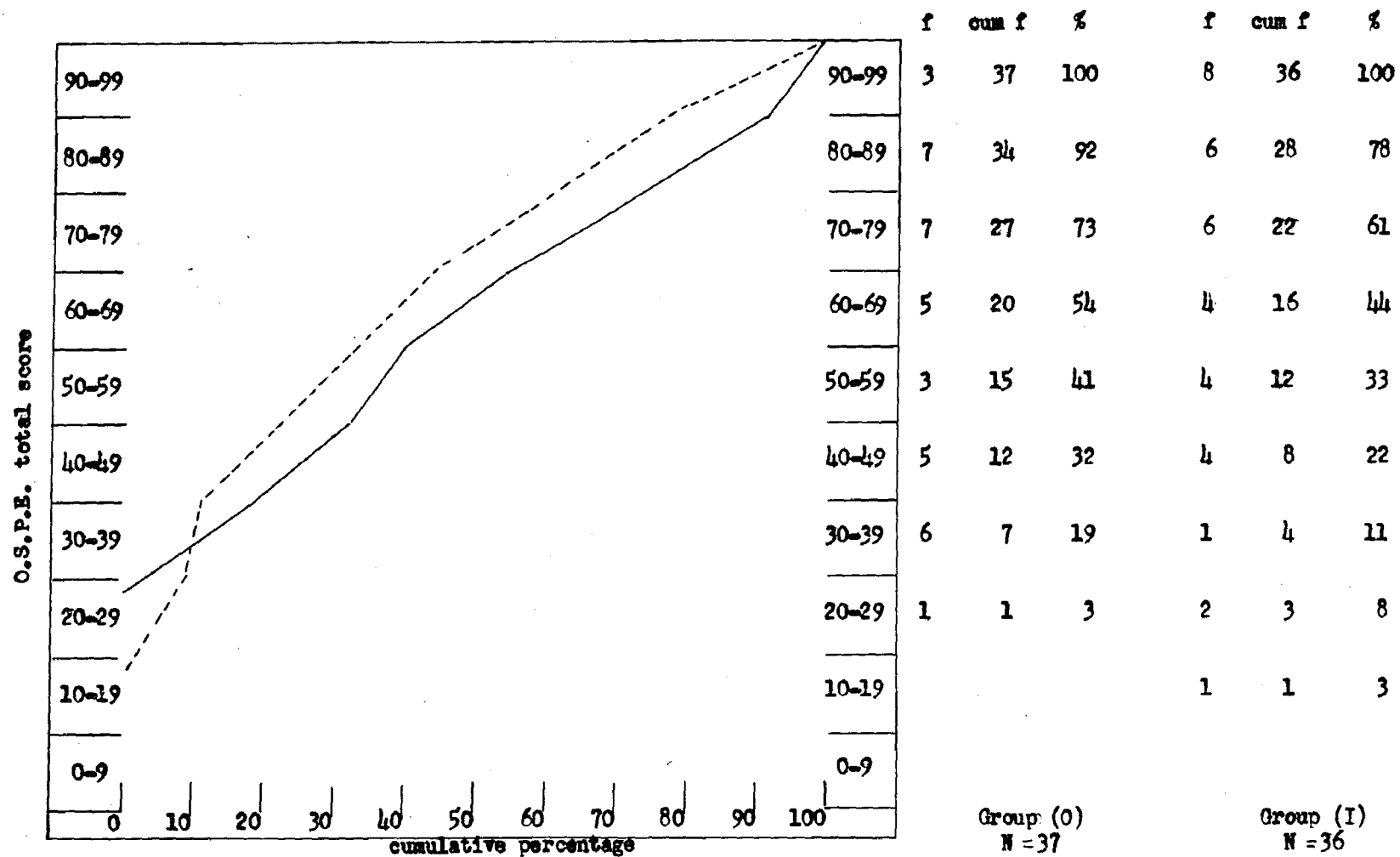
Score	f	cum f	%	f	cum f	%
90-99	3	37	100	8	36	100
80-89	7	34	92	6	28	78
70-79	7	27	73	6	22	61
60-69	5	20	54	4	16	44
50-59	3	15	41	4	12	33
40-49	5	12	32	4	8	22
30-39	6	7	19	1	4	11
20-29	1	1	3	2	3	8
10-19				1	1	3

Group (O)
N = 37

M = 62.95
σ = 20.46

Group (I)
N = 36

M = 68.25
σ = 22.51

GRAPH I
CUMULATIVE PERCENTAGE CURVE REPRESENTING O.S.P.E. TOTAL SCORE
DISTRIBUTIONS FOR GROUP (O) AND GROUP (I)

O.S.P.E. reading score	f	cum f	%	f	cum f	%
90-99	5	37	100	8	36	100
80-89	5	32	86	5	28	78
70-79	7	27	73	4	23	64
60-69	2	20	54	3	19	53
50-59	8	18	49	6	16	44
40-49	1	10	27	7	10	28
30-39	4	9	24	1	3	8
20-29	4	5	14	1	2	6
10-19						
0-9	1	1	3	1	1	3

Group (0)
N = 37

M = 60.89
σ = 24.17

Group (1)
N = 36

M = 66.36
σ = 22.99

GRAPH II
CUMULATIVE PERCENTAGE CURVE REPRESENTING O.S.P.E. READING
SCORE DISTRIBUTIONS FOR GROUP (0) AND GROUP (I)

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GRAPH III
CUMULATIVE PERCENTAGE CURVE REPRESENTING CUMULATIVE POINT
DISTRIBUTIONS FOR ROTC (O) AND ROTC (T)

Cumulative percentage

Cumulative point hour

M.T.A.I. score	f	cum f	%	f	cum f	%
100-109	1	37	100	1	36	100
90-99	6	36	97	2	35	97
80-89	6	30	81	6	33	92
70-79	9	24	65	8	27	75
60-69	4	15	41	4	19	53
50-59	3	11	30	6	15	42
40-49	3	8	22	4	9	25
30-39	2	5	14	1	5	14
20-29	1	3	8	2	4	11
10-19				2	2	6
0-9						
-10--1	1	2	6			
-20--11	1	1	3			

Group (o)
N = 37
M = 66.62
σ = 20.42

Group (1)
N = 36
M = 62.83
σ = 22.25

GRAPH IV
CUMULATIVE PERCENTAGE CURVE REPRESENTING M.T.A.I. SCORE
DISTRIBUTIONS FOR GROUP (O) AND GROUP (I)

pre-test score	f	cum f	%		f	cum f	%
30-32					2	36	100
27-29	3	37	100		1	34	94
24-26					1	33	92
21-23	5	34	92		6	32	89
18-20	12	29	78		10	26	72
15-17	11	17	46		8	16	44
12-14	3	6	16		7	8	22
9-11	2	3	8		1	1	3
6-8	1	1	3				

cumulative percentage

Group (0)
N = 37

M = 18.01
σ = 4.53

Group (1)
N = 36

M = 18.31
σ = 4.87

GRAPH V
CUMULATIVE PERCENTAGE CURVE REPRESENTING PRE-TEST SCORE
DISTRIBUTIONS FOR GROUP(0) AND GROUP (I)

Graph I might be interpreted by saying that for group (O),
2.70 per cent of the cases fell below the upper limit of
the class interval score 20-29; 18.92 per cent or 7 cases
(indicated by cum for cumulative frequency column) fell
below the upper limit of the interval 30-39, and so forth.
Thus each point on the upper limit of the class interval
represented the cumulative percentage of cases falling below
the indicated point.

Because of several omissions of O.S.P.E. scores and
cumulative point hour data in the personnel files, it was
necessary to limit the experimental subjects in group (O)
to 37 and group (1) to 36. Thus a discrepancy exists be-
tween the number of enrollees previously stated and the
actual group numbers shown on the charts.

The mean and standard deviation for each learning
factor were computed from group data assembled in the fre-
quency distributions on each table to the right of the
graphs in the column marked f. The following formulae
were used:

$$M = \left(\frac{fd}{N}\right) i + AM \qquad \begin{array}{l} AM = \text{assumed mean} \\ \sigma = \text{standard deviation} \end{array}$$

$$\sigma = i\sqrt{\frac{fd^2}{N} - c^2} \qquad c = \frac{fd}{N}$$

Measures of central tendency and variability are
useful techniques describing single distributions. In most

types of distributions, the mean is considered the most stable measure of central tendency that may be estimated from a sample. The standard deviation characterizes the spread of values appearing in the distribution. Referring again to graph I group (0), it would be accurate to infer that two-thirds of the cases are included between one σ

(standard deviation) either way of the mean or between the scores 43.19 and 84.11. The size of the σ in the case of all four learning variables was rather large. This dispersion of scores indicated that the groups were not skewed at either end of the distribution but tended to include a range of scores reflecting wide distribution of student abilities in each section.

After identifying the learning variable in cumulative percentage curves together with means and standard deviations for the two groups, it was possible to conclude from graphs I, II, III, IV, and V that group (1) made higher scores on the O.S.P.E. measures, somewhat higher scores on pre-test, but lower accomplishments in terms of M.T.A.I. and cumulative point hour ratios. It was interesting to note that even though group (1) appeared more intelligent it also appeared less productive in terms of achievement. The reverse was true for group (0). The scores and cumulative percentage curves showed a close relationship between

O.S.P.E. total scores and the reading score on the same test (graphs I and II).

The task of identifying two groups involved a comparison of group differences to ascertain whether these differences were significant or attributable to chance variations in grouping. The amount of difference was not calculated between each learning variable (O.S.P.E. for group (0) as compared to O.S.P.E. for group (1)) but in relation to the total combination of learning variables in predicting the post test or performance on the criterion. A regression equation was used to determine whether any one of the 6 learning variables for each group was significant and significantly different from the other group in predicting performance on the post test. In the computation there were six variables because O.S.P.E. was recorded in terms of total score and reading score. Membership in group (0) or group (1) was considered a variable. The evidence did not indicate that there was a significant difference between the groups. In both instances the cumulative point hour was a significant learning factor in predicting the performance on the post test. In as much as this regression equation involved more than comparing the learning factors within and between groups it will be examined in chapter V with the statistical analysis of the data resulting from the experiment.

The sample population was also identified as to its representativeness of a larger population. Did the total experimental group (73) represent a cross section of students that might be taking this course any given quarter? In order to measure the representativeness, the sample was compared with 503 recent graduates in elementary education (those who obtained provisional elementary teaching certificates) with respect to O.S.P.E. and cumulative point hour ratios. The latter was extracted before Education 517 was taken so that achievement comparisons could be made on a comparable basis. Again cumulative frequency curves were supplemented by the computed mean and standard deviation for each learning factor. It was evident from graphs VI and VIII that the experimental subjects (73) had a higher O.S.P.E. estimate and a lower point hour achievement than the larger group of 503 elementary graduates.

In as much as obvious differences existed, the researcher was faced with the problem of determining whether the differences noted were so small that they might have resulted from individual differences among cases drawn for the two groups or so large that it was unreasonable to expect these discrepancies to have resulted. The 'critical ratio' was chosen as a test of significance and was computed according to the following mathematical formula.

$$CR = \frac{M_1 - M_2}{\sqrt{\sigma m_1 2 + \sigma m_2{}^2}}$$

M = mean
σ = standard deviation
σm = standard error of mean
$\sigma m_1{}^2 = \frac{\sigma^2}{N-1}$

As indicated in the formula the critical ratio is the ratio of the difference of the means of the designated variables for the 2 group to the square root of the sum of the squared standard error of the means. If the ratio is 1.96 it is said to be significant at the 5 per cent level. About 3.00 represents a 1 per cent level of significance. Significance at the 5 per cent level would imply that, if identical means exist, the probability of obtaining from random sampling two means as different or more different is probably 5 times out of 100.

It should be remembered that the learning differences between group (O) and group (1) were adjusted by using a regression equation in the prediction of post-test performance. Using that procedure to arrive at significant differences would be unrealistic in dealing with the 503 graduates for whom neither pre nor post test data were known. It seemed feasible (but not analogous to the process used in determining the learning differences between group (O) and group (1)) to obtain the critical ratio between the separate learning variables. This will serve as a rough index of the probability of chance differences between

score	f	cum f	%	f	cum f	%
90-99	11	73	100	75	503	100
80-89	13	62	84	79	428	85
70-79	13	49	67	53	351	69
60-69	9	36	49	53	298	59
50-59	7	27	37	57	245	48
40-49	9	20	27	37	188	37
30-39	7	11	15	57	151	30
20-29	3	4	5	43	94	19
10-19	1	1	1	38	51	10
0-9				12	13	3

N = 73

$M = 65.56$
$\sigma = 21.99$

N = 503

$M = 58.84$
$\sigma = 27.01$
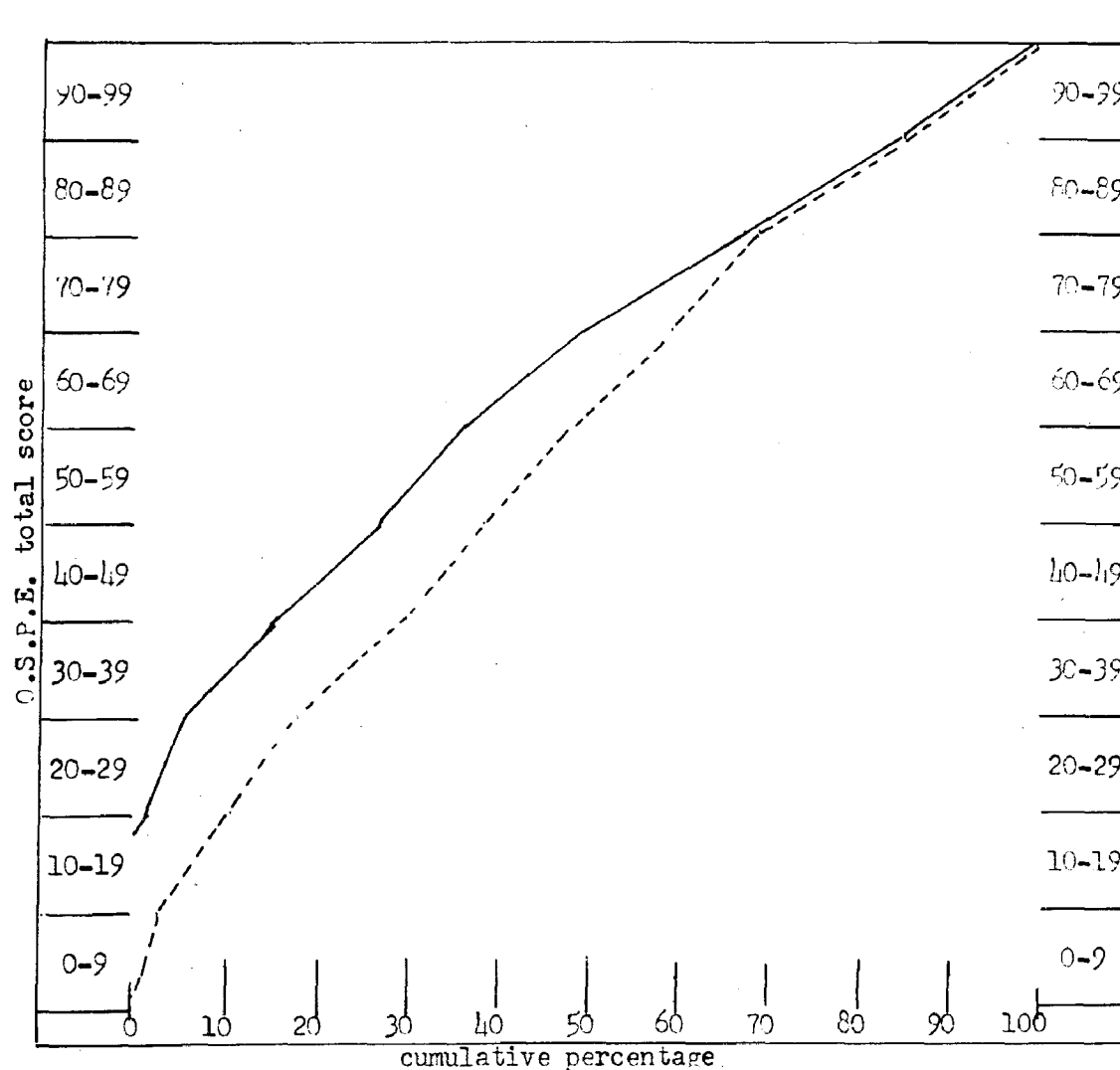
GRAPH VI

CUMULATIVE PERCENTAGE CURVE REPRESENTING O.S.P.E. TOTAL SCORE
DISTRIBUTIONS FOR EXPERIMENTAL GROUPS AND 503
GRADUATES IN ELEMENTARY EDUCATION

	f	cum f	%		f	cum f	%
90-99	13	73	100		62	503	100
80-89	10	60	82		68	441	88
70-79	11	50	68		66	373	74
60-69	5	39	53		51	307	61
50-59	14	34	47		41	256	51
40-49	8	20	27		56	215	43
30-39	5	12	16		41	159	32
20-29	5	7	10		53	118	23
10-19					41	65	13
0-9	2	2	3		24	24	5

cumulative percentage

GRAPH VII
CUMULATIVE PERCENTAGE CURVE REPRESENTING O.S.P.E. READING SCORE
DISTRIBUTIONS FOR EXPERIMENTAL GROUP AND 503
GRADUATES IN ELEMENTARY EDUCATION

$N = 73$

$M = 63.59$
$\sigma = 23.92$

$N = 503$

$M = 56.07$
$\sigma = 27.72$
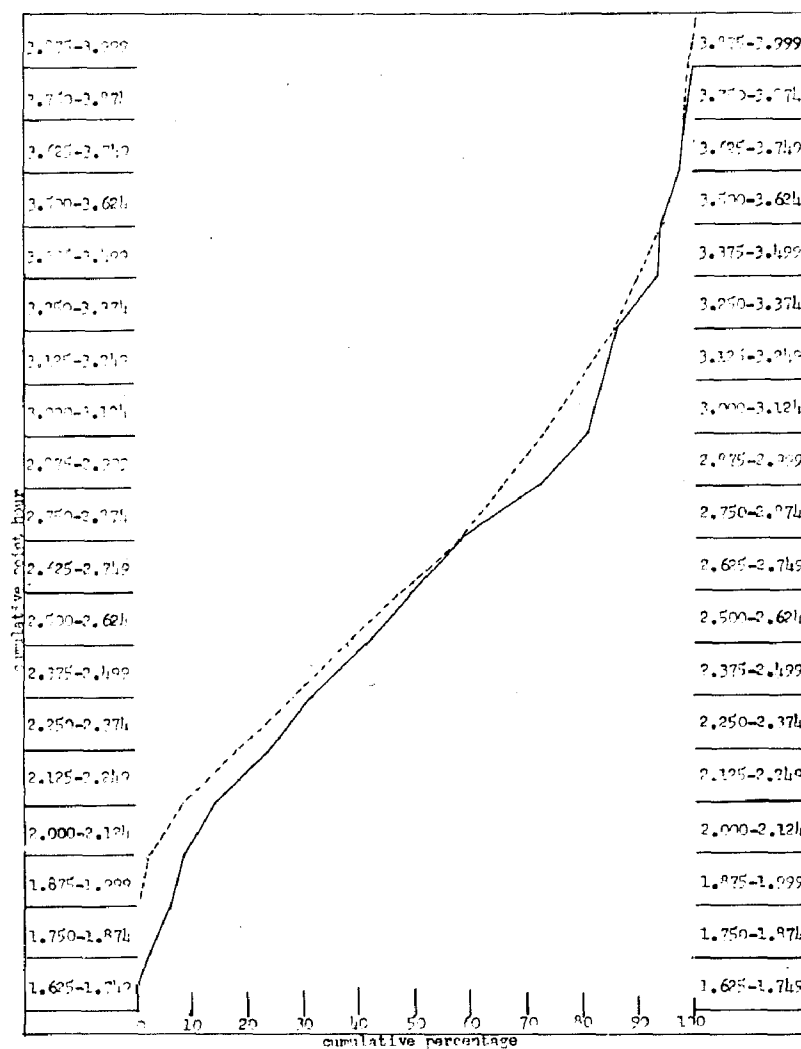
GRAPH VIII
CUMULATIVE PERCENTAGE CURVE REPRESENTING CUMULATIVE POINT HOUR
DISTRIBUTIONS FOR EXPERIMENTAL GROUPS AND 503
GRADUATES IN ELEMENTARY EDUCATION

Interval	f	cum f	%	f	cum f	%
3.875-3.999				3	503	100
3.750-3.874	1	73	100	4	500	99
3.625-3.749	1	72	99	6	496	98
3.500-3.624	2	71	97	14	490	97
3.375-3.499	1	69	95	24	476	95
3.250-3.374	5	68	93	24	452	90
3.125-3.249	2	63	86	29	428	85
3.000-3.124	2	61	84	36	399	79
2.875-2.999	6	59	81	32	363	72
2.750-2.874	10	53	73	43	331	66
2.625-2.749	7	43	60	50	288	57
2.500-2.624	6	36	49	51	238	47
2.375-2.499	7	30	41	47	187	37
2.250-2.374	6	23	32	52	140	28
2.125-2.249	7	17	23	50	88	18
2.000-2.124	4	10	14	30	38	8
1.875-1.999	2	6	8	8	8	2
1.750-1.874	3	4	5			
1.625-1.749	1	1	1			

N = 73   N = 503

M = 2.631   M = 2.716
σ = .474   σ = .453

the total sample and the larger population. The computed critical ratios between the 73 and 503 students in regard to O.S.P.E. total score and reading score were 2.70 and 2.39 respectively. A ratio of 1.44 existed between the cumulative point hour ratios of the two groups. Both the O.S.P.E. total scores and reading scores have reached the 5 per cent level of significance. From these estimates of probability it would seem that the differences, between the identified groups with respect to three measured variables, is greater than random sampling would suggest.

Available norms for juniors and seniors on the M.T.A.I. were plotted on graph IX. It was surprising that the experimental group (numbering 73 juniors and seniors) would so nearly approximate a half-way position between the two norms.

Although not essential to the identification of the sample population a cumulative point hour comparison proved to be interesting. In a study made by Stover and Wooster in January 1954, the mean cumulative point hour for juniors in the College of Education was 2.6. The mean for the seniors was 2.7 during the Fall Quarter of 1953.[2]

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[2] W. W. Stover and Wooster, "Statistics for College of Education Students: Autumn Quarter 1953." Unpublished Report, January, 1954.
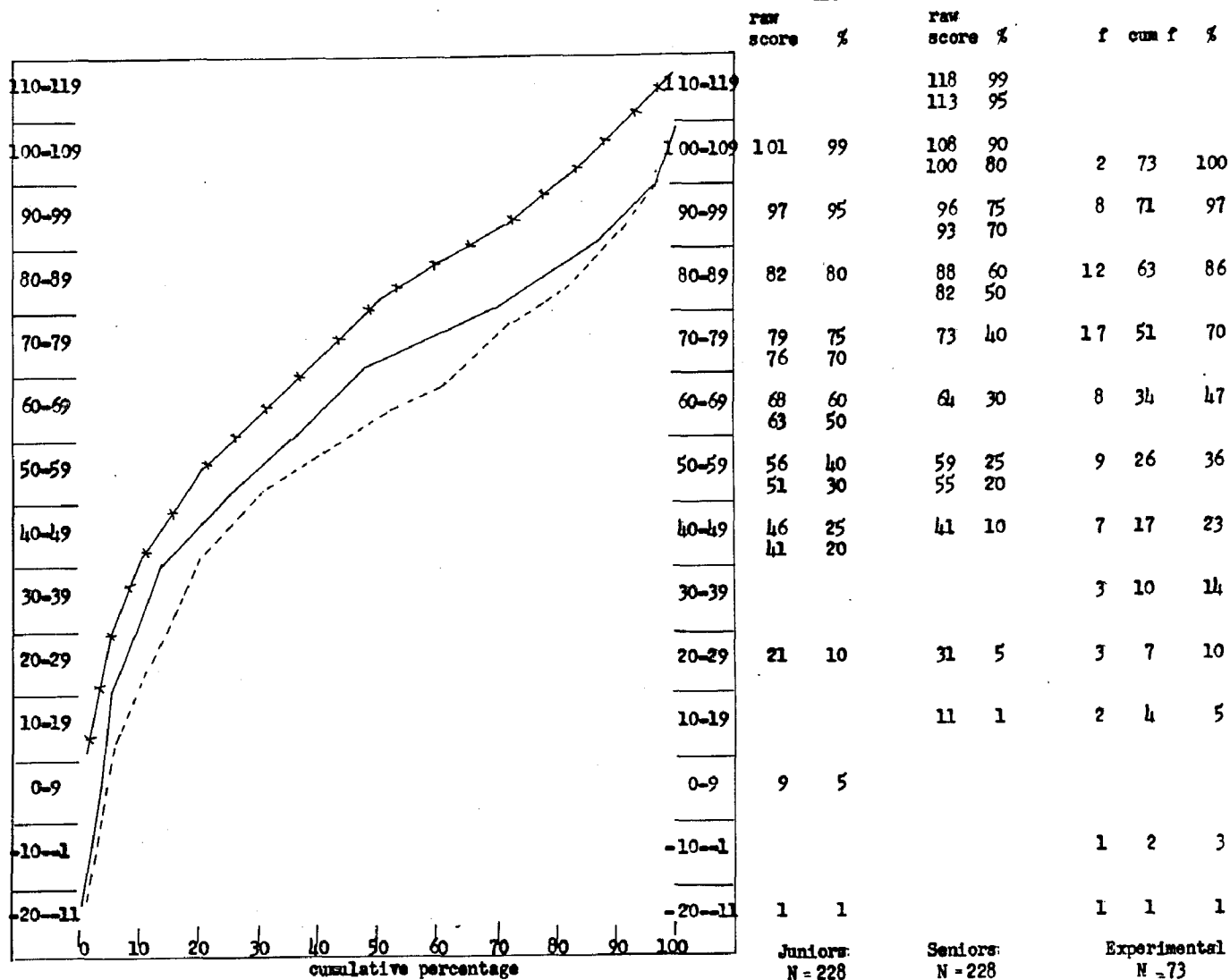
GRAPH IX
CUMULATIVE PERCENTAGE CURVE REPRESENTING M.T.A.I. SCORE
DISTRIBUTIONS FOR EXPERIMENTAL GROUPS AND NORM

band	raw score	%	raw score	%	f	cum f	%
110-119			118	99			
			113	95			
100-109	101	99	108	90			
			100	80	2	73	100
90-99	97	95	96	75	8	71	97
			93	70			
80-89	82	80	88	60	12	63	86
			82	50			
70-79	79	75	73	40	17	51	70
	76	70					
60-69	68	60	64	30	8	34	47
	63	50					
50-59	56	40	59	25	9	26	36
	51	30	55	20			
40-49	46	25	41	10	7	17	23
	41	20					
30-39					3	10	14
20-29	21	10	31	5	3	7	10
10-19			11	1	2	4	5
0-9	9	5					
-10--1					1	2	3
-20--11	1	1			1	1	1

Juniors
N = 228
- - - -
M = 59.5
σ = 26.3

Seniors
N = 228
x x x x
M = 77.4
σ = 24.7

Experimental
N = 73
————
M = 64.75
σ = 25.31

This would tend to indicate that the sample group (73) with a mean of 2.63 had achieved about average performance ratings. The mean cumulative point hour for graduating seniors and for the entire university and those for the College of Education was 2.5+.[3] The above figures revealed that both the 503 recent elementary graduates and the sample population had a favorable cumulative point hour when compared to the entire university population or to the College of Education population.

