THE IDENTIFICATION OF CRITICAL TEACHING SKILLS AND THEIR RELATIONSHIP TO STUDENT ACHIEVEMENT:
A QUANTITATIVE SYNTHESIS

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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To My Parents and Grandparents
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Selecting skills for teacher training. D. R. Cruickshank

Critical teaching abilities: What we know and what we should know to enhance classroom teaching. D. R. Cruickshank

Major Field: Early and Middle childhood & Educational Administration

Collaborative work as a Moral endeavor: The influence of roles. M. Johnston W. Wayson
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Chapter 1

Introduction

Today there is a discernible difference between "what is" and "what could be" in teacher education. Preservice teachers are often unaware or poorly informed of explicit teaching skills. As a result preservice teachers may be given insufficient guidelines to follow in their quest to become effective. Teachers who do not conceptualize and refine through practice generic skills of teaching will struggle to become competent practitioners during the early part of their career.

The question is not whether teachers should receive specialized preparation for teaching, but what kind of preparation they should receive (Silberman, 1970). Most academicians agree that teachers need to be professionally educated (Cruickshank, 1985). However, little progress will be realized until teacher educators further develop and incorporate into the curriculum a body of recognized teaching skills (Howsam, et al., 1976). Kerlingor (1976) concluded that effective teaching is not commonly agreed upon but posited the view that most experts within the field could agree upon desirable teaching abilities. Garrett (1978) also held the view that educators could define abilities critical to teaching. Gage (1981) called for empirical research to identify these desirable abilities or skills. The position has emerged that the identification of critical teaching abilities, by both expert consensus and empirical research, is necessary for the
improvement of the nation's teaching force.

Although teachers may not qualify as experts and rarely participate in empirical research that seeks to link mastery of a skill to positive student outcomes, they must be included within the framework of any study seeking to define abilities critical to teaching. Garrett (1978) asserted that how teachers perceive such abilities is important in determining teacher effectiveness.

Various authors have called for the identification of teaching abilities (Conant, 1963; Koerner, 1963; Smith, 1969; and Silberman, 1970). Efforts to identify and classify teaching skills, such as The Commonwealth Teacher Training Study by Charters and Waples (1929) studied the duties of K-12 teachers to assist in the development of preservice teacher education. Later efforts included Dodl (1972), Brown and Okey (1973), Cooper, Jones, and Weber (1973), Turner (1973), and Henderson and Lanier (1977).

Numerous individual scholars have offered support for skill development. Broudy (1972) supported the training of abilities; test construction, selection of materials, and classroom management. Gage (1972) advocated the development of technical skills such as structuring, responding, and reacting. Traill (1973) promoted the skills of motivation, presentation and communication, small-group and individual instruction, and student evaluation. Cruickshank, et al. (1980), and Cruickshank (1987) advocated the use of skill training for problem solving, classroom control, teacher-parent relationships, time management and reflection.

Broudy, (1972, 1978); Gage, (1972); Cruickshank, et al. (1980); & Dunkin, (1987) emphasized the value of teacher training. Efforts continue to
be made to identify teaching needs that would be well served by teacher skill development. Included in these efforts are findings of field studies (Walberg, 1984; Brophy and Good, 1986; & Ellison, 1986) and surveys to identify precisely what the activities, needs, and problems of teaching are (Dick, Watson, & Kaufman, 1981; Huberman, 1985).

Worchester (1981) analyzed 83 studies and arrived at three general conclusions concerning effective teaching. Success in teaching is linked to: 1) knowledge of subject matter, 2) sufficient training and 3) effective teaching abilities which are observable quantitatively and qualitatively.

Many who have studied skill development consider it to be integral to professional preparation (Cruickshank & Metcalf, 1990). Medley (1984) and Zahofic (1986) contended that one goal of teacher preparation is to help teachers become more skillful, leading to increased classroom proficiency. Allen and Ryan (1969), calling for a method to bridge the gap between knowledge of teaching/learning and classroom application, suggested a training program in specific skills.

Scholarship, viewpoints, and research, such as discussed above, have led to numerous efforts to initiate skills development in teacher education preparation (Bondi, 1970; Hall, 1971; Hurst, 1974; Borg, 1975; and Cruickshank, 1987).

There are two underlying assumptions supporting skill development. First, knowledge is necessary for good teaching but not sufficient in and of itself. Second, knowledge combined with the ability to master teaching skills will greatly enhance professional success. Research derived from effective teaching studies has been most favorable in providing support for
the above assumptions. Underlying the above assumptions is the belief that the performance of the teacher is central to the success of our current educational system.

Several instructional alternatives have been put forward which emphasize skill development. Those supported by research are behavior modification, interaction analysis, inquiry training, microteaching, protocols, reflective teaching, simulations, and teacher effectiveness training.

It would seem professionally advantageous for teacher educator scholars to create some unifying conceptualization or taxonomy of teacher-training needs, to provide a map of the territory that might guide curricular and instructional efforts (Cruickshank & Metcalf, 1990). A teacher's education consists of knowledge of many things including general education, the content of their teaching specialty, educational foundations and pedagogy. Unfortunately, pedagogical knowledge is not enough. Teachers need more than knowledge of what they must do to be successful. They need to acquire specific performance skills. For example, in classes in pedagogy, preservice teachers are provided substantial information regarding effective teaching behaviors. To illustrate, they are told that in order to be effective instructors, they must be clear. However, it is very unlikely they will be given the opportunity to obtain the skills necessary, that is, be provided with some kind of regimen in order that they will learn to perform that skill. A first step toward improved teacher training is to identify and validate teaching abilities which are known or believed to be critical. Teacher educators must then focus on identifying from this list a taxonomy
of critical teaching abilities which could assist in the improvement and quality of teacher education programs.

Statement of the Problem

Every year thousands of new teachers enter the work force presumed to have broad competencies necessary for professional success and, therefore, positive student outcomes. Have these novices acquired sufficient expertise in abilities that could be agreed upon to be critical to competent teaching? What is more important, perhaps, have such critical abilities been fully identified, validated as being critical, and implemented within the regimen of preservice teacher education training?

It is imperative that beginning teachers become proficient in skills or abilities judged to be critical by expert consensus, research findings, or information from the primary stakeholders, namely, the practitioners of teaching. After all, as Garrett (1978) stated, the teacher should be assumed to be the variable most central to the degree of success of our educational system. Holding this assumption to be true, it becomes disturbing to conclude that preservice teacher education has not arrived at a list of critical teaching abilities deemed generic and appropriate for the preparation of teachers. Cruickshank (1985) deemed this serious when he stated:

The most serious obstacle preventing teaching from having true professional status is the lack of consensus among educators regarding what constitutes the requisite specialized body of knowledge and skills for effective teaching. (p.14)
In addition Cruickshank (1985) later concluded, "The profession simply does not agree on what teachers must know to begin practice, and therefore there is no scope and sequence..." (p.15). With little agreement upon what to emphasize, progress slows.

Compounding and confounding the problem is the contention by Gliessman (1986) and Cruickshank (1985) that a sufficient knowledge base exists from which teacher educators can draw for the purpose of designing professional preparation programs that seek to increase the competence of beginning teachers through training. Even with an increase in studies regarding the process of teacher training, Gliessman (1986) and Berliner (1984) concluded that teacher education programs have not sufficiently implemented this new found knowledge within teacher training. Questions remain concerning what skills teachers must have for teaching and to what extent these skills are being defined, conceptualized, reinforced, practiced, and transferred to the classroom context.

Gliessman (1986) contended that such critical abilities or skills may be harder for preservice teachers to master, and therefore it becomes necessary for beginning inservice teachers to have extended training. Of prime concern for development is the initial learning setting for such abilities, the preservice teacher education curriculum.

Problematic to skill training is the view that all teacher educators do not hold teacher training in high regard. Some maintain that teaching is far too complex to be broken down into discrete skills and abilities. Silberman (1970), similarly, alluded to these phenomena by noting that some would consider teacher training as conditioning. It becomes probable that such a
perspective hinders the identification and validation of abilities suited for teacher training.

For decades methods courses have come under fire. Staropoli and Heitzmann (1973) referred to such courses as "The classic problem: child of any elementary teacher preparation program" (p. 35). Conant (1963) was equally complimentary when he stated, "Those terrible methods courses which waste students' time" (p. 137). Gutek (1970) supported the idea that methods courses (and certainly any part of teacher training) held vast potential for practical preparation for teaching. However, potential does not guarantee consistency or quality. As Gutek (1970) stated: "Some institutions have developed well-thought-out programs of general education while others have programs of poor quality which consist merely of accumulating numbers of credit hours in something vaguely labeled liberal arts" (p. 140). With the exception of certain states which have limited the quantity of foundation and professional courses, most preservice elementary students undertake numerous specific and general methods courses that demand a large time investment. It makes sense to use as part of this large time investment an opportunity to conceptualize and refine potentially identified skills and abilities critical to teaching. Problematic to the process of skill development in teacher education are the following; 1) is skill development integrated within the framework of methods courses or other components of professional studies, or largely ignored, or 2) are skills implemented only as a result of instructor's choice, and 3) if critical abilities are implemented, how are they implemented and in what context?
The problem centers on the success of preservice teachers as they complete student teaching or similar internships and enter the profession. Student teachers should not learn competencies by trial and error, nor should they experience poor self-esteem and poor efficacy because they have not been sufficiently exposed to opportunities that strengthen their everyday teaching decisions. Proficiency entails training and it becomes difficult to explain to the public, practitioners, and preservice teachers that teachers must grow on their own. Unlike other professions education has not selected and validated skills deemed necessary for good status within the profession.

It stands to reason that the lack of consensus regarding the identification of abilities critical to teaching and their validation impedes teacher education directly, and classroom teaching indirectly. If teacher educators have a common knowledge base, why not a set of common critical abilities? Identifying and validating skills and abilities critical to teaching appears to be an effective method of bridging theory and practice. A link of this nature could foster teacher competency and success, thereby serving preservice teacher education programs well.

**Statement of Purpose**

This study is nested within the work reported by Cruickshank and Metcalf in their chapter "Training Within Teacher Preparation" in the *Handbook of Research in Teacher Education* (1990). Therein they call for better and more training, especially intellectual, for preservice teachers.

An initial task is determining which teacher skills are most
noteworthy. A list of validated teaching skills could serve as a common framework for university and school collaboration, provide new directions for field experiences and serve as a basis for accountability and excellence in teaching. It is incumbent on scholars in teacher education to identify teaching skills and determine which of them are most critical and which must receive attention in programs of teacher preparation.

Beginning then with the assumption that training in teaching skills, especially intellectual skills, should be a fundamental part of teacher preparation, the intent of this investigation is to identify those skills which are considered to be critical to instruction by means of a multi-stage screening process. Those skills deemed to be promising will be further validated through a meta-analysis of research that has documented positive student outcomes resulting from teacher skill proficiency. A survey of those considered to be experts in the field of teacher preparation, students exiting teacher education programs, and practicing teachers will be undertaken to further identify and validate critical teaching abilities. More specifically, the purposes of this study are,

1. to identify skills related to teaching;

2. to screen those skills utilizing the following criteria: the skill is
   a) supported by research showing student success,
   b) generic and applicable to a wide variety of subject areas,
   c) developed or acquired ability which can be integrated in teaching through practice,
   d) defined in a generally agreed upon manner within the profession,
e) observable and measurable,
f) mentioned in the reviewed literature, and

3. to operationally define each skill judged critical to instruction.

**Background of the Study**

Research efforts to identify teacher skills deemed to be effective began as early as 1900 (Ellena, Stevenson, and Webb, 1961). These early efforts looked for relationships between administration ratings of teaching and teacher traits, characteristics, or personality factors such as gender, marital status, intelligence, buoyancy, enthusiasm and emotional stability, among others (Cruickshank, 1985). Although inquiry of this type persisted for over half a century, the results of this early era of teacher effectiveness research were disappointing (Metcalf, 1989). As Howsam (1960) stated:

> Few, if any, factors are now deemed established about teacher effectiveness and many former findings have been repudiated. It is not an exaggeration to say that we do not know today how to select, train for, encourage, or evaluate teacher effectiveness. (p. 11)

Research related to teaching and schooling published in 1966 under the title of Equality of Educational Opportunity by the U.S. Department of Health, Education, and Welfare, commonly called the Coleman Report, concluded that schools and teachers did not make much of a difference in the achievement of students (Cruickshank, 1990). This response to the Coleman Report began the second era of research which studied the
relationship between teacher behavior and student learning. This second era, often called "process-product" research (examining the process: teacher behavior and its effect on product: student learning), has provided knowledge of behaviors and practices common to teachers whose learners achieve at higher levels (Metcalf, 1989).

Reviews of research on teacher effectiveness during the 1970's and 1980's focused on the identification of skills that were present or operative when pupils were succeeding. Rosenshine and Furst (1971) identified teacher behaviors consistently associated with pupil learning. Dunkin and Biddle (1974) produced a non-technical textbook on teaching based on the findings of research rather than on common sense and personal beliefs. Cruickshank (1976) compared and contrasted results of relatively large-scale, federally funded research on teaching. Medley (1977) provided teacher educators access to the research-based findings about effective teaching. Gage (1978) identified correlates of teaching effectiveness to be included in a Stanford University experimental teacher education program. Borich (1979) reported the most parsimonious and practical implications for teacher education based on five process-product studies investigating relationships between teacher behaviors and elementary school pupil achievement on standardized tests on reading and math. Good (1979) summarized what is known about effectiveness among elementary school teachers. Emmer and Evertson (1982) identified what is known about the behavior of teachers who are effective classroom managers. Stallings (1982) reviewed studies that isolated effective strategies for helping low-achieving secondary school pupils. Porter and Brophy (1988) synthesized
research on good teaching that emphasized the work of the Institute for Research on Teaching at Michigan State University.

As we progress through the 1990's we can no longer regard the preparation of teachers as simply education sans training (Cruickshank and Metcalf, 1990). With the potential development of a knowledge base of identified critical teaching skills, teacher educators could be in a position in which the profession could demand greater public respect and resources to educate the students of tomorrow.

Efforts to identify those skills critical to teaching hold promise for developing a teacher education preservice program that can provide a foundation for the teacher education curriculum, develop commonality between universities and practicing peers and also re-focus the direction of education.

**Significance of the Study**

The judgment and perception by society of teacher educators, as to whether teaching is a profession or a paraprofession, remains clouded. Cruickshank (1985) stated that the professional education component of the traditional model teacher education curriculum implies "education for a profession" (p.13). Ornstein (1981) listed several common characteristics that define a profession; possessing a defined body of knowledge that is not normally possessed by the nonprofessional, was considered among the most important. Schlein (1972) concurred by stating that a profession must possess a "specialized body of knowledge and skills" (p.8). Cruickshank
(1985) stated that a knowledge base and regimen of needed (critical) skills must be agreed upon and used throughout the profession.

While support exists that there is a sufficient knowledge base within teacher education (Cruickshank, 1985; Gliessman, 1986), there is still little commonality among programs and there may be even less agreement regarding critical teaching skills essential to teaching success.

Determining the status of critical teaching skills within teacher education programs and securing agreement from practicing teachers are necessary preliminaries for developing a hierarchy of skills. Ignoring or haphazardly introducing teaching skills at random, within the teacher education curriculum, places beginning teachers, directly, and students, indirectly, at-risk. The student teacher needs to have knowledge of specific skills and opportunities to gain proficiency in them before actual teaching. Feedback given by cooperating teachers and university supervisors should support and refine previously learned skills or abilities, thereby making progress easier and more meaningful.

A common base of identified and validated teaching skills would serve teacher education well. Teacher education units could focus on specific critical skills and share training results, thereby increasing the proficiency of future teachers and teacher educators. A second benefit is simplicity. After the identification and validation of these abilities, instructional models could be developed to provide the elements needed for successful conceptualization and cultivation of each skill. Teacher education units could then collaboratively determine the effect of various presentation modes such as protocols, peer coaching, or traditional training
on the acquisition of skills. A third benefit is cost reduction. Having a
canon set of agreed on skills would reduce redundancy and provide focus,
thereby eliminating waste and allowing all financial resources to funnel to
a central and valid preparation program. Fourth, through the foundation
developed by the identification of the critical teaching abilities, a
curriculum could be developed that integrates the various components of the
teacher education program. Last, the identification and validation of
critical abilities of teaching would strengthen the argument that teaching
and the preparation of teachers are professional activities within a
profession by lending assistance to the goal of securing a specialized and
common body of knowledge and skills.

Justification for this investigation is specifically based on the
following points: 1) the causal relationship between skill development and
teacher performance needs to be further investigation; and 2) identification
and validation of critical teaching skills are essential for improvement
within the field of teacher education.

**Research Questions**

1. What criteria have been proposed for the identification of critical
   skills necessary for teacher preparation?
2. What skills, using the criteria developed, can be identified as being
critical to teaching?
3. Through a meta-analysis of available research, which skills can be
   identified as being critical by linkage to positive student outcomes?
Definition of Terms

**Skill:** A term associated with training that is assumed to be an outcome of training (Cruickshank and Metcalf, 1990). The ability to use one's knowledge effectively in executing a particular expertise. Skills are the execution of learned physical or mental tasks which have a direct relationship to teacher performance. They are abilities that enable one to achieve proficiency in obtaining predetermined objectives. Skills are a coordinated set of actions that increasingly become smooth and integrated through practice (Gove, 1971, p. 2133).

**Training:** To cause a skill to be disciplined and cultivated. To undergo instruction or drill in habits of thought or action. Training implies the development of a variety of behaviors depicting know-how across a wide spectrum of human activities (Cruickshank and Metcalf, 1990). Training is a process to modify attitudes, knowledge or skill behavior so as to achieve effective performance (Hill, 1982). Training is purposeful, planned, and seeks to develop knowledge and abilities deemed necessary for professional success through conceptualization and practice.

**Critical Teaching Ability:** A behavior, trait, characteristic, skill or quality exhibited by a teacher which results in positive student outcomes, academic or otherwise. Critical teaching skills/abilities can be integrated into teaching through practice (Cruickshank and Metcalf, 1990). Critical teaching skills are discrete behaviors which are observable and measurable both qualitatively and quantitatively. Qualitative in that a continuum of performance is discernible and different levels of performance
exist within the skill. Quantitative in that the frequency of the behavior, trait, or characteristic can be determined.

**Generic Ability:** A behavior, trait, skill or characteristic that is applicable to a wide variety of subject areas and teaching situations.

**Positive Student Outcome:** A positive application of a critical teaching skill in a teaching situation that results in student success in areas such as achievement, positive self-concept, improved academic ability, or self-reliance (Cruickshank, 1990).

**Teacher Educator:** A professional who works at the college or university level preparing preservice students for entry level positions through professional education, either by teaching, developing, or administration of: 1) content for the teaching specialty, 2) humanistic and behavioral studies, 3) teaching and learning theory, and 4) clinical or field experience (Cruickshank, 1985).

**Preservice Elementary Student:** An undergraduate student who has been accepted into an education program specifically designed for the preparation of kindergarten through eighth grade classroom teachers.

**Classroom Teacher:** A full time professional who has been employed in a teaching position for three or more years and has at least a baccalaureate degree from a teacher preparation program and a valid teaching certificate.

**Meta-Analysis:** Meta-analysis refers to the analysis of analyses. The term is used to refer to the statistical analysis of a large collection of analyses results from individual studies for the purpose of integrating the findings. It connotes a rigorous alternative to the casual, narrative
discussions of research studies which typify our attempts to make sense of the rapidly expanding research literature (Glass, 1976) The goal of meta-analysis should be to provide an accurate, impartial, quantitative description of findings in a population of studies on a particular topic (Glass et al., 1981).

**Limitations**

1. The research is conducted in a broad complex area over an extended period of time. No attempt is made to study critical teaching skills that are inherent to a specific subject area or student population. Skills identified and studied are generic across a wide range of subjects and teaching situations.

2. While an effort is made to trace critical teaching skills from 1900, the major emphasis of the study is skills identified from literature after 1960.

3. The skills investigated are often not operationally well defined.

4. Outcome measures studied are often not agreed upon, well defined and/or narrow in scope.

5. Not all studies used for the identification and validation of critical teaching skills are experimental. Early studies are primarily descriptive and correlational in nature.

6. Professional judgment of the researchers is, in part, employed to determine which skills meet the established criteria to be identified for the initial list.
7. This research in no way assumes that all teaching skills have been identified, although exhaustive effort is made to achieve this goal.

8. In limiting the scope of this study, the search for research reports to be used in this study was restricted to the Educational Resources Information Center (ERIC) system microfiches and to professional journals that could be located in the LCS Serials List.

9. This study was based only on research reports that were identified through the ERIC system data bases on CD-ROM from 1980-1993.

**Delimitations**

In the initial stages of this study, all research and articles related to teaching skills were examined using the following sources: the Educational Resources Information Center (ERIC) system microfiches and professional journals that could be located in the LCS Serials List; the Reader's Guide to Periodical Literature; National surveys; Individual scholars; Research on teacher effectiveness; and Models of teaching. In order for an article to be included in the meta-analysis it had to satisfy the following criteria for selection of documents:

1. The document was a published research report.
2. The publication date was from 1980 to 1993.
3. The document was concerned with teaching skills which had an outcome on student achievement.
4. The document was in English.
5. The document was concerned with English-speaking subjects.
6. The document was concerned with education from grades kindergarten through grade 12.
7. The document was either an experimental or correlational study.
8. The document identified the instruments that were used to measure student outcomes.

**Summary**

This narration is presented in five chapters: Chapter I is the introduction that presents the concept of critical teaching skills as an affective variable and includes the statement of the problem, the purpose of the study, the background of the study, the significance of the study, research questions, definition of terms, and delimitations. Chapter II is a review of the literature that defines the term teaching skills, identifies teaching skills from national surveys, scholars, research on effective teaching, models of teaching, and training research. Literature is also identified that presents criteria for selection of critical skills through the use of effect size in determining skill significance. Chapter III is concerned with research design and covers:

1. Data collection procedures
2. Sample
3. Rationale for the selection of the variables and research hypotheses
4. Operational definitions of the variables used in the study
5. Data analysis procedures
Chapter IV presents the results, identifies the significant skills, and summarizes the findings. Chapter V presents a summary and discussion of the findings, and recommendations for future research.
Chapter II
Review of Literature

Introduction

Major points presented in Chapter I included: 1) to be professionally competent, teachers in general should receive training in skills deemed as being important; 2) a lack of consensus exists concerning which skills are critical to teaching, and 3) satisfactory criteria are needed for determining which skills are critical.