From the preceding identification of the sample population it would appear that the randomized control method of selecting and describing sample populations was a rather logical approach for avoiding bias and obtaining a representative group of experimental subjects. The graphical and statistical descriptions lead one to infer that group (0) and group (1) did not differ significantly with references to the selected learning variables. The total experimental group (73) was representative to a degree of a cross section of prospective elementary teachers. However, the experimental results should be generalized for the larger student population with caution.

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[3] Annual Report of the Registrar and University Examiner. The Ohio State University 1955-56 p. 71; 1956-57 p. 69; 1957-58 p. 54.

Development of the Criterion

Perhaps no aspect of the investigation is more funda-
mental than the development of the criterion. In educa-
tional experimentation the criterion represents the educa-
tional objectives against which behavioral growth is to be
evaluated. It would be impossible to compare two methods
of teaching until the desired outcomes have been formulated.
The outcomes serve as an index for determining the relative
efficacy of each method.

The ultimate criterion of an educational experiment
is to be sought in the aims of education themselves. Such
aims are usually stated in broad general terms not amenable
to immediate evaluation. It becomes necessary for the re-
searcher to set up more direct and immediate criteria if
the experiment is to proceed. The educational objectives
of Education 517 should contribute to the immediate goal
of teacher education; namely, the development of teacher
competency. If the definition of competency in chapter II
is accepted, the ways of behaving that we expect elementary
teachers to develop in realizing the goals of social educa-
tion become the educational objectives of the course. These
objectives were the direct criterion in the experiment.
This researcher attempted to develop a criterion which de-
fined unit teaching in the form of specific behaviors. The
degree to which prospective teachers became capable of

performing these behaviors was evidence that the objectives had been achieved. The development of the criterion was treated in two phases; the process by which it emerged, and the product or actual statement of teaching behaviors.

An inspection of applicable literature (chapter III) diminished any hope of securing a validated listing of desirable unit teaching behaviors. Yet, insight was added as to how other researchers had attempted to solve the problem of identifying effective teaching behaviors. As noted previously, the critical incident technique involving an appreciable amount of classroom visitation by qualified observers was frequently the basic research tool.

The proposed schema for obtaining and listing unit teaching behaviors indirectly used the method of classroom observation. The writer planned to observe through the literature the recalled unit teaching experiences of teachers on the job. An inherent tenet of this plan presupposed that teachers who wrote up unit experiences voluntarily had felt some degree of satisfaction in this method of teaching. It was further assumed that this voluntary written evidence of teacher satisfaction had a positive relationship to teacher effectiveness. It is true that an outside observer visiting these same classrooms may have recorded similar or dissimilar accounts of teaching behaviors. However, it was reasoned that the actual teacher

participant would be more cognizant of effective teaching behaviors than an observer making reports from short term visits.

The numerous references to units of work in the Bureau of Educational Research library file became the starting point and most profitable resource for procuring descriptive accounts of unit teaching. As a supplement to teachers' narrative statements, the written expression of educators in the field lent balance and support to this approach of identifying behaviors. As a basis for establishing these teaching behaviors, the literature over the last 20 years was surveyed with chiefly one question in mind--what does the classroom teacher observably do in making the unit procedure tick. For the purpose of this investigation, teaching behaviors were interpreted to mean external, overt behaviors rather than inward beliefs, attitudes, or perception.

Realizing that the selection and classification of criterion behaviors denoted the judgments of one person, the writer attempted to validate his opinions by means of a panel of practitioner teams. The team approach was selected with the expectation that two qualified persons thinking together about the same problem would arrive at a more valid judgment than one person reacting alone. Each team was composed of a principal or supervisor plus a

teacher who was judged by the principal or supervisor to be an effective unit teacher. The five supervising principals in Columbus, a Bexley principal, an Arlington principal, a county supervisor and eight elementary teachers constituted the total panel of eight teams. In terms of sheer numbers the panel may appear small. More attention was focused on obtaining personnel well qualified to react from the practitioner's point of view. The above panel possessed several characteristics that might qualify the value of its thinking: (1) all members have frequent opportunity to observe and experience unit teaching; (2) all members are considered experts in teaching; (3) all members received preliminary instruction before rating the behaviors. The behaviors were judged according to the following relative scale:

1. Critical - This behavior is necessary for the success of the on-going unit to the degree that its absence blocks unit progress.

2. Desirable but not critical - This behavior contributes to successful unit teaching to the degree that its absence influences but does not block unit progress.

3. Questionable - This behavior is doubtful as to
its effect on successful unit
teaching to the degree that its
absence does not influence the
progress of the unit.

The tabulated questionnaire (Appendix A) showed
that a large proportion of the teaching behaviors were
judged critical or desirable. An opportunity was provi-
ded for the evaluators to add behaviors to each category.
In as much as no additional behaviors were suggested, it
might be assumed that the original listing was rather com-
plete. Thus the process involved in establishing the cri-
terion was one of reviewing the recalled experiences of
teachers and thinking of educators, selecting and classi-
fying unit teaching behaviors, and securing the reactions
of qualified personnel to the identified behaviors.

The development of criterion implies not only the
process by which the criterion emerged but also the product
or the defining of unit teaching in terms of teaching
behaviors.

In the last quarter of a century the unit approach
has evolved from its original form as a scheme of subject
organization to a fairly well defined method of teaching.
Writers tended to refer to the unit approach as including

both an organization of experiences and a method of im-
plementation. Even though opinions and definitions differ
semantically, there appeared to be common features and
thinking about the unit approach. In general the unit
approach involved

1. an organization and selection of a variety of
    learning activities which are focused on a
    socially significant understanding or life
    centered problem.

2. the creating of learning situations in which
    children experience democratic social behaviors,
    such as working together, respecting the
    opinions of others, accepting and carrying
    our responsibilities, and creatively solving
    of problems.

3. the involvement of pupils and teacher in con-
    tinuous and cooperative planning and evaluation.

4. a flexible developmental procedure which has
    unity and involves the sequential phases of
    the group problem solving process - orienta-
    tion, research, generalization.

5. problem solving which cuts across subject
    matter lines and requires a large block of
    time. Content is considered significant as
    a tool in the solution of the problem.

6. the utilization of natural drives (i.e., to
    construct, to communicate, to satisfy curiosity)
    and the recognition of individual differences.

This method of teaching requires positive, effective
leadership by the teacher. The leadership role of the
teacher may be evidenced in teaching behaviors which are
related to successful unit teaching. Teaching behaviors
might imply teacher-pupil relationships, such as sense of

humor, fairness, initiative, sympathy, and courtesy. Research recognizes and accepts these behavior traits as essential to successful teaching. However, in developing desirable unit teaching behaviors, the attention was focused more toward behaviors related to methodology governing unit procedure and development than toward the personality factors related to teaching effectiveness. Desirable unit teaching behaviors were not unique to this method of instruction. Rather they are operative in what might be termed "effective teaching." What is the difference between unit teaching and effective teaching if the teaching competencies are relatively the same? The unit approach involves an organization of experiences around a life centered problem or significant social understanding which involves the group problem solving process. To implement this group process, teaching behaviors are not randomly operative but tend to occur in a sequential pattern. This organization of teaching behaviors into a sequential pattern becomes an instructional procedure which might be called the unit teaching method. This does not assume that all unit teaching is effective teaching nor that all effective teaching is unit teaching. It merely suggests that the unit approach is unique in that the teaching behaviors occur in a sequential pattern which may or may not be the case in effective teaching.

Lists of outcomes in terms of behaviors can become lengthy, repetitive, and difficult to handle unless they are organized into some pattern or classification. It appeared logical to choose a scheme or classification which revealed interrelationships and focused upon the sequential development of the group problem solving process involved in unit teaching. Selection and initiation, developmental phase, and culmination became the three operational classifications for the teaching behaviors. In addition to the three operational classifications of unit progression, there seemed to be continuous teaching behaviors which re-occurred in every phase of unit teaching. Teaching competencies related to cooperative planning and evaluations reoccurred with noticeable frequency. Thus the following framework for classifying the behaviors included the three developmental phases of this method plus the continuous teaching competencies involved in cooperative planning and evaluation. A brief overview of each sequential phase of unit teaching will proceed the observable unit teaching behaviors and is intended to lend orientation to the role of the teacher.

I. Teaching Competencies Related to the Selection and Initiation of the Unit. This initial phase of unit teaching involves a process of orientation and exploration for the

teacher and children. New interests and concerns are identified and explored both individually and by the group. Cognizant of the curricular framework within which she works and aware of child growth and the learning process, the teacher is in a position to actively participate in the selection of a group study. Methods of choosing a unit vary, but there seems to be a trend toward pupil-teacher selection within a flexible curricular framework. During the exploration and initiation, the teacher stimulates interest by arranging the environment and by providing common experiences out of which problems emerge and effective planning proceeds. The teacher and the children co-operatively set up objectives or goals toward which they strive in undertaking the study. The identification of the children's questions and the stating of unit objectives bridge the gap between the initiation and the developmental phase of the unit. The teacher—

1. Arranges the environment to motivate interest and curiosity:
    a. makes displays effective and attractive and draws attention to them through discussion
    b. stimulates interest in several possible problem areas yet avoids confusion
    c. keeps possible problem areas within the maturity level of the children
    d. relates children's present interest to previous experiences
    e. arranges for common exploratory experiences and the setting in which exploratory thinking and sharing takes place
    f. uses audio-visual techniques to stimulate interest
    g. provides for more than verbal participation

2. Enriches personal and professional background:
    a. investigates and lists background experiences
       which the children have had through discussions
       and examination of school records
    b. makes an overview of the subject matter which
       might enter into the study, the kinds of ex-
       periences which might be enriching and the ways
       in which different subjects might be used
       effectively in the unit
    c. checks school and community resources for
       learning materials
    d. lists books and materials for pupil and
       teacher reference
    e. acquaints himself with the community through
       personal investigation
    f. reads appropriately in order to develop
       background understandings
    g. builds a file of resource materials

3. Participates in the selection of the unit:
    a. follows the agreed upon procedures of the
       school faculty
    b. tries to ferret out children's interests by
       recording their repeated questions and other
       indications of interest
    c. guides children in the development of criteria
       for the selection of the study
    d. coordinates thinking and action of the group
       for orderly progression toward final selection
    e. participates in the choice of the unit so the
       children will not be attempting to solve problems
       which are beyond them or using materials which
       will not be satisfying
    f. considers possible ways to initiate the unit

4. Helps the group to identify questions and objectives:
    a. records the group's questions on which information
       is needed and keeps available
    b. groups the questions into related sub-topics of
       the main problem
    c. leads the pupils to define their own objectives
    d. states desired outcomes in terms of behaviors and
       in the language of the pupils
    e. thinks through a tentative outline of the unit -
       assembles the sub-topics and analyzes materials
       in a tentative sequence of experiences

II. <u>Teaching Competencies Related to the Developmental</u>

<u>Phase of the Unit.</u> Research and expressional activities

appear to be inseparable and to receive special considera-

tion in this phase of unit progression. The research pro-

cess involves conscious searching of both pupils and

teacher in an effort to find answers to their questions.

Broadly interpreted, research includes the use of the

community, resource people, realia, children's daily ex-

periences, reading materials, and audio-visual materials.

The expressional activities become means of visually and

audibly representing the information that has been gathered

during the research experience. Socially useful work, ex-

perimentation, verbalization, dramatic expression, con-

struction, and aesthetic activities indicate a possible

range of activities. A degree of research normally pre-

cedes any activity. However, it might be thought of as a

circular process with research leading to expressional

activities and activities requiring further knowledge.

The teacher--

1. Exercises leadership in the organization and function-
   ing of committee or group:
   a. adjusts the degree of committee organization to
      the maturity level of the group
   b. guides committee organization in terms of
      interests, class structure, and the job to be done
   c. makes a chart of the final committee organization
   d. helps the group to establish and record desirable
      committee behaviors
   e. develops group standards to guide the use of
      tools, materials and space

    f. helps each committee or individual to become
       aware of its relation to the solution of the
       main problem or understanding
    g. works with individuals and with groups by
       circulating from group to group
    h. provides for group mobility and the best place
       for the various groups to work keeping in mind
       the kind of activity, number of children in
       each group, personnel of each group, and the
       location of materials and equipment in the room
    i. makes a tentative schedule for committee reports
      early and keeps available

2. Plans for and provides numerous research experiences:
    a. organizes research experiences into whole group,
      committee and individual situations
    b. maintains a balance between the various types
      of experiences
    c. pre-plans for each research or activity period
    d. plans ample time to do research
    e. helps the class to become aware of various
      sources of information
    f. uses a variety of learning materials - blackboard,
      bulletin board, radio, reference books, magazines,
      newspapers, models, and others
    g. encourages and directs children in searching out
      research materials
    h. reviews study skills previously learned and
      teaches those skills needed to use reference
      material effectively
    i. checks reading material to determine new terms,
      concepts, and shifts in word meaning that may
      cause difficulty for the group
    j. prepares children to read specific reading
      material by: giving attention to new terms,
      social concepts, complex understandings, names
      of strange places, and the relationship of
      reading to other experiences
    k. diagnoses skill difficulties and plans periods
      for purposeful guidance and practice
    l. facilitates contacts of group leaders and pupils
      working on individual projects with special
      subject teachers, parents, and directors of
      community agencies
    m. selects audio-visual materials that will contri-
      bute most to the study under progress, orders
      materials in time, previews learning material,
      shows at the time in the unit when the need arises,

makes arrangements for necessary equipment,
helps the children to know the reason for
using the material and what to look for or
listen for, arranges the physical environ-
ment, and plans for follow-through

n. plans for educational trips; takes the trip
before the children, makes adequate arrange-
ments, makes the purpose of the trip clear to
the children, provides sufficient adult super-
vision, and guides an appropriate follow-
through activity

3. Personally participates as a member of the group in the
research process:
   a. takes an active part in the process of getting
   answers
   b. assumes responsibility for the whole group research
   c. records information from dictation - in the early
   elementary and occasionally in the later elementary

4. Provides for individual differences:
   a. provides for individual and group guidance in
   research and expressional activities
   b. provides for a wide range of reading ability
   and interests
   c. adapts materials and uses teacher prepared
   materials
   d. secures audio-visual resources for those who do
   not use printed materials effectively

5. Guides expressional activities:
   a. watches for educational possibilities in the
   activities suggested by the children and capi-
   talizes on their contribution
   b. makes sure that suggested procedures and activi-
   ties are feasible for the ages of the children
   and likely to result in the attainment of the
   purposes
   c. anticipates and has accessible materials for re-
   search and expressional activities before committee
   work begins to avoid congestion and to promote
   effective utilization
   d. provides a variety of materials
   e. checks on the economic use of materials
   f. checks on the safety of the tools
   g. keeps the activity period within productive
   time limits
   h. stops the work period in order to allow adequate
   clean-up time

i. is alert to opportunities for children to express
   themselves in the aesthetic arts
j. encourages creativity, provides new materials,
   provides a relatively tension free atmosphere,
   provides many sensory and research experiences,
   provides ample time for expression, exhibits
   appreciation for the efforts of children, ex-
   periences the creative process with the children

III. <u>Teaching Competencies Related to the Culmination</u>

<u>of the Unit</u>. In this final phase of unit teaching the

teacher is concerned with the organizing and reporting of

information, the formulating of generalizations, and the

possible sharing of learnings. The culminating activity

may be a matter of reporting within the class. It might in-

clude the sharing of the unit with parents or another class.

Regardless of the nature of the culminating activity, it

should be representative of the total learnings from the

unit experience and help parents to understand the value

of this method of teaching. The teacher--

1. Coordinates the reporting efforts of the children:
   a. suggests a variety of ways to report information
   b. helps the children to pool information from a
      variety of sources
   c. helps committees to organize and prepare reports
   d. checks the accuracy of the facts to be presented
   e. relates the sub-problems to the over all unit
      problem
   f. cooperatively selects from group presentations
      facts for which the whole class is responsible

2. Coordinates shared activity:
   a. arranges for the most appropriate time to
      present the report or shared activity
   b. assists the children in exhibiting their work
   c. emphasizes sharing and communicating ideas
      rather than putting on a "show"
   d. prepares the audience for effective listening

IV. <u>Continuous Teaching Behaviors Related to Cooperative</u>

<u>Planning</u>. Throughout the unit some teaching behaviors are

continuous and vital to each phase of unit progress.

These reoccurring behaviors tend to group themselves

chiefly into the areas of cooperative planning and evalua-

tion. In its simplest form cooperative planning means

that the pupils and teacher together develop plans and

purposes for their experiences. Cooperative planning does

not imply that the teacher relinquishes her responsibility

for planning. In reality the teacher pre-plans and gives

guidance in cooperative planning by becoming an active

participant in class discussions and decisions. This in-

volvement of the student in planning is rather typical of

unit teaching. It represents an attempt to achieve demo-

cratic behaviors through democratic procedures. The

teacher--

1. Establishes rapport with the children:
    a. creates a permissive atmosphere in which various
       sides of an issue are voiced and considered
       before any decision is reached
    b. encourages every child to participate
    c. respects the contribution of every child
    d. discourages arguments but respects individual
       differences
    e. helps children give and accept suggestions
    f. provides opportunity for the children to make
       choices within their maturity
    g. respects groups decisions

2. Promotes and participates in group thinking:
    a. provides time for cooperative planning
    b. recognizes readiness for cooperative planning

c. begins cooperative planning in small areas
and in areas that the children are competent
to plan
d. limits the length of discussions realistically
in terms of the developmental level of the
children
e. stimulates pupil thinking through questions
f. keeps individual contributions to the point
g. relates individual contributions to the group
thinking
h. suggests teacher noted needs at appropriate
points and related to children's comments and
questions
i. helps the children to define their role in
planning: helps each member to understand the
importance of accepting responsibility for
leadership and followership at appropriate times
j. guards against keeping leadership functions
which the children can assume: at the same time
she directly takes leadership responsibility
in those areas of experience where the maturity
of the children is not sufficient to warrant
their assumption of leadership - assumes and
shares leadership
k. uses chalkboard and charts to record the main
agreements in planning so as to avoid misunder-
standings and as a basis for further group action

3. Uses cooperative planning to foster group goals and
objectives:
a. uses previous evaluation as the basis for
cooperative planning
b. makes sure that the purposes and goals of the
discussion are clear to the children
c. assumes responsibility to point out possibili-
ties, resources, and limitations within which
they are working, that might otherwise be
overlooked
d. keeps the discussion moving steadily toward a
solution of the problem
e. plans with the children in such ways that they
are responsible as a group for putting their
plans into action

V. <u>Continuous Teaching Behaviors Related to Evaluation.</u>

No longer is evaluation thought of as the "culminating

activity" in instruction. Evaluation is the process of

determining the extent to which the stated objectives are being achieved. This statement involves a continuous evaluative cycle including: the setting up of objectives in terms of behaviors, the selecting of experiences and materials to attain these goals, the providing of experiences where desired behaviors may be observed, the selecting of evaluative techniques, the noting of behavior, the analyzing of the data in terms of the objectives, and the planning for further growth or the revising of the objectives. Evaluation has three distinct dimensions; it is usually cooperative, continuous, and comprehensive. Its cooperative dimension implies that the pupil and the other persons concerned with his growth are involved in this process. Evaluation is comprehensive in scope and method. This evaluative process should include judgments about the progress of the pupils in the elementary school toward all the goals which may be regarded as important. Such evaluation seeks many evidences of growth through a variety of procedures. The teacher--

1. Follows an evaluative cycle:
   a. evaluates in terms of stated behavioral objectives
   b. consciously creates situations where desired democratic behaviors can be observed
   c. selects the evaluation technique in relation to the behavior being evaluated
   d. uses evaluation as the basis for pre-planning, selecting of materials, and clarifying the needs of individual children - establishes needs as to next steps in unit and individual progress

e. uses frequent discussion of the elements of
   good committee work
f. uses frequent reporting of group progress to
   the whole group
g. keeps notes and records of the unit as it
   progresses to get a picture of the total program
h. observes and makes anecdotal records - children's
   remarks and behaviors are frequently the best
   source of evidence regarding growth
i. keeps children's work in individual folders
j. keeps a record which will show the abilities
   developed by the children and the opportunities
   in which each shared

The defining of the unit teaching behaviors in the
preceding criterion was not intended to be a prescription
that could result in conformity and inflexible classroom
procedures. Rather this approach was to be suggestive of
an overarching sequential framework which should be adjusted
to each teaching situation within which the teacher is free
to exercise resourcefulness and ingenuity. Different teach-
ing behaviors will receive shifting emphasis as the teaching
situations vary and change. Unit teaching refers more to
a teaching learning cycle than to a rigid teaching formula
or to an opportunistic concept of teaching. The process by
which the criterion was developed may provide a valid basis
for asserting that the desired outcomes are a representa-
tive range of unit teaching behaviors.

Differentiation Between Two Methods of Teaching

The differentiation of instructional procedures has
continuously plagued experimental researchers. This

pedagogical situation was pointed out in the general observations following the exploration of the literature (chapter III). As noted earlier, researchers have been prone to interpret method from a profusion of viewpoints. Internal consistency within or between the several approaches seemed to be lacking. In some instances, more labels were applied to the teaching process without clarifying the actual procedures in the classroom situation. Nevertheless, when the purpose of the proposed experiment is to evaluate two methods of teaching, the researcher becomes obliged to react to this instructional conundrum in such a way that potential likenesses and differences between proposed teaching procedures are functionally delineated.

Methods of teaching might be declared scientific on the grounds that they stemmed from certain accepted theories of learning. Upon the investigation of authoritative thinking in regard to theories of learning, there emerged a disposition among psychologists and educators to condemn an either-or-type of thinking about contrasting schools of psychology. Instead of supporting polar viewpoints, a spirit of eclecticism and rapprochement was endorsed. This generalization can be sustained by a sampling of educational writers. The summary observations of Ernest Hilgard in his monumental <u>Theories</u> <u>of</u> <u>Learning</u> were made by him after considerable study in the psychology of learning:

While the state of knowledge is not therefore as bad as the parade of points make it out to be, it is still rather unsatisfactory. There are no laws of learning which can be taught with confidence. Even the most obvious facts of improvement with practice and the regulation of learning under reward or punishment are matters of theoretical dispute.[4]

A generally satisfactory theory of learning awaits a set of concepts which will be appropriate to all that is known about learning.[5]

William Burton recognized that various schools of psychology are not mutually exclusive. Each approach makes a contribution to our understanding of the learning process:

The various schools of psychological thought, however, are not mutually exclusive, nor should they be set so sharply in opposition to each other as some writers set them. Each school represents one effort by a given group of psychologists to derive facts concerning mental operations. Each makes a contribution to the total field. Conditioning, associationism, connectionism, the several field-theory interpretations (organsmic, gestalt, topological) are each an honest effort to state the facts of psychology.[6]

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[4] Ernest Hilgard, *Theories of Learning* (New York: Appleton-Century Croft Inc., 1956), p. 457.

[5] *Ibid.*, p. 458.

[6] William Burton, *The Guidance of Learning Activities* (New York: Appleton-Century Croft Inc., 1944), p. 211.

A plea for open-mindedness and acceptance of concepts from each theory that are vital to current educational thinking was the thesis of Gates:

> An open-minded comparison of stumulus-response views with field theories and with various formulations of the conditioned response ideas, make it obvious that the apparent effect of some students of education to somehow find which schemes are "all wrong" and which are "all right" is a pointless enterprise. When an educator declares, "I reject the 'atomistic' or 'mechanistic' conception and accept the 'organismic' or vice versa," he is probably merely making a display of superficial understanding of what these terms really mean. The practical difference between the most of these "systems" of psychology has been exaggerated beyond all reason. Some of them, for example, not only harmonize with, but contain many vital suggestions for further improvement of the best and most progressive forms of education now in existence.[7]

In developing a dynamic theory of learning Gertrude Hildreth acknowledged that rival learning theories were somewhat complementary and insufficient alone.