The purpose of the study is to answer the question, what skills can be identified as being critical to teaching. The primary intent of this chapter is to thoroughly review the line of inquiry into teaching skills by investigating the following topics: 1) assumptions underlying teacher skill development and training; 2) literature regarding the identification of teaching skills; 3) skills identified from models of teaching; 4) skills identified through training research; and 5) identification of screening criteria for selection of critical teaching skills.

Professional preparation rarely includes the cognitive, affective, or psychomotor skills needed for competence, largely because the training component is not sufficiently valued (Cruickshank and Metcalf, 1990; Gliessman, 1984, 1986; Berlin, 1985; Gage, 1972 and Allen & Ryan, 1969). The argument in favor of increased training efforts for the development of skill competency may be stated deductively:
1. Professional preparation should consist of education (the knowledge of a profession).

2. Professional preparation should also consist of training (developing needed skills for a profession).

Therefore, both education and skill training are important components in teacher education programs.

A difficult issue is to determine precisely what skills are critical to teaching success and amenable to training. A skill is a behavior that has been designated, through theory, practice, and/or research, as being beneficial within the teaching and learning context. The goal of training is to produce skill competence through systematic use of selected critical skill. Teacher education has the knowledge base to produce effective teachers through training, but frequently fails to incorporate this knowledge into teacher preparation for numerous reasons (Berliner, 1984). Gliessman (1986) noted that the past 21 years yielded an increase in studies concerning the processes of teacher training, but that little consensus continued to exist on one critical issue, that is, what critical skills should be incorporated into preservice education preparation?

Empirical evidence on how teacher behavior effects student outcomes should be the foundation for training models incorporating critical teaching skills (Hudgins, 1974). To improve teaching, there must be a logical structure in place for insuring competence in critical skills. Teaching consists of interrelated skills and concepts that must be understood and mastered. Therefore, it becomes incumbent upon the profession not only to produce teachers with a sufficient knowledge base of what to teach, but also the understanding and ability of how to teach.
Davis and Silvernail (1981) contended that an agreed upon list of validated critical skills should exist, especially for instruction and curriculum design. In contrast they concluded that little consistency regarding teaching skills exists across the boundaries of individual teacher education programs. Teaching consists of interrelated skills and concepts that must be understood and mastered.

**Assumptions Underlying Teacher Skill Development and Training**

A review of literature indicates that training theory and skill development are underpinned by basic assumptions which are both numerous and widely held. A listing of the primary assumptions listed chronologically is as follows:

1. Teachers are clinicians who make hundreds of professional decisions daily and training is more likely than intuition to yield appropriate decisions (Joyce, 1975).

2. Teachers must have both knowledge and skills to practice as a clinician and become adept at problem solving (Joyce, 1975).

3. The profession should determine which skills serve teaching best, define such skills behaviorally, and match learning experiences to critical skills (Joyce, 1975).

4. Complex teaching strategies and patterns can be reduced to individual skills (Emmer, 1985; McNerney, Caldwell, Medley, & McLaughlin, 1985).

5. Mastery of discrete skills reinforces competency of original complex strategies (Emmer, 1985).
6. Skill training is generic across content areas and grade levels (Emmer, 1985).

7. There are few, if any, beginning teachers who enter preservice programs or teaching with high level competency (McNerney, Caldwell, Medley, & McLaughlin, 1985).

8. Practice is key to developing identified competencies (McNerney, et al., 1985).

9. Practice, occurs best within the classroom domain where opportunities are identified to apply skills learned in training (McNerney, et al., 1985).

10. Conceptualization must be combined with practice to effect skill competence (McNerney, et al., 1985).

11. To gain status as a true profession, education must have a codified knowledge base containing skills critical to the profession (Cruickshank, 1985).

12. Systems that develop both skills and knowledge can increase student learning (Joyce & Showers, 1988).

13. Teachers can learn and become competent in complex teaching strategies (Joyce & Showers, 1988).

14. Teacher training is a vehicle for effecting change regarding teacher beliefs and behavior (Joyce & Showers, 1988)

**Summary**

Historically, training has been strongly linked to skill development. Also, training has evolved as a result of underlying theory which contains a number of basic assumptions important for understanding the concept of teaching skills. The assumptions strongly suggest that teachers need both knowledge and skills based on sound practice and not on intuition. Also,
teaching can be reduced to discrete skills and the profession must increase efforts to determine those skills most critical to teaching. In addition, beginning teachers do not typically possess sufficient knowledge of or proficiency in skills common to the act of teaching, even though most skills are discrete, cross subject and grade boundaries, and can be enhanced through practice or other training measures such as conceptualization. To further the status of teaching, the profession is in need of a list of agreed upon skills common to effective instruction.

**Literature Regarding the Identification of Teaching Skills**

The search for a consummate list of validated critical teaching skills has yet to be completed. This section provides knowledge concerning the distinction between skills and training, insights useful for identifying skills, and potential sources of skills, including surveys, scholars, and effective teaching research and studies. The aim of this section is to generate skills to consider for inclusion within a preliminary skill list which will eventually be subjected to later screening criteria for the purpose of identifying skills critical to teaching success.

**Distinction Between Skills and Training**

In the identification of critical teaching skills the terms "skills" and "training" are often associated (Cruickshank & Metcalf, 1990). Distinction between skills and training was made by Billings (1981) who stated that skills permit us to be informed and know, whereas training permits us to do. Skills are further delineated as lower order and higher order (Cruickshank
and Metcalf, 1990), the distinction between the two being the amount of education needed to perform the skill. Lower order skills can be self taught, while higher order skills are achieved through teacher assistance by (1) knowledge or understanding (conceptualization) of what is known about the skill and (2) practice.

Sources For the Identification of Skills

Ratsoy, McEwan and Caldwell (1979) proposed seven potential sources, drawn from teacher education scholarship and effective teaching research, for drafting a preliminary list of skills for screening potential skills of teaching.

1. Previous skill lists.
2. Course translations (lists of skills included in syllabi).
3. Taxonomies (analysis of).
4. Professional input.
5. Theoretical knowledge from the literature base.
6. Input from primary stakeholders such as preservice teachers and the community.
7. Task analysis of the literature or research.

Brown, Gliessman, and Ochoa, (1987); and Gliessman, Pugh, Brown, Archer, and Snyder (1989) suggested an ERIC computer search of teaching skills to determine skills for inclusion on a preliminary list. Cruickshank and Metcalf (1990) identified surveys, the work of individual scholars, and research on effective teaching as primary sources for constructing a preliminary list of teaching skills. National surveys categorize skills under
such clusters as classroom instruction, classroom management, assessment, generic, and skills related to specific subject areas. Scholars have distinguished specific skills that lend themselves to training and concluded that a relationship exists between training and skill competency (Cruickshank and Metcalf, 1990). Major research on effective teaching is linked to process-product studies. Attention has been given to the identification of specific teaching behaviors present or operative during pupil success.

National Surveys

The Commonwealth Teacher Training Study (Charter & Waples, 1929) was a national survey that identified the duties of K-12 teachers, for the purpose of developing curricula for the training of teachers. Approximately 12,000 specific teacher activities were obtained and classified as follows:

1. Teachers' activities involved in classroom instruction
   a. Teaching subject matter
   b. Teaching pupils to study

2. Teachers' activities involved in school and class management
   a. Activities involved in recording and reporting facts concerning pupils
   b. Activities involving contacts with pupils

3. Activities involving supervision of pupils' extra classroom activities

4. Activities involving relationships with personnel of school community
5. Activities involving relations with members of school community
6. Activities concerned with professional and personal advancement
7. Activities in connection with school plant and supplies

Teaching Traits Identified by the Commonwealth Teacher Training Study (1929) are listed in Appendix A.

The Comprehensive Elementary Teacher Education Model Program (Cruickshank, 1970) was the United States Office of Education’s effort to improve preservice teacher preparation (Cruickshank & Metcalf, 1990). Outcomes of these efforts were catalogs of teacher competencies such as the Florida Catalog of Teacher Competencies (Dodl et al., 1972). Under the headings of assessing and evaluating student behavior, planning instruction, conducting and implementing instruction, performing administrative duties, communicating, developing personal skills, and developing pupil–self, there were identified 1,119 teacher behaviors.

In 1973 Richard Turner categorized an aggregation of studies under the headings of: generic, early childhood, socialization and classroom management, language arts in the elementary school, English, social studies, mathematics and science. From this study the following table of Generic Teaching Skills in Teacher Skills Training was developed.
Table 2.1
Generic Teaching Skills developed by Richard Turner

<table>
<thead>
<tr>
<th>Defining Skills</th>
<th>Development Skills</th>
<th>Selecting Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>defines</td>
<td>develops</td>
<td>selects</td>
</tr>
<tr>
<td>identifies</td>
<td>invents</td>
<td>justifies (gives-</td>
</tr>
<tr>
<td>distinguishes</td>
<td>designs</td>
<td>-rationale for)</td>
</tr>
<tr>
<td>specifies</td>
<td>devises</td>
<td></td>
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<tr>
<td>describes</td>
<td>constructs</td>
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<td></td>
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<td></td>
<td>formulates</td>
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<tr>
<td></td>
<td>adapts</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Organizing Skills</th>
<th>Presenting Skills</th>
<th>Eliciting Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>arranges</td>
<td>introduces</td>
<td>questions</td>
</tr>
<tr>
<td>organizes</td>
<td>structures</td>
<td>challenges</td>
</tr>
<tr>
<td>sequences</td>
<td>demonstrates</td>
<td>confronts</td>
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<tr>
<td></td>
<td>engages</td>
<td>probes</td>
</tr>
<tr>
<td></td>
<td>conducts</td>
<td>elicits</td>
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<td></td>
<td>explains</td>
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<td></td>
<td>articulates</td>
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<td></td>
<td>relates</td>
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<table>
<thead>
<tr>
<th>Responding Skills</th>
<th>Nurturing Skills</th>
<th>Appraising Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>supports</td>
<td>encourages</td>
<td>questions</td>
</tr>
<tr>
<td>corrects</td>
<td>guides</td>
<td>constructs</td>
</tr>
<tr>
<td>reflects</td>
<td>facilitates</td>
<td>listens</td>
</tr>
<tr>
<td>reinforces</td>
<td></td>
<td>collects</td>
</tr>
<tr>
<td>accepts</td>
<td></td>
<td>distinguishes</td>
</tr>
<tr>
<td>expands</td>
<td></td>
<td>administers</td>
</tr>
<tr>
<td>re-directs</td>
<td></td>
<td>records</td>
</tr>
<tr>
<td>limits</td>
<td></td>
<td>reports</td>
</tr>
</tbody>
</table>

The Florida Coalition for the Development of a Performance Measurement System (1983) was a survey of research on generic teaching behaviors conducted at the University of South Florida. Using studies whose dependent variables were measures of student outcomes, a set of 31 concepts of effective teaching was assembled and classified into six domains (Smith, 1985). These 31 concepts encompassed a list of 134 indicators of teaching abilities under the following headings and subheadings:
Table 2.2
Florida Coalition for the Development of a Performance Measurement System Concepts of effective teaching

<table>
<thead>
<tr>
<th>Planning</th>
<th>Management of Student Conduct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content Coverage</td>
<td>Rule Explication and Monitoring</td>
</tr>
<tr>
<td>Utilization of Instructional Materials</td>
<td>Teacher Withitness</td>
</tr>
<tr>
<td>Activity Structure</td>
<td>Overlapping (Withitness)</td>
</tr>
<tr>
<td>Goal Focusing</td>
<td>Quality of Desist</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>Group Alert</td>
</tr>
<tr>
<td>Instructional Organization &amp; Development</td>
<td>Movement Smoothness</td>
</tr>
<tr>
<td>Effective Use of Time</td>
<td>Movement Slow-down</td>
</tr>
<tr>
<td>Review of Subject Matter</td>
<td>Praise</td>
</tr>
<tr>
<td>Lesson Development</td>
<td></td>
</tr>
<tr>
<td>Teacher Treatment of Student Talk</td>
<td>Communication</td>
</tr>
<tr>
<td>Teacher Academic Feedback</td>
<td>Control of Discourse</td>
</tr>
<tr>
<td>Management of Seatwork/Homework</td>
<td>Emphasis</td>
</tr>
<tr>
<td></td>
<td>Speech</td>
</tr>
<tr>
<td></td>
<td>Task Attraction and Challenge</td>
</tr>
<tr>
<td></td>
<td>Body Language</td>
</tr>
</tbody>
</table>

Presentation of Subject Matter
- Presentation of Interpretative (Conceptual) Knowledge
- Presentation of Explanatory (Law or Law-Like) Knowledge
- Presentation of Academic Rule Knowledge
- Presentation of Value Knowledge

Testing: Student Preparation, Administration, Feedback
- Preparation for Testing
- Test Administration
- Formative Feedback

Scholars
Gage (1972) reported specific, trainable, technical skills of teaching derived from the Stanford program of the 1960's. Technical skills are instructional techniques and procedures common to the act of teaching and include: 1) establishing set and appropriate frames of reference (viewpoints), 2) closure, 3) using questions, 4) recognizing and obtaining attending behavior, 5) control of participation, 6) providing feedback, 7) employing rewards, 8) information processing, 9) social interactions,
10) technical skills of teaching, such as structuring, soliciting, responding, reacting and punishments and 11) setting a model.

Gage (1972) supported the training of teachers through the method of rule-following with pre-established courses of action. Further, he suggested that the modal curriculum should contain a technical proficiency component for training teachers in test construction, selection of materials, and classroom management.

A study conducted by Brophy and Good (1974) concluded that training does not necessarily have to be a complex myriad of sophisticated components. It was hypothesized that most negative behavior of teachers toward students was unintentional and caused by a lack of awareness. Data indicated that teacher behavior can be easily changed simply by accenting awareness and that the skill of teacher enthusiasm was a strong candidate for training programs.

Gage, Snow, Bush, Corno, and Clark (1977a) stated that training should focus on teachers as individuals since they are more adaptable than institutions and capable of change over a shorter time. They defined skills as being distinct (discrete), observable, based on performance objectives, and under the control of the user (teacher). They warned of inflexible and fixed training criteria, and called for training programs to incorporate skills related to personal interactions and transactions. Based on the findings of Rosenshine and Furst (1971) and Dunkin and Biddle (1974), Gage et al. (1977a) concluded that a relationship existed between training and skill competency in questioning, praise, probing, and using student ideas.
Cruickshank, et al., (1980) and Cruickshank (1987) identified problems of teaching that lend themselves to training processes, such as, teacher reflection. They also suggested training for the following skills: problem solving, affiliation, control, relationship with parents, student success, time management, and reflective practice.

Joyce and Showers (1983) categorized skills twofold: (1) skills used as circumstances demand; and (2) skills brought into play because of professional judgment. They argued that teacher education must both identify skills critical to teaching and delineate and define them. Skills identified were collaboration and teaching styles.

Cruickshank and Metcalf (1990) identified individual scholars and groups that promoted particular kinds of training for specific skills, as follows:

Broudy (1972)—test construction, materials selection, classroom management; Broudy (1987)—instruction, classroom management, decision making; Chaukin and Williams (1984)—parent relationships, human relationships; Collins (1978)—enthusiasm; Dunkin (1987)—assessing pupil needs, monitoring one's own teaching, analyzing the requirements of subject matter and educational objectives; Flanders (1963a)—verbal influence; Gliessman (1986)—questioning, direct influence, verbal structuring, behavior management; Jackson (1965)—planning, arranging classrooms, analyzing pupil information; Medley (1984)—decision making; Turney, Clift, Dunkin, and Traill (1973)—motivation, presentation and communication,
questioning, small group and individual instruction, development of pupil thinking skills, evaluation, classroom management; and Zoharic (1986) presentational skills, checking (monitoring, reflecting) p. 472.

**Research On Effective Teaching**

Research has provided valuable information concerning required skills needed to be a successful teacher. Attempts to identify effective teachers have followed two approaches which reflect distinct eras of research on teaching (Cruickshank, 1990). The first era, before 1960, focused on the identification of teacher traits or characteristics considered exemplary in the view of administrators and supervisors (Cruickshank, 1990). Early concern with teachers' personal traits led to presage-product rather than process-product studies (Brophy and Good, 1986). Beginning with the 1960's, researchers turned their attention to identifying specific teacher behaviors present or operative during pupil success and competencies associated with a good classroom environment (Brophy and Good, 1986; Cruickshank, 1990). Cruickshank (1990) identified the following reasons for an increase in teacher effectiveness research:

1. There was strong motivation to counter the Coleman Report finding, that socio-economic status of the pupils and community is the significant factor related to student success, and prove that teachers do make a difference.

2. Several models for guiding research appeared that could be used to study direct and indirect relationships between and among the principle variables operating in the teaching environment.
3. The appearance of instruments to record specific classroom behaviors permitted systematic analysis of what a teacher and/or pupil do. (pp. 68-69)

The following ten studies represent research on teacher effectiveness during the decades of the 1970's and 1980's. They are presented in chronological order with the results of each study. Other studies within that era are depicted in Appendix A.

**Identification of Skills From Effective Teaching Research**

**Rosenshine and Furst (1970)**

The major focus of this paper was upon procedures for the determination of teaching skills that contribute to student affective and cognitive growth. The authors proposed four general sources for review in the identification of critical teaching skills: laboratory studies, subject matter research, experimental classroom studies, and process product studies.

Considered to be meaningful human learning situations, laboratory studies contained instruction mediated by written materials, audio tapes, or films. The authors believed experimental studies provided the best source of behavioral specifications for teacher education programs. Unfortunately, at this period of time, Rosenshine and Furst state that this type of research was almost non-existent. Process-product research, the fourth source for behavioral specifications for teacher education programs, consisted of studies which investigated attempts to relate observed teacher behaviors to student outcome measures (Mitzel, 1960). The results of process-product...
studies represented some of the best knowledge available for use in teacher education programs (Rosenshine and Furst, 1970).

The following table of teaching skills, developed by Rosenshine and Furst, represents a distillation of empirical research findings on the relationships between teacher behavior and student achievement. The skills listed below are in order of the strength of the supporting data.

Table 2.3
Skills representing the relationships between teacher behavior and student achievement by Rosenshine and Furst

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Clarity</td>
<td>6. Use of student ideas and general indirectness</td>
</tr>
<tr>
<td>2. Variability</td>
<td>7. Criticism</td>
</tr>
<tr>
<td>3. Enthusiasm</td>
<td>8. Use of structured comments</td>
</tr>
<tr>
<td>4. Task oriented and/or business like</td>
<td>9. Types of questions</td>
</tr>
<tr>
<td>5. Student opportunity to learn</td>
<td>10. Level of Difficulty</td>
</tr>
<tr>
<td></td>
<td>11. Probing</td>
</tr>
</tbody>
</table>

Rosenshine and Berliner (1973)

Rosenshine and Berliner first reviewed the research findings in the area of classroom activities and student achievement gain, then discussed the implications for training and practice of teachers. Results from the research reported limited the findings to achievement gain in reading and mathematics for students in the primary grades (ages 6 through 10). The major skill in academic engaged time appeared to be managing students when they are working privately. Results of Rosenshine and Berliner's Academic Engaged Time study are depicted in Table 2.4.
Table 2.4
Rosenshine and Berliner’s Academic Engaged Time Study

<table>
<thead>
<tr>
<th>Academic Engaged Time</th>
<th>Verbal Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content Covered</td>
<td>Decrease in Discussion</td>
</tr>
<tr>
<td>Student Attention or Engagement</td>
<td>Factual Questions</td>
</tr>
<tr>
<td>Academic Engaged Time</td>
<td>Controlled Practice</td>
</tr>
<tr>
<td></td>
<td>Higher Order Questions</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Increasing Academic Engaged Time</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Focus</td>
<td>Student Initiated</td>
</tr>
<tr>
<td>Teacher Directed</td>
<td>Working Privately</td>
</tr>
<tr>
<td>Grouping Students for Learning</td>
<td>Atmosphere</td>
</tr>
<tr>
<td>Student Choice of Activity</td>
<td></td>
</tr>
</tbody>
</table>

**Dunkin & Biddle (1974)**

This book summarized the methods, concepts, and findings of observational research on teaching with the intent of deriving knowledge about instruction. All of the approximately 500 studies reviewed had involved systematic observation of teaching in classrooms. The culmination of the study resulted in a textbook on teaching which helped define the field of research on teaching and differentiate it from other forms of educational research (Brophy and Good, 1986). A listing of the findings follows:

1. Avoidance of criticism
2. Maintain pupil involvement
   - momentum
   - with-itness
   - group alerting
   - smoothness
   - accountability
- overlapping
- valence and challenge (efforts by the teacher to generate student enthusiasm and get them involved in the lesson)

3. Maintain student involvement in seat work
   - vary teaching methods
   - vary group arrangements
   - vary use of material

4. Reward acceptable classroom behavior
   - praise
   - material incentives
   - response manipulation (not allowing students to do things they prefer until after they have completed assigned tasks)
   - peer manipulation (use of peer pressure)

5. Use of small group only when activities are supervised to keep students on target

6. Active roles for students

7. Increase teacher clarity

Medley (1977)

The American Association of Colleges for Teacher Education (AACTE) commissioned Medley to answer the critical question: "What does research say about teacher competence and teacher effectiveness?" Medley analyzed and synthesized the results of 289 research studies which survived a weeding-out process from an original list of 732 items. The four criteria applied in selecting usable studies were: 1) the studies were generalized to populations of teachers larger than the sample studied; 2) the relationship had to be both reliable enough to be statistically significant and large enough to be practically significant; 3) the measure of teacher effectiveness had to be based on long-term pupil gains in achievement areas
recognized as important goals of education; and 4) the process measured had to specify the behaviors exhibited in such a way that they could be reproduced as desired. Only 14 of the 289 studies met all of the above criteria. The following list was reported by Cruickshank, (1990, pp. 27-29).