> In an effort to clarify the situation it seems worth noting that some of the differences between rival theories are more apparent than real: the theories to some extent prove to be complimentary rather than mutually exclusive.[8]

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[7] Arthur Gates, The Psychology of Learning, Forty-first Yearbook of the National Society for the Study of Education, Part II (Bloomington, Ill.: Public School Publishing Co., 1942), pp. 163-164.

[8] Harold Shane (ed.), American Elementary School, Thirteenth Yearbook of the John Dewey Scoeity (New York: Harper and Brothers, 1953), p. 36.

> An analysis of rival theories suggest that
> each has something to contribute to a better
> understanding of childhood learning, but that
> no one theory alone is sufficient to account
> for all the ways in which children may learn.[9]

Arthur Melton like Gertrude Hildreth did not adhere

to any one of the popular systems of psychology in his

article in the Encyclopédia of Educational Research.

Melton referred to his approach as associationistic func-

tionalism.[10]

The spirit of rapprochement among the advocates of

the several learning theories was developed historically in

Walter Monroe's classic contribution--Teaching Learning

Theories and Teacher Education 1890 to 1950.

> A spirit of rapprochement has emerged in the
> psychology of learning.[11]
> The frequent references in recent educational
> writings, especially around 1940, to disagreements
> between the Progressives and the Essentialists
> suggest the recognition of two opposing teaching
> theories. It is, however, the considered judgment
> of the present writer that the disagreements are
> actually fewer and less significant than an

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[9] Ibid., p. 54.

[10] Walter S. Monroe, Encyclopedia of Educational Research (New York: Macmillan Co., 1952), p. 668.

[11] Walter S. Monroe, Teaching-Learning Theory and Teacher Education 1890 to 1950 (University of Illinois Press, 1952), p. 155.

uninformed person would infer; some of the
apparent disagreements are essentially verbal,
some stem from comparisons with "straw men" and
others are differences in relative emphasis.
In so far as the directing-learning-activities
and guiding-pupil-experiencing views are iden-
tifiable as distinctive theories of learning,
the present trend appears to regard them not
as opposing positions but rather as complemen-
tary aspects of a common theory.[12]

The writers in the above sampling tended to suggest

rather emphatically that the prevailing status of the

learning process may be appropriately characterized as

being embued with a spirit of eclecticism and rapproche-

ment. Although the teaching-learning process has been the

topic of extensive psychological and pedagogical research

and debate, knowledge about the actual process of learning

is limited. It became rather obvious that an attempt to

base method on theoretical concepts of two rival schools

of psychology would be inconsistent with current thinking.

At the same time such an approach would be rather

presumptuous on the part of the investigator for several

reasons. First, it would be most difficult to establish

specific tenets of opposing positions and then to trans-

late theory into teaching procedure without some over-

lapping of procedures. Second, it is beyond the scope of

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[12] Ibid., pp. 159-160.

this experiment and experimenter to develop and compare widely divergent learning processes. Third, current thinking has indicated that effective teaching is not limited to one learning approach. It would be hazardous and limiting to imply that unit teaching coheres to one learning theory exclusively.

Now the investigator must encounter the next logical query--can a method of instruction have its moorings in any other direction except in psychological foundations? Probably it would be possible to say that there are two complementary approaches to pedagogical procedures. Common sense dictates that teaching methods cannot be divorced from what research suggests as to the nature and process of learning. Even though an eclectic position is defensible, the formulation of accepted learning principles is essential for the skeletical development of teaching method. The subsequent learning generalizations are not unique to this investigator. The phraseology used to express the generalizations, manifests a residue from reading and experience, a spirit of rapprochement, and a proving ground for further experimentation.

1. Learning is an active process which involves the interaction of the learner and his environment. Active participation is preferable to passive reception.

2. Learning is more effective when motivated by goals which are intrinsic to the activity and to the learner. A motivated learner acquires what he learns more readily than one who is not motivated.

3. Individuals need experience in setting realis-
   tic goals for themselves - purposing is an
   integral part of learning.
4. Information about the nature of good perfor-
   mance, knowledge of his own mistakes, and
   knowledge of successful results, aid learning.
5. The whole learner is the reactive agent.
6. Understandings are most effectively developed
   as unified wholes. Meanings should precede
   practice. There is probably no substitute
   for repetitive practice in the learning of
   certain skills (playing piano, and manipula-
   tive skills) or in memorization of unrelated
   facts.
7. Transfer in new situations will be higher if
   the learner has experienced a similar situa-
   tion and has discovered certain relationships
   and generalization for himself.
8. A significant type of learning in a democratic
   society is characterized by problem solving
   (reflective thinking) rather than mechanical
   habit formation.

Thus one approach would suggest that in the final

analysis a method of instruction should inevitably reflect

some accepted principles of learning.

Implied in the other approach to the challenging

inquiry was the assumption that a method of teaching can

be oriented toward the achievement of the desired outcomes.

It was assumed (page 23) that education is for the purpose

of changing behavior toward merited outcomes. A method of

instruction was clarified as an orderly procedure for

approaching the teaching-learning process for the attain-

ment of the desired goals (page 24). Since unit teaching

behaviors were the ascribed educational objectives it

became necessary to devise two orderly procedures for

obtaining the stated objectives within the framework of
how learning or behavior changes are fostered. The master
key utilized in removing the thought barriers, which had
blocked methodological differentiation, was suggested in
the recurring maze of questions (page 3). Several relevant
questions bear restatement at this point. Will conven-
tional instructional methods promote operational objectives?
Does directness of experience in a professional course
directly influence teaching behaviors in the elementary
classroom? On the college level, does a transfer of desir-
able outcomes from the college classroom to the elementary
classroom result from the building of positive attitudes
toward the behavior through vicarious experiencing or
through the direct experiencing of the outcome?

The basic difference between the two methods may
be referred to as the directness of experience provided for
the achievement of the desired teaching competencies.
Group (O) experienced more indirect experiences in which
the instructor built positive attitudes toward certain unit
teaching behaviors through lectures and limited class dis-
cussions. Group (1) was directly involved in the unit
approach which gave the students an opportunity to develop
a unit and to observe unit teaching behaviors of the in-
structor. Even though the instructional activities in the
two sections had marked differences, certain constant

factors existed. The educational objectives, reference materials, and situational test were consistent in both sections. The two methods became more sharply focused when differentiated in terms of pre-structured written assignments, division of responsibility between instructor and students, and sequence of course experiences.

Written assignments. The written assignments for group (1) were structured in such a way as to give the student an opportunity to express his understanding of the objectives of social education resulting from class experiences and participation experiences (anecdotal records). The last three written requirements for the experimental group (1) were in connection with the group study: namely, the stating of questions, the formulating of purposes, and the compiling of a committee report based on each group's research. In comparison, the students in group (0) wrote reports describing and evaluating their classroom experiences during their participation. Each student chose and developed a resource unit replete with suggestions for guiding a teaching unit appropriate for a designated age level.

Unit Approach (Direct Experiencing) Group (1)	Lecture Discussion (Indirect Experiencing) Group (0)
1. concept of social education including objectives-- due after first 3 weeks	

2. participation report--
minimum of 4 anecdotal re-
ports involving democratic
behaviors observed

1. participation report--
involving a description
of the situation, how
they participated, and
an evaluation of the
participation experience

3. questions related to concerns
about unit teaching

2. development of a rather
extensive resource unit

4. objectives or desired out-
comes of the selected unit

5. group report

Division of responsibility between instructor and
students. Division of responsibility implies a conscious
planning for the emerging involvement of students in cooper-
ative planning and carrying out instructional activities.
It was not intended that the instructor should shed her
instructional responsibilities. The shifting of responsi-
bility between the students and the instructor was an
attempt to involve the students more actively as partici-
pants in the teaching learning process than is convention-
ally done. Active student involvement in co-planning, in
research, and in emerging leadership roles is basic to and
typical of the unit approach.

Unit Approach (group (1))

Lecture Discussion
(group (0))

1. Instructor - students
shift class responsibilities

1. Instructor assumes a
major responsibility
for instructional
planning and leader-
ship

2. Instructor assumes and shares the leadership role

2. Instructor assumes a continuous leadership role

3. Students are involved in cooperative planning

3. Instructor does the planning and decision making

4. Learning materials are selected cooperatively

4. Instructor chooses the learning materials

5. Class procedures include lectures, discussion, group work with the instructor as resource person

5. Class procedures include lectures and limited discussion with the instructor as group leader

6. Class and instructor work together to find answers to their questions, students listen to instructor and to each other-- instructor helps others contribute to the group

6. Instructor motivates and conveys information-- students listen mostly to instructor--no attempt is made to encourage student comments

Sequence of course experiences. The pre-structured course experiences in group (1) mirrored a flexible organization with the unit pattern revolving around the students' questions. Whereas in group (0) the organization and selection of course experiences were arranged in a supposedly logical order by the instructor. An outline of each day's program was given to the students at the first session.

Unit Approach
(group (1))

Lecture Discussion
(group (0))

Jan. 7 course framework
9 overview of social education
cooperatively plan next 2 weeks

14 pre-test +

Jan. 6 no class (registration)
8 course objectives + course outline discussed

13 pre-test + overview of social education

(group (1))   (group (0))

Jan. 16 Minnesota Teacher   Jan. 15 M.T.A.I. + dynamic na-
         Attitude   ture of our society
         Inventory +

     21   20 democratic nature of
                                         our society + democratic
                                         behaviors
     23   22 curricular approaches
                                         to social education +
                                         unit teaching

     28 group's expression of   27 overview of unit teach-
         social education   ing
     30 overview of unit   29 selection of unit dis-
         teaching   cussion of participa-
                                          tion reports--Mar. 10

Feb. 4 initiating group   Feb. 3 initiation of unit ob-
         study with two   jectives + 1 movie
         movies   5 discussion of resource
      6 unit characteristics   unit due Mar. 3
         - student questions

     11 formulation of unit   10 nature of cooperative
         objectives + division   planning and committee
         of questions into   organization
         committee and whole   12 research process in unit
         group responsibilities   teaching

     13 ⎫   17 community resources
        ⎪   19 effective learning ma-
        ⎪   terials
     18 ⎪
     20 ⎬ committee and whole   24 basic skills and unit
        ⎪ group research   teaching
        ⎪   26 expressional activities
     25 ⎪
     27 ⎭

Mar. 4 ⎫   Mar. 3 culminating activities
      6 ⎬   5 role of teacher in
        ⎪ reporting by committees   unit teaching
     11 ⎭
     13 generalizing unit learn-   10 evaluation process
         ings + evaluation of   12 review and 1 movie
         group study

Essentially the instructional process experienced in group (O) was predominantly a series of pre-planned lectures about unit teaching. It was the purpose of the indirect approach to develop positive attitudes toward unit teaching which could be translated into teaching behaviors in the elementary classroom situation.

The unit approach may require further elaboration. The above sequence of experiences for the course was a flexible outline rather than a detailed schedule of activity. Planning beyond the initial stages could only be anticipated in the sequential pattern of unit teaching. As indicated in the pre-structuring, the first three weeks were devoted primarily to developing an understanding of social education. The remaining seven weeks explored unit teaching as a potential method for realizing the aims of social education. "School in Centreville" and "Effective Learning in the Elementary School" were the two movies shown to motivate interest, to provide a common experience for group members, and to stimulate individual questions about unit teaching. The students' questions were organized by a five-member committee (including the instructor) and submitted to the whole group for acceptance and further analysis. This proposed organization of questions became the basis for the group study and for further cooperative planning. After a written formulation of unit objectives,

the group divided the questions into what they considered

to be whole group, committee, and individual topics. Each

student was asked to indicate three topics on which he

would be most interested in working. The class was divided

into committees on the basis of these choices. The follow-

ing tentative guide for committee and whole group discus-

sions was set up for the remainder of the quarter and given

to the students.

Feb. 13 - committee organization - chairman, recorder,
                                       questions involved,
                                       possible resources

      whole group - initiation, committee organization

Feb. 18 - committee - plan and decide approach to topic,
                   divide up committee responsibilities

      whole group - cooperative planning

Feb. 20 - committee research - bring resource materials,
                          evaluate committee progress
                          and ways of working together

Feb. 25 - committee - pooling research information

      whole group - research process

Feb. 27 - committee - plan for reporting and develop
                 committee report

      whole group - possible ways of reporting
                      community materials

Mar. 4 - committee - complete reports

      whole group - resource units

Mar. 6 & 11 - reporting by committees

Mar. 13 - generalizing unit teaching behaviors and
          evaluation of group study

With a two-hour period it was possible to plan for
both a whole group discussion and a committee work study
period. During the committee session, the instructor
assumed the role of a resource person. She circulated among
the committees, answering questions, helping to provide in-
formation, and making suggestions when asked. The committee
reports were presented orally and duplicated for group dis-
tribution.

Three techniques were used to evaluate the charac-
teristics and consistency of the instruction, pre-structur-
ing the course, securing perceptions of the students as to
frequency of certain instructional procedures, and the
recording of daily logs for each class session. Included
in Appendix C will be found the organization of the stu-
dent's questions, the stated objectives of the group study,
the division of topics into whole group and committee re-
search, and the daily logs.

In summary, it might be said that the instructional
procedures in both sections were oriented not only in
general learning principles but also toward the achieve-
ment of the desired outcomes. The amount of directness in
experiencing the unit teaching approach and teaching be-
haviors (educational objectives) differentiated the two
teaching methods. The differences between the two methods
were more sharply focused in pre-structuring the written

assignments, the division of instructor-student responsibility, and the sequence of instructional activities.

Appraisal Mediums

Five appraisal mediums (included at the end of the chapter) were constructed as data gathering devices with the ultimate purpose of accepting or rejecting the null hypothesis. A rating scale and a situational test were devised to appraise operational and verbal expressions of the criterion. Recognizing a possible variance in student teaching situations, it was necessary to appraise potential situational factors effecting unit teaching effectiveness. In an effort to establish pedagogical differences between group (0) and group (1), a student analysis form was constructed. A student reactionnaire form was developed for the purpose of registering the students' perceptions of course effectiveness. A brief reporting of the construction processes together with a sample of the appraisal mediums will complete the discussion of the research design used in this experiment.

An adequate criterion is of paramount importance in experimental investigations. The word 'adequate' implies that the behaviors incorporated in the educational objectives are measured with some degree of validity. The type of measuring instrument to be constructed depends on the

nature of the outcome to be evaluated. If the desired out-
comes of instruction are stated in terms of specific
teaching behaviors, the appraisal mediums must be planned
to collect behavioral evidence. It was contemplated that
behavioral evidence might result from verbal expressions
of intended behavior as well as from observing the student
function in a teaching situation. Hence a situational test
to estimate verbal concepts of behavior plus a rating scale
to judge operational demonstrations were originated as in-
dices of the level of criterion achievement.

Rating scale. A rating scale entitled Unit Teaching
Effectiveness of Student Teachers (appraisal medium 1)
emerged directly from the unit teaching behaviors stated in
the criterion. In view of the time pressures on coopera-
ting teachers and college supervisors, the rating scale was
limited to two pages. When it was necessary to omit certain
behaviors, the elimination was done on the basis of the
opinions of the panel of practitioners. Those behaviors
judged critical most frequently by the 8 team panel were
included in the rating scale. In some cases it seemed ex-
pedient to combine two behaviors into one statement. A
numerical code ranging from one to five gave the evaluator
some freedom in discriminating among the several degrees of
possible behavioral evidence in the student teaching situa-
tion. The rating scales were distributed early in the

quarter to the evaluators to use as worksheets in observing expected unit teaching behaviors. This 'guided observation' extended over a period of seven or eight weeks while the unit was being developed with the children. Each student teacher was rated by the cooperating teaching, college supervisor, herself, and in ten cases the investigator. It was thought that three and in some cases four opinions as to each student's teaching performance would serve as a rather reliable estimate of the student's unit teaching competency.

Situational test. The situational test (appraisal medium 2) was a paper-and-pencil test which was arranged to appraise course understandings as related to predicting teacher behavior in life-like school situations. Situational testing was reported by the Office of Strategic Services about 1941 as a screening process for the selection of officer personnel.[13] It was an organismic approach to the observation of a candidate's behavioral responses when confronted with life-like situations. After 20 months of experimentation, the Office of Strategic Services formulated the following guidelines:

1. Every situational task should have a number of alternative solutions.

[13] Office of Strategic Services, The Assessment of Men (New York: Rinehart and Company, Inc., 1941), chapter I.

2. The accomplishment of a situational task should not require very specialized abilities because if it does, a large proportion of the candidates will be seriously handicapped and unable to participate on a level with the "experts."
3. Situations should be designed to reveal the kind of behavior which cannot be registered by mechanical means.
4. The most productive situations are those which involve group action: each man is called upon to accomplish something with the aid of a few co-workers under conditions which encourage initiative and the display of unique patterns of response.
5. The candidates should be given an opportunity, either in the course of the task or immediately afterward, to discuss their performance.[14]

In as much as neither facilities nor personnel were available to observe all the students before or after course experiences, it was necessary to revert to observation through paper-and-pencil responses in order to assess a verbal prediction of behavior. The above guide lines were directive yet some adaption to verbal testing situations seemed imperative. The pre- and post-test were identical, hypothesizing that equivalent situations were vital to appraising relative growth. The teaching situations originated from the writer's decade of teaching experience in the elementary school and were validated by two other elementary teachers with similar teaching

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[14] Ibid., 227-228.

experiences. The essential criterion of a good situational test is its congruence with reality. The selected teaching situations were tried out on the students during the pilot quarter not as a test but as group discussion. The students' reactions as to the clarity of the situation and ambiguity in the phrasing of the situation led to revision of the instrument.

Appraisal of student teaching situation. Student teaching situations, vary from building to building and from room to room within the same building. Thus the student teaching situation variable should be considered in making an unbiased appraisal of the student's teaching competency. Socio-economic status and intelligence quotients of elementary school children have been used as measurable bases for analyzing teaching situations. These data would be interesting; however, it is not assumed in this study that unit teaching effectiveness is limited to one level of intelligence or living. In order to analyze this variable, it was necessary to sift out factors in the teaching situation which potentially would make a difference in the student's unit teaching effectiveness. It was assumed that five measurable situational factors might be involved; namely, the previous unit experiences of the children, the availability of educational materials, the attitude of the cooperating teacher toward unit teaching, the physical

environment, and the size of the class group. An open-
ended check list (appraisal medium 3) was devised to dis-
cover the degree to which the five above factors were evi-
dent in each of the 22 student-teaching situations. The
college supervisors and the observer shared the responsi-
bility for the check list analysis. The numerical code was
so arranged that a high total score would indicate a situa-
tion that appeared more conducive to effective unit teach-
ing.

Student analysis of Education 517. In the process
of evaluating the relative effectiveness of two methods of
teaching, the researcher needed to substantiate her per-
ception of methodological differences. An available re-
source would be the student's perceptions as to the teach-
ing procedures experienced in the course. In order to
productively use this student resource, a Student Analysis
form (appraisal medium 4) was constructed to numerically
record the frequency of selected teaching procedures
irrespective of their value judgments as to its instruc-
tional value. The latter response was recorded on a
Student Reactionnaire form (appraisal medium 5) designed
to record personal value judgments. The questions in the
Student Analysis were developed to a large extent from the
differences in pre-structuring noted earlier in this chap-
ter. The introductory statements, the way in which the

questions were stated, and the coding explanations for
both Student Analysis and Reactionnaire were intended to
help the student to differentiate between analysis and
reactions. Five students who had participated in the pilot
study evaluated these two proposed instruments for clarity
and adequacy of the tools to measure student judgments.
Several questions were revised and then evaluated by 5
other students of varying ability who experienced the pilot
study. The two resulting appraisal mediums represented
what the investigator and 10 students considered to be
semantically understandable and comprehensive in relation
to course procedures.

The five appraisal mediums were included in this
chapter, rather than in the appendix, because they were a
vital part of the experimental design and thus necessary
for its completeness.

Summary

The primary purpose of this chapter was to narrate
the actual ongoing experimental procedures. A general
overview of the experiment preceded an analysis of four
aspects of scientific investigation. It was the intent of
the overview or running account to orient the reader to
the teaching situation and to the sequential relationship
of the experimental procedures.

The sample population was identified in terms of four learning variables and compared with 503 recent elementary graduates to determine the representativeness of the sample. The process by which the educational objectives evolved and the actual statement of the behavioral objectives were treated in the development of the criterion. It seemed unwise, in light of current educational thinking, to differentiate teaching methods in terms of opposing schools of psychology. It was accepted that both an understanding of the learning process and the desired outcomes of Education 517 would be the determining factors in structuring the two instructional outlines. The basic difference between the two teaching approaches may be referred to as the <u>directness of experience</u> provided for the achievement of the desired teaching competencies. The nature and development of the five appraisal mediums were explored. These five data gathering devices provide a connective link between the experiment as described in this chapter and the interpretation of the data in the succeeding chapter.

Unit Teaching Effectiveness of Student Teachers

This rating scale is an attempt to procure the opinions of the cooperating teacher and the college supervisor as to the unit teaching effectiveness of
_____ in student teaching. Research has indicated that many factors are involved in teaching competency. Personal qualities are significant and are often difficult to separate from teaching procedures. However, it is the purpose of the present inquiry to appraise teaching behaviors which are related more to unit teaching procedures than to personality factors. The suggested teaching procedures reflect a resumé of the literature and the expression of a panel of judges composed of supervisors and teachers in the field. You are asked to circle the degree to which the following teaching factors were operative in the student teaching situation. In order to have some consistency in the thinking of the raters, the following numerical code might serve as a basis for your judgments:

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1.   This factor was operative and observable to a very slight degree
2.    "     "     "        "        "         "      "  " slight degree
3.    "     "     "        "        "         "      "  an adequate degree
4.    "     "     "        "        "         "      "  a   high  degree
5.    "     "     "        "        "         "      "  " very high degree
```

1. In the selection and initiation of the unit did the student:
    a. arrange common exploratory experiences in addition to verbal participation
        1.   2   3   4   5
    b. arrange the environment so as to stimulate interest in several possible problems (on the maturity level of the group) yet avoid confusion
        1   2   3   4   5
    c. check school and community resources for learning materials 1   2   3   4   5
    d. acquaint himself with teacher references and read appropriately in order to develop background understandings   1   2   3   4   5
    e. participate in and coordinate group thinking in the development of criteria for unit selection and in the orderly progression toward the final selection
        1   2   3   4   5
    f. record the children's questions and organize them into sub-topics of the main problem   1   2   3   4   5
    g. lead the children to define their objectives in terms of desired behaviors
        1   2   3   4   5
    h. make an overview of the subject matter that might enter into the study and think through a tentative sequence of experiences   1   2   3   4   5

2. In the developmental phase of the unit did the student:
    a. guide the amount and kind of committee organization in terms of individual interest, class structure, maturity level, and job to be done   1 2 3 4 5
    b. organize research experiences into whole group, committee and individual situations   1   2   3   4   5
    c. help the group to establish and record desirable committee behaviors and agreements as to the use of space and materials 1   2   3   4   5
    d. help each committee or individual to become aware of its relations to the solution of the main problems or understanding   1   2   3   4   5
    e. work with individuals and with groups by circulating from group to group
        1   2   3   4   5
    f. pre-plan and allow ample time for each research or activity period
        1   2   3   4   5
    g. encourage and direct children in becoming aware of and searching out various research materials 1   2   3   4   5
    h. select audio-visual materials that will contribute most to the study under progress, order materials on time, preview learning materials, show at the time in the unit when the need arises, make arrangements for necessary equipment,help the children to know the reason for using the material and what to look for or listen for, arrange the physical environment, and plan for a follow-through 1   2   3   4   5

i. provide for individual differences in research experiences and expressional activities 1 2 3 4 5

j. guide expressional activities by providing a variety of materials, checking on the safety of the tools, being aware of educational opportunities s suggested by the children, and keeping the activity periods within productive limits 1 2 3 4 5

3. In the culmination of the unit did the student:

a. suggest a variety of ways to report information 1 2 3 4 5

b. help committees and individuals to pool information from a variety of sources and prepare a report or group activity 1 2 3 4 5

c. cooperatively select from group presentations facts for which the whole class is responsible 1 2 3 4 5

d. coordinate the shared activity for the purpose of communicating ideas rather than putting on a "show" 1 2 3 4 5

4. In cooperative planning situations did the student:

a. encourage every child to participate 1 2 3 4 5

b. provide opportunity for children to make choices within their maturity level 1 2 3 4 5

c. respect individual contributions and group decisions 1 2 3 4 5

d. recognize readiness for cooperative planning and begin in areas where the children are competent to plan 1 2 3 4 5

e. stimulate thinking by asking questions 1 2 3 4 5

f. keep individual contributions to the point and relate to group thinking 1 2 3 4 5

g. create an atmosphere in which various sides of an issue are considered before any decision is reached 1 2 3 4 5

h. help children to give and accept suggestions 1 2 3 4 5

i. guard against keeping leadership functions which the children could assume: at the same time directly take leadership responsibility in those areas of experience where the maturity of the children was not sufficient to warrant their assumption of leadership 1 2 3 4 5

j. assume responsibility to point out possibilities, resources, and limitations within which they were working 1 2 3 4 5

k. make sure the purpose of the discussion is clear to the children 1 2 3 4 5

l. keep the discussion moving steadily toward a solution of the problem 1 2 3 4 5

m. plan with the children in such ways that they were responsible as a group for putting their plans into action 1 2 3 4 5

5. In evaluation of situations did the student:

a. evaluate in terms of stated behavioral objectives 1 2 3 4 5

b. have an understanding of the evaluation process 1 2 3 4 5

c. consciously provide situations where desired behaviors can be observed 1 2 3 4 5

d. use evaluation as the basis for pre-planning, selecting materials and activities, clarifying the needs of individual children (which can be used as next steps in individual and group progress) 1 2 3 4 5

e. plan evaluation of the total unit of work - growth and changes which have taken place in the children - individual strengths, weaknesses, and problems which need further attention 1 2 3 4 5

f. observe children during construction activity, offer suggestions, ask questions, listen to the conversation of the participants, determine needs, and take notes to use later in evaluation 1 2 3 4 5

g. use a variety of evaluation techniques, such as: whole or small group discussions, anecdotal records, check lists, paper and pencil tests, etc 1 2 3 4 5

h. take time at the end of work periods to look at the way they have worked together 1 2 3 4 5

i. use frequent reporting of group progress to the whole group 1 2 3 4 5

6. Did the student have a general understanding of unit development 1 2 3 4 5

7. How much help did the student need in carrying out the unit 1 2 3 4 5

8. What degree of success did the student experience in unit teaching 1 2 3 4 5

9. Additional comments either about the effectiveness of the student or the adequacy of the suggested unit teaching behaviors are welcome. (Feel free to use the back of the rating scale for your comments.)

Ed. 517   Teaching Situations   ES

What would you do if you were teaching in the elementary grades and found yourself
in the following situations? No one set approach is expected as individuals react
differently to similar circumstances. These teaching situations are intended merely
to stimulate your thinking by giving you an opportunity to project yourself into a
school situation and to become aware of the "why" of your behavior. Thus your
reaction will indicate how you would behave and why you have chosen that approach.

1. Ann Jones, a second grade teacher in a relatively large city, taught in a
school system which had a flexible social studies program. Some children in her
room became interested in atomic energy from a motion picture which a number of the
children had seen. The majority of the class indicated a desire to study about
atomic energy. What would you do if you were Miss Jones? Why?

APPRAISAL MEDIUM 2

2.   It is the custom in your school system to have a grade group meeting each fall in order to become acquainted with the parents and to give. an overview of expected growth.   In the course of the meeting you discuss social education.   How might you relate social education to desirable citizenship behaviors?   What might be six desirable outcomes or objectives of   a social education program?

3.   One day at noon the teacher's lunchroom conversation reverted to the topic of unit teaching.   Mrs. Andrews, a well seasoned teacher, indicated that she did not teach by the unit method.   She also indicated that she did not understand this learning approach nor were the advantages of "this" method over the subject centered method clear to her.   Would you contribute to the conversation?   If so how, if not why not?

4. Much interest has been stimulated in your fifth grade by the viewing of television programs. After discussing favorite programs you and the group want to pursue the problem - How do we communicate with others and exchange ideas? You, as the teacher, begin to "think through" what might be involved in such a study.

    a. What are some possible questions that the children or you might want to ask?

    b. In getting answers to these questions, what possible research experiences might be involved.

    c. After you and the children have consciously search e d for information, how might you visually and verbally represent and interpret your information in expressional activities.

5. Suppose that you are a third grade teacher in a city the size of Columbus.
You and your group of youngsters have just launched a study involving the Feeding
of Your City. The group has compiled a list of questions, such as: How is food
brought to our city? Who are the people who handle our food? How is our food
kept from spoiling? Where is our food sold? You feel that the group is ready to do
research. How would you as the teacher function in the organizing of committees,
and in the research process?

6. Suppose that you were a teacher in a school system in which regular parent
conferences were held. During one of these conferences a concerned parent asked you
how the "basic skills" were taught in the unit. Let's further assume that this parent
is quite intelligent and that the 6 th grade child involved is a good all-round
student. How would you approach the problem?

Appraisal Medium #3   Student Teaching Situation - Check List

This open-ended check list is a device to help the observer to become aware of possible factors in the student teaching situation that could effect unit teaching. The sources for the following judgments are: the cooperative teacher, the daily program, the cumulative records, and the observations of the observer.

Possible factors effecting unit teaching	1	2	3	Comments
I. Previous unit experiences of the children				
a. Are previous unit studies recorded on the cumulative records?				
b. Does the teacher indicate that former studies were organized as units?				
c. Do the children share in some areas of planning?				
d. Do the children locate and bring in reference materials?				
e. Is there wide participation in class discussions?				
f. Are groupings flexible in order to meet various needs?				
g.				
II. Availability of educational materials				
a. Are varied audio-visual materials available?				
b. Are various types of reading materials available?				
c. Are there reference materials?				
d. Are materials available for art experiences?				
e.				
III. Attitude of the teacher toward unit teaching				
a. Does the daily program provide for pupil planning and evaluation?				
b. Is a unified approach used in organizing the social studies on the daily program?				
c. Is a block of time allotted for the social studies?				
d. Do the teacher's comments indicate a positive attitude toward unit teaching				
e. Have resource libraries been ordered for the room?				
f. Is a stimulating environment provided?				
g.				
IV. Physical environment				
a. Is the furniture moveable?				
b. Is there work space?				
c. Does the teacher have access to audio-equipment?				
d. Is there space to display materials?				
e.				
V. Number of children in the class				
a. Is there adequate space in terms of the number of children in the room?				

Code: 3 to a high degree   2 some   1 to a slight degree

Appraisal Medium #4

Student Analysis of Education 517

This is an attempt to have you, the students, analyze the teaching procedures used in Education 517. It is rather difficult to analyze a course without referring to the personal qualities of the instructor. However, the primary purpose of this student analysis is to get an honest and accurate appraisal of the method of instruction as you experienced it in this course. Thus your responses should not indicate your feeling as to the value of the teaching factors but should indicate the degree to which the teaching factors were evident and operative in the teaching procedures of this course. Please circle a number to the right of the question using the following symbols as a basis for your thinking:

1. this teaching factor was operative and evident to a very great degree in the teaching procedures of this course.
2. this teaching factor functioned to a great degree in the teaching of the course.
3. this teaching factor was operative to an appreciable degree in the teaching procedures.
4. this teaching factor was functionally evident and operative to a slight degree in this course.
5. this teaching factor operated to a very slight degree if it actually occurred at all in the teaching of this course.

1. To what extent were the stated objectives of the course clear? 1 2 3 4 5

2. To what extent were the objectives of the course used as guides in the selection of instructional materials and activities? 1 2 3 4 5

3. To what extent was attention given to on-the-job teaching problems in the area of social education? 1 2 3 4 5

4. To what extent were the course content and sequence of experiences pre-planned and fixed by the instructor? 1 2 3 4 5

5. To what extent were the student's questions considered in the planning and organization of this course? 1 2 3 4 5

6. To what degree was cooperative planning evident in the teaching procedures?
   1 2 3 4 5

7. To what degree was there a sharing of responsibility between the instructor and students in the selection of learning materials? 1 2 3 4 5

8. To what extent were the leadership and follwership roles shared between the instructor and the students in class discussions? 1 2 3 4 5

9. To what degree was individual thinking encouraged? 1 2 3 4 5

10. To what extent did the instructor assume the role of resource person? 1 2 3 4 5

11. To what extent did the instructor assume the role of lecturer? 1 2 3 4 5

12. To what extent was provision made for committee experiences? 1 2 3 4 5

13. To what extent were resource people used during the quarter? 1 2 3 4 5

14. To what extent were audio-visual materials used? 1 2 3 4 5

15. To what degree was a variety of class procedures used? (lecture, discussion, group work, group reporting, films, etc.) 1 2 3 4 5

16. To what extent were you given the opportunity to experience the unit method of teaching in this course? 1 2 3 4 5

Student Reactionnaire to Education 517

In order to improve instruction, it is desirable to obtain the reactions of the students to the course. This is an opportunity to evaluate the effevtiveness of Ed. 517 as a professional course for you as a prospective teacher. The only "true" answer to each question is the way you feel. For each question there are 5 possible responses. This range of responses provides for varying attitudes toward the level of effectiveness of this course. You are asked to indicate the effectiveness of the course by circling a number to the right of the question.

1. I think the course was extremely effective with respect to the factors involved in this question.

2. I think the course was highly effective with respect to the factors involved in this question.

3. I think the course was effective and adequate with respect to the factors involved in this question.

4. I think the course was ineffective and left much to be desired with respect to the factors involved in this question.

5. I think the course was totally ineffedtive with respect to the factors involved in this question.

1. How effective were the stated objectives for a professional course in social education?   1   2   3   4   5

2. What was the level of agreement between the announced objectives of the course and what was actually taught?   1   2   3   4   5

3. Do you feel that the class followed a logical sequence of experiences for the realization of the objectives?   1   2   3   4   5

4. Do you feel that the written assignments were appropriate in the light of course objectives and procedures?   1   2   3   4   5

5. Do you feel that there was realistic consideration given to the amount of outside preparation required of the student?   1   2   3   4   5

6. Do you feel that the nature of the participation report increased your understanding of social education?   1   2   3   4   5

7. Do you feel that you were free to express your own thinking?   1   2   3   4   5

8. How effective was cooperative planning as a teaching procedure?   1   2   3   4   5

9. Was the sharing of leadershipand followership roles between the instructor and students a worthwhile experience for you as a prospective teacher?   1   2   3   4   5

10. Do you feel that there was a conscious effort to relate the method of instruction used in this course to your teaching of social education in the elementary school?   1   2   3   4   5

11. How effective were the classroom teaching procedures harmonized with concepts of educational philosophy? (such as--wer learn from experience, from involvement and problem solving)   1   2   3   4   5

12. Do you feel that your committee experiences during the course were valuable learning experiences which had implications for your teaching?   1   2   3   4   5

13. How effective do you think the course was in terms of helping you to understand and to gain teaching competence in the area of social education?   1   2   3   4   5

14. How effective was the method of teaching used in this course in helping you to understand the unit method of teaching?   1   2   3   4   5

15. Were the reference materials suitable for the course?   1   2   3   4   5

CHAPTER V

TREATMENT OF THE DATA

The treatment of the data in this chapter is one phase of the total process of evaluating the effectiveness of two methods of instruction with reference to certain desired behavioral outcomes. Briefly, the evaluative process involves: the setting up of educational objectives (unit teacher behaviors--criterion), the conscious planning of class experiences for the purpose of attaining the objectives (two methods of instruction), the devising of instruments to gather relevant data (5 appraisal mediums), the providing of opportunities where the behaviors can be observed and quantified (pre- and post-situational test plus student teaching follow through), and the treating of numerical data to discover the relationship between instructional activities and outcomes. It should be noted that in the treatment of the data the researcher was working with the actual outcomes of instruction. In scientific investigation the relationship between the instructional activities and the actual outcomes is stated in the null hypothesis which gives direction to the analysis of the data.

A restatement of the null hypothesis (chapter II) was intended to give focus and purpose to the selection of the statistical methods, and to the interpretation of the statistical data. The null hypothesis stated that there is no significant difference in the verbal or operational attainment of the stated behavioral outcomes between a student group which experienced one method of instruction as opposed to a student group which experienced another method of instruction. An exploration of the null hypothesis led to four implied issues around which experimental procedures were organized to gather data.

a) Were the two sections of Education 517 taught differently?

b) Was each method effective in relation to pre- and post-test evidence?

c) Was one method significantly more effective than the other in the attainment of verbal behaviors?

d) Was there a significant difference in the observed operational behaviors that can be attributed to teaching methods?

It was also stated in chapter II that the educational researcher was expected to calculate the mean gains in achievement for each group as an index of the relative effectiveness of the two methods of instruction. The term relative effectiveness evoked a sense of restless skepticism and a need for reflective searching. To terminate

the evaluation by calculating the difference between the
mean gains in achievement seemed a shallow, loose procedure
to this investigator. A mean gain does not necessarily
guarantee that the course was effectively taught or that
the method of instruction was responsible for the gain. It
is the researcher's opinion that effectiveness is a broader
concept that should be assessed from several points of view.
Was there some standard against which the results of these
two teaching processes could be validated? It was assumed
that an acceptable measure for validating the performance
in Education 517 would be an accumulation of previous per-
formances (cumulative point hour). Thus it was reasoned
that instructional effectiveness would be reflected in a
correlation between student performance in this course with
previous course performances.

This knotty problem of assessing effectiveness might
be explored from the student's point of view. It is tenable
that students on the college level have relatively mature
judgments and have been subjected to enough classroom teach-
ing procedures to be capable of weighing the merits of
course experiences. Even though a student approach is open
to debate, an instructor cannot be immune to students'
attitudes and reactions in appraising the effectiveness of
course procedures.

In other words, the problem under investigation (the evaluation of the effectiveness of two methods of instruction) should go beyond the acceptance or rejection of the null hypothesis to an assessing of effectiveness from a broader point of view including correlation with previous performance and student reactions.

The organization of this chapter follows a rather simple pattern of progression. A general discussion of the statistical method was included to consider reasonable expectations from statistical analyses. A statistical analysis of the numerical data assembled from the five appraisal mediums is followed by a non-statistical discussion of data that were not quantified yet relevant to the investigation. The verbal and operational behaviors were analyzed separately. An attempt was made to explain each statistical method as it was functionally used in studying the numerical data. The results issuing from these mathematical computations became the basis for accepting or rejecting the null hypothesis and for making inferences pertaining to instructional effectiveness.

The researcher has used the remainder of the chapter as an opportunity to amass and to examine anecdotal data written during student teaching observations with the intention of discovering potential blocks to unit teaching. A brief profile of the 22 follow-up subjects might reveal

some clues as to the interrelationship of individual learn-
ing variables, method of instruction, and course outcomes.
Course effectiveness was again viewed through evaluative
statements about and by the students after the student
teaching experience. The findings are summarized at the
end of the chapter by drawing implications for the teaching
of Education 517.

Statistical Treatment of the Data

Statistical method. Statistical methods provide a
way of describing, analyzing, and interpreting numerical
data which have grown out of an investigation. The theory
of probability is fundamental to statistical method and
formulae. This theory, in turn, hinges upon observations
of what might be referred to as the law of chance. Accord-
ing to the law of chance, if a person should toss a coin
enough times, the coin would theoretically come up "heads"
half the time and "tails" the other half of the time.
Events of heads and tails are equally likely. It is im-
possible to declare with certainty whether one toss will
be 'heads' or 'tails', but it is possible by mathematical
calculations to predict the probability of heads in one
out of two tries. Statistical method should not be con-
sidered an end in itself but should be considered as formal-
ized procedures for sifting and relating data so that the

probability of facts which influence empirical evidence
can be identified. The reader should be mindful that the
statistical inferences arrived at through mathematical com-
putations represent only approximations and predictions
that certain causes will produce certain effects. Instead
of arbitrarily setting 5 per cent or 1 per cent level of
significance as the region of rejection, the researcher
chose to report the probability level actually associated
with the findings and then to weigh the evidence for a
rejection or acceptance of the null hypothesis.

In planning the research design the investigator had
to make some decisions as to the statistical technique
whose formula most closely approximated the conditions of
the research (null hypothesis) and whose measurement require-
ment was met by the measures used in the research (type of
appraisal medium and numerical data gathered).

Apparently the educational researcher must choose
between parametric and nonparametric statistical methods.
The characteristic of the population is called a parameter,
for example; mean, median, variance, or percentile. A
parametric statistical measure is descriptive of the dis-
tribution of a universe. When a parametric model is used,
the investigator assumes that his sample represents a normal
distribution of a universal population. Nonparametric
techniques are adjusted to a "distribution free" population

and do not assume that the scores under analysis were drawn from a normally distributed population. Many of the nonparametric tests are identified as "ranking tests" using scores which are not exact in any numerical sense but involve simple ranks of one score being equal to or greater than another. An added advantage of the nonparametric tests is their usefulness with small samples; a feature to be considered in collecting data from a limited sampling.

Siegel differentiated between parametric and nonparametric statistical methods in the following discussion:

> A parametric statistical test is a test whose model specifies certain conditions about the parameters of the population from which the research sample was drawn. Since these conditions are not ordinarily tested, they are assumed to hold. The meaningfulness of the results of a parametric test depends on the validity of these assumptions. Parametric tests also require that the scores under analysis result from measurement in the strength of at least an interval scale.
>
> A non-parametric statistical test is a test whose model does not specify conditions about the parameters of the population from which the sample was drawn. Certain assumptions are associated with most non-parametric statistical tests, i.e., that the observations are independent and that the variable under study has underlying continuity, but these assumptions are fewer and much weaker than those associated with parametric tests. Moreover, non-parametric tests do not require measurement so strong as that required for the parametric tests; most non-parametric tests apply to data in an ordinal scale, and some apply also to data in a nominal scale.[1]

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[1] Sidney Siegel, Nonparametric Statistics. (New York: McGraw-Hill Book Company, Inc., 1956), pp. 30-31.

It became apparent from the identification of the sample population (73) in chapter III that an exact relationship with the parent population (503 elementary graduates) was not represented. However, due to the existence of a reasonable similarity in population characteristics, the nature of scaling the verbal scores, and the number of subjects in the sampling, it was felt that parametric models would be appropriate for analyzing the data pertaining to verbal behaviors. Considering the limited sampling (22 students) in the follow through and the lack of exactness in the observational judgments, a nonparametric technique involving a ranking test was used in the exploration of the operational evidence. The researcher received active assistance from the Statistics Laboratory at The Ohio State University in both the selection of the statistical method and the IBM computations.

Verbal behaviors. Verbal behaviors were measured on the pre- and post-situational test (appraisal medium 2, page 149). In reality, this situational testing was a process of assigning numerical ratings to how the students said they would react or behave in certain teaching situations. It was thought that a difference between pre- and post-test means, on an identical appraisal medium, should represent the extent of verbal growth that took place during the quarter. The situational tests for each group were not

scored separately. All (73) of the papers were mixed together so as to reduce possible bias. The student responses to the teaching situations were scored in terms of taking a definite course of action and extent to which answers reflect understanding gained in class. Each question, except number 4 was evaluated on the basis of ten points. Question four was given fifteen points.

The statistical method ("t" test or critical ratio) for determining whether the difference between the two means was due to chance of whether it was statistically significant, involved a process of calculating the ratio of the difference of the two means to the square root of the sum of the squared standard error of the two means (discussed in chapter IV). Tables 1 and 2 present the data applicable to this statistical model.

TABLE 1

MEAN GAIN IN VERBAL BEHAVIORS IN THE CONTROL
GROUP (O)

Measure	Mean	σ	σm	Diff.	"t" Score[*]
Pre-test	18.08	4.53	.75		
Post-test	38.03	6.55	1.09	19.95	15.47

[*]1% significance level 3.00
5% significance level 1.96

TABLE 2

MEAN GAIN IN VERBAL BEHAVIORS IN THE EXPERIMENTAL
GROUP (1)

Measure	Mean	σ	σm	Diff.	"t" Score[*]
Pre-test	18.31	4.87	.807		
Post-test	39.08	5.23	.883	20.77	17.68

[*]1% significance level 3.00
5% significance level 1.96

An inspection of tables 1 and 2 left little doubt
that a stable gain in achievement with this test took place
in each group. The level of significance was such that
there was perhaps one possibility in a thousand that this
gain was due to chance. If the difference cannot be attri-
buted to chance it is logical to assume the gain was the
result of course experiences to an appreciable degree.

Several provocative facts supplement the above pre-
and post-test data. Out of a possible 55 points, the
scores for group (0) ranged from 8 to 28 on the pre-test
and from 27 to 49 on the post-test. The scores for group
(1) had a pre-test spread from 11 to 30 and a post-test
frequency from 30 to 49. There was very little overlapping
of scores on the pre- and post-test in either group. The
most able students scored about the same on the pre-test

as the least able scored on the post-test. In both groups the means of the two measures indicated that more than a doubling in achievement occurred. The dispersion of scores around the mean was greater in group (1) than group (0) on the pre-test but the situation was reversed on the post measurement at the end of the quarter.

It would seem credible, from the above discussion, to infer that a significant amount of changed verbalizations about behavior occurred which was not due to chance but to related course activities. It might also be concluded that both methods were effective but that the gain in achievement favored the experimental method. At this point the researcher needed to do some reflective searching. Can the superior mean gain in group (1) be attributed to method (class activities)? From the outset it was recognized and accepted by the researcher that the validity and reliability in constructing and scoring of the situational test could be subject to debate. It was not the intention to skew the instrument in favor of one method of teaching. Above and beyond the potential test limitations would other factors be operative in causing this difference between the groups? If the conclusions were accepted, one would be asserting that there was a one-to-one correspondence between a particular cause (method) and a particular effect (performance). In dealing with human beings one must take into account