General Findings:

1. A competent teacher of subject matter is likely to develop positive pupil attitudes toward school.

2. Teachers who achieve maximum pupil gains are also likely to improve pupil's self-concept.

3. Behaviors of effective teachers of reading and mathematics in the first three grades are very similar.

4. Behavior patterns of teachers effective with low socio-economic pupils differ considerably from those of teachers effective with high socio-economic students.

Specific findings for effective teachers of low socio-economic pupils.

1. Teachers devote more time to task-related, academic activities and less time to deviancy control.

2. They spend more time with large groups than with small groups.

3. More seatwork is assigned.

4. Assignments are more individualized.

5. More lower order questions of a factual nature are asked.

6. Teachers are less likely to simplify, discuss, or use pupil answers.

7. There are fewer pupil-initiated questions and comments.

8. Interactions are kept at a low level of complexity and have less pupil initiative.

9. There is less deviant or disruptive pupil behavior.
10. Teachers use less criticism and have a more varied repertoire of control techniques.

11. Pupils have less freedom to govern their activities.

12. An environment is maintained that, if not always quiet, is at least free from disruptive pupil behavior.

13. Teachers spend more time and effort supervising individual pupil work.

14. A primary teacher is more likely to ask a question and then to choose a non-volunteer to answer (a form of "group alerting").

15. Primary teachers pay more and closer attention to individual pupils.

Specific behaviors of effective teachers of upper elementary grades.
1. Talk more.
2. Keep pupils on task.
3. Are less permissive.
4. Permit pupils to initiate more interchanges.
5. Ask easier questions.
6. Manage with less effort.
7. Are more selective with criticism.
8. Attend to pupils less closely.
9. Favor less traditional materials.
10. Are more traditional, less exciting. ((Cruickshank, 1990, pp. 27-29)

Gage (1978)

The intent of this study was to identify correlates of teaching effectiveness for possible inclusion in a Stanford University experimental teacher education program (Cruickshank, 1990). Four studies were reviewed: Soar and Soar (1972), Brophy and Evertson (1974), Stallings and Kaskowitz (1974), and McDonald and Elias (1976). The results stated how
third grade teachers can maximize achievement in reading and mathematics for students in either high or low academic orientations:

1. Teachers should have a system of rules that allows pupils to attend to their personal and procedural needs without having to check with the teacher.

2. Teachers should move around the room a lot, monitoring pupils' seat work and communicating to their pupils an awareness of their behavior, while also attending to their academic needs.

3. When pupils work independently, teachers should insure that the assignments are interesting and worthwhile yet still easy enough to be completed by each third-grader working without teacher direction.

4. Teachers should minimize activities like giving directions and organizing the class for instruction. Teachers can do this by writing the daily schedule on the board, insuring that pupils know where to go, what to do, etc.

5. In selecting pupils to respond to questions, teachers should call on a child by name before asking the question, as a means of insuring that all pupils are given an equal number of opportunities to answer questions.

6. With less academically oriented pupils, teachers should always aim at getting the child to give some kind of response to a question. Rephrasing, giving cues, or asking a new question can be useful techniques for bringing forth some answer from a previously silent pupil or one who says "I don't know" or answers incorrectly.

7. During reading-group instruction, teachers should give a maximal amount of brief feedback and provide fast-paced activities of the "drill" type.
Good (1979)

The objective of this study was to present tenable conclusions from process–product research. Three major conclusions identified in Good’s paper were: a) elementary school teachers do exert differential effects upon student achievement; b) classroom management skills are exceedingly important; and c) a pattern of teaching behavior called "direct instruction" seems to be a useful heuristic for describing effective elementary classroom teachers (Good, 1979). An analysis of selected studies resulted in a summary of knowledge about elementary teacher effectiveness.

Findings:

1. Teachers’ managerial abilities are positively related to pupil achievement in every process–product study. However, although managerial skills are necessary, they are not sufficient to ensure pupil learning.

2. Teachers manage classrooms to maximize pupil task involvement and minimize disruption.

3. Teachers who structure and monitor learning do better at teaching basic skills.

4. Direct instruction is associated with increased pupil learning gains. Direct instruction is considered active teaching. The teacher sets and articulates the learning goals, actively assesses student progress, and frequently makes class presentations illustrating how to do assigned work (Good, 1979).

Emmer and Evertson (1982)

An investigation of research on teacher behaviors identified skills that: 1) related to high levels of student involvement in class activities;
2) caused minimal amounts of pupil behavior that interfered with or disrupted instruction, and 3) produced efficient use of instructional time. Classified under the heading "Classroom Management Abilities" the following behaviors are identified.

1. During recitations pupils are more involved and less prone to misbehavior when teachers exhibit momentum, with-itness, smoothness, and group alerting.

2. During seat work pupils are less prone to misbehavior when teacher exhibit with-itness, momentum, and smoothness. Pupils will be more involved in their work when teachers provide variety in seat work.

3. Pupils are more likely to be on task during activities led and paced by the teacher than during independent seat work.

4. Teacher behaviors associated with greater pupil involvement in lessons include use of feedback, focused and substantive interaction with academic content, structuring during math instruction, and use of prompting, structured transitions, questions, incentives, and appropriate pacing.

5. When beginning the school year, elementary teachers establish behavioral expectations for pupils, monitor behavior regularly, deal with inappropriate behavior promptly, provide clear directions and presentations, listen, and express feelings.

6. When beginning the school year, junior high teachers set expectations and standards, establish appropriate behaviors, monitor and deal with inappropriate behavior promptly, accept and use pupil ideas, and joke and smile.

**Berliner (1984)**

Berliner's 1984 study reviewed skills under the control or influence of teachers and known to affect student behavior, attitudes, and achievement.
These skills were categorized under the headings of: pre instructional factors, during instruction factors, climate factors, and post-instructional factors. Organizing the review in this manner served two purposes: 1) made explicit was the complexity of the decisions teachers must make; and 2) well-documented ways surfaced for teachers to make sensible choices about how they should go about teaching. A Review of Research on Teaching by Berliner in 1984 identified the skills listed in Table 2.5.

Table 2.5

<table>
<thead>
<tr>
<th>Pre instructional Factors</th>
<th>Instructional Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>content Decisions</td>
<td>engaged Time</td>
</tr>
<tr>
<td>time Allocation Decisions</td>
<td>time Management</td>
</tr>
<tr>
<td>pacing Decisions</td>
<td>monitoring Success Rate</td>
</tr>
<tr>
<td>grouping Decisions</td>
<td>academic Learning Time</td>
</tr>
<tr>
<td>activity Structures Decisions</td>
<td>structuring</td>
</tr>
<tr>
<td></td>
<td>questioning</td>
</tr>
</tbody>
</table>

**Climate Factors**

communicating Academic Expectations for Achievement
developing a Safe, Orderly and Academically Focused Environment for Work
sensible Management of Deviancy
developing Cooperative Learning Environments

**Post–Instructional Factors**

tests
grades
feedback
Brophy and Good (1986)

Brophy and Good (1986) conducted a review of process-product research of the 1960's and 1970's which linked teacher behavior to student achievement. The study emphasized teacher behavior over other classroom process variables, and student achievement gain over other product variables.

Findings:

Quantity of and Pacing of Instruction
- opportunity to learn/Content Covered
- role Definitions/Expectations/Time Allocation
- emphasis on academic instruction
- adherence to curriculum
- business-like or task oriented
- classroom Management/Student Engaged Time
- ability to organize and manage the classroom as an efficient learning environment.
- good preparation
- installation of rules and procedures at the beginning of the school year
- with-fitnes and overlapping in general interaction with students
- smoothness and momentum in lesson pacing
- variety and appropriate level of challenge in assignments
- consistent accountability procedures and follow-up concerning seatwork
- clarity about when and how students can get help
- consistent Success/Academic Learning Time
  - diagnosis
  - prescription
  - questioning which yields a high level of success (75%)
  - appropriate seatwork (90-100% success)
  - pacing of the lesson
    - moving in small steps
    - practice
    - integrate new learning with other lessons
  - active teaching
-presentation of information
-lecture
-demonstration
-questioning
-use of examples
-monitoring progress
-feedback

Whole Class Instruction, Small-Group Instruction and Individualization
-grouping

Giving Information
-structuring
-overviews
-advanced Organizers
-review of Objectives
-outlining the content
-signaling transitions
-calling attention to main ideas
-summarizing
-reviewing main ideas
-organizing concepts
-redundancy/Sequencing
-repeating rules and key concepts
-Sequenceing
-clarity
-enthusiasm
-pacing/wait-time

Questioning the Students
-difficulty level of questions
-low level questions
-high level questions
-cognitive Level of Questions
-clarity of Question
-post question Wait-Time
-selecting the Respondent
-waiting for the Student to Respond
Reacting to Student Responses
- reacting to correct responses
- reacting to partly correct responses
- reacting to incorrect responses
- reacting to no responses
- reacting to student questions and comments

Handling Seatwork and Homework Assignments

**Porter and Brophy (1988)**

A synthesis of research on good teaching accented the work of the Institute for Research on Teaching at Michigan State University. Findings of research from 1976 to 1988 at the Institute are given below:

1. Effective teachers have the ability to plan and negotiate a number of classroom goals. They seem to be able to accomplish both academic and socialization goals and integrate content and skills learning.

2. Effective teachers know their subject and their pupils; they display instructional and classroom management skills and other behaviors associated with pedagogy.

3. Effective teachers accept personal responsibility for pupil learning and behavior. They engage in corrective, problem-solving approaches with failing pupils rather than punishing them for their shortcomings.

4. Effective teachers make clear what is to be learned and how it relates to what has been learned previously or what will be learned in the future.

5. Effective teachers explicitly model and instruct students in information processing, sense-making, and problem-solving. They show students how to think and give them opportunities to do so. They monitor comprehension regularly.

6. Effective teachers anticipate and correct misconceptions students have about the world.
7. Effective teachers carefully select and use instructional materials to fit the curriculum goals and pupil characteristics. They clarify and expand on such materials to enrich the curriculum.

8. Effective teachers are reflective. They take time to think about what, why, and how they are teaching.

**Summary**

Literature indicates a need for agreement regarding what skills are essential for successful teaching. Knowledge exists in many forms concerning the efficacy of specific teaching skills. Skills determine how teachers teach and training is the process that informs and develops competence in the use of these skills. Skills are needed in a variety of teacher roles and have consequences for both teacher and student. Skills typically seek outcomes established from normative criteria, are intentional, and can be rated across a continuum of performance (quality). There are numerous sources for identifying teaching skills, including surveys, individual scholars, and research on effective teaching. The above three sources provide an ample base for constructing a preliminary list of teaching skills for later screening.

The effective teacher behaviors identified in the 10 studies summarized above and in the studies in Appendix A are organized into four clusters by Cruickshank (1990) in Table 2.6: 1) teacher character traits, 2) how the teacher teaches, 3) how the teacher reacts to pupils, and 4) how the teacher manages the classroom.
<table>
<thead>
<tr>
<th>Teacher Character Traits</th>
<th>How the Teacher Teaches</th>
</tr>
</thead>
<tbody>
<tr>
<td>enthusiasm</td>
<td>clarity</td>
</tr>
<tr>
<td>stimulation</td>
<td>variety</td>
</tr>
<tr>
<td>encouragement</td>
<td>momentum</td>
</tr>
<tr>
<td>task oriented</td>
<td>small grouping</td>
</tr>
<tr>
<td>businesslike</td>
<td>pupil participation</td>
</tr>
<tr>
<td>tolerant</td>
<td>monitor pupils</td>
</tr>
<tr>
<td>polite</td>
<td>structuring</td>
</tr>
<tr>
<td>tactful</td>
<td>teachable moments</td>
</tr>
<tr>
<td>trusting</td>
<td>monitoring progress</td>
</tr>
<tr>
<td>flexible</td>
<td>questioning</td>
</tr>
<tr>
<td>adaptable</td>
<td>peer teaching</td>
</tr>
<tr>
<td>democratic</td>
<td>programmed materials</td>
</tr>
<tr>
<td>hold high expectations</td>
<td>use manipulatives</td>
</tr>
<tr>
<td>overcome pupil stereotypes</td>
<td>large group instruction</td>
</tr>
<tr>
<td>less time conscious</td>
<td>provide information in small chunks</td>
</tr>
<tr>
<td>listening skills</td>
<td>use fewer traditional materials</td>
</tr>
<tr>
<td>mobile</td>
<td>home work</td>
</tr>
<tr>
<td>monitor</td>
<td>demonstrate</td>
</tr>
<tr>
<td>time management</td>
<td>use of student ideas</td>
</tr>
<tr>
<td>knowledge of subject matter</td>
<td>indirectness</td>
</tr>
<tr>
<td>responsibility for student learning</td>
<td>probing</td>
</tr>
<tr>
<td>modeling</td>
<td>academic engaged time</td>
</tr>
<tr>
<td>reflective</td>
<td>practice</td>
</tr>
<tr>
<td></td>
<td>seat work</td>
</tr>
<tr>
<td></td>
<td>pupil initiated interchanges</td>
</tr>
<tr>
<td></td>
<td>interesting assignments</td>
</tr>
<tr>
<td></td>
<td>pacing of lesson</td>
</tr>
<tr>
<td>How the Teacher Reacts to Pupils</td>
<td>lecture</td>
</tr>
<tr>
<td>accepting</td>
<td>use of examples</td>
</tr>
<tr>
<td>supportive</td>
<td>summarizing</td>
</tr>
<tr>
<td>consistency</td>
<td>How the Teacher Manages</td>
</tr>
<tr>
<td>criticism</td>
<td>development of a rules system</td>
</tr>
<tr>
<td>with-itness</td>
<td>communicating expectations</td>
</tr>
<tr>
<td>praise</td>
<td>planning</td>
</tr>
<tr>
<td>adjust for individual differences</td>
<td>organization</td>
</tr>
</tbody>
</table>
Cruickshank (1990) identified a number of limitations of teacher effectiveness research, including: (1) a lack of agreement on the outcome variable to determining effectiveness, (2) populations sampled (most of the research of government studies have been with low socio-economic pupils at the elementary level), (3) the teacher populations studied were volunteers, and (4) the methodology of the studies.

Nevertheless it is clear that these efforts have produced a plethora of potential teaching skills. Beginning with attempts to identify behaviors of teachers to fill an administrative need for evaluation, to research designed to identify specific teaching techniques and programs, these findings provide considerable support for the implementation of the development of critical teaching skills in the teacher education program.
Skills Identified From Models of Teaching

Joyce, et al., (1985) identified as a source for compiling a preliminary skill list naturalistic studies that identified teaching practices. These naturalistic studies and the identified practices derived from them provided structure for Joyce and Weil (1980, 1986) to classify hierarchical models of teaching into the following categories: social models, information processing models, personal models, and behavioral systems models. This section will describe how skills present within teaching models are measured for effectiveness and will describe the various hierarchies of teaching models as well as delineate the skills suggested as being effective by research.

Determining Skill Effectiveness Through Effect Size

Determining the effectiveness of specific skills was a primary thrust of teaching model research. Measuring skill effectiveness has been problematical, but less so with the introduction of a concept of measurement called "effect size" that describes the magnitude of gain from any given change in educational practice and predicts the effects professionals can expect from using a specific practice or combination of practices (Mullen, & Rosenthal, 1985; Joyce & Showers, 1988).

A pretest to equate the treatment and control groups is given, followed by the treatment and posttest. The posttest results are compared with the baseline data derived from the pretest, the difference being the effect size. The unit known as "effect size" is equal to the difference in standard deviations (positive or negative) between the control and
treatment groups. Skills possessing high standard deviations demonstrate research support, a typical criteria for being considered as critical. However, it is difficult to assess the effect of specific skills from teaching model research due to limitations. Skills were not isolated, they were frequently nested within larger practices. Research was conducted on models that contained numerous approaches and practices.

Effect sizes have three classifications (Joyce & Showers, 1988):

1. Modestly effective—up to one-half of a standard deviation (a gain of close to 20 percentile points).

2. Substantially effective—one-half to a full standard deviation (a gain of between 20 and 30 percentile points).

3. Very effective—more than a full standard deviation (a gain of more than 30 percentile points).

Models of Teaching

Social models include cooperative learning approaches that utilize the strategy of peers teaching peers in group investigations. Skills researched from the various social models include inquiry skills such as the generation of hypotheses, gathering information, formulating group conclusions, problem solving, negotiation, and conflict resolution. Highly structured social models yielded an average effect size of 0.28, where those with less structure and more cooperation averaged slightly over 1.00. Social models increased higher-order thinking between 1.25 and 3.0 effect sizes (Joyce & Showers, 1988).

Information-processing models feature advanced organizers (Ausubel, 1963) and skills related to systems for improving memorization. Rolheiser—
Bennett (1986) reviewed 18 investigations and reported the average effect size on lower-order cognitive skills as 1.35. Higher-order cognitive skills yielded an effect size of 0.42. Stone (1983) concluded that advanced organizers are effective across student grade levels, making this skill attractive for generic training. Joyce and Showers (1988) reported that teachers who possess cognitive-oriented skills like the use of organizers, intellectual scaffolding, schema development, and conceptualizing lesson and unit structures, demonstrated an effect size of nearly 2.00.

Joyce and Showers (1988) reported as promising the skills of imagery and association for improving memory techniques that can create linked associations (relationships) and increase retention. Research indicated a 50 percent increase in retention for an experimental group using associations, and even greater gains when students practiced imagery (Joyce and Showers, 1988). Pressley, Levin, and Delaney (1982) concluded that word association is fitting for generic training across subject areas (effect size = +1.91).

Personal models are deficient in research support, abundant, student-centered, rhetorical, and controversial (Joyce and Showers, 1988). An exception to the above limitations is the synetics strategy of Gordon and Poze (1971). The strategy targets the following outcomes which produced a recall of written passages by an effect size of 2.0.

1. personal flexibility,
2. creativity,
3. increased student performance in higher-order thinking skills
4. problem solving,
5. divergent thinking,
6. generating ideas, and
7. fluency in expressing ideas.

Nondirective teaching models were humanistic in nature and purported to develop self-directed, positive, and empathetic learners (Joyce & Showers, 1988). The research of Roebuck, Buhler, and Apy (1976) indicated that learning disabled students, under teachers trained in this model, exhibited increases in:

1. improved self-concept
2. interaction
3. reading achievement
4. class attendance
5. interpersonal skills
6. intelligence test scores

**Summary**

Teaching practices derived from naturalistic studies have provided the basis for the development of teaching models under the classifications of: social; information-processing; personal; and nondirective models. These practices and models serve as a source of teaching skills determined to be effective through the use of a concept of measurement called "effect size."
Skills Identified Through Training Research

During the last three decades the knowledge base drawn from psychological research, funded efforts, and teacher education inquiry aided the effort to better define, conceptualize, implement, and evaluate the process of training. This effort in turn led to research regarding the worth of numerous skills. Such a knowledge base is useful for drawing skills for inclusion on a preliminary list which is to be judged for criticality.

Historically, teacher training methods include; behavior modification, interaction analysis, microteaching, reflective teaching, protocols, simulations, and inquiry training (Cruickshank and Metcalf, 1990), described in the sections which follow.

Skills Supported By Behavior Modification Training

Behavior modification is a training system based on the assumption that certain teacher behaviors are more desirable than others, and presupposes that teachers who are both knowledgeable and trained can effect positive changes in student behavior. Behavior modification utilizes a set process where, first, the child's behavior is observed and assessed, and, second, teachers target student behavior(s) and intervene using agreed upon strategies.

Brown et al. (1969) sited reinforcement, praise, and non verbal behavior as skills important to changing student behavior through the use of behavior modification. Johnson and Slout (1980) advanced the skills, praise and positive teacher behavior, as worthy of training. Ringer (1973) and Bowies and Nelson (1976) support reinforcement through behavior
modification. Slout et al. (1977) developed training incorporating prompting and cueing and providing information. Woolfolk and Woolfolk (1974) incorporated reinforcement of pupil attending behavior.

**Skills Supported By Interaction Analysis Research**

A historical research breakthrough of the 1960's was the use of classroom observational systems and instruments that intended to record and analyze teacher interactions with students through observation. In its infancy, interaction analysis focused on the frequency of teacher behaviors in predetermined categories.

Flander's (1963) system analyzed teacher and pupil verbal interactions and classified them into ten categories, seven of which are teacher-centered:

1. Accept and clarify pupil emotions.
2. Pupil praise/encouragement.
3. Accept and use pupil ideas.
4. Questioning of pupil(s).
5. Expository teaching (lecture).
6. Giving directions or directives.
7. Pupil criticism, justify authority.

Research on interaction analysis includes the studies of Bondi (1970), Flanders (1963), Furst (1967), Hough and Amidon (1967), Kirk (1967), Lohman, Ober and Hough (1967) and Langer and Allen (1970). Results of their studies indicate a positive relationship between teacher performance (skill development) and interaction analysis.
Skills Supported By Microteaching Research

McKnight (1978) perceived microteaching as a scaled down, but realistic classroom training context where teachers, both experienced and inexperienced, could acquire new teaching skills and refine old ones. Operationally defined, microteaching is:

- A brief teaching encounter in which preservice teachers teach five to twenty minute lessons in their subject field to a small group of pupils who are usually peers. The purpose of microteaching lessons is to (give) practice (in each) specific technical skills of teaching until the preservice teacher reaches an acceptable level of performance (Cruickshank, 1985). pp. 83–84.

MacLeod (1987) noted that microteaching gave the individual an opportunity to practice teaching in a simplified environment: small class size, short lesson length and simple task complexity.

The training procedure for microteaching consists of six steps.

1. The individual selects a single technical skill of teaching to learn and to practice.
2. The skill is conceptualized.
3. The skill is demonstrated by a master teacher.
4. The individual prepares a five to 20 minute lesson that demonstrates the skill.
5. The student and instructor critique the lesson.
6. The student reteaches the lesson implementing the changes derived from the critique, or advances to another lesson.