the multi-learning variables that interact to produce a
certain result. The question for exploration became--can
the superior mean gain in group (1) be attributed to method
when identified learning variables (chapter IV) are equated
in terms of post-test performance. To carry out this
analysis, coefficient of correlation and a multiple re-
gression were done involving the dependent variable Y on
the six independent variables X_1 to X_6.

Before proceding further, it might be expedient to
comment briefly on correlation and regression concepts in
order that the selected statistical methods will have more
functional meaning.[2]

One of the underlying aims of this chapter is to
report the discovery of causal relationships of one variable
to another for controlling and predicting. In research,
correlation coefficients and regression coefficients are
used in pairing the relationship of two different variables.

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[2]
Francis Cornell, The Essentials of Educational
Statistics. (New York: John Wiley and Son Inc., 1956).

M. J. Nelson, E. C. Denny, Arthur Coladarci,
Statistics for Teachers. (New York: Dryden Press Inc.,
1956).

Herbert Sorenson, Statistics for Students of
Psychology and Education. (New York: McGraw-Hill Book Co.,
1936.

By relationship is meant the extent to which changes in the measured amount of one variable are associated with changes in the other variable. The numerical expression of the amount and kind of relationship is indicated by the coefficient of correlation. For the purpose of illustration, it might be advantageous to arrange two variables on a scattergram to graphically represent the corelation between the value of paired variables. One variable is measured along the vertical axis and the other one on the horizontal axis. Each pair of measures form the coordinates for a point (tally mark) in the scattergram.

Table 3 typifies a positive correlation (.501) characterized by the location of the points along an elliptical area with the majority of markings on the upper right and lower left quadrants. When the predominance of points are charted in the upper left and lower right quarters the correlation is negative. When the scatter is about the same in each quadrant about the center a zero correlation is present. All correlations range in size from $\pm$ 1.00 (which is complete dependence) to 0 (complete independence of one variable to another). A scattergram is useful in visually showing how two variables may be corelated but the actual computation of coefficients is abstractly arrived at by a formula which is used to express these paired relationships in a numerical quantity.

TABLE 3

SCATTERGRAM OF THE PRE- AND POST-TEST SCORES FOR
THE 73 EXPERIMENTAL SUBJECTS

Pre-test	26-27	28-29	30-31	32-33	34-35	36-37	38-39	40-41	42-43	44-45	46-47	48-49
29-30							/					//
27-28									//			/
25-26												
23-24										/		/
21-22	/					///		//	/	/	/	/
19-20			//	/			///	///		///	/	/
17-18	/			//	/	//	/	//	//	//	/	
15-16		/		////			////	/	///			
13-14			/	///	/				/			
11-12			/	//		/	//					
9-10			/									
7-8						/						

Post-test

$$r = \frac{\frac{\leqslant X_{41}X_{21} - M \; \overline{x_4} \; \overline{x_2}}{M}}{\sigma x_4 \cdot \sigma x_2}$$

As noted in tables 4 and 5, seven scores were available on each of the 73 subjects as follows: X_1 was the group variable which took the value of 0 or 1 depending on whether the student was in the control or experimental group, X_2 was the students' Ohio State Psychological Examination total score, X_3 signified the O.S.P.E. reading score, X_4 represented the students' cumulative point hour, X_5 denoted the score on the Minnesota Teacher Attitude Inventory, X_6 marked the pre-test score, and the variable y was the post-test score. Table 4 contains the sums, sums of squares, and sums of cross products of the seven above designated variables. Coefficients of correlation, means, and standard deviations for each of the variables can be noted in table 5. In terms of the kind and the amount of relationship between the six independent variables to the dependent variable (post-test), table 14 bears close inspection.

Of particular importance is the correlation coefficient of .648 between the post-test and the cumulative point hour ratio. If it is feasible to assume that cumulative point hour is a stable indication of potential

TABLE 4

SUMS, SUMS OF SQUARES, AND SUMS OF CROSS PRODUCTS

n = 73

| | Group | O S P E | | Cumulative Point Hour | M T A I | Teaching Situation | |
| | | Total | Reading | | | Pre-Test | Post-Test |
	x_1	x_2	x_3	x_4	x_5	x_6	y
x_1	36.000	2457.000	2389.000	92.988	2262.000	659.000	1407.000
x_2		348584.000	335479.000	12890.404	318970.000	89562.000	186778.000
x_3			336388.000	12503.181	307433.000	87054.000	181447.000
x_4				521.374	12759.630	3582.827	7533.167
x_5					352201.000	89253.000	183788.000
x_6						25672.000	52166.000
y							11974.000
Sum	36.000	4786.000	4642.000	192.045	4727.000	1328.000	2814.000

TABLE 5

COEFFICIENTS OF CORRELATION, MEANS AND STANDARD DEVIATIONS

n = 73

| | O S P E | | | Cumulative Point Hour | M T A I | Teaching Situation | |
| | Group | Total | Reading | | | Pre-Test | Post-Test |
	x_1	x_2	x_3	x_4	x_5	x_6	y
x_1	1.000	.121	.115	-.100	-.075	.025	.090
x_2		1.000	.822	.400	.226	.344	.245
x_3			1.000	.357	.157	.330	.247
x_4				1.000	.376	.570	.648
x_5					1.000	.390	.146
x_6						1.000	.501
y							1.000
Mean	.493	65.562	63.589	2.631	64.753	18.192	38.548
Standard Deviation	.503	21.987	23.923	.474	25.307	4.585	5.893

performance, then .648 represents a substantial relation-
ship between previous performance and performance on the
criterion measure. It would be unsagacious to conclude
that the methods of instruction were effective in producing
performance comparable to expected performance. However,
these statistical data gave the researcher another facet
of evidence to consider in judging the value of instruction.
The post-test correlation of .501 with the pre-test pointed
to the fact that students who did well on the pre-test had
a tendency to do well on the post-test despite the method.
The correlations of the other variables with y were negli-
gible at best. Yet it was worth pausing to ponder the im-
plication of the .090 correlation between the post-test
score and the group to which the students happened to be
members. One might hypothesize that student performance on
both pre- and post-test was not effected by membership in
the control or experimental group.

The high correlation between the O.S.P.E. total score
and reading score would normally be expected since the read-
ing score is included in the total O.S.P.E. score and bears
a high correlation to part of the total score.

Thus far in the analysis of the verbal data the
attention has been directed toward establishing effective-
ness by computing the difference in mean gains within each
group. It was noted that a very significant gain was

evident in both groups. In an effort to pursue instructional effectiveness and difference in mean gains in relation to identified learning variables, correlations were established in table 5. A substantial relationship was found between previous achievement (cumulative point hour) and achievement on the criterion measure (post-test) irrespective of group membership. Both instructional methods appeared effective in terms of expected performance. Did the experimental group do better on the post-test than the control group when the learning variables are statistically equated? (It will be remembered that a variance in mean gains was noted on tables 1 and 2.) Is this a true difference when the learning variables for each group are considered?

Correlation and regression are inseparable. The plotting of a line which best fits the swarm of marks (table 3) and estimating the extent to which the swarm fits the line is the function of the researcher in establishing regression coefficients. Consider the scattergram in table 6 which is a duplicate of table 3. If an X was recorded for the mean score on each horizontal line and an O for the mean score in each vertical column, the lines of best fit for the X's and O's would be regression lines X^1 and Y^1. (The O's and X's in the scattergram were approximations for purposes of illustration.) These two

TABLE 6

REGRESSION LINES FOR PRE- AND POST-TEST

Pre-test x^1	26-27	28-29	30-31	32-33	34-35	36-37	38-39	40-41	42-43	44-45	46-47	48-49
29-30						/				o		//
27-28									//	o		/
25-26												
23-24										/ o		x/
21-22	/					///		o//	/	/	/	/
19-20	x		//	/			/o/	/// x	x	/// x	x/	/
17-18	/			//	/	//	b	//	//	//	/	
15-16		x/		////	x	///// o		/	///			
13-14			x/	//6	/				/			
11-12			/	//	o	/	//					
9-10			/o									
7-8						o/						
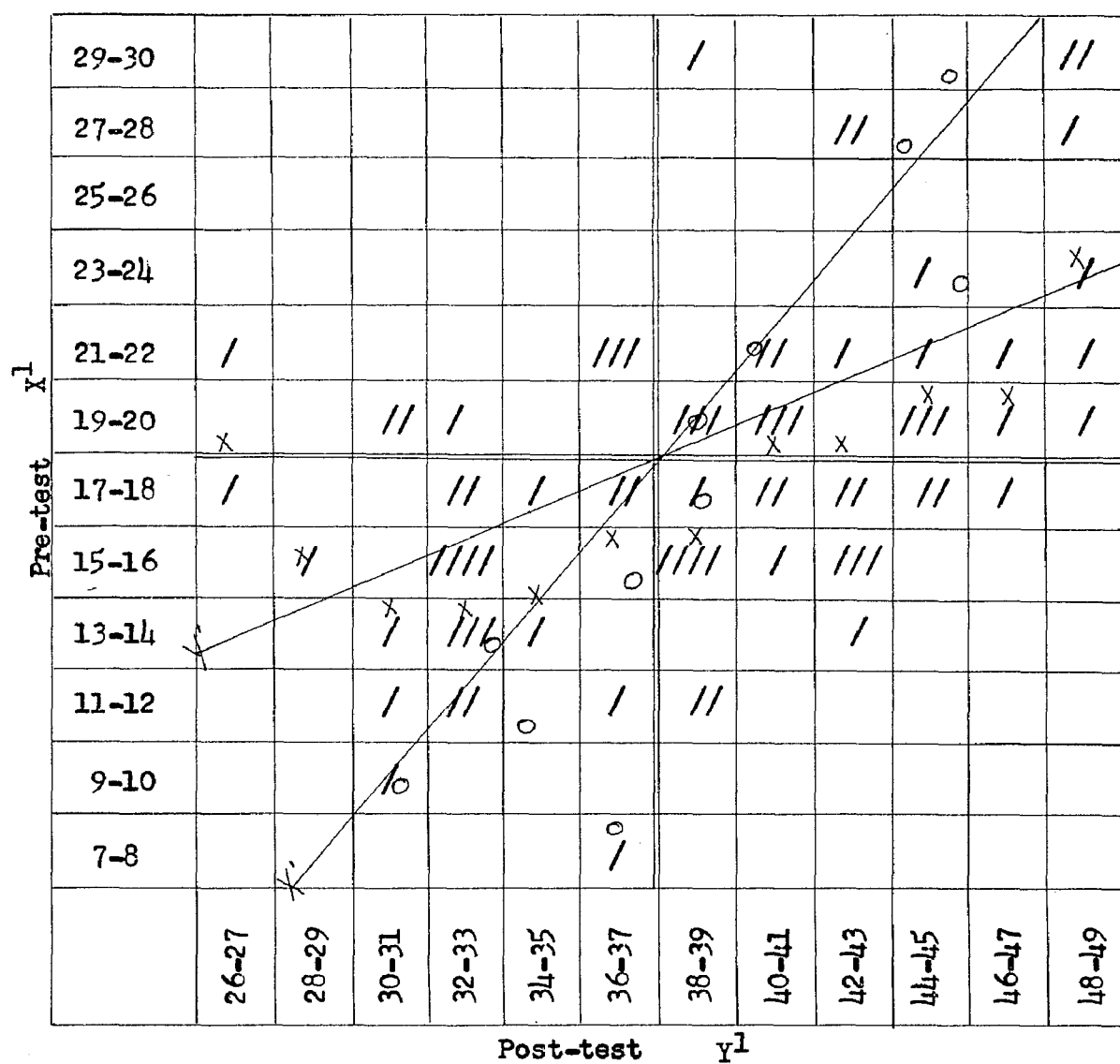
Post-test y^1

regression lines permit one to make "the best prediction"
when one variable is known. For example, a pre-test score
of 22 should produce about a post-test score of 44. (Find
22 on pre-test scale and move horizontally to Y^1 line or
post-test prediction. Drop a perpendicular line down to
the corresponding post-test score. Regression coefficients
like regression lines indicate the amount of change of one
variable which accompanies a given amount of change in
another variable. When the situation calls for a predic-
tion involving more than two variables in combination a
regression equation is derived. The regression equation
for Y in terms of the six learning variables was developed
as follows:[3]

$$Y = 1.66X_1 - .02X_2 + .008X_3 + 7.62X_4 - .03X_5 + .29X_6 + 15.66$$

The regression coefficients and their test of sig-
nificance were computed from I.B.M. cards. "t" tests were
carried out to determine whether the coefficient of the
group variable was significantly different from 0. The
results were recorded in table 7.

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[3] Computed by The Ohio State Statistics Laboratory
on I.B.M.

TABLE 7

"t" SCORES FOR THE REGRESSION COEFFICIENTS
OF THE 6 VARIABLES

Variable	Regression Coefficient	"t" Score[*]
Group	1.66	1.57
O.S.P.E. Total Score	-.02	.56
O.S.P.E. Reading Score	.008	.22
Cumulative point hour	7.62	5.33
M.T.A.I.	-.03	1.48
Pre-test	.29	2.00

[*]1% significance level   2.00+
5% significance level   2.67

The "t" ratio has 66 degrees of freedom (N-7) and
for the coefficient to be significantly different from 0
the value of "t" should exceed 2.00 on the 5 per cent sig-
nificance level and 2.67 on the 1 per cent significance
level. With reference to table 7 it can be noted that the
group variable, O.S.P.E. variables, and M.T.A.I. variable
have coefficients that are not significantly different from
0. The cumulative point hour and pre-test scores are quite
significant.

Essentially the same results were obtained when in place of the variable y the increase $y^{1}(y-X_{6})$ was used.

In a multiple regression equation the coefficient shows the regression of the independent variables on the dependent variable with the effects of the other variables eliminated. In other words, it is not necessary to substitute all 6 variables in the regression equation in order to predict y. Predictions based on high significant coefficients (cumulative point hour and pre-test) are more reliable than those based on low coefficients. What relation does this regression analysis have to the problem of determining whether group 1 did better than group 0 on pre-test and post-test when the 6 learning variables are equated? The regression analysis did not indicate that there was a difference between the control and experimental groups in performance on the situational test when the learning variables for each group are statistically controlled. This reduced substantially the feasibility of inferring from tables 1 and 2 that the difference in mean gains favored the experimental group.

In summarizing this section treating verbal behaviors, several inferences relative to the null hypothesis can be drawn from the statistical data:

1) Both methods of instruction were effective in terms of pre- and post-test evidences. Significant mean gains in

achievement represented by "t" scores of 15.47 and 17.68 suggested that more than chance factors were operative in these gains. It is reasonable to suggest that part of the gain could be attributed to class activities.

2) Course experiences appeared to produce expected student performance. A .645 correlation between performance on post-test and previous performance (cumulative point hour) would tend to intimate that the results of instruction were quite satisfactory when judged by this accepted standard of performance.

3) Neither method possessed superiority in relation to verbal performance. The correlation between post-test scores and group membership approached zero (.090) which would imply that membership in group (0) or group (1) had extremely little relationship to the students' post-test score. The regression computations revealed that the groups did not differ from each other in performance when the 6 learning variables were statistically controlled.

Operational behaviors. Operational behaviors is the term assigned to the teaching behaviors observed in the student teaching situation and numerically assessed by the college supervisor, cooperating teacher, student teacher, and the observer. The appraisal medium 1 (page 148) was

so coded that the more effective student teachers scored

higher than the less effective students. A total meaning-

ful score was summated by multiplying the tallies for each

level of effectiveness by the numerical number assigned to

that level. These sums may be found in table 8. The head-

ing of each sub table represents the operational ratings of

each of the four evaluators involved.

Several factors led to the selection of an applicable

statistical test: the smallness of the sample population,

the difficulty of translating judgments into exact numeri-

cal scores and interval scaling, the unlikely assumption

that the 22 students represented a normally distributed

population, and the realization that scores represented

simple ranks of effectiveness. A nonparametric U test

which is the most useful alternative to the parametric "t"

test seemed a prudent choice.[4] The U test is a mathematical

process of comparing the rank sum of the control group with

its mean in terms of its standard deviation.

$$X = \frac{U - \frac{n_1 n_2}{2}}{\sqrt{\frac{n_1 n_2 (n_1 + n_2 + 1)}{12}}}$$

n_1 = number in control group

n_2 = number in experimental group

R_1 = rank sum of control group

$$U = R_1 - \frac{n_1 (n_1 + 1)}{2}$$

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[4]Siegel, *op. cit.*, 116-127.

TABLE 8

RANKING OF JUDGMENTS OF OPERATIONAL EFFECTIVENESS

College Supervisor				Cooperating Teacher				Student Self-evaluation				Observer			
Case No.	Judgment	Group	Rank	Case No.	Judgment	Group	Rank	Case No.	Judgment	Group	Rank	Case No.	Judgment	Group	Rank
57	73	1	1	57	114	1	1	53	146	1	2	57	111	1	1
06	129	0	2	52	131	1	2	57	146	1	2	22	139	0	2
22	137	0	3	22	143	0	3	62	146	1	2	53	150	1	3
26	138	0	4	65	150	1	4	05	157	0	4	13	151	0	4
45	141	1	5	47	151	1	5	13	159	0	5	40	160	1	5
62	144	1	6	33	156	0	6	40	160	1	6	69	162	1	6
58	147	1	7	26	159	0	7	15	161	0	7	65	176	1	7
05	148	0	8	13	162	0	8	22	165	0	8	15	179	0	8
53	153	1	9	53	163	1	9	47	167	1	9	21	181	0	9
47	154	1	10	40	164	1	10	21	168	0	10	31	189	0	10
65	157	1	11	58	168	1	11	60	169	1	11				
69	167	1	12	05	170	0	12	06	172	0	12.5				
41	168	1	13	45	178	1	13	33	172	0	12.5				
13	169	0	14	31	182	0	14	45	173	1	14				
33	170	0	15	62	187	1	15.5	52	180	1	15				
52	175	1	16.5	15	187	0	15.5	58	182	1	16				
60	175	1	16.5	21	191	0	17	65	183	1	17				
15	176	0	18	60	193	1	18	26	184	0	18				
21	192	0	19	41	194	1	19	31	192	0	19				
40	193	1	20	69	199	1	20	29	196	0	20				
29	195	0	21	29	217	0	21	69	200	1	21				
31	207	0	22					41	203	1	22				

Rank Sum = 126.0
x = .725*

Rank Sum = 103.5
x = .320*

Rank Sum = 116.0
x = .066*

Rank Sum = 33.0
x = 1.078*

*x should exceed 1.96 to be significant at the 5% level.

The evaluator ratings in each sub table were arranged in ascending order of magnitude in the column entitled judgments. Case numbers provided a means of identifying students. The group associated with each score was indicated by (0) control or (1) experimental beside the score in the group column. The judgments were so arranged so as to denote ranks 1, 2, 3 ---- up to the number involved. The rank sum found at the bottom of the sub table was the sum of the ranks associated with the control group. For example, in the sub table labeled college supervisors, group (0) had ranks of 2, 3, 4, 8, 14, 15, 18, 19, 21, and 22. The summation of these numbers was the rank sum of 126. The solving for X (using the same example) became a matter of making numerical substitutions in the U test formula,

$$X = \frac{(126 - \frac{(10)(11)}{2}) - \frac{(10)(12)}{2}}{\sqrt{\frac{(10)(12)(10+12+1)}{12}}} \qquad n_1 = 10$$

$$n_2 = 12$$

$$X = .725$$

The X value should exceed 1.96 to be significant at the 5 per cent level. None of the four observational ratings attained this stated level of importance. The ratings obtained by the student had only a chance relationship to his instructional group in Education 517. Those students who participated in the unit approach could not be identified

from those students who experienced the lecture-discussion
approach. The range of judgments made by each group of
evaluators was rather striking. The spread of student self-
evaluation was less than half that of their college super-
visors and somewhat less than either the cooperating teacher
or the observer. It would appear that students did not see
themselves in the same perspective as they are deemed by
their evaluators. On the whole, the students had higher
estimates of their teaching behaviors. A comparison of
case numbers indicated that there was some discrepancy and
some agreement between the four appraisers as to the
observed and felt effectiveness of the individual student
teacher.

An attempt was made to determine whether there might
be any group distinction in grades received in Education
517 and in student teaching. The arrangement of the data
in table 9 is amenable to the nonparametric U test. No
consequential variances were found between the two groups
with respect to the grades earned in either student teach-
ing (operational behaviors) or in Education 517 (verbal
behaviors). Several additional comments seemed appropos
to the discussion. Nine A's were received in student
teaching as compared to four A's in Education 517. The A
students in Education 517 were A students in the follow
through. When case numbers and corresponding grades are

TABLE 9

RANKING OF STUDENT GRADES

Grade in Education 517				Student Teaching Grade			
Case No.	Grade	Group	Rank	Case No.	Grade	Group	Rank
47	C	1	3	47	C	1	1.5
57	C	1	3	57	C	1	1.5
60	C	1	3	41	B	1	8
06	C	0	3	45	B	1	8
29	C	0	3	52	B	1	8
40	B	1	12	53	B	1	8
41	B	1	12	58	B	1	8
45	B	1	12	62	B	1	8
52	B	1	12	06	B	0	8
53	B	1	12	05	B	0	8
58	B	1	12	22	B	0	8
62	B	1	12	26	B	0	8
05	B	0	12	33	B	0	8
21	B	0	12	40	A	1	18
22	B	0	12	60	A	1	18
26	B	0	12	65	A	1	18
31	B	0	12	69	A	1	18
33	B	0	12	13	A	0	18
65	A	1	20.5	15	A	0	18
69	A	1	20.5	21	A	0	18
13	A	0	20.5	29	A	0	18
15	A	0	20.5	31	A	0	18

Rank Sum = 117   x = .132[*]   Rank Sum = 130   x = .987

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[*]x should exceed 1.96 to be significant at the 5% level.

matched, it was evident that the student teaching grade was the same or higher than the course evaluation. In six of the twenty-two cases, students were graded higher in student teaching. This difference may reflect a broader scope of evaluation, than unit teaching behaviors, in the student teaching grade.

Classroom teaching situations were thought to influence teaching effectiveness to the extent that this situational variable was actively surveyed. The five sections of the open ended check list (appraisal medium 3) were tallied and totaled. No additional factors were inserted, but several raters qualified their estimates in the comment column. The U test was again the basic statistical tool.

TABLE 10

RANKING OF STUDENT TEACHING SITUATIONS

Case No.	Judgment	Group	Rank
57	38	1	1.5
41	38	1	1.5
58	40	1	4
52	40	1	4
22	40	0	4
06	41	0	8
45	41	1	8
62	41	1	8
05	41	0	8
26	41	0	8
40	42	1	11
65	43	1	12

TABLE 10   (contd.)

Case No.	Judgment	Group	Rank
13	44	0	13
53	46	1	14.5
33	46	0	14.5
69	48	1	16.5
60	48	1	16.5
15	52	0	19
29	52	0	19
31	52	0	19
21	57	0	21

Rank Sum = 133.5   x = 1.653

x should exceed 1.96 to be significant at the 5% level

The x value at the bottom of table 10 succinctly reported the lack of significant difference at the 5 per cent level. From this data it follows that the student teaching situations for the students in group (0) and group (1) were not statistically different. This did not eliminate the possibility that in individual cases the teaching situations may have influenced teaching effectiveness. A range of 38 to 57 points out of a possible 66 point (analysis of student teaching situation-appraisal medium 3, page 150) would indicate that some situations were more favorable than others with reference to specific factors effecting unit teaching. By comparing grades in 517,

student teaching grades, and the ranking of the student teaching situation, it became evident that the 9 cases who received A in student teaching taught in favorable situations which averaged 49.7 points. Cases 60 and 29 made a conspicuous increase from a grade of C in Education 517 to A in student teaching. One of the recipients of C in Education 517 and student teaching taught in what was judged to be a weak teaching situation. The evaluation of the teaching situation for the other case who received C was not available. The primary problem was not to study individual cases but rather to determine whether a significant difference existed between the groups in student teaching situations. Only chance fluctuations were apparent between the two groups.

The statistical analysis of the operational data provided a basis for reasoned judgments that might affirm similarity of operational behaviors between students in group (0) and group (1). The two groups received corresponding grades in Education 517 and student teaching. No significant difference was discernible between the groups with respect to the student teaching situation. Group comparisons rather than individual case comparisons have been the central focus in these summary generalizations for two reasons: the null hypothesis is stated in terms of groups rather than individuals, plus the fact that individual

cases will be given further attention in the non-mathematical treatment of the data in this chapter.

Student opinions. Student opinions were solicited as part of an effort to substantiate the premise that the two courses were taught by diverse instructional procedures and to weigh student reactions in assessing instructional effectiveness. The student analysis (appraisal medium 4, page 151) was designed to obtain student perceptions of instructional activities. Table 11 tallied the responses plus recording the test of significance between group responses. The numbers in the questions column correspond to the 16 questions forming the evaluative tool. The numbers opposite each question are the frequency of the score on that question in each group. A score of one indicated that the student judged the teaching factor under consideration to be evident in course procedure to a very great degree. Scores of two, three, and four gave the student a freedom of choice within a moderate range of expectancy. A score of five would carry the student judgment that the teaching factor was evident to a very slight degree if it actually occurred at all. The $\bar{X}$ column, or mean value, for each question was computed by summing the value of each frequency and dividing by the number of students $\frac{X}{N}$. The S^2 represents the sum of the squared deviations which may be algebraically stated as $S^2 = X^2 - (\frac{X}{N})^2$. The value of the

"t", used to test the difference between the groups on
each question, may be computed by making numerical substi-
tutions in the following formula:[4]

$$t = \frac{\bar{X}\text{ cont-}\bar{X}\text{ exp}}{\sqrt{\dfrac{s^2\text{cont} + s^2\text{exp}}{1131.027027}}}$$

The "t" has 72 degrees of freedom and for the group
to be expressively different the "t" score should exceed
2.00 on the 5 per cent level and 2.66 per cent on the 1
per cent significance level.

The interpretation of table 11 would be more meaning-
ful if the reader would continuously associate the welter
of figures in the table to the questions in the student
analysis appraisal medium included at the end of chapter
IV. Several general observations will follow an examina-
tion of student responses to each question.

The stated objectives were clear to a great or very
great extent in both sections (question 1). However, the
students in the experimental group felt that the stated ob-
jectives were noticeably more functional in the selection
of instructional materials (question 2). Little variance

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[4] The numerical denominator was computed by the
Statistics Laboratory.

TABLE 11

STUDENT ANALYSIS OF EDUCATION 517

	Control Group (0) Score							Experimental Group (1) Score							
Question	1	2	3	4	5	$\bar{x}$	s^2	1	2	3	4	5	$\bar{x}$	s^2	t^*
1	28	10				1.2632	7.3684	29	7				1.1944	5.6389	0.70
2	18	12	5	2	1	1.8421	39.0526	26	10				1.2778	7.2222	3.03
3	10	16	9	3		2.1316	30.3421	11	18	7			1.8889	17.5556	1.28
4	30	8				1.2105	6.3158	21	7	5	3		1.7222	35.2222	-2.90
5	3	5	6	9	15	3.7368	65.3684	30	6				1.1667	5.0000	11.18
6		2	7	7	22	4.2895	33.8158	24	11	1			1.3611	10.3056	16.08
7				10	28	4.7368	7.3687	26	9	1			1.3056	9.6389	30.19
8	4	6	8	11	9	3.3947	63.0789	13	16	6	1		1.8611	22.3056	6.06
9	9	10	8	8	3	2.6316	60.8421	12	15	7	2		1.9722	26.9722	2.57
10	19	8	4	4	3	2.0526	65.8947	14	21	1			1.6389	10.3056	1.73
11	18	12	5	3		1.8158	33.7105	5	13	11	5	2	2.6111	40.5556	-3.37
12				1	36	4.9737	.9737	29	6	1			1.2222	8.2222	45.13
13				2	36	4.9474	1.8947	4	19	8	5		2.3889	26.5556	17.50
14	4	11	16	7		2.6842	30.2105	9	18	8	1		2.0278	20.9722	3.35
15		3	15	17	3	3.5263	21.4737	30	4	2			1.2222	10.2222	14.93
16	1		1	4	32	4.7368	21.3684	21	11	4			1.5278	16.9722	18.91

*1% significance level should exceed 2.66
5% significance level should exceed 2.00

was noted between the groups with reference to the attention
given to on-the-job teaching problems in question 3. The
minus "t" score corresponding to question 4 left little
doubt as to the control students recognition of the instruc-
tor's prestructuring of course content and experiences. A
"t" of 11.18 further disclosed a student awareness in both
groups as to the extent to which their questions formed
the basis of course organization and activities (question
5). It was rather plain from both the response frequencies
and the estimated "t" of 16.08 that cooperative planning
was not operative in the control group (question 6).
Assuming that 30.19 approximates a true value, it follows
that group (0) members did not perceive themselves as shar-
ing responsibility with the instructor in the selection of
learning materials (question 7). Even though a more than
chance variance existed neither group saw themselves sharing
as much responsibility for class discussions (question 8)
as for selection of learning materials. The encouragement
of individual thinking seems not too different yet signi-
ficant at the 5 per cent level (question 9). The responses
to question 10 were provocative. Most of the students in
the experimental section identified the instructor as a
resource person to a great or very great degree, while two-
thirds of the students in the control group were of the
same opinion. There was more significant differentiation

between the groups in identifying the instructor as a lecturer. The control group was more aware of the instructor as a lecturer than the experimental group (question 11). It was apparent that the control group identified, to a perceptible degree, the instructor as both lecturer and resource person. The highest significant difference was associated with the provision for committee experiences (question 12). Group (0) registered almost unanimously the absence of group work. The distribution of responses on question 13 revealed that the control group was cognizant of the lack of resource people as an instructional procedure. Two resource people enriched the thinking of the experimental group; to some students this meant that resource people were used to a very great degree, to others this frequency was not given the highest rating. This was an example of the varying student perceptions of the same class experiences. Both groups showed a spread of opinions in regard to the use of audio-visual materials (question 14), but the "t" score favored the experimental group. Group (1) appeared to recognize the variation in classroom procedures. By the same token, the control students were quite sensitive to the sameness of instructional activities (question 15). It was quite significant to the investigator to note that the members of group (0) discerned the ommission of direct unit experience opportunities as

opposed to a very positive response to unit opportunities by the members of group (1).

The general observations encompass two crucial questions—how did the students visualize the overall instructional procedures experienced in both sections and were their discriminations significantly different to infer that the instructional approaches were dissimilar with respect to directness of experience (underlying pedagogical difference established in chapter IV)? At this point it might be worth restating that the "t" score was an estimated value of the difference between the two groups and as such described a limited profile of teaching procedures. For example, the "t" for question 1 suggested that the groups did not differ to any measurable extent but it did not indicate the extent to which the stated objectives were clear to the students. The responses to this question could have been clustered around the lower end of the scale and have produced the same "t". Since the "t" is an index of group difference and not a degree to which teaching factor was evident in both groups, it should be supplemented by the mean ($\bar{X}$ value).

A hasty glance at the $\bar{X}$ values for the experimental group would communicate to the observer that all the teaching factors were operative to a great or very great degree except the lecturer role of the instructor, the use of

resource people and the use of audio visual materials.
These latter factors were believed evident from an appreciable to a great degree. From these data it might be supposed that the instructor was able to carry out the instructional methods outlined in chapter IV. To consistently carry out desired procedures to a great or very great extent almost appears beyond human control or skill. Possibly the numerical code was biased or maybe the instructor had the group "with her" in this experimentation. Neither group was informed about the research project by the investigator. Yet it is most likely that students living in the same dormitories compare class assignments and activities.

Generally speaking, the mean scores of the control group showed a greater spread of judgments. Again the researcher doubts whether teaching skill was alone responsible for student perceptions which so closely approximate the method the researcher was attempting to carry out. The clarity of the objectives, the use of the objectives as guides, the pre-planning of the course by the instructor, and the lecturer role of the instructor were evident to a great or very great extent. At the other end of the continuum the students estimated that cooperative planning, sharing of responsibility in selecting learning materials, committee experiences, and resource people were used infrequently as part of the instructional pattern. The