The individual learns 18 skills that are clustered in five categories in Table 2.7: response repertoire, questioning skills, creating student involvement, increasing student participation, and presentation skills.
<table>
<thead>
<tr>
<th>Response Repertoire</th>
<th>Questioning Skills</th>
<th>Creating Student Involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verbal Responses</td>
<td>Fluency in Asking Questions</td>
<td>Set Induction</td>
</tr>
<tr>
<td>Nonverbal Responses</td>
<td>Probing Questions</td>
<td>Stimulus Variation</td>
</tr>
<tr>
<td>Verbal &amp; Nonverbal Behavior</td>
<td>Higher Order Questions</td>
<td>Closure</td>
</tr>
<tr>
<td></td>
<td>Divergent Questions</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Increasing Student Participation</th>
<th>Presentation Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reinforcement</td>
<td>Completeness of Communication</td>
</tr>
<tr>
<td>Recognizing Attending Behavior</td>
<td>Lecturing</td>
</tr>
<tr>
<td>Silence And Nonverbal Cues</td>
<td>Use of Examples</td>
</tr>
<tr>
<td>Cuing</td>
<td>Planned Repetition</td>
</tr>
</tbody>
</table>

In addition to the 18 original technical skills of teaching offered by Allen and Ryan (1969), other researchers have used the concept of microteaching to develop competency in the following skills:

1. Questioning, modeling, stimulation, listening, non-verbal behavior, reinforcement, feedback, closure (Gardner, Bartholomew, 1969).


3. Set induction, developing behavioral objectives, critical thinking, questioning, reinforcement (Blandenburg and Thompson, 1971).

4. Verbal behavior, questioning, clarity (Sadker and Cooper, 1972)


7. Questioning, lecturing, illustration, using examples, planned repetition, reinforcement, focusing, stimulation, cueing (Madike, 1980).

8. Set induction, stimulus variation, questioning, reacting, closure (Cripwell and Geddes, 1982).


10. Management, lecture, practice time, clarity, demonstration, feedback (Metzler, 1984).

11. Questioning, lecturing, giving directions (Simbo, 1989).

**Training Teachers Through the Skill of Reflective Teaching**

Although reflective teaching can serve as an instructional alternative for the preservice and inservice teacher as well as a research tool, reflection can also be considered as a skill of teaching. As a research tool it may provide a work sample of what teachers do under controlled conditions (Cruickshank, 1987). Reflective teaching as an instructional alternative provides preservice and inservice teachers the opportunity to become more thoughtful. Valverde (1982) stated that reflection is an examination by the teacher of his/her situations, behaviors, practices, effectiveness and accomplishments. The teacher asks questions for self-reflection on the what and why of teaching. The individual’s responses come from information stored in memory and judgments are made as to whether the individual is satisfied or dissatisfied. This engages teachers in a self-monitoring process causing investigation, introspection and analysis of the teaching act.
The model as conceived at The Ohio State University (Cruickshank, 1987) provides the individual with continuous opportunities to plan, practice, and reflect upon the teaching process.

Reflective teaching groups contained four to six students with one individual from each group selected to be the designated teacher. The designated teachers were given the same lesson to teach. After teaching, each group discussed what was learned about teaching and learning. Following this the groups convened as a whole and discussed the conclusions drawn from the small groups. Ideally, this process would be divided into the following time segments: teaching 15 minutes; evaluation, five minutes and reflection; small-group, 15 minutes; and large group, 15 minutes (Cruickshank, 1991).

Reflective teaching allows the individual to teach, to evaluate and determine learner achievement and satisfaction, and to examine the act of teaching. Its benefits have been perceived as positive from preservice teachers and professional organizations.

Skills Identified Through Protocol Research

A report developed by the National Institute for Advanced Study in Teaching Disadvantaged Youth, advanced the concept and materials of the concept of protocol that originated in Teachers for the Real World by B. O. Smith and associates. They proposed a training program of three components: 1) theoretical, 2) training, and 3) teacher field or subject matter content. The rationale for the development of protocol materials, as presented by Smith and associates, was:
Teachers fail because they have not been trained calmly to analyze new situations against a firm background of relevant theory. Typically they base their interpretations of behavior on intuition and common sense...If the teacher is incapable of understanding classroom situations, the actions he takes will often increase his difficulties. (pp. 28-29)

Smith, et al., (1969), due to the complex and varied nature of teaching, suggested the use of behavioral situations (protocols) in training. Situations involving teaching skills should be reproduced and analyzed at length taking into account the psychological knowledge base. Participation in behavioral situations, they stated, accelerates preservice teacher understanding and delivery of important teacher behaviors. They placed great efficacy on the use of behavioral situations by stating: "The identification, analysis, and sequential arrangement of behavioral situations is perhaps the most difficult part of building a teacher education program."

The main emphasis of protocols is knowing and using knowledge to interpret classroom events. To determine which concepts of theory are most relevant to a preservice curriculum, a systematic analysis of the situations or events teachers routinely encounter is necessary. Once identified and recorded, the relevant theoretical knowledge provides the basis for the interpretation and analysis of behaviors that lead to the development of the protocols of the teaching profession.

Smith, et al., (1969) noted the importance of skills in training and offered a minute list of skills purported to be critical:
1. stimulating operations (questions, probing),
2. manipulating knowledge,
3. reinforcing,
4. negotiating interpersonal relations,
5. diagnosing student needs,
6. communicating and emphasizing with students and parents,
7. providing small and large group work,
8. utilizing equipment,
9. evaluating student achievement, and
10. judging the appropriateness of instructional materials.

**Skills Identified From Use of Simulations**

Another alternative instructional practice for preservice teachers is the use of simulations. Simulations present real situations in teaching to preservice teacher educators to prepare them for problems encountered during teaching (Cruickshank & Metcalf, 1990). Through the use of simulations, the preservice student has the opportunity to learn and practice responses before entering the real student teaching situation.

Doak, Keith, Emmer, and Turner (1988) used simulations to develop understanding of classroom organization, student expectations, and the development of rules and procedures. Others who have developed simulations based in part on teaching skills include:

2. Lunetta (1985), classroom management.
Skills Identified Through Inquiry Training

Briefly defined inquiry training seeks to identify skills of a cognitive nature, specifically higher level thinking skills. Cruickshank and Metcalf (1990) cited Joyce and Showers (1988) who stated that teachers who teach inductively must possess skills to help pupils process information, develop concepts, and nurture causal thinking.

Studies supporting the use of inquiry type skills include:
1. Porterfield (1974), higher level question.
2. Cotten et al. (1978), process skills, such as those used in discovery and inquiry teaching, higher order questions.

Summary

Training has been instrumental in the identification of skills thought to be important to teaching success. Teacher training alternatives are numerous. Methods denoting skills include: behavior modification; interaction analysis; microteaching; reflective teaching; use of protocols; simulations; and inquiry training. Behavior modification skills seek to change behaviors through a set training sequence. Interaction analysis focuses on skills involved with teacher-student interactions. Microteaching has provided training opportunities for numerous skills. But initially microteaching sought to develop competency in 18 identified technical skills of teaching. Reflective teaching is both a process and a skill, where teachers develop, through the reflective skill, the process to develop other skills to improve their teaching. Protocols, a long standing training method, develops skill identified from common classroom events. Likewise,
Simulations present real situations to preservice teachers to facilitate their development of teaching skills. Last, inquiry training has identified cognitive skills that are higher level and process oriented.

**Identification of Screening Criteria for Selection of Critical Skills**

Scholars have supported the creation of a screening process composed of individual screening criteria used to determine which skills are critical to teaching (Davis and Silvernail, 1981; Brown, Gliessman, and Ochoa, 1987; Gliessman, Pugh, Brown, Archer, and Snyder, 1989). The screening process is initiated by the establishment of a preliminary list drawn from selected sources (Ratsoy, McEwan and Caldwell, 1979; Joyce et al., 1985).

Each skill from the preliminary skill list must be judged against specific criteria. Individual screening criteria offered by scholars for inclusion within the screening process include:

1. The skill must be definable (Gibney, Johnson, Maynard, Nussel, Rusche, and Wiersma, 1987; Joyce, et al., 1985).

2. The skill must be measurable (Gibney, Johnson, Maynard, Nussel, Rusche, and Wiersma, 1987).

3. The skill must not be produced as a result of ordinary experience (Joyce, et al., 1985).

4. The skill has intentionality, that is, it is used purposefully (Joyce, et al., 1985).

5. The skill has a continuum of performance, that is, its quality can be measured (Joyce, et al., 1985).
6. The skill is linked to positive student outcomes (Brown, Gliessman, and Ochoa, 1987; Gliessman, Pugh, Brown, Archer, and Snyder, 1989).

7. The skill lends itself to training (Brown, Gliessman, and Ochoa, 1987; Gliessman, Pugh, Brown, Archer, and Snyder, 1989).

8. The skill is generic, that is, it is applicable to a wide spectrum of teaching contexts ((Brown, Gliessman, and Ochoa, 1987; Gliessman, Pugh, Brown, Archer, and Snyder, 1989).

Scholars have identified two conditions necessary for providing additional support for skills that survive the screening criteria. First is the use of survey research to gain preservice teacher and professional consensus on the criticality of the surviving skills (Ratsoy, McEwan and Caldwell, 1979; Engstrom and Schwaab, 1984; Streifer, 1985). This is to say that skills surviving the screening process should be scrutinized by survey to determine which skills each group believes to be critical. Second is the use of content analysis to determine support for the surviving skills from a research perspective (Stripper, 1985), that is, to determine which skills have been shown by previous researchers to be correlated with positive student outcomes.

In summary, scholars involved with teaching skill research suggest the generation of a screening device comprised of specific criteria. After an initial screening of skills contained within a preliminary list, skills surviving the scrutiny of screening can be offered as tentative critical teaching skills. Scholars further contend that additional support in two areas is necessary to validate the criticality of tentative teaching skills. The first area is establishing a degree of consensus among members of the education community such as preservice teachers, teachers, teacher
educators, and personnel concerned with teacher competency, namely, principals, personnel directors and curriculum coordinators. The second area is an analysis of research to verify support for each tentative skill.

**SUMMARY**

This chapter has reviewed literature in five areas in an attempt to present the background, rationale, and importance of the present study. First, 13 assumptions were given regarding teacher training and skill development. Of utmost importance among these assumptions is the realization that teachers make thousands of decisions that affect students. It is naive to believe that teachers can make these judgments intuitively. Instead they need specialized knowledge of what to teach and how to teach it. Education is striving to be recognized as a true profession. To do so it is necessary to establish a codified knowledge base that contains a group of skills determined to be critical to teaching success. Skills are generic and adaptable across subject and grade levels. Skills can be identified and acquired from various training methods and have numerous characteristics. They are observable, measurable, discrete, trainable and have intent.

Second, literature regarding the identification of teaching skills identifies as primary sources surveys, the work of individual scholars, and research on effective teaching. National surveys categorize skills under such classifications as classroom instruction, classroom management, assessment, generic teaching skills, and skills related to specific subject areas. Scholars have reported specific skills that lend themselves to training and concluded that a relationship exists between training and skill
competency. Major research on effective teaching is linked to process-product studies. Attention has been given to the identification of specific teaching behaviors present or operative during pupil success.

Research efforts of various authors from the last six decades detail attempts to identify those skills critical to teaching. The usefulness of teacher training practices lies in their ability to help teachers master skills that are most effective in classrooms and in the degree to which trainees transfer these skills from the training setting to use in natural classrooms.

Third, Joyce and Weil (1986) classified training approaches according to teaching models such as social, information processing, personal, and behavioral systems. These models yielded numerous skills demonstrated to be effective through the statistical technique of "effect size". Many skills were associated with higher order thinking or information processing. Personal models did not produce a list of generic teaching skills.

Fourth, research associated with training has provided an ample source of identified skills. Training has long been associated with developing skill competency through training methods frequently known as instructional alternatives. In addition, these methods contain individual skills that have been scrutinized by research. Methods commonly linked to skill research and teacher training include behavior modification, interaction analysis, microteaching, reflective teaching, use of protocols, simulations, and inquiry training.

Fifth, the identification of skills critical to teaching is a process. The first part of this process involves the compilation of a preliminary list,
derived from various sources, such as those described above. Skills within the preliminary list are next subjected to a set of screening criteria, each of which offers some support for skills being designated as critical. Criteria for screening skills offered by scholars include: 1) a skill must possess characteristics such as being definable, observable, measurable, trainable, intentional and generic and 2) a skill must be supported by research as being linked to positive student outcomes. Skills surviving the process of screening can gain additional higher level support as being critical by undergoing two additional processes: 1) the gaining of professional consensus from; and 2) positive support from an analysis of studies involving each of the skills surviving the screening.

Chapter III describes specific research procedures used in investigation of the question concerning the identification of which skills can be identified as critical to teaching. Described in the chapter are 1) objectives of the study, 2) a discussion of meta-analysis, 3) data collection procedures, 4) method and 5) analysis.
CHAPTER III

RESEARCH PROCEDURE

This chapter describes specific research procedures used in investigation of the question, what skills can be identified as critical to teaching. Described are 1) objectives of the study, 2) a discussion of meta-analysis, 3) data collection procedures, 4) method and 5) analysis. Specific attention concerning the research design covers:

1. Data collection procedures
2. Sample
3. Rationale for the selection of the variables and research hypotheses
4. A discussion of meta-analysis as a means of using quantitative methods for coding and analyzing results of groups of studies that investigate similar hypotheses
5. The concept of effect size is defined and related to this study
6. Operational definitions of the variables used in the study
7. Data analysis procedures

Objectives

The primary purpose of this study is to identify skills critical to teaching as determined through an analysis of research linking skills used by teachers with positive student outcomes. Specifically, the following research question is addressed:
1. Through a meta-analysis of available research, which teaching skills can be identified as being critical by linkage to positive academic student outcomes?

**Meta-Analysis**

Meta-analysis is an alternative to the narrative literature review that uses quantitative methods for coding and analyzing results of groups of studies that investigate similar hypotheses. In a sense, meta-analysis is a method of statistical analysis wherein the units of analysis are results of independent studies, rather than the responses of individual subjects (Mullen and Rosenthal, 1985). In a meta-analysis, study results are recorded as "effect sizes", or standardized estimates of the observed departures from the study hypothesis (Robey, 1992). Effect size is defined as "the degree to which the phenomenon is present in the population, or the degree to which the null hypothesis, identified in the articles, is false" (Cohen, 1977, pp. 9-10). Study characteristics are identified and coded. Descriptive and inferential statistics are used to summarize the effects of the studies reviewed and/or to explore the relationships between effects and study characteristics (Light, Singer, & Willett, 1990). Effect sizes are computed by standardizing the differences between the experimental groups and the control groups expressed in the measurement units of the dependent variable, and divided by common standard deviation (Blimling, 1988). In meta-analysis, probability values (P-Values) and effect sizes (ES) are used in two general ways: to combine study outcomes and to compare study outcomes. Effect sizes are combined from independent studies to ascertain
the magnitude of the effect of a particular treatment or the degree to which a phenomenon is present in a relationship. They are compared to determine whether the effect sizes are homogeneous, thus measuring the same underlying phenomenon, and to determine if there is systematic variance in the effect sizes attributable to a moderating variable (Blimling, 1988).

Mullen and Rosenthal state:

The significance level obtained for a single hypothesis test tells the researcher the possibility that the result obtained, or one more extreme, would have been obtained, if the null hypothesis were true. Probability levels (p levels) are reported in most published empirical studies which rely upon some type of inferential statistics. Meta-analysis procedures allow one to combine the p levels for a number of independent studies, in a number of ways.

The effect sizes derived for a single hypothesis test tell the researcher the magnitude of the observed effects. The standardized difference between the means is the difference between group means (d). The larger the standardized difference between the means, the greater the magnitude of the effect. Another common index of effect size is the Pearson product moment correlation coefficient (r), and the associated r squared. The larger the r and associated r squared, the greater the magnitude of the effect. Recently, Rosenthal and Rubin (1982) have proposed an intuitively appealing, general-purpose display of effect size which is derived from the
product moment correlation coefficient. This binomial effect size display (BESD) illustrates the effect of the independent variable of concern on success rate/improvement rate. The BESD can be expressed as a change from one percentage or proportion to another percentage or proportion, and is defined as $\text{BESD} = \text{change from } (.50 - r/2) \text{ to } (.50 + r/2)$. Thus, an $r$ of .30 results in a BESD of a change from 35% success rate to 65% success rate. (pp. 1-3)

Blimling (1988) reports that meta-analysis is more than a series of statistical techniques applied to a body of studies. It is a systematic approach to selecting and integrating research from studies measuring the same phenomenon. It entails:

1. Identifying a common conceptual topic shared among studies in a research domain.
2. Operationally defining the conditions under which studies will be included and excluded.
3. Systematically searching the literature base for common studies.
4. Identifying important study characteristics which may influence study outcomes and developing a coding scheme to capture this material.
5. Analyzing and extracting comparable statistical information from research studies.
6. Reporting the findings in a way which accurately summarizes the literature.
"Meta-analytic review techniques help guard against the potential reviewer biases of the traditional narrative forms of review. These approaches tend to be more sensitive to specific details of the study design, and are more sensitive to the small, but meaningful effects that are often encountered in clinical research. Clearly, the results of a meta-analytic review offer more precision and objectivity than can be achieved using traditional narrative approaches" (Randolf, 1990).

As with any good research design, meta-analytic research should be conducted with caution, responsible attention to detail, and explicit \textit{a priori} specifications of the meta-analytic techniques employed. Valid meta-analytic research also calls upon researchers to exercise rigor in the operationalization of independent and dependent variables, to conduct research that is characterized by strong internal and statistical conclusion validity, to adhere to specific reporting standards, and to conceptualize and theorize more sharply (Mullen & Rosenthal, 1985).

**Data Collection Procedures**

Six criteria for inclusion in a screening process for the identification of critical teaching skills were derived from the literature review.

1. The item fits the definition of a skill as defined by Cruickshank and Metcalf (1990), namely, a developed or acquired aptitude or ability which can be integrated into teaching through practice.

2. The item's definition is generally agreed upon within the profession.

3. The item is a discrete behavior which is observable and measurable both qualitatively and quantitatively.
4. The item is a generic skill applicable to a wide variety of subject areas.

5. The item is mentioned in the reviewed literature.

6. The item is supported by research and is associated with positive student outcomes.

The screening process was used to determine the level of support for each individual skill.

A systematic search was undertaken involving the following: a search of pertinent literature to identify teaching skills; a categorical listing of these skills; the development of criteria for the identification of critical skills; and listing of the critical skills necessary for teacher preparation.

A review of literature consisted of six sources:

1. ERIC documents;
2. Reader's Guide to Periodical Literature;
3. National surveys;
4. Individual scholars;
5. Research on teacher effectiveness.

An ERIC search using the descriptors "microteaching", "teaching skills", and "skill development" revealed 125 sources. Using the descriptors "microteaching" and "teacher training" the Readers Guide to Periodical Literature revealed 154 articles on teaching skills. A review of research on teacher effectiveness during the 1970's and 1980's focused on the identification of skills that were present or operative when pupils were succeeding. These studies, listed in Chapter Two and in Appendix A,
revealed a list of 88 skills. After eliminating duplications, a preliminary list of 132 skills was compiled (See Appendix B). An assumed step not listed is that the skill was mentioned within the literature review and, therefore, was included within the preliminary list. After the initial list was developed, the screening process was undertaken to determine which skills could be considered critical to teaching.

The data collection procedures followed were in accordance with the data collection procedures described by Glass et al. (1981) in their discussion of meta-analysis. The procedure can be described in eleven steps:

1. Search of the literature that identified the research reports on effects of teaching skills on student outcomes.
2. The research reports were identified through the ERIC system data bases on CD-ROM from January, 1980 to December, 1993 inclusive.
3. The study was published in a journal, a book, or was a dissertation or paper published or unpublished ERIC document to be included in the meta-analysis.
4. The document was in English.
5. The document was concerned with English-speaking subjects.
6. The document was concerned with effects were on grades kindergarten through grade 12.
7. The study was empirically based and used an experimental or quasi-experimental design. Qualitative studies or studies which report only survey data and no comparison group were not included.
8. To be included, studies must report a statistic(s) from which an effect size was reasonably defined. This means studies reported either the means, standard deviations, and sample sizes of both the experimental and control groups or at least one of the following statistics: chi square, t-test, F with 1-df, Pearson Product Moments Correlation Coefficient r, a point biserial r, or a probability level.

9. The studies that were identified connected teaching skills and their relationship to student outcomes.

10. The variables used in this analysis were operationally defined so that quantitative data was obtained for every variable.

11. The articles were coded to generate the data from the research reports.

**Method**

To measure skill effectiveness the concept of measurement called "effect size" was used. It describes the magnitude of gain from any given change in educational practice and predicts the effects professionals can expect from using a specific practice or combination of practices. The unit known as "effect size" is equal to the difference in standard deviations (positive or negative) between the control and treatment groups. Skills possessing high standard deviations demonstrate research support, a typical criteria for being considered as critical. Effect sizes have three classifications (Joyce & Showers, 1988):

1. Modestly effective—up to one-half of a standard deviation (a gain of close to 20 percentile points).
2. Substantially effective— one-half to a full standard deviation (a gain of between 20 and 30 percentile points).

3. Very effective— more than a full standard deviation (a gain of more than 30 percentile points).

**Analysis**

Procedural steps in the analysis and interpretation of data were from the work of Mullen and Rosenthal (1985). In their book, *Basic Meta-Analysis: Procedures and Programs*, they wrote fourteen computer programs for use in meta-analytic computation. All of the actual mathematical computations for the meta-analyses of this study were done using these programs.

The meta-analytic procedure used for this study was the combination of effect sizes. This program allowed the reviewer to estimate the mean effect size for the included set of studies for each of the skills. The meta-analytic techniques of combination reveal the overall significance level or magnitude of effect in that area of research. From the statistics of each study, effect sizes ($r$, $r$ squared, $d$ and the BESD) were derived. $Z$s were obtained for each study's effect sizes by performing Fisher's transformation of the statistics for each study. Each Fisher's $Z$ was then multiplied by a weight (e.g., "1", sample size, etc.). The effect sizes ($r$, $r$ squared, $d$, and the BESD) corresponding to this new $Z$ represented the combined effect sizes for the included studies.
Summary

Chapter III dealt with the study's methodology. Using the information from Chapter II a preliminary screening was completed to identify a list of generic teaching skills. This list was subjected to the six criteria developed to identify critical skill. Finally, those skills meeting the criteria were further analyzed through the meta-analysis procedure described above to identify their importance as determined by past research.