participants of group (0) checked the following teaching variables as existing from a slight to an appreciable degree: the use of students' questions in planning the course, the sharing of the leadership and followership roles between the students and instructor, the occurrence of divergent class procedures. It would appear that the students in the non experimental group were rather objectively discriminate in analyzing which methodological factors were plainly evident and which factors were obscure in practice.

Would each group's general perceptions of course activities justify the assumption that directness of experience was the key differentiating element? The "t" and mean scores substantiate a positive position with reference to this assumption. Eleven of the sixteen factors were significantly positive in favor of the experimental group. The two negative differential values (pre-structuring of course by instructor and the definite lecturer role of the instructor) lend further support to the recognition by the students of indirect unit experiencing in the control group. In reality a reply to the inquiry can be succinctly summarized by comparing group responses to question sixteen. Thirty-six of the students in the control group recognized that very little or no opportunity was provided for them to experience the unit method directly. A counter tendency

was apparent in the experimental group by an acknowledged
awareness from 32 of the 36 students that direct unit
teaching was experienced to a great or very great degree.
It would appear reasonable to infer that the two sections
were taught differently and that some continuity existed
between the actual directness of experience and the pro-
posed directness of experiences as outlined in chapter IV.

Student opinions were also invited as another source
of data to be used in evaluating course effectiveness. An
understanding of table 12 would be facilitated by reference
to the Student Reactionnaire questions (appraisal medium 5,
page 152). The mechanics involved in the organization of
the table and the statistical computations were the same
as those discussed for table 11. Again the "t" score needed
to be clarified and supplemented by mean values ($\bar{X}$). As in
the interpretation of table 11, specific attention to each
question will precede general statements in terms of over-
all course effectiveness.

The sample groups viewed both the stated objectives
and their agreement with actual objectives highly effective
(questions 1 and 2). Group (1) was inclined to rate higher
the ordering of course proceedings for the realization of
course objectives than group (0), (question 3). A high
level of agreement existed between the groups as to the
appropriateness of the assignments and the time required

TABLE 12

STUDENT REACTIONNAIRE

	Control Group (0) Score							Experimental Group (1) Score							
Question	1	2	3	4	5	$\bar{x}$	s^2	1	2	3	4	5	$\bar{x}$	s^2	t^*
1	14	10	14			2.0000	28.0000	11	18	7			1.8889	17.5556	0.60
2	20	12	5	1		1.6579	24.5526	22	12	2			1.4444	12.8889	1.27
3	13	13	10	2		2.0263	30.9737	17	17	2			1.7500	34.7500	0.74
4	15	15	5	2	1	1.9211	36.7632	18	8	7	2		1.7500	34.7500	0.74
5	17	12	6	1	2	1.9211	44.7632	18	15	2	1		1.6111	18.5556	1.42
6	10	10	13	1	4	2.4474	55.3947	15	8	7	6		2.1111	45.5556	1.22
7	21	9	5	2	1	1.7632	40.8684	22	9	2	3		1.6111	30.5556	0.66
8	1	3	5	11	18	4.1053	43.5789	16	14	6			1.7222	19.2222	10.97
9	2	6	14	10	6	3.3158	44.2105	12	17	5	2		1.9167	24.7500	6.15
10	10	8	10	7	3	2.6053	61.0789	15	20	1			1.6111	10.5556	4.29
11	7	6	13	6	6	2.9474	63.8947	14	20	3			1.7500	10.7500	5.06
12		1		4	33	4.8158	11.7105	14	7	12	2	1	2.1389	42.3056	13.29
13	9	16	11	1	1	2.1842	31.7105	8	20	8			2.000	16.000	0.97
14	12	11	8	4	3	2.3421	58.5526	19	12	5			1.6111	18.5556	3.04
15	11	20	7			1.8947	17.5789	15	21				1.5833	8.7500	2.21

*1% significance level should exceed 2.66
5% significance level should exceed 2.00

for out-of-class preparation (questions 4 and 5). Even though the nature of participation reports were not alike the 2 groups responded alike in ranking the effectiveness of the assignments (question 6). The degree of freedom that the students felt in expressing their own thinking might be indicative of the quality of classroom "climate" developed in both groups (question 7). The students in the control group responded negatively to the absence of cooperative planning. The opposite student response was true in the case of the experimental group, thus making a marked numerical disparity between the groups (question 8). While the subjects in group (1) thought the sharing of leadership and followership roles was highly effective, the subjects in group (0) believed such classroom procedures bordered on the ineffective (question 9). A conspicuous dissimilarity was noted in evaluating the attempt to relate methods of instruction used in the course and the teaching of social education in the elementary school. The experimental group assumed this relationship to be more effectively accomplished (question 10). The control group followed through the response to question 10 by recording the ineffectiveness of the course in harmonizing teaching procedures and educational philosophy (question 11). As might be expected from the table 11, question 12, the highest salient differentiation in effectiveness judgments was related to committee

experiences. Not only was the variance noticeable between
the groups but within the experimental group the spread of
opinions indicated some uncertainty as to the value of the
committee experiences. The mean score for question 13 would
lead one to infer that both groups thought the course was
relatively effective in terms of gaining teaching competence
in social education. Yet when a similar question (14) was
directed specifically to unit teaching there was a signi-
ficant difference in favor of the experimental group. Even
though the reference materials were quite similar, group (1)
evaluated them as more effective than did group (0) (ques-
tion 15).

A few collective and disquieting statements emerge
from the Student Reactionnaire data. The control group
expressed a greater distribution of opinions, as was also
true in the Student Analysis of class procedures. The
narrowness of the range and the consistency of high effec-
tiveness evaluations in the experimental group may indicate
that "halo" feelings were operative in student decisions.
The students felt that the course was generally satisfying,
so every aspect of the course was checked effective. It was
hard to assume that one method of teaching could so effec-
tively meet the needs and learning expectation of 36 indi-
viduals. It was equally onerous to assume that the control
group was not aware, from the questions in student analysis

and reactionnaire forms, that many supposedly desirable
instructional procedures were absent from their course ex-
periences. Yet the average student rated the course from
effective to highly effective in terms of gaining an under-
standing of social education and unit teaching. It would
seem that the average college student tends to be satisfied
with course activities and does not react critically to the
instructional gap between "say" and "do" educational phil-
osophy.

These statements may be merely biased inferences.
In the first place, the above discussion practically assumed
that one method of instruction should be superior because
it exemplified current educational thinking about the way
learning takes place. Due to the countless combinations of
multi-learning variables in every teaching situation, some
of the assumptions about the learning process made by pro-
fessional educators have not been irrevocably established
(chapter IV). Then, too, it is only natural for students
to evaluate present experience in relation to previous ex-
periences. The students would evaluate course effectiveness
more in terms of previous cause experiences than in relation
to what might have been experienced. By and large group
opinions were not as significantly different in the respond-
ing to effectiveness as in estimating the occurrence of
actual teaching procedures. By and large the statistical

differential resulting from the student analysis and
student reactionnaire favored the experimental approach.

Acceptance of the Null Hypothesis

The ultimate purpose for gathering and critically
reviewing the experimental data was to accept or reject
the null hypothesis which stated that there is no signifi-
cant difference in the verbal or operational attainment of
the stated behavioral outcomes between a student group which
experienced one method of instruction as opposed to a stu-
dent group which experienced a dissimilar method of instruc-
tion. The four questions forming the directional framework
for examining this educated guess were stated in chapter II
and brought into focus again at the beginning of this chap-
ter. These four querries provide continuity and direction
in summarizing the findings in the preceding sections with
the intention of arriving at a rational position pertaining
to the null hypothesis. The data relative to each question
will be summarized separately.

1. Were the two sections of Education 517 taught
differently? Instructional data were secured from three
sources: pre-structure outline, student analysis, and
anecdotal records. The structural outline (chapter IV)
presented the preplanned written assignments, division of
responsibility between students and instructor, and sequence
of course experiences. The tentativeness of the class

activities for group (0) allowed freedom for cooperative planning and direct student participation in the selection, development, and evaluation of a group study. The student analysis recorded a significant difference between the groups in 13 of the 16 suggested teaching factors. A very salient recognition by the control group of little or no provision to experience the unit approach might be contrasted to the conspicuous awareness of unit experiences by the experimental group. Realizing the inescapable element of subjectivity, the daily logs (Appendix B and C) lend support to the student analysis of teaching procedures and parallel the pre-structure outline. On the base of statistical and descriptive evidence it seemed reasonable to contend that the two sections of Education 517 were taught by unlike methods which were differentiated by conscious provision for directness of the unit approach and student involvement.

2. Was each method effective in relation to the pre- and post-test evidence? The difference in mean gains between the pre- and post-test for group (0) was 15.47 and 17.68 for group (1). These distinctions were significant to the extent that it was highly improbable that this gain was due to chance. It can be assumed that the teaching procedures were vital factors in the learning situations and to some degree responsible for the increase in verbal understandings. Each method appeared quite effective in bringing about verbal growth.

3. **Was one method significantly more effective than the other in the attainment of verbal behaviors?** A multiple regression was done to determine whether group (1) actually did better on the post-test than group (0) when the six known learning variables were equated. The results of this computation did not indicate a difference between the groups when the learning variables were statistically controlled. With some degree of confidence it was possible to say that neither group enjoyed superior gain in verbal behaviors. Consequently neither method enjoyed superiority.

4. **Was there a significant difference in the observed operational behaviors that can be attributed to teaching method?** The observed operational behaviors were numerically rated and ranked. No real variations were found between the two groups in regard to observer judgments, grades, or teaching situations. Again neither group or subsequent teaching method appeared superior.

After establishing that the two courses were taught differently, the behavioral findings emerging from the statistical examination of the data left the researcher no alternative but to accept the null hypothesis.

Effectiveness of Instructional Procedures

In as much as the problem under investigation concerns an evaluation of the effectiveness of two methods of instruction in attaining certain desired outcomes, further

attention was converged on the term "effectiveness." The researcher attempted to develop a broader point of view for evaluating effectiveness than mean gain in achievement which satisfies scientific research (chapter II). It is conceivable that the null hypothesis could be accepted or rejected and neither method be effective. Performance on the post-test was found to have a correlation of .648 with an accepted standard of performance (cumulative point hour ratio). The instructional procedures appeared effective in producing expected student performance. The students judged both methods to be effective but generally rated the effectiveness of the experimental approach slightly higher than the control procedures.

Method per se warrants consideration as a causal influence in the attainment of the desired outcomes. It was impossible to identify a causal relationship between directness of experience and the actual verbal and behavioral performance of the two student groups. Yet a noticeable relationship existed between student estimates of course effectiveness and the directness of the unit approach.

Non-statistical Treatment of Data

Not all of the evidence was directly applicable to the null hypothesis nor amenable to quantitative symbols and statistical methods. Anecdotal material together with

post student teaching judgments shed luster to the overall
evaluation of course effectiveness. Thus it was thought
desirable to expand scientific requirements and to explore
non statistical data for the purpose of discovering plaus-
ible blocks to unit teaching, interrelationships in student
profiles, and course inadequacies. This exploration plus
the preceding statistical analysis of the data became in-
herent to implications for course amelioration.

Plausible blocks to unit teaching. Summary anecdotal
accounts for each observation were made by the investigator
during the student teaching follow through. Ten students
were visited on an average of six times for a period of an
hour to an hour and a half once a week. The researcher
sought to discover those factors which seemed to reduce the
unit teaching efficiency of the student in the classroom
situation.

Perhaps the most distinct and recurring opposition
to high quality teaching performance was the lack of group
control. Group studies were begun before the student knew
her group and had established a cooperative relationship
with the children. Generally the morning schedules had been
devoted to skill development. When the routine of the child-
ren was changed, the group needed orientation to new routine
or confusion was audible and visible. Lack of group control
might also be traced to the paucity of previous unit exper-
iences. If this method of teaching had been used by the

cooperating teacher, the children knew what to expect and what was expected of them. Too rapid a transition, converting control from without (teacher control) to control from within (cooperative planning and responsibility), released freedom before a balance of freedom and responsibility had been accepted by the group.

During the development of the unit the pacing or timing of discussion periods and research activities led to loss of pupil interest and meager understandings. A keen sensitivity to overt signs of group disinterest and fatigue on the part of the student teacher was seldom observed. Work periods were often too long for the job to be done. Where group discussions were carried on past the point of involvement, distracting behaviors resulted. Neither whole group reactions or individual behaviors were sensed and redirected rapidly enough for ideal progress of the study. In several instances attempts were made to be "too democratic". For example, when second graders spent forty minutes voting for the person responsible for each work material, the group was lost before the work period began. Deficiency in student pre-planning may have been a limiting factor in pacing. There is perhaps no substitute for stimulating teacher ideas in motivating group action. Those students who constantly interjected resourceful suggestions kept their groups pulling together toward common goals.

To the observer, committee experiences disclosed some student frustration. The prospective teacher frequently assumed the children to be mature beyond their years. Clear step-by-step procedures for group undertakings were not communicated. Too many simultaneous groupings made it impossible to give adequate assistance every work period. This thwarting situation may have been averted to some degree if whole group planning of potential committee accomplishments had preceded the actual work period. A brief evaluation at the end of a multi group session should yield direction for pre-planning the next day's agenda.

There was a tendency to rush through research experiences only to find that the expressional activities represented surface understandings. The committee-of-the-whole could have been used more frequently to implement the answer getting process. Where considerable teacher direction, few or special resources, development of basic generalizations, and general group interest were involved to a high level, whole group activity might have supplanted individual or committee efforts.

It is accurate to say that the sensing of group rapport and group reactions, the pacing of the activities, the pre-planning in detail for alternative procedures, the judging of appropriate committee experiences, and the cooperative planning and exchanging of ideas appeared to

be plausible blocks to unit realization. It is hoped that through evaluative experiences the prospective teacher will recognize these limitations. In time, such an additive process of broadening educational horizons should transform plausible blocks to plausible unit teaching power.

Profiles of follow through students. Table 13 brings into sharper focus the interrelationships of student characteristics. This phase of the study was an effort to balance the rigid analyses of the data in dichotomous instructional groups and to suggest individual and group tendencies that may be provocative to teacher educators.

If the Ohio State Psychological Examination is a predictive measure of probable academic success in college, why do the A students, with the exception of case 15, represent the third quartile of score distributions on this examination? The first and second quartile members received B or C evaluation marks. Did the instructional program fail to reach the more able students? There was no tendency for the high capacity students to perform differently under one teaching method or the other. If the most effective teachers are of average capacity, should this factor be considered in pre-service selection? What combination of factors caused Nos. 13, 65, and 69 to perform well in verbal and operational situations? Why did Nos. 29 and 60 "click" in student teaching with an apparently low verbal

TABLE 13

PROFILES OF FOLLOW THROUGH STUDENTS

Case No.	O.S.P.E. Group	O.S.P.E. Total	Reading	Cum. Pt. Hr.	M.T.A.I.	Pre-test	Post-test	Self Rating	Coll. Sup. Rating	Coop. Teach. Rating	Observer Rating	Student Teach. Grade	Grade in 517	Teaching Situation
05	5	53	59	2.564	42	20	44	157	148	170		B	B	41
06	3	69	84	2.797	78	20	30	172	129	*		B	C	41
13	3	67	65	2.409	32	17	45	159	169	162	151	A	A	44
15	2	82	74	3.301	70	28	49	161	176	187	179	A	A	52
21	3	29	31	2.661	97	19	30	168	192	191	181	A	B	57
22	2	77	78	2.239	58	20	39	165	137	143	159	B	B	40
26	3	59	90	3.077	77	17	43	184	138	159		B	B	41
29	3	62	23	2.774	77	20	39	196	195	217		A	C	52
31	3	47	39	2.872	84	22	41	192	207	182	189	A	B	52
33	2	83	51	2.594	68	17	38	172	170	156		B	B	46
40	3	64	47	2.301	70	19	40	160	193	164	160	A	B	42
41	3	75	85	2.906	58	30	39	203	168	194		B	B	38
45	2	81	86	2.870	60	18	47	173	141	178		B	B	41
47	2	93	86	2.793	80	16	39	167	154	151		C	C	*
52	3	69	59	2.781	44	15	43	180	175	131		B	B	40
53	1	97	98	3.066	95	21	44	146	153	163	150	B	B	46
57	3	72	90	2.230	77	19	38	146	73	114	111	C	C	38
58	2	91	84	2.895	44	18	45	182	147	168		B	B	40
60	3	72	65	2.700	80	16	33	169	175	193		A	C	48
62	1	97	96	3.340	36	21	41	146	144	187		B	B	41
65	3	52	39	2.845	59	20	40	183	157	150	176	A	A	43
69	3	75	82	3.264	92	30	49	200	167	199	162	A	A	48

*Information was not available.

understanding of unit teaching? Part of their success in student teaching might be attributed to favorable teaching situations. By and large, a rather close relationship existed between how the students said they would behave and actual teaching behaviors in the classroom. The affinity between the desirability of the student teaching situation and the student teaching grade has been alluded to on pages 183 and 184.

The subjectivity in evaluative observations was manifested in the range of individual judgments for the same teaching performance. In some ratings the difference was slight; in others the discrepancy was decidedly pronounced. For example, a disagreement of 73 points (case 57) between student and college supervisor evaluations revealed little communication. A variance of 30 points or more was noticeable for cases 6, 26, 40, 41, 45, 57, 58, and 69. The same letter grade in the pre-service teaching experience represented varying degrees of effectiveness. A grade of C was given with supervisor ratings of 73 and 154. Supervisor assessments of 129 to 175 fell in the B category. A ratings were given for evaluations of 157 to 207. The inference that student teaching grades were influenced appreciably by the teaching situation and the standards of the individual supervisor was inescapable from this limited data. Gaps in operational agreement with the

student judgments were numerous for both the cooperating teacher and the observer. Reference was made on page 180 to the relatively high student self evaluations. The operational data suggested a need for more realistic communication between the student, supervisor, and cooperating teacher as to expected effectiveness and the level of attainment. It would be redundant to present a resume of each student's profile in as much as the above general patterns are group trends of individual relationships.

Post student teaching evaluations of and by students. It was reasoned that after the student teaching experience the effectiveness of Education 517 could be viewed in a more functional perspective. By tabulating the responses on appraisal medium 1, page 148, it was possible to estimate behavioral areas that the student, cooperating teacher, and college teacher judged to be ineffective in the classroom. In addition to these tabulations, the follow through subjects reacted verbally to the adequacy of Education 517 in developing professional readiness for classroom teaching.

From the combined judgments of the evaluators in table 14, it is possible to discern teaching competencies that could be more functionally treated in the professional course. The numbers heading the five columns coincide with the five estimates in the ineffective-effective continuum. It was the consensus of opinion that students lacked skill

TABLE 14

TABULATION OF UNIT TEACHING EFFECTIVENESS OF STUDENT TEACHERS
(Appraisal Medium 1)

		1	2	3	4	5
1	a	3	4	25	19	13
	b	3	4	14	21	18
	c			11	25	26
	d		4	17	22	17
	e	7	6	17	20	8
	f	1	2	8	31	19
	g	1	5	21	22	7
	h	1	2	14	25	21
2	a	1		17	24	18
	b		5	15	21	16
	c	1	2	25	21	7
	d	1	2	26	21	6
	e			11	22	24
	f		2	19	21	19
	g		2	21	26	10
	h		1	11	18	31
	i		2	17	35	8
	j		3	21	31	9
3	a		3	17	23	16
	b	1	2	17	26	10
	c		7	15	20	10
	d		1	14	26	19
4	a			10	27	26
	b			20	30	12
	c			6	35	23
	d		1	20	36	4
	e	1		13	34	14
	f		4	18	33	6
	g		4	25	21	3
	h		1	17	35	10
	i		2	27	25	7
	j			21	37	5
	k		1	20	32	8
	l		2	27	25	8
	m		2	19	28	11

TABLE 14 (contd.)

		1	2	3	4	5
5	a		1	27	27	13
	b		1	22	26	14
	c		3	25	28	3
	d		3	26	26	9
	e		3	23	25	9
	f		3	17	30	11
	g		2	30	19	10
	h		2	19	18	19
	i		6	18	28	5
6		1	2	13	32	15
7		8	21	17	12	2
8		1		13	35	13

in arranging the environment, providing for common explora-
tory experiences, and coordinating group thinking toward
the final selection of the unit. (In several situations
the student did not participate in selecting the unit as
the group study was pre-determined.) The organization of
research experiences into whole group, committee, and
individual undertakings proved difficult for the beginning
teacher. General classroom management during research and
expressional activities fell short of the ideal. In cul-
minating the study, the student might have assumed more

responsibility for the formulating of generalizations gleaned from group research. Overall growth in cooperative planning and evaluation would be desirable. Adequate directing of group discussions and evaluations were less frequently observed.

In regard to verbal student reactions, there was common recognition in group (1) that either writing a resource unit, reading more units carried on by others, or observing a unit in an elementary classroom would have enriched course activities. The students acknowledged the value of developing a group study on the college level. Yet they felt that the experience of planning and writing a resource unit would have given them more security in student teaching.

The control students (group (0)) stated that writing a resource unit plus class instruction adequately prepared them for teaching. The group requested more direct experience with the unit approach either through actual participation or observation. A recognized need for a deeper understanding of committee work was recorded. Several students indicated the desire to prepare a bulletin board and daily lesson plans for one week in order to stress the need for pre-planning.

Each group seemed satisfied with the instructional procedures but would like to have incorporated what the

other group experienced. This supported the researcher's
hunch that each group was well aware of what was happening
in the other group. Recognizing the human element involved,
some direction for course improvement can be sifted out.
In general, the students would like to experience unit
teaching, write a resource unit, see unit teaching "in
action" on the elementary level, and have a better under-
standing of committee expectations.

Methodological implications for Education 517. To
avoid a recital of the statistical and non-statistical
findings discussed and summarized earlier in this chapter,
implications from these (presently available) data were
suggested for the purpose of instructional improvement.
The emphasis was not what were the results of the investi-
gation but what implications did the gathered data have for
directing course activities.

The researcher must envisage realistically the pene-
trating challenge at the core of accepting the null hypothe-
sis. Acknowledging instructional differentiation, how can
the similarity of verbal and operational outcomes between
the two groups be justified? Should one infer that class-
room activities have little causal relationship to the de-
sired outcomes? Do students learn in spite of instruction
rather than because of it? Attempts to find the reason or
reasons were speculative. The results of this investigation

are applied to the specific situation in which they
occurred.

The difference in mean gains in verbal achievement
between the pre- and post-test predicted that class exper-
iences influenced behavior beyond a chance relationship.
Teaching method was an essential factor in changing behavior
toward desired outcomes. It did, however, show that neither
method produced superior performance on the post-test. It
would appear that when course objectives are clear and when
organized teaching procedures are followed for the attain-
ment of the stated objectives, the college students have a
frame of references for illuminating relevant experience
that makes actual experiencing unnecessary. Lecturing was
an effective as actual unit approach in developing positive
attitudes toward and transfer of unit teaching behaviors.
The firsthand, personally involving experiences, while
good, were not sufficient. The results suggested that in-
volvement did not eliminate passive listening (nonverbal
participation). Yet, student reactions supposed that
teacher competence could be achieved to a higher level if
the course were conducted in a more integrated manner for
maximum insight, utility, and transfer.

In the selection of pedagogical procedures instruc-
tor preference should be weighed. Instructor security bears
a psychological relationship to teaching effectiveness.

Any structural framework should encourage the instructor to exercise resourcefulness and ingenuity.

Student preference cannot be dismissed in evaluating and planning for more adequate instruction. While the majority expressed the desire to participate in the unit approach, the students who developed resource units felt less anxiety in student teaching. A plan of instruction including both resource and teaching unit is feasible. However, 10 weeks is a relatively short period of time to pursue fully an extensive gamut of activities. Professional course work seems merely to make students somewhat aware of problems, but real teaching problems are encountered and recognized during student teaching. Possibly a workshop or problem centered course after the teaching experience would be more beneficial as students would be aware of unit teaching weaknesses. Such areas as unit selection, committee expectations, cooperative planning, and evaluation were suggested for student exploration and growth.

Returning to the methodological challenge, is method significant? It is hardly possible to argue convincingly against the verbal growth that was evident. Yet, similarity of behavioral performance for the two groups reduced the significance of direct experiencing in influencing changed behavior. The challenge becomes one of making decisions about structuring class procedures in light of action oriented outcomes, research about the teaching

learning process, and continuous evaluative evidence. Are
there implications for raising the level of transfer? Yes.
Transfer depending on "identical elements" from college unit
experience to the elementary classroom experience is not
sufficient even though relationships for potential transfer
exist. This experiment indicated that understanding of
general principles underlying unit teaching behaviors may
be the key to fostering transfer. If so, the method of
teaching must be directed toward securing more transfer
through a multi-situational approach (actual experiencing,
observing, reading, writing resource unit) which is design-
ed to arrive at generalizations about unit teaching be-
haviors.

CHAPTER VI

REFLECTIVE AND PROJECTIVE DISCUSSION

Origin and Significance of the Problem

The motivating force which generated the undertaking of this study was curiosity. Many recurring and intriguing questions emerged from the researcher's teaching experiences on the elementary school level. Would direct experiencing in a professional course influence unit teaching behaviors in the elementary classroom? On the college level, would transfer of desirable educational outcomes from the professional course to the elementary classroom result from building attitudes toward the behaviors through vicarious experiencing or through the direct experiencing of the desired outcomes? The broad problem area involved experimental research to determine the effectiveness of two methods of instruction in attaining a higher level of teaching competence. In order to estimate, and to observe competency, it became necessary to judge instructional effectiveness not only at the end of course activities but also in a student teaching follow through. Embedded in any effort to foster unit teaching behaviors was the preliminary step of identifying unit

teaching in terms of desirable and observable teacher
behaviors.

The researcher's curiosity was supported by an ack-
nowledged awareness found in the literature and by a re-
cognized relationship of the problem to the basic goals of
teacher education.

Delimiting the Problem

The proposed problem was explored in light of the
experimental method of research. Within this working