Chapter IV recounts the results of the data analysis of the skills identified as potentially being critical to teaching in relationship to positive student achievement. Those teacher skills or abilities surviving the six screening criteria were subjected to an meta-analysis of procedure of combination of effect sizes, which produced the final list of critical teaching skills. Results are reported in the skills Binomial Effect Size Display (BESD) using the classifications of Joyce & Showers, (1988):

1. Modestly effective—up to one-half of a standard deviation (a gain of close to 20 percentile points).

2. Substantially effective—one-half to a full standard deviation (a gain of between 20 and 30 percentile points).

3. Very effective—more than a full standard deviation (a gain of more than 30 percentile points).
CHAPTER IV
RESULTS

Introduction

This chapter reports the results of data analysis related to the principle research question examined in this study: through a meta-analysis of available research, which teaching skills can be identified as being critical by linkage to positive academic student outcomes? Before the meta-analysis could be completed, it was necessary to answer the following questions.

1. What criteria have been proposed for the identification of critical skills necessary for teacher preparation?

2. What skills, using the criteria developed, could be identified as being critical to teaching?

This screening process was initiated by the establishment of a preliminary skill list drawn from selected sources. Each skill from the preliminary skill list was judged against the specific criteria listed below.

1. The item fit the definition of a skill as defined by Cruickshank and Metcalf (1990), namely, a developed or acquired aptitude or ability which can be integrated into teaching through practice.

2. The item's definition was generally agreed upon within the profession.

3. The item was a discrete behavior which was observable and measurable both qualitatively and quantitatively.
4. The identified skill was generic and applicable to a wide variety of subject areas.

5. The skill was mentioned in the reviewed literature.

6. The skill was supported by research and associated with positive student outcomes.

An initial review of literature yielded a list of generic behaviors, traits, characteristics, and qualities purported to be teaching skills. After eliminating duplications, a list of 132 skills was compiled. They were then listed under the categories of Preactive, Interactive, and Postactive based on the role each play in a lesson. Many of the skills fit neatly under one category while others fit under more than one. For the sake of simplicity it was decided to list each skill within its predominant category. Items related to the planning stages were placed in the Preactive category. Items related to the delivery of a lesson were placed in the Interactive category and those related to assessment, recording or reflection, were placed in the Postactive category. The 132 items revealed by the literature search are listed in their categories in Appendix B.

After they were categorized, the screening process was undertaken to determine which could be considered critical teaching skills. Results of the screening process are listed in Appendix C. Table 4.1 lists the abilities that qualified for further consideration under the headings of Preactive, Interactive, and Postactive, based on the role each plays in lesson.
Table 4.1
Critical Teaching Abilities grouped as to when they are used in the teaching process

<table>
<thead>
<tr>
<th>Preactive</th>
<th>Interactive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnosing Skill Levels</td>
<td>Advanced Organizer</td>
</tr>
<tr>
<td>Prescribing Materials</td>
<td>Planned Repetition</td>
</tr>
<tr>
<td>Developing Objectives</td>
<td>Using Examples</td>
</tr>
<tr>
<td></td>
<td>Wait Time</td>
</tr>
<tr>
<td></td>
<td>Feedback</td>
</tr>
<tr>
<td><strong>Postactive</strong></td>
<td>Questioning</td>
</tr>
<tr>
<td>Reflection</td>
<td>Reinforcement</td>
</tr>
<tr>
<td></td>
<td>Assigning Homework</td>
</tr>
<tr>
<td></td>
<td>Set Induction</td>
</tr>
<tr>
<td></td>
<td>Smoothness of Transition</td>
</tr>
<tr>
<td></td>
<td>Enthusiasm</td>
</tr>
<tr>
<td></td>
<td>Variety of Instruction</td>
</tr>
<tr>
<td></td>
<td>Time Management</td>
</tr>
<tr>
<td></td>
<td>Clarity</td>
</tr>
</tbody>
</table>

**Research Question**

Through a meta-analysis of available research, which teaching skills can be identified as being critical by linkage to positive academic student outcomes? The meta-analyses reported in this chapter were completed using the procedures for combination of effect sizes as described by Mullen and Rosenthal (1985). The BASIC program provided by the authors was adapted to run as a Statistical Analysis System (SAS) program. The SAS computational procedures were verified by replicating the analysis examples in Mullen and Rosenthal (1985). Each study in a meta-analysis was weighted by the sample size of the study. Drawing from the skills
identified in tables 4.1 the following list of skills provided sufficient data to be subjected to a meta-analysis.

Table 4.2
Skills subjected to a meta-analysis of research

<table>
<thead>
<tr>
<th>reinforcement</th>
<th>homework</th>
</tr>
</thead>
<tbody>
<tr>
<td>time management</td>
<td>wait time</td>
</tr>
<tr>
<td>advanced organizers</td>
<td>clarity</td>
</tr>
<tr>
<td>enthusiasm</td>
<td>questioning</td>
</tr>
<tr>
<td>feedback</td>
<td></td>
</tr>
</tbody>
</table>

**Reinforcement**

Reinforcement is defined as the ability to provide appropriate verbal and non-verbal techniques following appropriate student responses (Allen, Ryan, Bush & Cooper, 1969); a response which attributes success to student effort and ability.

Six studies identified the concept of reinforcement. The three studies shown in Table 4.3 reported results that could be incorporated into the meta-analysis of effect size.
Table 4.3
Summary of reinforcement studies

<table>
<thead>
<tr>
<th>Author</th>
<th>Student Population</th>
<th>Outcomes Studied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filipczak (1981)</td>
<td>68 seventh, eighth &amp; ninth grade students</td>
<td>grade point average, class grades, attendance, behavior</td>
</tr>
<tr>
<td>Horn (1985)</td>
<td>72 junior high students</td>
<td>cognitive competence, social competence, physical competence, self esteem</td>
</tr>
<tr>
<td>Lujan (1980)</td>
<td>24 high school, &amp; nine grade school classes</td>
<td>academic achievement</td>
</tr>
</tbody>
</table>

Across the three studies, there were six statistics reported that could be incorporated into the meta-analysis of effect size of student achievement summarized in Table 4.4.

Table 4.4
Summary of a meta-analysis procedure of combination of effect sizes of studies of reinforcement

<table>
<thead>
<tr>
<th>Measure</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>mean standardized Difference Between means</td>
<td>1.31</td>
</tr>
<tr>
<td>mean Correlation Coefficient</td>
<td>.55</td>
</tr>
<tr>
<td>R-squared</td>
<td>.30</td>
</tr>
<tr>
<td>Binomial Effect Size Display (BESD) from</td>
<td>.23 to .77</td>
</tr>
</tbody>
</table>

The Binomial Effect Size Display (BESD) indicates that the effect size for reinforcement is equivalent to increasing the success rate from 28 to 72
percent, which is very effective—more than a full standard deviation (a

gain of more than 30 percentile points).

Results from these studies support the connection between
reinforcement and changes in children’s behavior. While the focus of this
study has been upon the connection between teaching skills and student
academic performance, it is also of interest that these studies claim
additional benefits in attendance, behavior, social competence, physical
competence, and self esteem.

While the research does support the idea that reinforcement by adults
has an effect on students’ perceptions of their ability and students’
performance, several considerations must be deliberated. Achievement
requires effort engagement on the part of the student as a necessary but not
sufficient condition for successful performance. Teacher reinforcement
primarily influences effort-engagement behavior which in turn affects
achievement. However, in addition to teacher reinforcement, the teacher
must demand academic performance and provide the concepts and methods
for each student to perform successfully (Lujan, 1980).

These studies also reveal low achieving/low status students who are
unable to do on-grade level work perceive that a teacher, while providing
reinforcement, is not asking the students to put out a good deal of academic
effort to make up for their deficiencies. If the goal is to do something
about the marked academic needs of low status students, they need to know
that they have to put forth a great deal of effort and that the feedback is
tied to performance.
Teacher praise is not seen as a reward for work well done but as a part of a diffused, reinforcing of the individual. Reinforcement, to be successful, must be clearly tied to performance. Appropriate and performance-contingent reinforcement from significant adult evaluation has been identified both theoretically and empirically as a facilitator of students' perceptions of competence and control (Horn, 1985).

The teacher must also be aware that the amount of reinforcement given to students also has an effect upon performance. As with little or no reinforcement having a negative effect, too much reinforcement may be viewed by the student as not pertinent or phony.

**Time Management**

Time Management is defined as the ability to efficiently make assignments and dispense materials resulting in more instructional time (Stallings, 1982). Five studies all by Schaub and Baker, as seen in Table 4.5, related time management in association with management of class time to the areas of preparing for class, explaining new material, reviewing old material, administration in class and keeping order.
Table 4.5  
Summary of time management studies

<table>
<thead>
<tr>
<th>Author</th>
<th>Student Population</th>
<th>Outcomes Studied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schaub &amp; Baker (1991)</td>
<td>430 students in middle grades</td>
<td>mathematics achievement in relationship to the amount of time administering in class</td>
</tr>
<tr>
<td>Schaub &amp; Baker (1991)</td>
<td>430 students in middle grades</td>
<td>mathematics achievement in relationship to the amount of time explaining new material</td>
</tr>
<tr>
<td>Schaub &amp; Baker (1991)</td>
<td>430 student in middle grades</td>
<td>mathematics achievement in relationship to the amount of time reviewing old material</td>
</tr>
<tr>
<td>Schaub &amp; Baker (1991)</td>
<td>430 students in middle grades</td>
<td>mathematics achievement in relationship to the amount of time in preparing for class</td>
</tr>
<tr>
<td>Schaub &amp; Baker (1991)</td>
<td>430 students in middle grades</td>
<td>mathematics achievement in relationship to the amount of time keeping order</td>
</tr>
</tbody>
</table>

Across the studies by Schaub and Baker (1991), there were five statistics reported that could be incorporated into the meta-analysis of student achievement in relationship to mathematics summarized in Table 4.6.
Table 4.6
Summary of a meta-analysis procedure of combination of effect sizes of studies of time management

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>mean standardized Difference Between means</td>
<td>0.21</td>
</tr>
<tr>
<td>mean Correlation Coefficient</td>
<td>.10</td>
</tr>
<tr>
<td>R-squared</td>
<td>.01</td>
</tr>
<tr>
<td>Binomial Effect Size Display (BESD) from</td>
<td>.45 to .55</td>
</tr>
</tbody>
</table>

The Binomial Effect Size Display (BESD) indicates that the effect size for time management is equivalent to increasing the success rate from 45 to 55 percent which is below a modest effect -- up to one-half of a standard deviation (a gain of close to 20 percentile points).

These studies assessed the national differences in middle-grades mathematics between students of the United States and Japan. It hypothesized that teachers' management of class time is a major reason for the differences in student achievement. In comparing class management time it was found that American teachers prepare less, review older material, and spend more time on keeping order and doing administrative tasks during the classroom period than Japanese teachers.

There are clear differences between American and Japanese teachers. But the differences in time management do not have a significant effect. If time management is considered with instructional methods, then Japanese teachers produce more class change. When comparing time management and instructional methods an interesting pattern emerged. American teachers were restricted by the level of knowledge and ability of incoming students.
Achievement in American classes was less sensitive to between-student variation. Japanese teachers were able to reduce variation among students in a class which yielded higher achievement. The Japanese teachers organized their classrooms and used their time to impart new materials in a fashion that was conducive to student achievement.

Based on the findings of these studies, time management does have an effect upon student achievement but to be significant it needs to be associated with instructional methods. By manipulating the learning environment so that all or most students gain new knowledge, greater student achievement will result. Japanese students spent more time receiving lectures dealing with new knowledge, and less time working alone, in groups or in taking tests.

**Advanced Organizers**

An advanced organizer is a set of materials that is related to new material but written on a higher level of abstraction, inclusiveness, and generality than the new textual information. The function of the organizer, which is presented to students before they read or interact with unfamiliar material, is to link what the learner already knows to what the learner needs to know before he/she can successfully learn a task (Grollier, 1991).

The successful teacher displays this teaching ability by providing an overview of new material, writing important concepts on the board, repeating and summarizing material to be presented. This presentation is essential for stressing important concepts and making learning more meaningful.
There were five studies, Table 4.7, identified for the concept of advanced organizers which reported results that could be incorporated into the meta-analysis of effect size.

**Table 4.7**

<table>
<thead>
<tr>
<th>Author</th>
<th>Student Population</th>
<th>Outcomes Studied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Darch (1986)</td>
<td>24 fourth, fifth &amp; sixth grade learning disabled students</td>
<td>effects of visual display of content on literal comprehension</td>
</tr>
<tr>
<td></td>
<td>24 fourth, fifth &amp; sixth grade learning disabled students</td>
<td>use of text with teacher initiated group instruction on comprehension</td>
</tr>
<tr>
<td></td>
<td>24 fourth, fifth &amp; sixth grade learning disabled students</td>
<td>student satisfaction in relationship to what they felt they had learned</td>
</tr>
<tr>
<td>Hawk (1986)</td>
<td>15 classes of 390 middle school life science students</td>
<td>comprehension of seven chapters of life science (achievement test scores)</td>
</tr>
<tr>
<td>Healy (1989)</td>
<td>59 ninth grade science students</td>
<td>effects of advanced organizers on the learning and retention of science concepts</td>
</tr>
<tr>
<td>Horton (1990)</td>
<td>383 seventh &amp; tenth grade students enrolled in science, social studies, and health</td>
<td>effectiveness of graphic organizers on student performance</td>
</tr>
<tr>
<td>Reis (1986)</td>
<td>64 mentally retarded students with a mean age of 15.4 and 64 fourth grade students</td>
<td>success on comprehension questions</td>
</tr>
</tbody>
</table>
Across the five studies, there were 18 statistics reported that could be incorporated into the meta-analysis of student achievement summarized in table 4.8.

Table 4.8
Summary of a meta-analysis procedure of combination of effect sizes of studies of advanced organizers

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>mean standardized Difference Between means</td>
<td>1.48</td>
</tr>
<tr>
<td>mean Correlation Coefficient</td>
<td>.60</td>
</tr>
<tr>
<td>R-squared</td>
<td>.36</td>
</tr>
<tr>
<td>Binomial Effect Size Display (BESD) from</td>
<td>.20 to .80</td>
</tr>
</tbody>
</table>

The Binomial Effect Size Display (BESD) indicates that the effect size for advanced organizers is equivalent to increasing the success rate from 20 to 80 percent which is very effective—more than a full standard deviation (a gain of more than 30 percentile points).

The results from these studies support the use of advanced organizers as a teaching skill. These studies indicate that advance organizers can positively affect students with disabilities as well as students in regular education.

Of interest was the effectiveness of visual displays or graphic organizers on the students' ability to comprehend the information. Darch (1986) suggested several possible reasons for effectiveness of the visual displays. First, the displays allowed the teacher to highlight the most critical concepts in each unit of instruction. Much of the irrelevant detail
was eliminated during the teacher presentation. Second, the schema theory presented reasons for the success of a visual treatment. Student used the schema as a frame of reference for policing and synthesizing incoming information. A schema facilitated editing and summarizing of information in an orderly search of a student's memory when asked to recall previously presented content.

The findings of these studies have critical implications for teacher education. It appears that the advanced organizer, an experimentally validated teaching tool, if used on a consistent basis by regular classroom teachers and special education teachers, has a positive result on student academic outcomes.

**Clarity**

Clarity is a multidimensional phenomenon or skill which successful teachers possess; they do a number of things to make a lesson or instructions clear to students. Clear teachers are consistently concerned that their students understand. They try to insure understanding by providing students with appropriate opportunities to learn, utilizing abundant illustrations and examples, logically organizing and reviewing the materials to be learned, and assessing student learning (Cruickshank, 1985). Specific factors of teacher clarity and their indicators are listed in Figure 4.1, (Metcalf, 1989).
Teacher Clarity

Figure 4.1

A. The teacher logically organizes instruction and instructional content.
   1. Informs students of lesson objectives in advance.

B. The teacher emphasizes important aspects of instruction and instructional content.
   1. Points out what is important for students to learn.
   2. Repeats things that are important.
   3. Writes important things on the board (chart).
   4. Summarizes the material presented in class.

C. Explains/demonstrates how to do the work by using examples.
   1. Examples are used.
   2. Works examples and explains them.
   3. Explains what unfamiliar words mean.
   4. Explains something and then pauses to allow students time to think.

D. Provides opportunities for students to ask questions and answers students’ questions.
   1. Repeats things when students do not understand.
   2. Asks questions to find if students understand.
   3. Allows time (pauses) for students to ask questions and answers students’ questions.
   4. Provides opportunities for students to practice (work examples).
   5. Examines students work.

There were four studies identified for the concept of clarity. Two of these studies reported results that could be incorporated into the meta-analysis of effect size summarized in table 4.9.
Table 4.9

Summary of clarity studies

<table>
<thead>
<tr>
<th>Author</th>
<th>Student Population</th>
<th>Outcomes Studied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metcalf (1991)</td>
<td>54 preservice teacher educators, &amp; elementary school students</td>
<td>trainability of clarity, elementary student achievement</td>
</tr>
<tr>
<td>Smith, (1984)</td>
<td>160 high school social students</td>
<td>student achievement in relationship to teacher clarity</td>
</tr>
</tbody>
</table>

Across the two studies, there were five statistics reported that could be incorporated into the meta-analysis of effect size of student achievement summarized in table 4.10.

Table 4.10

Summary of a meta-analysis procedure of combination of effect sizes of studies of clarity

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>mean standardized Difference Between means</td>
<td>0.52</td>
</tr>
<tr>
<td>mean Correlation Coefficient</td>
<td>.25</td>
</tr>
<tr>
<td>R-squared</td>
<td>.06</td>
</tr>
<tr>
<td>Binomial Effect Size Display (BESD) from</td>
<td>.37 to .63</td>
</tr>
</tbody>
</table>

The Binomial Effect Size Display (BESD) indicates that the effect size for clarity is equivalent to increasing the success rate from 37 to 63
percent which is a substantial effective—one-half to a full standard deviation (a gain of between 20 and 30 percentile points).

The results of these analyses indicate that clarity training positively affects teachers' ability to produce increased student learning. They also supported the efficacy and effectiveness of training in the development of preservice teachers' instructional clarity. Preservice teachers who had been trained in clarity were found to be more clear than their untrained counterparts on all dimensions of teacher clarity. Clarity training appeared to most affect rating of teachers' use of low and moderate-inference clarity behaviors. Highly significant differences were also found in rating of trained versus untrained teachers' overall instructional clarity (Metcalf, 1991).

The studies also provided support for a causal relationship between teacher clarity and student achievement. Trained teachers produced greater student learning than untrained teachers. This finding extends earlier correlational findings of a strong, positive relationship between clarity and achievement (Rosenshine and Furst, 1971; Williams, 1983; and Hines, 1981).

**Questioning**

Questioning is defined as the ability to ask a question to obtain the student's level of understanding of the content. Lower level questions employ the ability of asking factual, single answer questions with smoothness and ease requiring memory responses or sensory description (Allen, Ryan, Bush & Cooper, 1969). Divergent questions provide for more than one possible response. These questions require the student to use
concrete and abstract thinking in order to determine appropriate response. Higher order questions involve the ability to ask questions requiring abstract thinking and the ability to relate facts in meaningful patterns to compare and contrast concepts or principles, make inferences and perceive cause/effect (Allen, Ryan, Bush & Cooper, 1969).

As seen in Table 4.11, there were five studies identified for the concept of questioning which reported results that could be incorporated into the meta-analysis of effect size.
Table 4.11
Summary of questioning studies

<table>
<thead>
<tr>
<th>Author</th>
<th>Student Population</th>
<th>Outcomes Studied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clasen (1983)</td>
<td>72 gifted seventh graders</td>
<td>effects of higher-order questioning, divergent questioning, and lower order questioning on student achievement</td>
</tr>
<tr>
<td>Gleissman (1987)</td>
<td>20 post-baccalaureate experienced teachers</td>
<td>the trainability of questioning as a teaching skill from low level cognitive questions to higher level</td>
</tr>
<tr>
<td>Korinek (1987)</td>
<td>14 elementary level exceptional children</td>
<td>effects of questioning on students ability to remember, understand, and apply knowledge</td>
</tr>
<tr>
<td>Otto (1983)</td>
<td>30 volunteer eighth-grade students from science classes</td>
<td>the relationship between the implementation of specific types of questions and student achievement and retention</td>
</tr>
<tr>
<td>Schmidt (1989)</td>
<td>120 students with learning disabilities in grades 6 through 9</td>
<td>the relationship between student performance and the mode of questioning questioning</td>
</tr>
</tbody>
</table>

Across the five studies, there were 23 statistics reported that could be incorporated into the meta-analysis of effect size of student achievement summarized in table 4.12.
Table 4.12
Summary of a meta-analysis procedure of combination of effect sizes of studies of questioning

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>mean standardized Difference Between means</td>
<td>0.46</td>
</tr>
<tr>
<td>mean Correlation Coefficient</td>
<td>.23</td>
</tr>
<tr>
<td>R-squared</td>
<td>.05</td>
</tr>
<tr>
<td>Binomial Effect Size Display (BESD) from</td>
<td>.39 to .61</td>
</tr>
</tbody>
</table>

The Binomial Effect Size Display (BESD) indicates that the effect size for questioning is equivalent to increasing the success rate from 39 to 61 percent which is a substantial effective--one-half to a full standard deviation (a gain of between 20 and 30 percentile points).

Results from the research of Clasen (1983) support previous results by Ryan (1973), Clark et al., (1979), and Gall et al., (1978). Lower-order questioning provided achievement test scores significantly better than those for students not receiving the treatment. Students participating in higher order questioning and divergent questioning did not score at a significant difference from students not receiving the treatment. Factors considered for the success of lower order questioning were: time period of the study, and familiarity with the treatment. The lack of significant support for higher-order and divergent questioning groups may be attributable to the fact that the students participated in novel learning situations, and the instructional goals of the higher-order and divergent questioning were not adequate for measurement.
Schmidt's (1989) findings indicate that an oral recitation mode of questioning was more effective than a supplement form of questioning. In support of Clasen (1983), results also indicated that students performed better on knowledge-level questions than on comprehension questions and that questions asked in the text and again in the posttest produced higher scores than unasked questions.

Several factors were involved among the studies of questioning which affected student outcomes. Consideration should be given to the variability in teacher questioning feedback, and to wait-time behaviors. Questioning, interactions, although a vital part of instruction, must be considered in the larger context of the total teaching act (Korinek, 1987). The results of a study by Gliessman (1987) indicate that verbal teaching skills that are marked by continuity over time (the sequencing of questions as a strategy) and interconnectedness (the linking of key elements in an explanation) are modifiable and indicated a significant increase in the findings for the study groups. It has also been noted that the disparity of success of higher-order and divergent questioning may be do to the lack of teacher expertise in using these skills.

**Homework**

Assigning homework is the ability to provide varied, interesting, motivating, and challenging assignments, and yet enable students time to practice work at a near 100% success rate. This enhances a teacher's ability to hold students accountable for their work through consistent
examining and monitoring in order to provide feedback and follow-up (Brophy and Good, 1986).

The theoretical support for homework on achievement has been shown to have positive impact for elementary, high school and college students. Additionally, homework seems to improve minority students' and gifted students' achievement (Cool & Keith).

There were two studies identified for the concept of homework which reported results that could be incorporated into the meta-analysis of effect size, see Table 4.13.

<table>
<thead>
<tr>
<th>Author</th>
<th>Student Population</th>
<th>Outcomes Studied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cool (1991)</td>
<td>28,051 high school students</td>
<td>determine the extent of the direct and indirect influence of homework on academic achievement</td>
</tr>
<tr>
<td>Keith (1982)</td>
<td>20,364 high school students</td>
<td>the relationship between time spent studying on homework and high school grades</td>
</tr>
</tbody>
</table>

Across the two studies, there were two statistics reported that could be incorporated into the meta-analysis of effect size of student achievement summarized in table 4.14.
Table 4.14
Summary of a meta-analysis procedure of combination of 
effect sizes of studies of homework

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>mean standardized Difference Between means</td>
<td>0.64</td>
</tr>
<tr>
<td>mean Correlation Coefficient</td>
<td>.31</td>
</tr>
<tr>
<td>R-squared</td>
<td>.09</td>
</tr>
<tr>
<td>Binomial Effect Size Display (BESD) from</td>
<td>.35 to .65</td>
</tr>
</tbody>
</table>

The Binomial Effect Size Display (BESD) indicates that the effect size for homework is equivalent to increasing the success rate from 35 to 65 percent which is a substantial effective--one-half to a full standard deviation (a gain of between 20 and 30 percentile points).

Cool and Keith (1991) report that the strongest effects on homework were from motivation, academic coursework, gender, and quality of instruction, which suggest that those students who are female, motivated, take the most rigorous courses, and rate the quality of instruction in their school at higher levels find the greater academic success through the use of homework. Their findings also reveal that ability and family background both had substantial influences on quality of instruction, suggesting that higher ability and higher SES (social, economic status) students are exposed to higher quality of instruction and schooling than are other students (or they rate their instruction/schooling more highly).

The significance of this and past research is that increased homework time results in higher achievement, as measured by grades, for all levels of ability. Homework also seems to have compensatory effects; students of
lower ability can achieve grades commensurate with their brighter peers through increased study (Keith, 1981). Strother's (1984) reported that homework improved achievement, when achievement was measured by standardized tests or by course grades. Factors common to all of these studies were that a larger effect on achievement was found for homework that bears teachers' comments and grades; assigned homework produced more learning than no homework, and daily homework produced superior results.

**Wait Time**

Wait time is defined as the duration of teacher and student pauses in questioning dialogue. Previous research has identified two pauses in the dialogue between the teacher and the student that appear to be critical variables in the determination of the cognitive level and the affective climate of classrooms. The first pause occurs after teachers ask questions and before the students respond. The second occurs after students pause momentarily in their replies without teachers ascertaining that the students have completed replies (Swift & Gooding, 1983). These studies investigated the effects of increasing teachers' wait times on general questioning skills in science teaching.

There were two studies identified for the concept of wait time which reported results that could be incorporated into the meta-analysis of effect size.
Table 4.15
Summary of wait time studies

<table>
<thead>
<tr>
<th>Author</th>
<th>Student Population</th>
<th>Outcomes Studied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gooding (1983)</td>
<td>196 science students</td>
<td>effects on student memory level, cognitive levels, management and longer student answers</td>
</tr>
<tr>
<td>Swift (1983)</td>
<td>40 middle school science students</td>
<td>effects on student length of responses, more frequent student questions, management, cognitive level, and higher level questioning,</td>
</tr>
</tbody>
</table>

Across the two studies, there were nine statistics reported that could be incorporated into the meta-analysis of effect size of student achievement summarized in table 4.16.
Table 4.16
Summary of a meta-analysis procedure of combination of
effect sizes of studies of wait time

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>mean standardized Difference Between means</td>
<td>0.64</td>
</tr>
<tr>
<td>mean Correlation Coefficient</td>
<td>.39</td>
</tr>
<tr>
<td>R-squared</td>
<td>.15</td>
</tr>
<tr>
<td>Binomial Effect Size Display (BESD) from</td>
<td>.31 to .69</td>
</tr>
</tbody>
</table>

The Binomial Effect Size Display (BESD) indicates that the effect size for wait time is equivalent to increasing the success rate from 31 to 69 percent which is very effective—more than a full standard deviation (a gain of more than 30 percentile points).

From the two studies of Gooding and Swift it is apparent that the skill of wait time did have a positive impact on student performance. Students produced longer answers and more answers in classrooms where emphasis was not on a teacher dominated discussion. While teachers have control over wait time, they often have difficulty in observing the pause for wait time. When teachers did take the time to pause when students were speaking, the length of answers and the number of responses both were increased. Gooding and Swift (1983) maintain that it is important to work toward extending wait times to the three second criterion proposed by Rowe (1974) in her studies. It appears to have an effect not only on the cognitive variables in the classroom, but also has implications for the affective climate as well. They also claimed that any increase in wait time can contribute to more effective classroom discussions.
Of further significance from these studies was that increased wait time in the classrooms of experienced teachers, with supportive feedback provided to students, created even more powerful changes.

**Enthusiasm**

Enthusiasm is defined as the ability of a teacher to use: 1) voice inflection in large changes of rate or volume in his/her speech; 2) gestures which use hands and arms in coordination with verbal content; and 3) facial movements communicating happiness and amusement which have an influence on student outcomes (Collins, 1976). Teacher enthusiasm can be represented by eight elements: (a) rapid, uplifting, varied vocal delivery; (b) dancing, wide open eyes; (c) frequent, demonstrative gestures; (d) varied, dramatic body movements; (e) varied, emotive facial expression; (f) selection of varied words; (g) ready, animated acceptance of ideas and feelings; and (h) exuberant over-all energy level (Bettencourt et al., 1983). For example, enthusiastic teachers might be seen to be moving briskly about the classroom; speaking in a clear, distinct voice with varied inflections and vocabulary; making frequent eye contact with various members of the class; and openly soliciting and accepting student contributions.

Conversely, unenthusiastic teachers might be more likely to stand or sit in the same position of the class; speak in a more uniform and unexpressive tone of voice; make less frequent eye contact or animated facial expressions; and generally interact less with the students (Brigham, 1992).
There were five studies identified for the concept of enthusiasm which reported results that could be incorporated into the meta-analysis of effect size.

Table 4.17
Summary of enthusiasm studies

<table>
<thead>
<tr>
<th>Author</th>
<th>Student Population</th>
<th>Outcomes Studied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Larkin (1982)</td>
<td>232 seventh grade students</td>
<td>effects of three levels of enthusiasm (high, normal, low) on social studies achievement</td>
</tr>
<tr>
<td>Brigham (1992)</td>
<td>32 seventh and eighth grade students with LD (Learning Disabilities)</td>
<td>effects of enthusiasm on academic performance in science and on student behavior</td>
</tr>
<tr>
<td>Burts (1985)</td>
<td>55 three and four year old children</td>
<td>effects of three levels of teacher enthusiasm on the acquisition of four concepts and student behavior</td>
</tr>
<tr>
<td>McKinney (1984)</td>
<td>52 first grade students three lessons on the topics of land, air and water pollution</td>
<td>effects of enthusiasm on student achievement</td>
</tr>
<tr>
<td>Streeter (1986)</td>
<td>229 students in grades 1-5 middle reading ability reading groups</td>
<td>effects of the enthusiasm on attitude towards reading</td>
</tr>
</tbody>
</table>
Across the five studies, there were 20 statistics reported that could be incorporated into the meta-analysis of effect size of student achievement summarized in table 4.18.

Table 4.18
Summary of a meta-analysis procedure of combination of effect sizes of studies of enthusiasm

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>mean standardized Difference Between means</td>
<td>0.86</td>
</tr>
<tr>
<td>mean Correlation Coefficient</td>
<td>.40</td>
</tr>
<tr>
<td>R-squared</td>
<td>.16</td>
</tr>
<tr>
<td>Binomial Effect Size Display (BESD) from</td>
<td>.30 to .70</td>
</tr>
</tbody>
</table>

The Binomial Effect Size Display (BESD) indicates that the effect size for enthusiasm is equivalent to increasing the success rate from 30 to 70 percent which is very effective—more than a full standard deviation (a gain of more than 30 percentile points).

Results from the various studies found significant results in the effect of enthusiasm on student academic success. These findings support earlier research by Barr, (1929), Rosenshine, (1970), Collins, (1976), Bettencourt, (1979), and Gillett, (1980).

Several conclusions can be drawn from these studies. It is clear that teachers can be trained to increase their levels of enthusiasm; they can be trained to appear more or less enthusiastic regardless of their genuine or felt level of enthusiasm. The studies presented in this meta-analysis suggest support for enthusiasm and its affect on achievement. However,
evidence is mounting to support the contention that teacher enthusiasm may be less important for younger children, especially in relationship to achievement (Burt, 1985).

Although not all of the analysis produced significant findings between and among groups in relationship to achievement, differences were observed in the behavior of the children. Subjects who were presented the lessons at the high level of enthusiasm were characterized as more attentive, interested, and responsive than students receiving low levels of enthusiasm. These data lend support to the findings that teacher enthusiasm positively affects student on-task behavior.

Feedback

Feedback is defined as the teacher's ability to provide information to an individual or individuals about a particular aspect regarding learning or behavior. Effective feedback is precise, frequent, immediate, differential and positive (Cooper, Heron & Heward, 1987).

The examination of feedback by Schimmel (1993) is a meta-analysis conducted of simple confirmation feedback which informs the learner whether a response was correct or incorrect, and feedback which provides the correct answer. Fifteen studies were identified which met the criteria of involving: 1) high school or college students learning meaningful verbal material; 2) questioning about the material and immediate feedback following responses; 3) measurement of responses to all criterion test items; 4) an immediate post-test; and 5) a no feedback control group. Data
from this study are reported in mean effect sizes instead of Binomial Effect Sizes due to the lack of information provided in the study.

Table 4.19
Summary of a meta-analysis procedure of mean effect sizes for different types of feedback

<table>
<thead>
<tr>
<th>Type of Feedback</th>
<th>Number of Studies</th>
<th>Mean Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feedback Treatment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correct response and confirmation</td>
<td>15</td>
<td>.47</td>
</tr>
<tr>
<td>feedback combined (a)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confirmation feedback</td>
<td>5</td>
<td>.76</td>
</tr>
<tr>
<td>Correct response feedback</td>
<td>10</td>
<td>.36</td>
</tr>
</tbody>
</table>

Results from these studies of feedback found that learners receiving feedback were found to perform .47 standard deviations above (or, on average, better than 62.8% of) learners receiving no feedback.

Summary

The results of these analyses indicate that the teaching skills reinforcement, homework, time management, wait time, advanced organizers, clarity, enthusiasm, questioning, and feedback do have a positive impact on student learning. On the basis of the three classifications of Joyce and Showers (1988): modestly effective—up to one-half of a standard deviation (a gain of close to 20 percentile points); substantially effective—one-half to a full standard deviation (a gain of between 20 and 30 percentile) and very effective—more than a full standard deviation (a
gain of more than 30 percentile points), table 4.20 corroborates the findings of the effects size and significance of each skill.

**Table 4.20**

Summary of the meta-analysis studies of teaching skills and their Binomial Effect Size in relationship to impact on student achievement

<table>
<thead>
<tr>
<th>Skill</th>
<th>Binomial Effect Size</th>
<th>Effect on Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reinforcement</td>
<td>from .28 to .72</td>
<td>Very effective</td>
</tr>
<tr>
<td>Time Management</td>
<td>from .45 to .55</td>
<td>Modestly effective</td>
</tr>
<tr>
<td>Advanced Organizers</td>
<td>from .20 to .80</td>
<td>Very effective</td>
</tr>
<tr>
<td>Clarity</td>
<td>from .37 to .63</td>
<td>Substantially effective</td>
</tr>
<tr>
<td>Questioning</td>
<td>from .39 to .61</td>
<td>Substantially effective</td>
</tr>
<tr>
<td>Homework</td>
<td>from .35 to .65</td>
<td>Substantially effective</td>
</tr>
<tr>
<td>Wait Time</td>
<td>from .31 to .69</td>
<td>Very effective</td>
</tr>
<tr>
<td>Enthusiasm</td>
<td>from .30 to .70</td>
<td>Very effective</td>
</tr>
</tbody>
</table>

Chapter IV is a summary of this study and a discussion of the results. Methods procedures and findings will be briefly reviewed. Implications and conclusions drawn from the findings will be discussed, followed by a series of research questions recommended for future research.
CHAPTER V
SUMMARY AND DISCUSSION

This chapter is devoted to a summary and discussion of the results of the present study. Methods, procedures, and findings will be briefly reviewed. Implications and conclusions drawn from the findings will be discussed, followed by recommendations for future research.

SUMMARY

The primary objective of this study has been to identify teaching skills, supported by an analysis of research, that are associated with increased academic achievement and positive learning outcomes. Through a meta-analysis of available research, skills identified as being critical by linkage to positive student outcomes, were compared by their average effect size on student achievement. To accomplish this objective two major research tasks were undertaken:

1. Criteria was developed and used for the identification of critical skills necessary for teacher preparation.

2. Using the developed criteria, skills critical to teaching were identified.

A systematic search was undertaken involving the following: a search of pertinent literature to identify teaching skills; categorical listings of these skills; the development of criteria for the identification of
critical skills; and a listing of the critical skills essential to teacher preparation.

A review of literature consisted of six sources:

1. ERIC documents;
2. Reader's Guide to Periodical Literature;
3. national surveys;
4. individual scholars;
5. research on teacher effectiveness; and
6. models of teaching.

The screening process was initiated by the establishment of a preliminary list of skills drawn from the selected sources. Each skill from the preliminary list was then judged against the specific criteria, developed from a review of the literature, listed below.

1. The item fits the definition of a skill as defined by Cruickshank and Metcalf (1990), namely, a developed or acquired aptitude or ability which can be integrated into teaching through practice.

2. The item's definition is generally agreed upon within the profession.

3. The item is a discrete behavior which is observable and measurable both qualitatively and quantitatively.

4. It is a generic skill applicable to a wide variety of subject areas.

5. The item is mentioned in the reviewed literature.

6. The item is supported by research and is associated with positive student outcomes.

From the list of 17 critical teaching skills revealed by the screening process, Table 4.1, eight skills met the requirements and were subjected to
a meta-analysis of the research. Those skills, which did not meet the final requirements, failed because the research did not provide the data necessary to do a meta-analysis. Table 5.1 lists the eight skills analyzed in order of magnitude of the Mean Standardized Difference Between Means, Means Correlation Coefficient, R-Squared and Binomial Effect Size Display (BESD).

Table 5.1
Critical Abilities of Teaching

<table>
<thead>
<tr>
<th>Skill</th>
<th>Mean Standardized Difference Between Means</th>
<th>Mean Correlation Coefficient</th>
<th>R-Squared</th>
<th>BESD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Organizers</td>
<td>1.48</td>
<td>.60</td>
<td>.36</td>
<td>.20 to .80</td>
</tr>
<tr>
<td>Reinforcement</td>
<td>1.07</td>
<td>.43</td>
<td>.19</td>
<td>.28 to .72</td>
</tr>
<tr>
<td>Enthusiasm</td>
<td>0.66</td>
<td>.40</td>
<td>.16</td>
<td>.30 to .70</td>
</tr>
<tr>
<td>Wait Time</td>
<td>0.84</td>
<td>.39</td>
<td>.15</td>
<td>.31 to .69</td>
</tr>
<tr>
<td>Home Work</td>
<td>0.64</td>
<td>.31</td>
<td>.09</td>
<td>.35 to .65</td>
</tr>
<tr>
<td>Clarity</td>
<td>0.52</td>
<td>.25</td>
<td>.06</td>
<td>.37 to .63</td>
</tr>
<tr>
<td>Questioning</td>
<td>0.46</td>
<td>.23</td>
<td>.05</td>
<td>.39 to .61</td>
</tr>
<tr>
<td>Time Management</td>
<td>0.21</td>
<td>.10</td>
<td>.01</td>
<td>.45 to .55</td>
</tr>
</tbody>
</table>

Based upon the three classifications of effect sizes developed by Joyce & Showers, (1988): 1) modestly effective—up to one-half of a standard deviation (a gain of close to 20 percentile points); 2) substantially effective—one-half to a full standard deviation (a gain of between 20 and 30 percentile points); and 3) very effective—more than a full standard deviation (a gain of more than 30 percentile points); the identified skills fall into these categories as depicted in Table 5.2.
Table 5.2
Summary of the meta-analysis studies of teaching skills and their Binomial Effect Size in relationship to impact on student achievement

<table>
<thead>
<tr>
<th>Skill</th>
<th>BESD</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Organizers</td>
<td>.20 to .80</td>
<td>Very effective</td>
</tr>
<tr>
<td>Reinforcement</td>
<td>.28 to .72</td>
<td>Very effective</td>
</tr>
<tr>
<td>Enthusiasm</td>
<td>.30 to .70</td>
<td>Very effective</td>
</tr>
<tr>
<td>Wait Time</td>
<td>.31 to .69</td>
<td>Very effective</td>
</tr>
<tr>
<td>Home Work</td>
<td>.35 to .65</td>
<td>Substantially effective</td>
</tr>
<tr>
<td>Clarity</td>
<td>.37 to .63</td>
<td>Substantially effective</td>
</tr>
<tr>
<td>Questioning</td>
<td>.39 to .61</td>
<td>Substantially effective</td>
</tr>
<tr>
<td>Time Management</td>
<td>.45 to .55</td>
<td>Moderately effective</td>
</tr>
</tbody>
</table>

The findings of these various analyses, reviewed below, have critical implications for teacher education. The use of the seven skills identified in the study (advanced organizers, reinforcement, enthusiasm, wait time, homework, clarity, and questioning) has positive results on student academic outcomes, if employed on a consistent basis by teachers.

**Advanced Organizers**

An advanced organizer is a set of materials that relates new material to students on a higher level of abstraction, inclusiveness, and generality than the new textual information. The function of the organizer is to link what the learner already knows to what the learner needs to know before he/she can successfully learn a task (Grolle, 1991). The successful teacher displays this teaching ability by providing an overview of new
material, writing important concepts on the board, repeating and summarizing material to be presented. This presentation is essential for stressing important concepts and making learning more meaningful.

The studies of advanced organizers, used in this research, covered the fourth through ninth grades in regular education and special education Learning Disabilities classes. Areas of focus were comprehension and achievement test scores in the content areas.

The Binomial Effect Size Display (BESD) indicated that the effect size for advanced organizers is equivalent to increasing the success rate from 20 to 80 percent which is very effective—more than a full standard deviation (a gain of more than 30 percentile points).

The results from these studies support the use of advanced organizers as a teaching skill and have critical implications for teacher education. It appears that the advanced organizer, an experimentally validated teaching tool, if used on a consistent basis by regular classroom teachers and special education teachers, has a positive result on student academic outcomes.

**Reinforcement**

Reinforcement is the teaching ability to provide appropriate verbal and non-verbal techniques following appropriate student responses (Allen, Ryan, Bush & Cooper, 1969). This response attributes success to student effort and ability.

The studies identified for the concept of reinforcement covered the seventh through ninth grade levels in regular education classrooms. Focus
of the studies was upon student grade point average, class grades, and academic achievement.

The Binomial Effect Size Display (BESD) indicated that the effect size for reinforcement is equivalent to increasing the success rate from 28 to 72 percent, which is very effective—more than a full standard deviation (a gain of more than 30 percentile points).

Results from these studies support the connection between reinforcement and changes in children's behavior. While the research does support the idea that reinforcement has an effect on students' perceptions of their ability and performance, several considerations must be deliberated: 1) achievement requires effort engagement on the part of the student as a necessary but not sufficient condition for successful performance; 2) teacher reinforcement primarily influences effort-engagement behaviors, which in turn affects achievement; and 3) in addition to teacher reinforcement, the teacher must demand academic performance and provide the concepts and methods for each student to perform successfully (Lujan, 1980).

**Enthusiasm**

Enthusiasm is the ability of a teacher to use: voice inflection in large changes of rate or volume in his/her speech; gestures which use hands and arms in coordination with verbal content; and facial movements communicating happiness and amusement which have an influence on student outcomes (Collins, 1976).
From the five studies identified for the concept of enthusiasm, the outcomes for social studies achievement, science achievement, and overall achievement were measured in preschool through seventh grades.

The Binomial Effect Size Display (BESD) indicated that the effect size for enthusiasm is equivalent to increasing the success rate from 30 to 70 percent which is very effective—more than a full standard deviation (a gain of more than 30 percentile points).