framework the problem and null hypothesis were stated--

A. Statement of Problem--A study to evaluate the effective-
ness of two methods of instruction in teacher education
in attaining certain desired behavioral outcomes.

B. Null hypothesis--There is no significant difference in
the verbal or operational attainment of the stated be-
havioral outcomes between a student group which ex-
perienced one method of instruction as opposed to a
student group which experienced another method of
instruction.

Analysis of the null hypothesis led to certain pertin-
ent questions which the experimental procedures were
organized to answer--
1. Were the two sections taught differently?
2. Was each method effective in relation to
pre- and post-test evidence?
3. Was one method significantly more effective
than the other in the attainment of verbal
behaviors?
4. Was there a significant difference in the
observed operational behaviors that can be
attributed to teaching method?

Historical Perspective

The primary objective of the retrospective summary
was to discover the progress human inquiry had made in the

investigation of analogous problems. Available literature
was reviewed in two spheres of research activity; namely,
the identification of classroom competencies, and the ex-
perimentation relevant to instructional methods on the
college level. Direction for identifying teaching behaviors
was found in the Commonwealth Teacher Training Study, the
thinking of a committee representing the American Educa-
tional Research Association, the studies planned by the
Colleges of New York City, the New England School Develop-
ment Council's attempt to define competency, and several
individual research contributions. Devious procedures were
used to identify teaching competency. However, observation
of the actual classroom situation by qualified observers
and recalled incidents by teachers or supervisors appeared
to be promising research techniques.

A résumé of 92 isolated, experimental studies of
instructional methods on the college level revealed incon-
clusive and contradictory data. Instructional procedures
have been camouflaged by numerous labels but revert to the
investigator's interpretations of lecture versus discussion,
or more recently, instructor centered versus student cen-
tered. Teaching methods lacked identification and consist-
ency in successive experiments. An inspection of the re-
lated studies indicated that the difference between the
measured results of the various methods of instruction were

generally small and unreliable. Mastery of subject matter
has been the most prominent educational objective in the
majority of the investigations. It was difficult to relate
student preference or student ability to any one teaching
procedure. While a respectable quantity of experimental
research has been done, its value might be subject to debate.
Much duplication and loss of productive effort has been due
to the lack of cataloging, the short duration of the study,
the small student sampling involved, and the lack of inter-
action between research studies.

The Experiment

During the Winter Quarter of 1958, seventy-seven
juniors and seniors at The Ohio State University were en-
rolled in two sections of Education 517. This is a course
in the required professional sequence which is devoted to
social education and unit teaching in the elementary school.
Group (0) experienced a more conventional lecture-discussion
type of teaching procedure while in group (1) an effort was
made to provide opportunity for direct unit experiencing.
A pre- and post-situational test was designed to appraise
growth in verbal understandings. At the completion of the
course experiences in both sections, the students were
given an opportunity to analyze the frequency of selected
instructional procedures and to react to the effectiveness
of these procedures as they perceived them.

A follow through of 22 students from both sections ensued during the Spring Quarter of 1958. This provided an opportunity to approach student transfer and course effectiveness from operational observations. Student teaching situations were assessed in terms of factors that could effect unit teaching effectiveness. A rating scale, based on the criterion (educational objectives of Education 517), facilitated the numerical evaluation of operational evidence as judged by the college supervisor, cooperating teacher, student teacher, and in 10 cases the observer. In addition to a self-evaluation, the 22 teaching students reacted verbally to the adequacy of course activities in light of their pre-service teaching experience.

A randomized control method was the basis for selecting and describing the sample population. No attempt was made to select the participants of either section. The two groups were identified and compared in regard to four learning variables which were thought to bear a relationship to performance on the post-test: intellectual capacity, motivation, achievement, and precourse understandings of unit teaching. A regression computation revealed that the two groups were not significantly different when the learning variables were equated. In both groups, cumulative point hour was a significant factor in predicting verbal performance. The representativeness of the sample

population was sought by a comparison of the sample with 503 recent elementary graduates. The sampling was representative to a degree of a cross section of prospective elementary teachers in terms of capacity and achievement.

The development of criterion or educational objectives for the course involved the defining of unit teaching in specific teaching behaviors. Unit teaching behaviors were procured from the recalled unit experiences of elementary teachers and from the thinking of educators as revealed in the literature. The behaviors were categorized in a framework denoting the sequential phases of unit teaching; namely, selection and initiation, development, and culmination. In addition to the three operational classifications of unit progression, there seemed to be continuous teaching behaviors throughout the unit. Two more classifications were added to accommodate the teaching behaviors recurring in continuous cooperative planning and evaluation. A panel of 8 practitioner teams was chosen to react to the thinking and organization of the researcher.

The underlying difference between the two methods of instruction was the degree to which direct unit experiencing was provided for the achievement of the desired course outcomes. Class procedures were more sharply differentiated in terms of pre-structured written assignments, division of responsibility between instructor and students, and sequence of course experiences.

Findings

The overall analysis of the data accruing from the appraisal mediums indorsed the acceptance of the null hypothesis. Within the limits of this experiment it is possible to assert that no significant difference was noted in the verbal or operational attainment of the stated behavioral outcomes between two student groups which experienced dissimilar methods of instruction.

Upon closer scrutiny of the statistical and non statistical data, one might reasonably generalize for the situation in which this investigation occurred that:

1) Both methods of instruction were effective in terms of pre- and post-test evidence. Significant mean gains in achievement suggested that more than chance factors were operative in bringing about verbal growth.

2) Neither method enjoyed superiority in relation to verbal performance. A correlation of .090 between the post-test score and group membership would imply that being an experimental subject in either group (0) or group (1) had extremely little relationship to the students' post-test performance.

3) No significant difference was found in the operational effectiveness of the student groups as evaluated by three or four observers. Thus neither method of instruction appeared superior in realizing a higher level of behavioral transfer.

4) The student analysis of course procedures substantiated the position that directness of experience was the differentiating instructional factor between the two sections.

5) Method per se is essential in achieving educational objectives but directly experiencing the unit approach is not sufficient to develop generalized principles about unit teaching behaviors.

6) The students indicated a desire for experiencing unit teaching, observing unit procedures in an elementary classroom, and writing a resource unit.

7) Both sections were judged to be effective in terms of producing significant verbal growth, expected student performance (correlation of .645 between cumulative point hour and post-test scores), and favorable student reactions.

8) The students tended to prefer the experimental group procedures.

9) No marked group differences were noted in student teaching situations, or grades received in Education 517 and student teaching.

10) There appeared to be some relationship between the desirability of the student teaching situation, the college supervisor's "standards," and the grade received in student teaching.

11) The sensing of group rapport, the pacing of the daily program, the pre-planning in detail and for alternative

situations by the student, the judging of appropriate
committee experiences, and the cooperative exchanging of
ideas appeared to be plausible blocks to unit progression.

The above findings have realistic implications for
instructional planning in Education 517. In selecting a
method of instruction one should consider instructor pre-
ference, student preference, available research in the
teaching-learning process, and the type of educational ob-
jectives to be realized. On the college level, transfer of
verbal behaviors into operational patterns appears to be
fostered by developing generalized attitudes toward teach-
ing behaviors through a variety of experiences. Developing
a method of teaching based on the transfer of "identical
elements" is somewhat limiting. The role of the student
in the college classroom is not identical to the role of
the student teacher in the elementary classroom situation.
Although common elements between the two situations do
exist.

The urgent instructional challenge requires skill
in continuous appraisal to discover in actual operation the
effect of professional course experiences in influencing
teaching competency. Teaching procedures that are action
oriented toward the development of higher levels of teach-
ing competency should realistically enable prospective

elementary teachers to bridge the gap between pre-service and in-service experiences.

Projective Questions

It would be an error to assume that this study "answered" the questions which motivated the research. Further searching might well be directed toward exploring instructional approaches designed to promote a higher level of transfer from the professional course to the professional experience. Is conventional teaching adequate to achieve operational behaviors? Could transfer be related to developing role expectencies? Would unit experiences in Education 514 and 517 effect role concepts? What combination of course experiences would develop generalized attitudes toward unit teaching behaviors? What instructional or programming approach would realistically prepare students to anticipate the classroom situations they will encounter? How can a professional course functionally use the problem solving approach when students are unaware of their future needs? Would a problems course or a workshop after student teaching reduce insecurity and first-year unit teaching problems?

Is integration related to personality factors? Is there a positive relationship between certain personal traits and transfer readiness? What type of classroom activities will motivate the more able students in

educational courses? How are other teacher education institutions meeting the instructional challenge?

More research effort could be focused in the area of group dynamics and the teaching-learning process. How can the barriers to cooperative planning and decision making be alleviated? How can the student effectively participate in decision processes?

In this final chapter, some time was spent in looking back over the experimental path ventured in this inquiry and in projecting several avenues of potential research. Dreaming answers to our questions is a preliminary step, increasing educational visibility. But improvement in teacher preparation is a result of taking knowledge seriously and trying to find out what would happen if it were put into practice and lived by.

APPENDIXES

APPENDIX A

The following questionnaire is a sample of the instrument used to verify the researcher's identification and organization of unit teaching behaviors. Included in parenthesis, following the numerical scale rating, are the tabulated opinions of the eight teams of practitioners which formed the panel of judges. Nine teams are represented rather than the previously described eight teams. One supervisor mislaid a completed questionnaire. After requesting another and involving a teacher from a different grade level, the first questionnaire was found and returned. In as much as the opinions were anonymous, it was impossible to exclude these judgments.

To the Participant:

This is an attempt to make the rather nebulous term "unit teaching" more concrete and functional by identifying successful unit teaching with sequential pattern of teaching behaviors.

As a basis for establishing these teaching behaviors the literature over the last twenty years was surveyed with this question in mind - what does the classroom teacher observably do in making the unit procedure tick: Feeling that educational authorities might be somewhat biased and at times removed from the classroom situation, I am coming to you, the practitioner, to verify and supplement the thinking found in the literature.

This may appear to be a lengthy and time consuming assignment for you. After a brief introduction which develops a concept of unit teaching, suggested unit teaching behaviors are to be evaluated on a rating scale. From your experience you may recall teaching behaviors that have been desirable and critical to your success with unit teaching which have been omitted here. It would be appreciated if these additional behaviors would be written in the blank spaces at the end of each group of behaviors.

Your cooperation as a participant on a panel of judges in rating teaching behaviors in light of your experience will make it possible to support and supplement the thinking found in the literature. Through this behavioral approach it is hoped that the term "unit teaching" can be made more functional for prospective teachers in the College of Education.

Thank you.

The literature indicates that many educators have been concerned with units and unit teaching. In the last quarter of a century the unit approach has evolved from its original form as a scheme of subject organization to a fairly well defined method of teaching. Writers tend to refer to the unit approach as including both an organization of experiences and a method of implementation. Even though opinions and definitions differ sematically, there appears to be common features and thinking about the unit approach. In general the unit approach involves:

1. an organization and selection of a variety of learning activities which are focused on a socially significant understanding or life centered problem.

2. the creating of learning situations in which children experience democratic social behaviors, such as: working together, respecting the opinions of others, accepting and carrying our responsibilities, and creatively solving of problems.

3. the involvement of pupils and teacher in continuous and cooperative planning and evaluation.

4. a flexible developmental procedure which has unity and involves the sequential phases of the group problem solving process - orientation, research, generalization.

5. problem solving which cuts across subject matter lines and requires a large block of time. Content is considered significant as a tool in the solution of the problem.

6. the utilization of natural drives (i.e. to construct, to comunicate, to satisfy curiosity) and the recognition of individual differences.

This method of teaching requires positive, effective leadership by the teacher. The leadership role of the teacher may be evidenced in teaching behaviors which are related to successful unit teaching. Teaching behaviors might imply teacher-pupil relationships, such as: sense of humor, fairness, initiative, sympathy, and courtesy. Research recognizes and accepts these behaviors as essential to successful teaching. However, in developing desirable unit teaching behaviors, the attention is focused more toward behaviors related to methodology governing unit procedure and development than toward the personality factors related to teaching effectiveness. These desirable unit teaching behaviors are not unique to this method of instruction.

Rather they are operative in what might be termed "effective teaching."
What is the difference between unit teaching and effective teaching if the
teaching competencies are relatively the same? The unit approach involves an
organization of experiences around a life centered problem or significant
social understanding which involves the group problem solving process. To
implement this group process, teaching behaviors are not randomly operative
but tend to occur in a sequential pattern. This organization of teaching be-
haviors into a sequential pattern becomes an instructional procedure which
might be called the unit teaching method. This does not assume that all unit
teaching is effective teaching nor that all effective teaching is unit teaching.
It merely suggests that the unit approach is unique in that the teaching be-
haviors occur in a sequential pattern which may or may not be the case in
effective teaching. In attempting to identify successful unit teaching be-
haviors the literature is perhaps the most available source of teachers' re-
called unit experiences and the opinions and research of educational authorities.

Lists of outcomes in terms of behaviors can become lengthy, repetitive,
and difficult to handle unless they are organized into some pattern or classi-
fication. It appears logical to choose a scheme or classification which
reveals interrelationships and focuses upon the sequential development of the
group problem solving process involved in unit teaching. Thus selection and
initiation, developmental phase, and culmination become the three operational
classifications for the teaching behaviors. In addition to the three operation-
al classifications of unit progression, there seemed to be continuous teaching
behaviors which reoccurred in every phase of unit teaching. Teaching compe-
tencies related to cooperative planning and evaluations reoccurred with
noticeable frequency. Thus the framework for classifying the behaviors in-
cludes the three developmental phases of this method plus the continuous
teaching competencies involved in cooperative planning and evaluation. For the
purpose of this investigation, teaching behaviors are interpreted to mean

external, overt behaviors rather than inward beliefs, attitudes, or perceptions. Thus behaviors are selected that are observable and amenable to evaluation.

In the following rating scale a brief overview of each sequential phase of unit teaching precedes the observable teaching behavior and is intended to lend orientation to the role of the teacher. To the right of the teaching behaviors you are asked to circle the degree to which you feel that the teaching behavior involved is vital to the success of the ongoing unit. As a basis for your judgment it is suggested that you evaluate the teaching behavior in terms of the following relative scale:

1. Critical - This behavior is necessary for the success of the ongoing unit to the degree that its absence blocks unit progress.

2. Desirable but not critical - This behavior contributes to successful unit teaching to the degree that its absence influences but does not block unit progress.

3. Questionable - This behavior is doubtful as to its effect on successful unit teaching to the degree that its absence does not influence the progress of the unit.

Teaching Competencies Related to the Selection and Initiation of the Unit. This initial phase of unit teaching involves a process of orientation and exploration for the teacher and children. New interests and concerns are identified and explored both individually and by the group. Cognizant of the curricular framework within which she works and aware of child growth and the learning process, the teacher is in a position to actively participate in the selection of a group study. Methods of choosing a unit vary, but there seems to be a trend toward pupil-teacher selection within a flexible curricular framework. During the exploration and initiation, the teacher stimulates interest by arranging the environment and by providing common experiences out of which problems emerge and effective planning proceeds. The teacher and the children cooperatively set up objectives or goals toward which they strive in undertaking the study. The identification of the children's questions and the stating of objectives bridge the gap between the initiation and the developmental phase of the unit.

1. Arranges the environment to motivate interest and curiosity

   a. makes displays effective and attractive and draws attention to them through discussion   1(6)   2(3)   3
   b. stimulates interest in several possible problem areas yet avoids confusion   1(5)   2(4)   3
   c. keeps possible problem areas within the maturity level of the children   1(7)   2   3
   d. relates children's present interest to previous experiences   1(7)   2(2)   3
   e. arranges for common exploratory experiences and the setting in which exploratory thinking and sharing takes place   1(7)   2   3
   f. uses audio-visual techniques to stimulate interest   1(5)   2(4)   3
   g. provides for more than verbal participation   1(6)   2(3)   3

2. Enriches personal and professional background

   a. investigates and lists background experiences which the children have had through discussions and examination of school records   1(6)   2(3)   3
   b. makes an overview of the subject matter which might enter into the study, the kinds of experiences which might be enriching and the ways in which different subjects might be used effectively in the unit   1(8)   2(1)   3
   c. checks school and community resources for learning materials   1(7)   2(1)   3
   d. lists books and materials for pupil and teacher reference   1(7)   2   3
   e. acquaints himself with the community through personal investigation   1(4)   2(5)   3
   f. reads appropriately in order to develop background understandings   1(9)   2   3
   g. builds a file of resource materials   1(6)   2(3)   3

3. Participates in the selection of the unit

   a. follows the agreed upon procedures of the school faculty   1(4)   2(5)   3
   b. tries to ferret out children's interests by recording their repeated questions and other indications of interest   1(4)   2(5)   3
   c. guides children in the development of criteria for the selection of the study   1(8)   2(1)   3
   d. coordinates thinking and action of the group for orderly progression toward final selection   1(9)   2   3
   e. participates in the choice of the unit so the children will not be attempting to solve problems which are beyond them or using materials which will not be satisfying   1(9)   2   3
   f. consider possible ways to initiate the unit   1(7)   2(2)   3

4. Helps the group to identify questions and objectives

   a. records the group's questions on which information is needed and keeps available   1(8)   2(1)   3
   b. groups the questions into related sub-topics of the main problem   1(7)   2(2)   3
   c. leads the pupils to define their own objectives   1(8)   2   3
   d. states desired outcomes in terms of behaviors and in the language of the pupils   1(7)   2(1)   3
   e. thinks through a tentative outline of the unit - assembles the sub-topics and analyzes materials in a tentative sequence of experiences   1(8)   2(1)   3

<u>Teaching Competencies Related to the Developmental Phase of the Unit.</u> Research

and expressional activities appear to be inseparable and to receive special

consideration in this phase of unit progression. The research process involves

conscious searching of both pupils and teacher in an effort to find answers to

their questions. Broadly interpreted, research includes the use of the community,

resource people, realia, children's daily experiences, reading materials, and

audio-visual materials. The expressional activities become means of visually

and audibly representing the information that has been gathered during the re-

search experience. Socially useful work, experimentation, verbalization,

dramatic expression, construction, and aesthetic activities indicate a possible

range of activities. A degree of research normally precedes any activity.

However, it might be thought of as a circular process with research leading to

expressional activities and activities requiring further knowledge.

1. Exercises leadership in the organization and functioning of committee or
   group
   a. adjusts the degree of committee organization to the maturity level of
      the group   1(9) 2   3
   b. guides committee organization in terms of interests, class structure,
      and the job to be done   1(8) 2(1) 3
   c. makes a chart of the final committee organization   1(5) 2(3) 3
   d. helps the group to establish and record desirable committee behaviors
      1(9) 2   3
   e develops group standards to guide the use of tools, materials and space
      1(7) 2(2) 3
   f. helps each committee or individual to become aware of its relation to
      the solution of the main problem or understanding   1(9) 2   3
   g. works with individuals and with groups by circulating from group to
      group   1(9) 2   3
   h. provides for group mobility and the best place for the various groups
      to work keeping in mind the kind of activity, number of children in
      each group, personnel of each group, and the location of materials and
      equipment in the room   1(7) 2(2) 3
   i. makes a tentative schedule for committee reports early and keeps
      available   1(4) 2(5) 3

2. Plans for and provides numerous research experiences

   a. organizes research experiences into whole group, committee and in-
      dividual situations   1(9) 2   3
   b. maintains a balance between the various types of experiences   1(7) 2(2) 3
   c. pre-plans for each research or activity period   1(8) 2(1) 3
   d. plans ample time to do research   1(7) 2(2) 3
   e. helps the class to become aware of various sources of information
      1(9) 2   3
   f. uses a variety of learning materials - blackboard, bulletin board, radio,
      reference books, magazines, newspapers, models, and others   1(7) 2(2) 3

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g. encourages and directs children in searching out research materials
   1(8) 2(l) 3
h. reviews study skills previously learned and teaches those skills needed
   to use reference material effectively   1(7) 2(2) 3
i. checks reading material to determine new terms, concepts, and shifts in
   word meaning that may cause difficulty for the group   1(6) 2(3) 3
j. prepares children to read specific reading material by: giving attention
   to new terms, social concepts, complex understandings, names of strange
   places, and the relationship of reading to other experiences   1(5) 2(4) 3
k. diagnoses skill difficulties and plans periods for purposeful guidance
   and practice   1(7) 2(2) 3
l. facilitates contacts of group leaders and pupils working on individual
   projects with special subject teachers, parents, and directors of
   community agencies   1(2) 2(7) 3
m. selects audio-visual materials that will contribute most to the study
   under progress, orders materials in time, previews learning material,
   shows at the time in the unit when the need arises, makes arrangements
   for necessary equipment, helps the children to know the reason for using
   the material and what to look for or listen for, arranges the physical
   environment, and plans for follow-through   1(7) 2(2) 3
n. plans for educational trips; takes the trip before the children, makes
   adequate arrangements, makes the purpose of the trip clear to the children,
   provides sufficient adult supervision, and guides an appropriate follow-
   through activity   1(7) 2(2) 3

3. Personally participates as a member of the group in the research process

   a. takes an active part in the process of getting answers   1(5) 2(4) 3
   b. assumes responsibility for the whole group research   1(5) 2(4) 3
   c. records information from dictation - in the early elementary and occasion-
      ally in the later elementary   1(6) 2(2) 3(l)

4. Provides for individual differences

   a. provides for individual and group guidance in research and expressional
      activities   1(7) 2   3
   b. provides for a wide range of reading ability and interests   1(9) 2   3
   c. adapts materials and uses teacher prepaded materials   1(6) 2(3) 3
   d. secures audio-visual resources for those who do not use printed materials
      effectively   1(5) 2(4) 3

5. Guides expressional activities

   a. watches for educational possibilities in the activities suggested by
      the children and capitalizes on their contribution   1(7) 2(2) 3
   b. makes sure that suggested procedures and activities are feasible for
      the ages of the children and likely to result in the attainment of the
      purposes   1(8) 2(l) 3
   c. anticipates and has accessible materials for research and expressional
      activities before committee work begins to avoid congestion and to
      promote effective utilization   1(7) 2(2) 3
   d. provides a variety of materials   1(7) 2(2) 3
   e. checks on the economic use of materials   1(4) 2(5) 3
   f. checks on the safety of the tools   1(7) 2(l) 3
   g. keeps the activity period within productive time limits   1(8) 2(l) 3
   h. stops the work period in order to allow adequate clean-up time   1(5) 2(4) 3
   i. is alert to opportunities for children to express themselves in the
      aesthetic arts   1(6) 2(3) 3

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j. encourages creativity, provides new materials, provides a relatively tension free atmosphere, provides many sensory and research experiences, provides ample time for expression, exhibits appreciation for the efforts of children, experiences the creative process with the children
1(7) 2(2) 3

Teaching Competencies Related to the Culmination of the Unit. In this final phase of unit teaching the teacher is concerned with the organizing and reporting of information, the formulating of generalizations, and the possible sharing of learnings. The culminating activity may be a matter of reporting within the class. It might include the sharing of the unit with parents or another class. Regardless of the nature of the culminating activity, it should be representative of the total learnings from the unit experience and help parents to understand the value of this method of teaching.

1. Coordinates the reporting efforts of the children

    a. suggests a variety of ways to report information   1(7) 2(2) 3
    b. helps the children to pool information from a variety of sources   1(8) 2   3
    c. helps committees to organize and prepare reports   1(8) 2(1) 3   .
    d. checks the accuracy of the facts to be presented   1(7) 2(2) 3
    e. relates the sub-problems to the over all unit problem   1(7) 2(2) 3
    f. cooperatively selects from group presentations facts for which the whole class is responsible   1(9) 2   3

2. Coordinates shared activity

    a. arranges for the most appropriate time to present the report or shared activity   1(6) 2(3) 3
    b. assists the children in exhibiting their work   1(6) 2(3) 3
    c. emphasizes sharing and communicating of ideas rather than putting on a "show"   1(8) 2(1) 3
    d. prepares the audience for effective listening   1(7) 2(2) 3

are