Results from the various studies provided a positive review of enthusiasm. Brigham (1992), McKinney (1984), and Streeter (1986) found significant results in the effect of enthusiasm on student academic success. These findings supported research by Barr (1929), Rosenshine (1970), Collins (1976), Bettencourt (1979), and Gillett (1980). Evidence is mounting, though, to support the contention that teacher enthusiasm may be less important for younger children, especially in relationship to achievement (Burt, 1985).

**Wait Time**

Wait time is defined as the duration of teacher and student pauses in questioning dialogue. Previous research has identified two pauses in the dialogue between the teacher and the student that appear to be critical variables in the determination of the cognitive level and the affective climate of classrooms. The first pause occurs after teachers ask questions and before the students respond. The second occurs after students pause momentarily in their replies without teachers ascertaining that the students have completed replies (Swift & Gooding, 1983).
The studies investigated, in this research, the effects of increasing teachers' wait times on general questioning skills in science teaching. Two studies identified for the concept of wait time provided outcomes in memory, cognitive levels, and depth of student understanding in seventh grade science classes.

The Binomial Effect Size Display (BESD) indicated that the effect size for wait time is equivalent to increasing the success rate from 31 to 69 percent which is very effective—more than a full standard deviation (a gain of more than 30 percentile points).

From the studies of Gooding and Swift, it is apparent that the skill of wait time has a positive impact on student performance. Students produced longer answers and more answers in classrooms where emphasis was not on a teacher dominated discussion. Gooding and Swift (1983) maintain that it is important to work toward extending wait times to the three second criterion proposed by Rowe (1974) in her studies. It appears to have an effect not only on the cognitive variables in the classroom, but also has implications for the affective climate as well.

**Homework**

Assigning homework is the ability used by teachers to create and vary interesting, motivating, and challenging assignments and yet maintain students' work at a near 100% success rate. This enhances a teacher's ability to hold students accountable for their work through consistent examining and monitoring in order to provide feedback and follow-up (Brophy and Good, 1986).
From studies identified, the influence of homework was examined in relationship to academic achievement with high school students.

The Binomial Effect Size Display (BESD) indicated that the effect size for homework is equivalent to increasing the success rate from 35 to 65 percent which is a substantial effective—one-half to a full standard deviation (a gain of between 20 and 30 percentile points).

The implications of this and past research are that increased homework time results in higher achievement, as measured by grades, for all levels of ability. Homework also seems to have compensatory effects, that is students of lower ability can achieve grades commensurate with their brighter peers through increased study (Keith, 1981). Strother's (1984) reported that homework improved achievement when achievement was measured by standardized tests or by course grades. Factors common to all of these studies were that a larger effect on achievement was found for homework that bears teachers' comments and grades, assigned homework produced more learning than no homework, and daily homework produced superior results.

Clarity

Clarity is a multidimensional phenomenon or skill which successful teachers possess in which they do a number of things to make a lesson or instructions clear to students. Clear teachers are consistently concerned that their students understand. They try to insure understanding by providing students with appropriate opportunities to learn, utilizing
abundant illustrations and examples, logically organizing and reviewing the materials to be learned, and assessing student learning (Cruickshank, 1985).

From the studies identified for the concept of clarity, the outcome studied was student achievement in elementary grades. The Binomial Effect Size Display (BESD) indicated that the effect size for clarity is equivalent to increasing the success rate from 37 to 63 percent which is a substantial effective—one-half to a full standard deviation (a gain of between 20 and 30 percentile points).

The results of these analyses indicate that clarity training positively affects teachers' ability to produce increased student learning. Preservice teachers who had been trained in clarity were found to be more clear than their untrained counterparts on all dimensions of teacher clarity. Highly significant differences were also found in rating of trained versus untrained teachers' overall instructional clarity (Metcalf, 1991). These finding extend earlier correlational findings of a strong, positive relationship between clarity and achievement (Rosenshine and Furst, 1971; Williams, 1983; and Hines, 1981).

**Questioning**

Questioning is defined as the ability to ask a question to obtain student's level of understanding of the content. Lower level questions employ the ability of asking factual, single answer questions with smoothness and ease, questions which elicit memory responses or sensory description (Allen, Ryan, Bush & Cooper, 1969). Divergent questions provide for more than one possible response. These questions require the student to
use concrete and abstract thinking in order to determine appropriate response. Probing questions require the student to defend his/her answer, make comparisons, draw inferences and think. Higher order questions involve the ability to ask questions requiring abstract thinking and the ability to relate facts in meaningful patterns to compare and contrast concepts or principles, make inferences and perceive cause/effect (Allen, Ryan, Bush & Cooper, 1969).

Five studies identified for the concept of questioning reported results from elementary grades through grade eight. The focus of the studies was upon the impact of different levels of questions on student achievement and retention.

The Binomial Effect Size Display (BESD) indicated that the effect size for questioning is equivalent to increasing the success rate from 39 to 61 percent which is a substantial effective--one-half to a full standard deviation (a gain of between 20 and 30 percentile points).

Results from the research of Clasen (1983) supported previous results by Ryan (1973), Clark (1979), and Gall (1978). Lower-order questioning provided achievement test scores significantly better than students not receiving the treatment. Students participating in higher order questioning and divergent questioning did not score significantly difference than students not receiving the treatment.

Schmidt’s (1989) findings indicated that an oral recitation mode of questioning was more effective than a supplement form of questioning. In support of Clasen (1983), results also indicated that students performed better on knowledge-level questions than on comprehension questions and
that questions asked in the text and again in the posttest produced higher scores that unasked questions.

**Time Management**

Time Management is defined as the act of efficiently making assignments and dispensing materials that results in more instructional time (Stallings, 1982). The studies identified in this research related time management in association with the areas of preparing for class, explaining new material, reviewing old material, administration in class and keeping order. All of the studies related time management to mathematics achievement in the seventh grade.

The Binominal Effect Size Display (BESD) indicated that the effect size for time management is equivalent to increasing the success rate from 45 to 55 percent which is below a modest effective--up to one-half of a standard deviation (a gain of close to 20 percentie points).

Based on the findings of these studies, time management does have an effect upon student achievement, but to be significant it needs to be associated with the instructional methods.

**Feedback**

Included in the analyses was the analysis of feedback by Schimmel (1993) that recounted that learners receiving feedback were found to perform .47 standard deviations above (or, on average, better than 62.8% of) learners receiving no feedback. These results were not noted in the analyses of this study due to the limitations of the data provided in
Schimmel's study. The information, from its original source, was included in Chapter IV due to the significance of the findings and their relationship to this study.

From the eight skills identified as being critical to teaching and student achievement, there were also other student outcomes identified within the research that impacted students. Table 5.3 lists the skills and the additional effects of each skill. While this study did not focus on these outcomes, the studies in each of the skill areas clearly revealed that these teaching skills also have an impact on student satisfaction, attendance, behavior, social competence, physical competence, self esteem, quality of work, and motivation of students.

Table 5.3

<table>
<thead>
<tr>
<th>Skill</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Organizers</td>
<td>student satisfaction</td>
</tr>
<tr>
<td>Reinforcement</td>
<td>attendance, behavior, social competence, physical competence, self esteem</td>
</tr>
<tr>
<td>Enthusiasm</td>
<td>behavior</td>
</tr>
<tr>
<td>Wait Time</td>
<td>management</td>
</tr>
<tr>
<td>Home Work</td>
<td>quality of work, motivation</td>
</tr>
</tbody>
</table>
DISCUSSION

Apparent from an analysis of this research is the interconnectedness of the various skills. In the study of questioning, the variables of feedback and wait time became factors in the success of the student academic outcomes related to the questioning. Gliessman (1987), in his research on questioning and clarity, pointed out that interconnectedness (the linking of key elements in an explanation) and the sequencing of questions as a strategy increased the effect of the skills on student outcomes. These findings and review of the literature also indicate the possibility that if practitioners in teacher education go beyond the use of just simple generic skills, and implement programs that combine skills and interconnect them, over time there is the potential to generate greater student understanding and teacher expertise.

A significant factor, from the studies in this research, is the impact of training of skills in teacher education programs. Metcalfe (1992) indicated that clarity training positively affects teachers’ ability to produce increased student learning. Metcalfe’s study also adds to evidence that teachers’ use of behaviors which facilitate students’ clarity of understanding causes students to learn more of the content. Teachers who were more clear, who used the behaviors more frequently and more proficiently, facilitated greater student learning of the content than teachers who were less clear. Gliessman (1987) feels that through the use of complex skills such as clarity, skill training for teachers develops situations more closely related to desired content and behavior learning outcomes.
Opponents argue that past attempts at skill development in teacher education have never been useful or effective. They conclude that it is neither reasonable nor possible to expect that the preservice teacher education program can develop every skill needed during a teacher's career, and that, as a result, skill development has no place in teacher education.

But the studies of skills in this investigation indicate that it is unreasonable to conclude that teacher education must avoid complex skill development. Systematic and sustained skill development activities, incorporated into the existing structure of preservice teacher education can be effective in developing teachers' use of complex teaching skills.

At least four common themes cut across the findings of this study:
1) academic learning is influenced by the amount of time that students spend engaged in appropriate academic tasks, 2) students learn more efficiently when their teacher first structures new information for them, 3) students are motivated to learn by their teacher's support and zeal, and 4) student learning is enhanced when the teacher monitors students' performance and provides corrective feedback during recitation, drill, practice, or application activities.

An undeniable assumption underlying the educational reform movement of the past ten years is that the school achievement of American children can be enhanced through better teaching (Cruickshank & Metcalf, 1993). The past several decades have produced a knowledge base linking specific teaching skills to student achievement. If applied properly this knowledge base should help improve teacher education, and the practice of teaching. Improvement of teaching must begin with the development of
preservice teacher education programs and continue with in-service teacher education in both subject matter and pedagogy. It is important that this information be presented in ways that respect the uniqueness of each classroom and recognize that classrooms are complex social settings in which teachers must process a great deal of information rapidly, deal with several agendas simultaneously, and make quick decisions throughout the day (Brophy & Good, 1986). Therefore, rather than trying to translate it into overly rigid or generalized prescriptions, teacher educators should present this information to teachers within a decision making format that enables them to examine concepts critically and adapt them to the particular contexts within which they teach.

The data reviewed here should refute the myth that anyone can teach, "Those who can, do; those who can't, teach." Those who have successfully developed high expectation for their students, designed and developed specific plans, and communicated and instructed these academic plans with students have done so with a blend of knowledge, motivation, communication, decision making and teaching skills not possessed by an untrained individual (Brophy & Good, 1986).

Many states have initiated teacher testing to provide a more rigorous assessment of practicing teachers and preservice teachers. Teacher testing to identify and assess important teacher attributes appeared early in this century (Cruickshank & Metcalf, 1993).

Historically teacher assessment has been done by means of paper-and-pencil test and classroom observation. Recently funding has been made available to support the development of alternative teacher assessment
instruments and portfolios of teachers' work. The Carnegie Corporation funded development of alternative teacher assessment instruments and materials by the National Board for Professional Teaching Standards (NBPTS), including the use of videotapes of teaching performance and portfolios of teachers' work (Cruickshank & Metcalf, 1993).

Developing from the current search for alternative means of improving preservice teacher education is the need to predict future teaching performance (Cohen, 1989). Interest in the support for alternative methods to teacher assessment, includes programs experimenting with innovative approaches related to the preservice teaching experience. A related conviction to the enhancement of student achievement through better teaching and teacher assessment may be to provide preservice teachers with multiple forms of on-campus laboratory experiences in which they would be engaged in job-related tasks. Performance on these tasks could be assessed at various points and for various uses, including admission, retention, and graduation (Cruickshank & Metcalf, 1993).

Several forms of alternative approaches of on-campus experiences have been delineated in Chapter II; microteaching, simulations, and reflective teaching. The critical abilities (skills) of teaching identified by this study could be incorporated into preservice teacher preparation and staff development programs through the microteaching format or a modification thereof. If these abilities are, in fact, critical, then preservice teachers could be assessed to determine the extent to which they can perform them successfully. Microteaching provides an effective and useful format for determining the extent to which preservice teachers and
classroom teachers are able to demonstrate these critical abilities of teaching.

The use of these critical teaching skills through microteaching, a laboratory experience, concurrent with simulations and reflective teaching as defined in Chapter II, offers relatively valid and efficient opportunities to assess preservice teachers' professional ability and aptitude. The following section, drawing from Cruickshank and Metcalf (1993), offers options for the use of microteaching, using this study's critical teaching abilities, to aid in the assessment of preservice teachers during three phases of professional preparation: 1) admission to the professional education program; 2) admission to student teaching; and 3) exit from the professional program.

Traditionally admission to an educational program has been based upon grade point average, personal interviews, high school grades or rank, standardized test scores, and letters of recommendation. Laboratory experiences provide an alternative which could aid in the determination of an applicants' entering ability to demonstrate desirable teaching behaviors and aptitudes. An applicant's potential talent or aptitude for teaching could be assessed at entry into the program using the microteaching format. Each candidate could be given the task of preparing a brief lesson and teaching it to other potential applicants. Candidates, informed in advance of teaching abilities they should demonstrate, would be observed and instruction rated based upon demonstration of the identified teacher abilities associated with pupil learning and satisfaction, that is, the skills of advanced
organizers, reinforcement, feedback, enthusiasm, wait time, assigning homework, clarity, and time management.

Criteria currently used for admission to student teaching are mostly related to student academic success; namely, a minimum of courses taken, and a required overall grade point average attained. On-campus laboratory experiences offer a supplementary tool that could effectively identify preservice teachers' critical skills. Through the use of microteaching, potential for student teaching could be assessed by having preservice teachers teach a prescribed lesson in their subject specialty. They should be expected to demonstrate, concurrently and at high levels, knowledge of subject and teaching skills deemed by the special program area to be critical to teaching performance.

Many State Departments of Education are looking to alternate forms of assessment to redefine and upgrade the expectations for what all teachers should know and be able to do. Developing from this need, many teacher education programs have collaborated with school districts in designing and implementing innovative strategies for evaluating and assisting student teachers. It also has created the opportunity to design and implement formal induction programs for provisional teachers and develop assessment processes for annual contract teachers.

The completion of course work and field experiences, teaching certificate, and graduation with a prescribed grade point average has been the norm for exiting from the Professional Education Program. In recent years many states have developed assessment instruments to supervise the progress of teaching performance at the preservice teacher and provisional
contract teacher levels. Preservice teachers and beginning teachers are observed in the classroom and an assessment made of their performance. The purpose for use of the evaluation instrument is to determine whether preservice teachers and beginning classroom teachers can apply fundamental teaching skills in the classroom.

The instrument is designed to measure only those teaching skills that can be observed during classroom instruction and that are generic to all teachers regardless of subject area, grade level, or context. The selection of identified skills is typically derived from state and national teacher evaluation forms and, in many situations, through an additional survey of educators in the state. Some examples of these instruments contain over 50 items, many of which are not validated by research as having any impact on positive student outcomes.

A sound basis for the development of such an instrument should be a list of critical teaching abilities such as those identified in this study. If preservice teachers have an opportunity to develop the critical teaching abilities throughout the laboratory experiences, field experiences and student teaching, the assessment at the end of the professional program should include not only a display of these abilities but also an ability to thoughtfully examine their professional practice.

If the identification of and use of critical teaching skills through microteaching, simulations, and reflective teaching are more likely to predict future teacher performance, why are they not used? While we are developing alternative methods of determining teacher performance, standardized testing is still foremost in teacher assessment. These
standardized instruments may be used to assess an individual's mastery of appropriate knowledge, but they are not able to predict future teaching success. Efforts need to be made to balance the use of standardized tests and professional performance tests. The use of the generic critical teaching abilities identified in this study provides a solution that accommodates the need to be able to predict future teachers' success.

A second obstacle, identified by Cruickshank and Metcalf (1993), is the current preoccupation with field-based experiences in the preparation of teachers. As preservice teachers have engaged in greater numbers of more extensive field experiences, on-campus laboratory experiences have been overlooked as either (a) a powerful instructional option or (b) a valid assessment tool. This trend continues to grow in spite of the increasing evidence which indicates the relative failure of field-based experiences to develop desirable professional practice or to predict accurate future teaching performance (Metcalf, 1991). The relative failure of field-based experiences may reflect the practices that are being used in, or that are missing, from these experiences. The list of critical skills should be considered seriously for integration into the field experience, or optionally, the on-campus laboratory concept may become a part of field experience of preservice teachers.

If the educational profession could agree upon what constitutes desirable professional practice, there could be a blending of what is developed in on-campus laboratory experiences and what is developed and assessed in the field. In order for this to occur, specific criteria must be identified for assessing professional performance. The identified critical
teaching skills in this study could serve as a starting point in the
development of particular instructional behaviors, appropriate strategies
and techniques for solving classroom problems and desirable ways of
thinking about or reflecting on teaching practice. Research supports the
development of sequenced skill practice in the reinforcement of successful
skill generalization and transfer (Cornford, 1991). With the identification
of critical teaching skills, the advantage of an extensive practice program
which permits the examination of skill practice and performance over time,
and at sequential, theoretically identified stages, should benefit the teacher
education programs at universities and assessment programs of teacher
performance.

Teaching has struggled with the problem of functioning as a semi-
profession (Howsam et al., 1976). A profession contains a specialized body
of knowledge and skills acquired during a prolonged period of education and
training (Schein, 1972). To the extent that the teaching profession has
ignored this criteria it has remained a semi-profession. Efforts analogous
to this study can lead the way to developing an authoritative reference for
the profession. The validated skills identified here can serve as an action
agenda for the numerous stake-holders in education and specifically for the
domain of teacher education. State governments, accrediting and
certification associations can incorporate these skills into their standards
for teacher certification. Teacher education units can develop and
implement instructional and training experiences designed to help
preservice teachers become proficient in abilities critical to competent
teaching. The validated skills could also embellish the content of general
and special methods courses and be used as competencies for assessing student progress in laboratory, clinical and practicum experiences.

Teacher associations and teacher education associations could sponsor workshops focusing on validated teaching skills. Interested individuals and philanthropic associations could fund and undertake research efforts to further define, observe, measure and validate additional skills. Efforts could be directed at creating training experiences that focus on and refine validated skills. The validated skills listed here could be used to update and enrich microteaching experiences.

In spite of the impediments, a cadre of teachers with the knowledge and skills identified as professional and pertinent would be able to serve effectively the nation's youth and adult learners in our schools. In spite of the broad scope, limitations and impediments inherent in this type of effort, the process of identifying and implementing critical skills is essential to both the process and product of preservice teacher education.

If education reform, such as the implementation of critical teaching abilities, is to become a permanent part of teacher preparation, teacher educators must become better informed of their enterprise. They must be aware of the impediments and have knowledge of the forces influencing and controlling school reform progress.

**Recommendations for Future Research**

The present study, while extending the line of inquiry into teaching skills and professional skill development, also raises several questions which deserve further investigation.
1. What skills, through other forms of research, can be further identified as critical to teaching?

2. What criteria have been proposed for the identification of critical skills necessary for teacher preparation? What skills, using the criteria developed, can be identified as being critical to teaching? Through a content analysis of available research which skills can be identified as being critical by linkage to positive student outcomes?

3. What are the teaching skills that preservice elementary teachers, classroom teachers, and teacher educators believe to be critical to teaching?

4. To what extent have preservice elementary teachers within their professional education program received instruction in skills identified as being critical?

5. To what extent have elementary classroom teachers within their professional preparation programs, additional course work, or inservice activities received instruction in skills identified as being critical?

6. To what extent have teacher educators incorporated instruction concerning critical teaching skills within course structure?

7. To what extent have preservice elementary teachers, classroom teachers, and teacher educators used skills identified as being critical within their teaching context?

8. To what extent have teacher educators provided planned opportunities for preservice elementary teachers to use and/or practice skills identified as being critical?