    Throughout the unit some teaching behaviors continuous and vital to each phase of unit progress. These reoccuring behaviors tend to group themselves chiefly into the areas of cooperative planning and evaluation.

Continuous Teaching Behaviors Related to Cooperative Planning. In its simplest form cooperative planning means that the pupils and teacher together develop plans and purposes for their experiences. Cooperative planning does not imply that the teacher relinquishes her responsibility for planning. In reality the teacher pre-plans and gives guidance in cooperative planning by becoming an active participant in class discussions and decisions.

This involvement of the student in planning is rather unique to unit teaching. It represents an attempt to achieve democratic behaviors through democratic procedures.

1. Establishes rapport with the children

   a. creates a permissive atmosphere in which various sides of an issue are voiced and considered before any decision is reached   1(7) 2(2) 3
   b. encourages every child to participate   1(7) 2(2) 3
   c. respects the contribution of every child   1(9) 2   3
   d. discourages arguments but respects individual differences   1(6) 2(3) 3
   e. helps children give and accept suggestions   1(6) 2(2) 3
   f. provides opportunity for the children to make choices within their maturity   1(9) 2   3
   g. respects groups decisions   1(8) 2(1) 3

2. Promotes and participates in group thinking

   a. provides time for cooperative planning   1(9) 2   3
   b. recognizes readiness for cooperative planning   1(7) 2(2) 3
   c. begins cooperative planning in small areas and in areas that the children are competent to plan   1(9) 2   3
   d. limits the length of discussions realistically in terms of the developmental level of the children   1(9) 2   3
   e. stimulates pupil thinking through questions   1(8) 2 (1) 3
   f. keeps individual contributions to the point   1(6) 2 (2) 3
   g. relates individual contributions to the group thinking   1(7) 2(2) 3
   h. suggests teacher noted needs at appropriate points and related to children's comments and questions   1(6) 2 (3) 3
   i. helps the children to define their role in planning: helps each member to understand the importance of accepting responsibility for leadership and followership at appropriate times   1(7) 2(2) 3
   j. guards against keeping leadership functions which the children can assume: at the same time she directly takes leadership responsibility in those areas of experience where the maturity of the children is not sufficient to warrant their assumption of leadership - assumes and shares leadership   1(9) 2   3
   k. uses chalkboard and charts to record the main agreements in planning so as to avoid misunderstandings and as a basis for further group action 1(7) 2(2) 3

3. Uses cooperative planning to foster group goals and objectives

   a. uses previous evaluation as the basis for cooperative planning   1(7) 2 (2) 3
   b. makes sure that the purposes and goals of the discussion are clear to the children   1(9) 2   3
   c. assumes responsibility to point out possibilities, resources, and limitations within which they are working, that might otherwise be overlooked   1 (7) 2(2) 3
   d. keeps the discussion moving steadily toward a solution of the problem 1(8) 2(1) 3
   e. plans with the children in such ways that they are responsible as a group for putting their plans into action   1(9) 2   3

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<u>Continuous Teaching Behaviors Related to Evaluation</u>. No longer do we think of

evaluation as the "culminating activity" in instruction. Evaluation is the

process of determining the extent to which the stated objectives are being

achieved. This statement involves a continuous evaluative cycle including:

the setting up of objectives in terms of behaviors, the selecting of experiences

and materials to attain these goals, the providing of experiences where desired

behaviors may be observed, the selecting of evaluative techniques, the noting

of behavior and the analyzing of the data in terms of the objectives, and the

planning for further growth or the revising of the objectives. Evaluation has

three distinct dimensions; it is cooperative, continuous, and comprehensive.

Its cooperative dimension implies that the pupil and the other persons concerned

with his growth are involved in this process. Evaluation is comprehensive in

scope and method. This evaluative process should include judgments about the

progress of the pupils in the elementary school toward all the goals which may

be regarded as important. Such evaluation seeks many kinds of evidence through

many kinds of procedures.

f. uses frequent reporting of group progress to the whole group   1⑧ 2⑴ 3
g. keeps notes and records of the unit as it progresses to get a picture
of the total program   1⑹ 2⑶ 3
h. observes and makes anecdotal records - children's remarks and behaviors
are frequently the best source of evidence regarding growth.   1⑧ 2⑴ 3
i. keeps children's work in individual folders   1⑷ 2⑸ 3
j. keeps a record which will show the abilities developed by the children
and the oportunities in which each shared   1⑹ 2⑶ 3

APPENDIX B

Class Logs - Lecture - Discussion Group (O)

Jan. 8 - Course objectives plus course outline.
Both the objectives of the course and sequence
of experiences for the quarter were written on
the chalk board. The nature of the written re-
quirements was indicated. This group was in-
formed that class period would involve mostly
lectures but questions were welcome at any time.
Three students remarked at the close of the
period that they liked the outline of class
activities, paper assignments, and deadlines
given the first day. The physical arrangements
in Stillman Hall 201 were adequate and the
chairs remained in rows.

Jan. 13 - Pre-test plus overview of social education.
Fifty minutes were devoted to the pre-test. The
teaching situations were introduced as "my"
attempt to find out the thinking of the class
at the present time. A concept of social
education as a process of helping boys and
girls to become responsible members of our
society was developed. Criticisms of social
education ensued. This group seemed quite
concerned about the emphasis on social educa-
tion at the expense of science education. It
was announced that the thinking on Wednesday
would continue the discussion of social educa-
tion and perhaps progress to the dynamic nature
of our society. The group was not given a
choice as to a break and shortened class
session. The regular college break was followed.

Jan. 15 - Minnesota Teacher Attitude Inventory plus the
dynamic nature of our society.
After administering the M.T.A.I. with no explan-
ation, the instructor continued the development
of social education by means of a time line.
The girls worked individually, not in groups, in
an attempt to relate the pledge of allegiance to
the flag to the understandings of a six year old
child. The following represents an individual
effort. "I promise to take care of and love the
flag of America. I also promise to be fair to
people and obey the rules we have, so that
the people will stay friendly and be good

to one another." The dynamic nature of
our society was to be carried over to the
20th and Chapter I in Hanna's <u>Unit Teaching
in the Elementary School</u> was assigned.

Jan. 20 - Democratic nature of our society plus democratic
behaviors.
The dynamic nature of our society was approached
by making a chart indicating the technological
advancements and the resulting changes in our
living, values, and school responsibilities.
Dr. Spitz's article on democracy and conformity
in the Lantern was used to introduce the nature
of democratic citizenship. Democratic values,
basic to citizenship behaviors, were enumerated.
Sources of our values were also discussed, for
example: documents of our country, religious
values, thinking of philosophers, etc. Evi-
dence of democratic behaviors was pushed down
to Jan. 22nd.

Jan. 22 - Curricular approaches to social education and
unit teaching.
The lecture first picked up democratic behaviors
such as responsibility, cooperation, open minded-
ness, tolerance, critical thinking, etc. The
group then completed a list of 15 behaviors
from their reading. Curricular approaches were
outlined on the board from subject approach to
unit approach with brief historical comments.
The group took notes steadily for two hours.
At the end of two hours questions were invited--
not one inquiry. Either their thinking pro-
cesses had not been stimulated, or their re-
sponses deadened by copious note taking, or
the subject had been adequately treated (which
is doubtful).

Jan. 27 - Overview of unit teaching.
A closer look at the scope and sequence of the
social studies curriculum was pursued. About
twenty minutes was devoted to solving a problem.
Potential curriculum areas were listed which
the group individually gave time allotments
and arranged in a daily program, illustrating
that about one-third of the day is devoted to unit
study. Five definitions of unit teaching were

listed and common elements in each formed
the basis for developing an overview of unit
teaching. The unit was identified in terms
of distinguishing characteristics.

Jan. 29 - Selection of units plus participation report
due March 10th.
The unit concept was reviewed. Unit selection
was approached in terms of how selection is
made. What are appropriate units for various
group levels, and what is teacher's role in
selection. The participation report is to
include three phases: description of the situ-
ation, how the student participated, and an
evaluation of the situation. Material was
given to the students suggesting activities
they might do in their participation.

Feb. 3 - Initiation of unit plus objectives plus 1 movie.
The sequential phases of unit teaching were
reviewed. The developing of interest, provid-
ing for common experiences, and gathering of
children's questions were noted as essential
to initiation of the unit. Guidelines to follow
in stating of objectives were developed by the
instructor. Some group discussion revolved
around knowing the difference between surface
interest and real interest in unit study. The
movie, "School in Centreville" was used to
illustrate a unit "in action" and potential
ways to initiate a group study. The film
raised some discussion as to the role of
parents in curriculum planning.

Feb. 5 - Discussion of Resource Unit due March 3rd.
The outline for the resource unit was put on
the chalk board and discussed. The resource
unit was to contain the following sub-headings:
selection, initiation, research activities,
expressional activities, and culmination. It
was stressed that resource units should contain
alternate ideas so that the teacher could
select ideas in terms of her group.

Feb. 10 - Cooperative planning and committee organization.
Two filmstrips "How to Keep Your Bulletin Board
Alive" and "Bulletin Boards on Parade," helped
the class to gain an appreciation of bulletin
boards as potential means of stimulating in-
terest and relating the progress of the unit.

Cooperative planning was approached from identifying what the teacher does to foster cooperative planning with a group and signs of effective planning. Committee organization had to be postponed.

Feb. 12 - Research process in unit teaching.
Committees were discussed in terms of selection, purpose, maturity of children, developing committee behaviors, and division of research into committee and whole group undertakings. Research phase was defined as the conscious seeking to find answers to questions that the children and teacher considered important. The research process began with children's questions and proceeded to the formulation of generalization and further questions.

Feb. 17 - Community resources.
Community resources involved educational trips, realia, resource people, and audio visual material. Most of the attention was directed to values, planning, taking, and following through an educational trip. Potential uses of resource people in unit teaching were also explored with reference to ways of locating, inviting, and using in the classroom. Sources of audio visual materials and means of securing materials were noted.

Feb. 19 - Effective learning materials.
Dr. Dale's cone of instructional materials was basic to classifying materials in categories of doing, observing, and symbolizing. Criteria were developed for the selection of maps and globes. The pros and cons of television as an instructional medium were discussed. The discussion was lively. The general feeling was that television cannot be ignored but discriminate viewing should be encouraged. The possible role of television in the classroom was a provocative and positive analysis of current reading.

Feb. 24 - Basic skills and unit teaching.
As a carry over from Feb. 19th two filmstrips - "Enriching the Curriculum with Filmstrips," and "Teaching with a Motion Picture" showed

the group how these two visual materials could be effectively used by the teacher. Basic skills were defined broadly and examples were given as to how these skills were developed in unit teaching. Special emphasis was given to the fact that one-third of the day was devoted to skills. Unit teaching provided a functional opportunity to use the 3 R's. Some skills such as research skills are taught as needed in the unit development. Very little class participation occurred.

Feb. 26 - Expressional activities.
Unit activities as discussed in Burr, Harding, and Jacobs <u>Student Teaching</u> was followed. Examples of activities were related to specific units and experiences the students had observed in participation.

Mar. 3 - Culminating activities.
The class was given mimeographed material related to unit teaching. After a reading period the instructor led a discussion of the following questions - 1) Is a culminating activity always necessary? 2) Of what value are culminating activities to parents? 3) Where is a good location for the activity? Why? 4) How might a unit on "Pioneers Move Westward" be culminated? 5) How long would this phase of the unit last? 6) How would you define unit culmination?

Mar. 5 - Role of the teacher in unit teaching.
In reviewing each phase of unit teaching the specific role of the teacher was emphasized. These teaching behaviors were those "spelled out" in the criterion or educational objectives for the course. No class participation was involved.

Mar. 10 - Evaluative process.
Evaluation was presented in terms of a cycle involving the setting up of behavioral objectives, the planning of situations where the behavior can be observed, the selecting of a measuring tool, the gathering of evidence, and the comparing of the results in light of the objectives. Characteristics of an

evaluation program were discussed. Specific techniques of evaluation were considered such as observation, group discussion, testing, and sociometric measures.

Mar. 12 - Review.
Course purposes and procedures were reviewed. A film entitled "Effective Learning in the Elementary School" was used as a means of visually summarizing course content. The group seemed interested in viewing resource materials that had been collected.

APPENDIX   C

Class Log - Unit Approach Group (1)

Jan. 7 - Course framework.
Being a course in the professional sequence,
Education 517 is designed to contribute to
students' teaching competency by 1) develop-
ing an understanding of social education;
2) presenting a method of teaching for
achieving the goals of social education.
The overview of the instructional activities
were outlined as being divided into social
education and unit teaching. The discus-
sion of shifting responsibility, cooperative
planning, and group work made a rather doubt-
ful impression if their puzzled expressions
were an indication of their thinking. The
class was invited twice to ask questions
about the proposed instructional activities
of the course, but there was no response.
The chairs were arranged in two parallel
semi-circles.

Jan. 9 - Overview of social education plus cooperatively
plan the next two weeks.
Social education was developed in terms of
the schools' contribution to the development
of democratic citizens. About six students
shared the leadership role in giving concrete
examples (from past experience) of how the
school functions in promoting social growth.
Current criticisms of social education were
also explored. The cooperative planning for
the next three sessions resulted in the
following plans:

Jan. 14 - changing nature of our society
with the resulting effect on
education
Jan. 16 - democratic values and behaviors
that become the objectives of
social education
Jan. 21 - how the schools have gone about
approaching social education in
curriculum planning.

Jan. 14 - Pre-test + changing society.
After a brief review of the concepts involved
in the process of social education, attention
was focused on the dynamic nature of our so-
ciety. The following guidelines were put on
the board as a structure for class discussion.

Technological → Social → Effect on → Implications
advancement → change → family living → for education

The pre-test was explained as an attempt to
find out the current thinking of the group so
the course could be planned more effectively.
Two comments were expressed at the end of the
session: "I really need this course because I
don't know any of these answers." "I didn't
write much because I didn't know much."

Jan. 16 - M.T.A.I. + democratic values.
A brief résumé of the proposed outline for the
day was brought to the attention of the group.
The group chose to take the Minnesota Teacher
Attitude Inventory first, then proceed with the
discussion of democracy.
The discussion of the democratic nature
of our society was quite interesting. In
general, the word "democracy" was synonymous
with the word "freedom." It was agreed that
as a basis for the thinking in this course
democracy is our way of living based on
accepted values.
A consideration of creativity, as a desired
democratic behavior, really caught fire. For
a time it seemed best for the instructor to
stay out of the discussion and let the class
members take the leadership role. There was
quite a bit of frank argument and disagreement.
In summarizing our thoughts members concurred
by stating that creativity was a process of
meeting problems in new ways. The desire to
be different should not necessarily be the
driving force for the creative process, but
creativity should serve in developing the
individual and benefiting of society. Teach-
ers have a responsibility to foster and
evaluate creativity.

Jan. 21 - Curricular approaches to the teaching of
social education.
The tabulated results of the teaching situa-
tions were presented with little discussion.
The interest in the way other classmates
thought about the teaching situations was
on a rather high level. The instructor made
no personal comments as to how she felt the
students handled the teaching situations.
The general feeling seemed to be that they
had much to learn about unit teaching.

About thirty minutes were devoted to
cooperative planning in regard to a method
for evaluating their current understanding
of social education. Several methods were
suggested: test, panel, paper, individual
conference. After deliberating the pros
and cons, the group voted to have a 30
minute essay test and a panel with a re-
source person. This split approach seemed
logical because they reasoned that they
should be evaluated as an individual and as
a member of the group. Everyone is to be
responsible for the discussion as well as
the panel who are to stimulate thinking.
Lloyd Gray, Mary Ellen Regan, Patricia
McCollum, Clayde Kuster, and Ray Gooch vol-
unteered to serve on the panel. It was the
plan to ask Dr. Burr to be a resource person.
The panel members will meet Thursday to plan
an approach that would stimulate group
thinking.
The group's thinking concerning demo-
cratic values was summarized and brought up
to date. To the previous list were added
concern for others, and skill in problem
solving. If the schools are concerned with
changing and forming these desired behaviors,
how do we approach the problem? Curricular
approaches were postponed until next meeting.

Jan. 23 - Curricular approaches.
Curricular approaches were represented on a
continuum from subject centered to experience
centered.
The members of the panel met during the
break and planned their approach. It was
agreed that instead of mouthing what had been
said in previous class sessions that the

discussion should stimulate thinking and
seek to bring out other questions in rela-
tion to social educations. Four areas of
consideration are to serve as the basis
for the class and panel thinking:
1) Science and technology is conquering time
   and space - What is the role of the
   elementary school in developing world
   citizenship?
2) Isn't our attempt in a planned approach
   to develop democratic behaviors indoctrin-
   ation?
3) We say that the role of the school is to
   perpetuate and improve our society - How
   does the school go about improving society?
4) In the light of current emphasis on science
   and mathematics are we devoting too much
   time to the social education of the child?

Ray Gooch, the chairman, reported the
panel's thinking to the class in order that
they might be able to participate in the dis-
cussion. The chief concern of the group
seemed to be that they didn't know where to
go to "find" the answers. It was explained
that the intention was not to have them
"find" an answer but to think through the
question in light of the concept of social
education that had been developed thus far
and their own thinking.

Jan. 28 - Group's expression of social education.
During the first 30 minutes the students took
an essay test in which they communicated
their understanding of social education. The
students were asked to identify the "Hallmarks"
of a democratic citizen and how the school
might contribute to social growth of children.
A panel of 5 volunteer class members with
Dr. Burr as a resource member explored and
discussed with the group several problems:
1) With the current emphasis on science and
   mathematics are we devoting too much time
   to the social education of the child?
2) Is our approach to social education by con-
   sciously providing for the development of
   democratic behaviors indoctrination?

About one-half of the group partici-
pated--apparently this was a learning ex-
perience of some merit. Perhaps such a
thinking together session should be re-
peated at a future time.

Jan. 30 - Overview of unit teaching.
The mimeographed material explaining the
nature of the anecdotal participation re-
ports was reviewed. Each student is to
write five anecdotal reports involving
evidence of democratic behaviors observed
during the participation experience.
Five definitions of unit teaching were
presented. Common elements were combined
to form a group definition. During the dis-
cussion of types of units, a request was
made for securing sources of resource units.

Feb. 4 - Initiation of the group study with 2 movies.
The group met in the curriculum center and
viewed two films: School in Centreville and
Effective Learning in the Elementary School.
Several suggestions were made as to what to
'look for' in the film. A general discussion
followed the viewing experience. The stu-
dents were asked to think about the unit
teaching films and to write 6 to 12 questions
that they would be interested in exploring
further. The written questions should be
brought to the next class session.

Feb. 6 - Student questions and unit characteristics.
The questions concerning unit teaching were
collected. A volunteer committee of 5 stu-
dents agreed to meet in Arps 118 with the
instructor and to organize the questions in
the afternoon. Unit characteristics were
discussed as perceived from their reading
and from the films. In as much as unit ini-
tiation involves the stimulation of interest
two filmstrips were shown: "How to Keep
Your Bulletin Boards Alive" and "Bulletin
Boards on Parade".
The committee met at 1:00 P.M. and
agreed on a possible framework for organizing
the questions.

Feb. 11 - Organization of questions into whole group and committee projects.
The mimeographed questions (organized by the committee) were distributed and cooperatively divided into whole group and committee categories. Since it was suggested on several of the papers that the students would like to "see a unit" taught, the committee and instructor proposed that these questions be the basis for a group study entitled--"What is the Role of the Teacher in Unit Teaching?" This idea seemed to be amenable to the rest of the group. Each person indicated his first, second and third committee preference. Karen Reber, Eileen Katter and Dianne Stupka volunteered to organize the committees on Wednesday in Arps 118.

Attention was devoted to formulating objectives for the proposed unit. It was agreed that each person would write 6 objectives for our proposed study and bring them to class on Thursday.

The last twenty minutes were concerned with the group of questions revolving around the selection of the unit and the role that the teacher assumes in the unit selection.

Feb. 13 - Committee organization plus whole group discussion.
The students handed in their objectives for the proposed study. A committee of four is to meet on the 17th to compile the group thinking. The whole group discussion involved discussing the initiating phase of unit teaching plus how committees function in investigating a problem. The students were given a mimeographed tentative schedule for the rest of the quarter and committee choices. Nine committees were formed: individual differences, parent communication, cooperative planning, community resources (2), advantages and limitations of unit teaching, basic skills, creative expression and techniques of evaluation. The last half of the session the group broke up into committees to consider designated problems. The committees seemed to have a little difficulty in analyzing their problems.

Feb. 18 - Committee - plan and decide approach to
problem and whole group cooperative planning.
The desired outcomes anticipated from the
group study were presented by the committee.
The group accepted the committee's report
and made no additions. Cooperative planning
was discussed in terms of value, role of
teacher, difficulties, and ways to encourage
participation. The committees met and planned
to bring research material to class to work
the entire period on Feb. 20th.

Feb. 20 - Research day.
The day was devoted to individual and committee
research. At the beginning of the period we
"shared" resources. One group went to the
curriculum center to preview some film strips.
By the end of the research period (2 hours)
the instructor had met with each group and
participated in committee thinking. The abil-
ity to analyze and approach a group problem
appears to be a difficult problem for college
juniors and seniors. In general, the respon-
sibilities in each group had been delegated
to individual members, thus most of the re-
search can be done on their own. However,
time will have to be given to pooling their
individual findings and organizing a group
report. At times, this method of teaching
is frustrating to both student and instructor.

Feb. 25 - Committee - pooling research information plus
whole group discussion - research process.
About 10 minutes was spent reviewing course ob-
jectives and procedures. It was really a
brief evaluation of the progress made toward
achieving the stated objectives--1) to gain
an understanding of social education; 2) to
gain competence in teaching in this area.
        The whole group discussion revolved
around the research process and the role of
the teacher in this process. A diagram show-
ing the research process was used to illustrate
and to promote group thinking. The research
skills were identified and discussed. Some
attention was given to effective materials
and experiences in research. Dr. Dale's cone
of experience was the visual means of

classifying materials from the concrete to
the abstract. The instructor assumed the
responsibility for the whole group presenta-
tion and discussion.

Each committee met during the last 30
minutes and began to pool information. Ten-
tative reporting dates were agreed upon. The
group members appeared to be cooperating and
assuming responsibility for the group project.

Feb. 27 - Committee - develop committee report.
Whole group - possible ways of reporting and
use of community materials.
The group suggested the use of the last period
for committee pooling of information. The
first hour was centered on two whole group
problems--1) Ways of Reporting, and the Use
of Concrete Community Material and Resource
People. In general, the instructor assumed
the responsibility for the whole group dis-
cussion. The problem of sharing concrete
objects was of concern to many of the students
as they had met the problem in their partici-
pation.

Apparently the committees were function-
ing quite effectively. Resource materials
had been brought from the library and other
sources. The instructor circulated among the
groups. It was interesting to "listen in"
on group thinking and planning.

Mar. 4 - Committee - complete reports.
Whole group - report on sources of resource
units. The group asked for the second hour
to finish their committee reports. The first
hour we discussed culmination and its relation
to unit development and parent communication.

The report on Resource Units was in the
form of a buzz session. This topic was the
responsibility of the instructor. After talk-
ing briefly about Resource Units and developing
criteria for evaluating materials, the class
divided into 5 groups. Each group reviewed
resource units that had been received by mail
from educational and business sources. At the
end of 20 minutes, several key resource sources
were indicated by the group. This appeared to
be an effective and concrete way to deal with
the topic, "Sources of Resource Units."

The individual groups were given the
second hour to finish both their written and
oral reports.

Mar. 6 - Reporting.
Today was committee sharing day! Each group
presented an oral and written report. Two stu-
dents had individual projects. Perhaps the
most effective reporting was done by the
committee on the use of resource people. They
invited Mrs. Gump (Columbus Supervising Prin-
cipal) to show how to use a resource person in
a unit of work. Mrs. Gump spoke to the class
about unit teaching problems of beginning
teachers. Another group had a film strip to
illustrate the value of audio visual materials
in the classroom. In general the oral reports
were satisfactory but seemed to lack group
organization and coordination. The written
reports were well organized.

Mar. 11 - Reporting.
Reports were continued and seemed to be more
coordinated than Thursday's reports.

Mar. 13 - Generalizing and evaluating.
The last two groups presented interesting and
informative materials. The reports seemed to
progressively improve. The unit study gener-
alizations were on mimeograph paper and dis-
cussed.
Perhaps the most interesting and enlighten-
ing part of the wind-up was their evaluation of
the course in terms of objectives and their
verbal evaluation. In general they seemed to
feel that something was gained from handling
the course in this manner. One suggested that
the course should involve an actual unit on
the elementary level. One suggested that he
felt students could have learned the same
material from lectures. It will be interest-
ing to tabulate their written reactions.

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I, Emily Bell Schuh, was born in Toledo, Ohio, February 7, 1923. I attended the elementary and secondary schools in Bexley, Ohio. My undergraduate training was completed at Capital University which granted me the Bachelor of Science degree in 1945. From The Ohio State University a Master of Arts degree was received in 1949. During this interim between 1945 and 1956 I was employed as an elementary teacher in the Columbus Public School System. In January of 1956 I returned to The Ohio State University for a period of professional enrichment which led to completing the requirements for a second graduate degree.