9. To what extent has the significance of conceptualization and practice been determined regarding the acquisition and use of critical skills?
10. To what extent does the training method or presentation mode (traditional, individual, peer teaching, etc.) influence the acquisition and use of critical teaching skills?
APPENDIX A

Additional Teaching Skills Identified In the Review of the Literature for Chapter Two
APPENDIX A

Teaching Traits Identified by
The Commonwealth Teacher Training Study

1. Adaptability
2. Attractive Personal Appearance
3. Breadth of Interest
   Community
   Profession
   Pupils
Carefulness
Accuracy
Definiteness
Thoroughness
5. Consideration
   Appreciatiiveness
   Courtesy
   Kindliness
   Sympathy
   Tact
Unselfishness
6. Cooperation
   Helpfulness
   Loyalty
7. Dependability
   Consistency
8. Enthusiasm
   Alertness
   Animation
   Inspiration
   Spontaneity
9. Fluency
14. Industry
   Patience
   Perseverance
15. Leadership
   Initiative
   Self-confidence
16. Magnetism
   Approachability
   Cheerfulness
   Optimism
   Pleasantness
   Sense of Humor
   Sociability
   Voice (pleasing)
   Wittiness
17. Neatness
   Cleanliness
18. Open-mindedness
19. Originality
   Imaginativeness
   Resourcefulness
20. Progressiveness
   Ambition
21. Promptness
   Dispatch
   Punctuality
22. Refinement
   Conventionality
10. Forcefulness
   Courage
   Decisiveness
   Firmness
   Independence
   Purposefulness
11. Good Judgment
    Discretion
    Foresight
    Insight
    Insight
    Intelligence
12. Health
13. Honesty

Good Taste
Modesty
Morality
Simplicity
23. Scholarship
   Intellectual Curiosity
24. Self-Control
   Calmness
   Dignity
   Poise
   Reserve
   Sobriety
25. Thrift
The Florida Coalition for the Development of a Performance Measurement System

Planning

Content Coverage
- identification/selection of content
- analysis of content
- evaluation of content
- sequencing of content
- pacing of content

Utilization of Instructional Materials
- identification/selection of materials
- analysis of instructional material
- evaluation of instructional material
- management of instructional material

Activity Structure
- identification/selection of instructional activity
- sequencing of instructional activity
- analysis of instructional activity
- pacing of instructional activity
- specification of activity format
- evaluation of instructional activity

Goal Focusing
- identification of expected learner outcome
- justification of goals
- evaluation of goal/instruction congruence

Diagnosis
- identification of learner state
- matches learner needs with instructional element(s)
- evaluation of learner end-state
Management Of Student Conduct

Rule Explication and monitoring
  - rule specification and clarification
  - rule practice
  - rule monitoring

Teacher Withitness
  - deviancy spread
  - desist major deviance
  - correct target desist
  - alternative behavior

Overlapping (Withitness)
  - task desist overlap
  - task-instruction overlap

Quality of Desist
  - task-focus
  - clarity of desist
  - firmness of desist
  - roughness of desist
  - approval-focus desist

Group Alert
  - poses question, selects reciter
  - unison stimulus
  - alerts non-performers

Movement Smoothness
  - reacts to or interjects irrelevancies
  - flip-flop or dangle

Movement Slow-down
  - overdwelling
  - group fragmentation
  - prop fragmentation

Praise
  - praise for compliance
  - specific praise
- low-key praise
- conditional praise
- authentic praise
- teacher control of group praise

**Instructional Organization and Development**

**Effective Use of Time**
- punctuality
- management transition
- wait time avoidance
- controlled interruptions
- housekeeping

**Review of Subject Matter**
- lesson-initiating review
- topic summary within lesson
- lesson-end review

**Lesson Development**
- low order questions
- high order questions
- non-academic questions
- congruence of answer
- pause following a question
- lesson initiation
- solo performance
- choral practice
- academic comprehension check
- academic transition signals

**Teacher Treatment of Student Talk**
- restates student response
- avoids digression
- acknowledges a student response
- probes or amplifies a student response

**Teacher Academic Feedback**
- simple positive response
- academic praise
- correctives
- redirects after student response

Management of Seatwork/Homework
- gives seatwork or homework directions
- checks comprehension of seatwork/homework
- sets time for checking homework/seatwork
- teacher mobility
- holds students accountable and gives feedback

Presentation of Subject Matter

Presentation of Interpretative (Conceptual) Knowledge
- gives definition only
- gives example(s) only
- test example (rule-example)
- identifies attributes
- distinguishes related concepts
- concept induction

Presentation of Explanatory (Law or Law-Like) Knowledge
- explicates the cause
- explicates the effect
- states causal principle, using linking words
- applies a causal principle

Presentation of Academic Rule Knowledge
- describes the situation
- provides for application (practice)

Presentation of Value Knowledge
- states and explores a value question
- develops criteria of judgment
- assembles the facts
- tests the value judgment
Communication: Verbal Nonverbal

Control of Discourse
- question overload
- single questions
- connected discourse
- scrambled discourse
- vagueness words

Emphasis
- repetition
- marker expressions
- marker techniques

Task Attraction and Challenge
- task attraction
- task challenge

Speech
- loud, noisy, or grating voice
- shrill, piercing, high-pitched voice
- monotone—fails to vary the intensity, rate, and volume of speech
- speaks too softly, almost inaudibly

Body Language
- teacher smiles
- deadpan expression
- teacher frowns
- posture and movement
- eye contact

Testing: Student Preparation, Administration, Feedback

Preparation for Testing
Test Administration
Formative Feedback
Studies Providing Research On Teacher Effectiveness

Rosenshine (1971)

The emphasis of this text was on the knowledge of the relationship between teacher behaviors and student achievement. The focus was on observed behaviors of teachers during instruction, and the relationship between these behaviors and measures of student gain. The review included approximately 51 studies. Results of the study contain the categories: Teacher Approval and Disapproval, Teacher Cognitive, Flexibility and Variety, Enthusiasm, Amount of Teacher–Student Interaction, Time, and Antecedent and Demographic Variables.

Teacher Approval & Disapproval
Teacher use of criticism
Mild criticism

Affects loading of criticism
Teacher Non-Verbal Approval
Teacher Use of Praise
Use of Student Ideas
Teacher warmth

Flexibility and Variety
Variation in teacher behavior
Variability

Enthusiasm

Cognitive Behaviors
Achievement-oriented
-business-like-
-behavior
Organization
Clarity
Difficulty
Structuring
Pacing of lesson
Selection of materials
Teacher questions
-high level
-low level
-probing
Teacher questions/
-interchanges
-convergent
-divergent


Amount of Teacher-Student Interaction
Teacher talk
Student talk or participation
Frequency of teacher-student interactions
Time
Time on criterion activities
Student opportunity to learn
Teacher spent time in class preparation
Antecedent and Demographic Variables
Teacher knowledge
Teacher general attitude
Teacher expectation

Cruickshank (1976)

The purpose of the study was to compare and contrast results of relatively large-scale, federally funded research on teaching reported at the Research on Teacher Effects Conference held at the University of Texas in November 1975. Reports used in the study were those presented by Berliner and Tikunoff, Brophy and Evertson, Gage, McDonald, Stallings, and Ward and Tikunoff. Comparisons were in terms of their purposes, methodologies, variables, and results (Cruickshank, 1990).

I. Correlates of Reading Improvements

Berliner & Tikunoff (1976)

1. Second and fifth grade reading improvement is associated with teachers who are:

- satisfied
- accepting
- attentive
- encouraging
- optimistic
- democratic
- aware of developmental levels
- consistent in controlling
- tolerant of race and class
- equitable in dividing time
-knowledgeable about teaching reading  -providing structure
-capitalizing on unexpected events  -showing warmth
-waiting for pupil answers  -making pupils responsible for their work
-using praise  -adjusting to student's rate of learning
-monitoring  -using less busy work
-making fewer illogical statements  -less belittling
-less ignoring  -less harassing
-less recognition seeking

2. Effective second-grade teachers compared with effective fifth-grade teachers use:
- more positive reinforcement  -moved around more
- are more open  -are more trustful
- ask more open-ended questions  -are more polite
- ask more interpretive questions  -do less stereotyping
- call more pupils by name  -do less moralizing
- use more teacher-made material  -promote less competition
- do less rushing  -do less policing
- less sarcastic  -do less shaming
- are less concerned about time

3. Effective fifth-grade teachers compared with effective second-grade teachers tend to:
- defend their pupils  -utilize pupil peer teaching
- do less drilling  -exclude or banish pupils less
McDonald (1976)
1. Second-grade reading instruction is enhanced by use of:
   - small-group instruction
   - constant teacher monitoring and corrective feedback maximized
   - direct instructional time
   - maintain a high level of interaction
   - use a variety of instructional materials with pupils not in the reading group
2. Fifth-grade reading instruction is best accomplished when teachers spend considerable time:
   - explaining
   - questioning
   - stimulating cognitive progress
   - providing independent work
   - using instructional variety

Stallings (1976)
1. First and third grade improvement in reading is associated with:
   - length of the school day
   - time spent on reading
   - use of programmed workbooks
   - positive reinforcement
   - use of textbooks
   - task persistence by students
   - greater interactions between adult and pupils

II. Correlates of Language Arts and Mathematics Improvement

Brophy (1976)
1. Second and third-grade teachers whose pupils do well in both language arts and mathematics considered the socio-economic status of the pupils.

<table>
<thead>
<tr>
<th>High Socioeconomic Status</th>
<th>Low Socioeconomic Status</th>
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</thead>
<tbody>
<tr>
<td>- task-oriented</td>
<td>- high expectations for pupils</td>
</tr>
<tr>
<td>- high expectations</td>
<td>- more supportive</td>
</tr>
<tr>
<td>- demanding</td>
<td>- encouraging</td>
</tr>
<tr>
<td>- critical</td>
<td>- affectively oriented</td>
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</table>
III. Correlate of Mathematics Improvement

Berliner and Tikunoff (1976)

1. Second and fifth grade math improvement is associated with teachers who are:

- attentive to learners
- consistent in controlling
- optimistic
- monitor learning
- adjust to the learner's rate
- call pupils by name
- provide more structure
- do not seek recognition
- use less busy work
- do not treat class as a whole

- willing to reteach
- take up pupils' personal matters
- more accepting
- knowledgeable about math
- polite
- ask more open-ended questions
- capitalize on unexpected events
- make pupils responsible for their work
- less abrupt and belittling
- do not banish or exclude pupils
- use less sarcasm and shaming
- make fewer illogical statements

2. Effective second grade classroom teachers compared with effective fifth grade classroom teachers are more:

- democratic
- warm
- satisfied
- move around more
- use more praise

- encouraging
- flexible
- more aware of pupil's developmental levels
- equitable in dividing time among pupils
- individualize
- use peer teaching
- show more warmth
- care less about being liked
- no emphasis on quietness
- less ignoring
- less concerned with time

3. Effective fifth grade teachers compared with effective second grade teachers use:
- less nonverbal control
- more positive reinforcement

McDonald (1976)

1. Effective second grade mathematics instruction is characterized by:
- more time spent on math
- keeping pupils on-task
- more monitoring of individual pupil’s work
- teaching to a wide variety of content skills

2. Effective fifth grade mathematics instruction includes:
- use of whole class instruction
- small group instruction
- use of a variety of instructional techniques

Stallings (1976)

First and third grade mathematics instruction seems to be enhanced by:
- a longer school day
- frequent use of textbooks
- Cuisenaire rods
- discussion by pupils/teachers
- immediate reinforcement
- more time spent on math
- programmed workbooks
- Montessori materials
- systematic instruction
Borich (1979)


Findings:

Soar and Soar (1972)
1. Use moderate control techniques.
2. Vary structure. Increase it for low and decrease it for higher cognitive ideas.
3. Vary teacher-pupil interaction according to pupils’ needs and abilities.
4. Increase positive affect for low socio-economic pupils.
   Lower it for high socio-economic pupils.

Brophy and Evertson (1974)
1. Keep pupils actively involved.
2. Establish flexible rules for order.
3. Use mild, non-physical punishment.
4. Take responsibility for pupil achievement or lack of it, have high expectations.
5. Vary the difficulty of the lesson as necessary.
6. Call on pupils systematically rather than randomly.
7. Give credit for partially correct answers.
8. Give feedback.
9. Encourage question asking.

For Low Socio-Economic Students:
1. Be warm and encouraging.
2. Provide adequate pupil response time.
3. Present information in small chunks at a slow pace.
4. Stress factual knowledge.
5. Monitor pupil progress.
7. Provide smooth transitions.
8. Provide help immediately to those who need it.
9. Use special materials to meet individual needs.

For High Socio-Economic Students.
1. Correct wrong or poor answers.
2. Ask difficult questions.
3. Follow the curriculum.
4. Assign homework.
5. Let pupils initiate questions and projects.
6. Encourage the reasoning out of answers.

*Stallings and Kaskowicz (1974)*
1. Maximize instructional time.
2. Use systematic instruction (present content, ask questions, wait for responses, provide feedback, guide pupils to correct responses).
3. Encourage discussion of mathematics material.
4. Encourage and praise pupils with low mathematics achievement.
5. Use textbooks and programmed workbooks for math instruction.
6. Encourage task persistence during math instruction.
7. Use a wide variety of instructional materials.
8. Encourage pupil accountability.

*Good and Grouws (1975)*
1. Maximize whole-class instruction.
2. Maintain a relaxed atmosphere.
3. Establish work and success standards for pupils and maintain them.
4. Provide feedback.
5. Ask clear questions.
6. Limit use of praise when performance is poor or when pupil expectations are low.
7. Encourage pupil-initiated contact with teacher.
8. Maintain a classroom free of major behavioral problems.

McDonald et al. (1975)
1. Maximize direct instruction during second-grade reading by using small-group procedures and by maintaining a high level of interaction with individual pupils.
2. Maximize content coverage in second-grade math instruction.
3. Reduce group work and increase individual monitoring of pupils during math instruction in fifth grade.
4. Discuss, explain, question, stimulate during fifth-grade reading.

Denham & Lieberman (1980)
This study identified and described teaching skills and their impact on student outcomes, fostered research on teaching and teacher education, enhanced communication between researchers and educators, and modeled effective interagency cooperation. A field study, conducted during the years 1976 through 1978, involved approximately 25 teachers in each of grades two and five. Selected in each of the classrooms, were six students similar in entering (base line) achievement. These students completed achievement tests and attitude measures in October, December, May, and the following fall. Teachers, between tests, maintained records of time allocations, difficulty level of reading and mathematics tasks and reported on their planning in weekly interviews. Weekly observations focused on time allocation, student task engagement, task difficulty, and
teacher behaviors directed to the observed students. According to Denham and Lieberman (1980) effective teaching consisted of the following skills or characteristics.

Diagnosis

Prescription

Presentation
- giving directions
- structuring
- questioning
- checking seatwork
- explaining
- awareness of student progress

Feedback
- academic feedback
  - group interaction
  - recitation
  - modeling
  - correcting errors
- engagement feedback
  - feedback to the student about whether classroom behavior is acceptable or unacceptable
- clarity
- clear expectations
- positive reward system

Context
- academic orientation
  - emphasize, value, and work toward cognitive achievement
- affective orientation
  - aware of, acknowledge, and value student feelings
- learning environment
  - cooperation
  - student responsibility
The Model Classroom as defined by Denham and Lieberman.

1. There is a clear focus on cognitive learning.

2. The students expect to work and are held responsible for doing so.

3. The teacher cares about the students and wants them to learn.

4. The teacher and students interact comfortably and frequently on work activities.

5. The teacher emphasizes the belief that the purpose of school is learning and fosters an environment where everyone, teacher and students, works together to reach that goal.

**Stallings (1982)**

This study originated as part of a two-phase project sponsored by the Basic Skills Improvement Office of the Department of Education. The goal of the project was to create programs consisting of basic skills at the secondary level to insure that secondary students without basic skills acquired them before leaving the educational system.

The first phase of a national study group project, created to pull together critical issue papers, identified the central concerns in the development of basic skills programs. In the second phase the study group met with 150 principals from 14 Washington, D.C. area schools to share what they believed were the critical issues. The final phase of the project was the development of a guide for principals to use in developing their own basic skills programs. The effective strategies identified in the chapter
"Effective Strategies for Teaching Basic Skills" by Jane A. Stallings are listed below.

Findings:
1. In classrooms where there was less student misbehavior and more student achievement throughout the year there was greater clarity in first-day organization and planning.
   a. Teachers made rules, consequences and procedures clear on the first day. These included monitoring the students and following through with consequences for those who did not comply.
   b. Teachers established a system of student responsibility and accountability for work on the first day.
   c. Teachers were skillful in providing information and instruction.
   d. Teachers were skillful in organizing several instructional activities.
2. Effective classroom managers were:
   a. efficient in making assignments and dispensing materials resulting in more instructional time.
   b. were prompt in starting class and continued teaching until the end of class.
   c. when working with pupils who read below grade level, were likely to spend more time in oral reading in small groups and to devote more time to use of examples and providing explaining (clarity), reviewing, and discussing.
3. Effective classroom managers use the following school procedures to help low achieving students:
   a. maintaining a classroom climate that is friendly, competitive, and has high expectations.
   b. whole-class teaching with pupils sometimes leading, giving reports, and reading aloud.
c. keeping intrusions to a minimum.
d. assigning pupils to smaller, homogeneously grouped classes.
e. giving pupils grades based on progress rather than on attainment of grade-level standards.
f. encouraging parent interest and participation in their child's program and progress.

4. School policies related to effective basic skills instruction:
   a. have consistent expectations for students throughout the school.
   b. emphasize pupil success and potential
   c. have clear, direct and timely communication and feedback
   d. have teachers willing to see students for personal assistance.
   e. have joint curriculum planning (collaboration).

**Cruickshank (1990)**

Cruickshank (1990) synthesized research on effective teaching from the 1970's and 1980's. Within his text, *Research That informs Teachers and Teacher Educators*, he reviewed ten studies and identified 85 variables as being effective.

Effective teachers seem to demonstrate:

1. Clarity
2. Organization (clarity of)
3. Enthusiasm
4. Task-oriented, businesslike behavior
5. Provision of opportunity for students to learn criterion material
6. Variability/variety
7. Criticism (negatively related
8. Seatwork variety and challenge
9. With-itness
10. Smoothness (of transition)
11. Momentum (pacing)
12. Overlappingness
13. Group alerting
14. Accountability
15. Praise
16. Use of material incentives
17. Use of small groups
18. Use of more pupil participation/interaction
19. Acceptance-support
20. Attending/monitoring behavior
21. Awareness of and adjustment to developmental levels
22. Consistency in controlling
23. Encouragement
24. Tolerance-politeness-tact
25. Optimism
26. Equitableness of pupil participation
27. Knowledge of subject
28. Structure
29. Ability to capture and use unexpected events (teachable moments)
30. Warmth
31. Wait-time
32. Individualization
33. Less "busy work"
34. Time-on-task persistence and efficiency
35. Use of independent work
36. Stimulation
37. Use of feedback
38. High expectations
39. Awareness of and adjustment to pupil socio-economic status
40. Use of open ended questions
41. Call pupils by name
42. Less recognition seeking
43. Democratic teaching style
44. Flexibility-adaptability
45. Ability to overcome stereotypes of particular pupils
46. Acceptance of some "noise"
47. Less caring about being liked
48. Trust
49. Less time consciousness
50. Use of pupil peer teaching
51. Use of programmed materials
52. Use of manipulatives
53. Immediate reinforcement
54. Large-group instruction
55. More seatwork
56. More lower-order questions
57. Less use of pupil ideas or answers
58. Less pupil initiated talk
59. Less complexity
60. A repertory of control techniques
61. Questioning of non-volunteers
62. Use of less traditional materials
63. Use of independent work that is interesting, worthwhile and able to be completed independently
64. Use of mild forms of punishment
65. Responsibility for pupil learning
66. Ability to provide information in small chunks
67. Possession and use of factual knowledge
68. Ability to minimize disruptions
69. Provision of immediate help to learners
70. Ability to maintain relaxed atmosphere
71. Maintenance of student work and success standards
72. Maximal content coverage
73. Prompting
74. Ability to express feelings
75. Listening skills
76. Organization for and from the first day
77. Promptness in starting class
78. Use of oral reading
79. Use of parent participation
80. Planning expertise
81. Ability to show students relationships and importance of what is being learned to past and future learning
82. Metacognitive processes necessary for learning
83. Ability to anticipate and correct student misconceptions
84. Ability to select, use, enrich and expand on appropriate instructional materials
85. Reflectiveness
APPENDIX B

A Classification of the Skills Identified for the Initial Screening in Chapter III Under the Heading of Preactive, Interactive, and Postactive Skills
APPENDIX B

PREACTIVE, INTERACTIVE, POSTACTIVE SKILLS

PREACTIVE SKILLS

Alternative Teacher Responses
Collaboration
Developing Objectives
Developing a Teaching Style
Assessing Prior Knowledge
Reacting
Delegating Responsibility
Classroom Arrangement
Prescribing Materials
Planning Expertise
Role Perception
Organization of Daily Planning

Developing Student Relationships
Designing Affective Behavior
Planned Repetition
Assigning Homework
Constructing Tests
Time Management
Assessing Pupil Needs
Classroom Management
Organization (Clarity of)
Structuring
Diagnosing Skill Levels

INTERACTIVE SKILLS

Praise
Verbal behavior
Accepting Feelings
Discussion
Enthusiasm
Giving Directions/Instructions
Giving Affection
Helping Skills
Social Interaction
Teacher/Group Interaction
Interpersonal Skills

Set High Expectations
Non-verbal behavior
Class Participation
Developing Rapport
Feedback
Lower Order Questions
Human Relations
Information Processing
Interaction
Teacher/Student Interaction
Promoting Interaction
Cuing
Higher Order Questions
Reinforcement
Rewarding Students
Variability/ Variety
Use of Advanced Organizers
Creating Student Involvement
Recitation
Less Student Initiated Talk
Small Group Instruction
Closure
Demonstration
Illustration
Laboratory
Presentation
Stimulus Variation
Assessing Student Work
Student Management
Classroom Behavior
Criticize or Justify Authority
Control of Participation
Discipline
Movement Time
Management of Class Time
Use of Material Incentives
Obtaining Attending Behavior
Recognizing
Silent Non-Verbal Cues
Large Group Instruction
Momentum
Consistency in Controlling
Repertory of Control Techniques
Ability to Minimize Disruptions
Overcome Stereotyping of Students
Probing Questions
Divergent Questions
Creating Student Success
Silence (wait-time)
Clarity
Discussion
Audio/ Visual
Student Initiated Talk
Individual Instruction
Using Examples
Concept Teaching
Focusing
Lecturing
Motivation
Set Induction
Administer Tests
Thinking Skills
Decision Making
Critical Thinking
Developing Inferences
Development of Hypotheses
Problem Solving
Testing of Hypotheses
Value Analysis
Practice Time
Listening
Assessing skills
With-itness
Overlappingness
Mild Forms of Punishment
Time on Task Persistency
Seat Work
Maintain Relaxed Atmosphere
Adjustment to Development Levels
Adjustment to SES  
Prompting  
Information Processing  
Role Playing  
Smoothness Within Lesson  
Student Awareness  

Maintenance of Success Standards  
Variety of Instruction  
Setting a Model  
Smoothness of Transitions  
Re-direction  
Fluency in Asking Questions  

**POSTACTIVE SKILLS**

Assessment of Non-verbal Skills  
Analyzing Pupil Information  
Reflection  
Accountability  

Teacher-Parent Interaction  
Checking  
Self-Analysis
APPENDIX C

Screening Process for the Identification of Critical Teaching Skills
APPENDIX C
IDENTIFYING CRITICAL TEACHING SKILLS

The model for the identification of critical teaching skills consisted of six separate criteria. These screening criteria are as follows:

1. The item fits the definition of a skill as defined by Cruickshank and Metcalf (1990), namely, a developed or acquired aptitude or ability which can be integrated into teaching through practice.

2. The item's definition is generally agreed upon within the profession.

3. The item is a discrete behavior which is observable and measurable both qualitatively and quantitatively.

4. It is a generic skill applicable to a wide variety of subject areas.

5. The item is mentioned in the reviewed literature.

6. The item is supported by research and is associated with positive student outcomes.

Each item was subjected to the screening criteria listed above. To be given further consideration as a critical teaching skill an item had to successfully filter through all six criteria.
### Screening Process for Identifying Critical Teaching Skills

<table>
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<th>Skill</th>
<th>1</th>
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<td>Adjustment to Development Levels</td>
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