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The Relationship of Sequential Patterns to the Music Teaching Effectiveness of Elementary Education Majors.

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The relationship of sequential patterns to the music teaching effectiveness of elementary education majors

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THE RELATIONSHIP OF SEQUENTIAL PATTERNS TO THE MUSIC TEACHING EFFECTIVENESS OF ELEMENTARY EDUCATION MAJORS

A Dissertation

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ABSTRACT

The purpose of this study was to examine the relationship of sequential patterns of instruction (a direct instruction teaching cycle) and the individual components of these patterns to overall teacher effectiveness of music lessons taught by elementary education majors. Sequential patterns included (1) teacher task presentation, (2) student response, and (3) teacher reinforcement. A second focus of the study was the comparison of two instructional methods for providing training in the use sequential patterns of instruction.

Students enrolled in three sections of a music methods course for elementary education majors served as subjects. All subjects completed five teaching tasks which were videotaped and analyzed. The first four teaching tasks served as training for the presentation and analysis of a 6 minute music concept lesson which provided data for the study. The Contact Control Group (n=20) received teacher modeling in preparation for the five class activities. Two classes serving as Experimental Groups 1 (n=21) and 2 (n=20) received teacher modeling identical to the Control Group, as well as instruction and training in the use and analysis of sequential patterns. Experimental Group 1 received instruction and written practice in patterns, and Experimental Group 2 received instruction and active practice in patterns.

Music concept lessons were analyzed for time spent in the three components of sequential patterns (task presentation, student response, reinforcement) and for frequency percentage of patterns and pattern components. In addition, these videotaped lessons were evaluated by a master teacher for overall teacher effectiveness with scores ranging from 0 to 10. Teacher effectiveness scores were correlated to sequential pattern data (time spent in pattern components and frequency of patterns and components) to examine the

relationship between overall teacher effectiveness and teaching patterns. The performance of both Experimental Groups was also compared to determine the effect of instructional approach.

Comparisons of teacher effectiveness scores and 11 variables related to sequential patterns yielded correlations too low to serve as predictors of effective teaching, though significant correlations occurred with four variables associated with reinforcement and accurate task presentation. Group comparisons showed significant differences between the Control Group and Experimental Group 1 regarding time spent in task presentation, time spent in student response, and in frequency of patterns using nonspecific reinforcement.

No differences were evident between the two Experimental Groups, which perhaps indicates that variation of instructional method during sequential patterns training is not consequential to student achievement. The approach used for Experimental Group 1 required less class time than the procedure used for Experimental Group 2.

INTRODUCTION

Statement of the Problem

Effective instruction resulting in high achieving students has always been an important mission for teachers. Although the development and nurturing of the whole child is still generally accepted as an appropriate educational goal, demonstrated mastery of specific academic subject matter by students has become a primary focus of the business community, the media, taxpayers, parents, school boards, administrators, and teachers. As a result, increased emphasis on student achievement as a measure of effective teachers and schools has permeated education from preschool through university level. During the last decade, numerous editorials, reports, and political publications have urged greater emphasis on academic subject matter in teacher training and effective school practices in administrative training (Beck, 1988; Greenberg, 1989; Matthes, 1987; Sizer, 1984). Donald Medley (1979) listed two important ways to improve the effectiveness of teachers: (1) Change the way teachers are evaluated, and/or (2) change the way teachers are educated.

The educational community has responded to an increased emphasis on accountability with concerted efforts to identify variables which impact teacher effectiveness. According to Brophy and Evertson (1976), effective teaching requires more than just use of basic teaching skills, but rather the implementation of a large number of varied skills which can be specifically tailored for immediate needs. Investigation of these skills and their impact on effective teaching has focused on both education generally and subject matter specifically. Music educators have found that not all educational research can be

generalized across subject matter and grade levels. Thus, music-specific investigation has begun to provide a core of information regarding effective teaching issues pertinent to musical settings.

Sequential patterns of instruction is one procedure which has evolved through ongoing research projects in the field of music education (Yarbrough & Price 1981; 1989; Price, 1983, 1989). First, teaching sessions of experienced music teachers were systematically analyzed (Yarbrough, 1988) with procedures adapted from the direct instruction model— a model developed to provide a structured environment focused on academic content and student learning among slow learners. Pattern usage by experienced teachers provided the database for the development of the sequential patterns instructional method (Yarbrough & Price,1989). The second phase of research disseminated this instructional method to college methods classes for preservice teachers and inservice presentations for professional teachers, with results indicating that the procedure could be taught and students could successfully incorporate pattern usage into teaching presentations (Yarbrough & Price, 1989; Price, 1989).

The relationship of sequential patterns to teacher effectiveness has not yet been explored. Although students trained in the use sequential patterns improve in pattern usage and appear to become more effective teachers, there are no data which isolate the influence of sequential pattern instruction from other variables (such as teacher magnitude variables, teacher modeling, and teacher intensity variables) which impact teacher effectiveness.

Purpose of the Study

Preparing preservice elementary teachers to provide academic music instruction to students is a formidable task to accomplish within a one semester time frame. Not only must teaching skills appropriate for music instruction be mastered, but some level of proficiency in the music subject matter must also

be reached. The effective use of teaching time becomes critically important, and there is great need for isolation and examination of teaching procedures leading toward high student achievement.

Although there has been some analysis of sequential patterns used by music teachers in the elementary classroom (Yarbrough, 1988), there has been no study of pattern training incorporated into a class for elementary education majors who are primarily non-musicians. Therefore, the current study investigated the effectiveness of three instructional approaches for improving the appropriate use of sequential patterns by nonmusician preservice teachers when teaching a music concept lesson. The three instructional approaches examined were teacher modeling, training in sequential patterns through written practice, and training in sequential patterns through active student practice. Comparisons were made between the relationship of sequential pattern usage and effective teaching scores, and of pattern usage by students with differing treatments in sequential pattern usage.

Data were provided by videotapes of elementary education majors teaching a music concept lesson. These tapes were evaluated for lesson effectiveness by a master teacher and scored from 0 to 10. Additionally, sequential patterns were timed, coded, and counted to provide data regarding effect of treatment on the use of patterns by students in three classes. Pattern data was then correlated to the effective teaching scores to examine score and pattern relationships.

REVIEW OF LITERATURE

From rather simplistic beginnings, research in effective teaching has evolved into true scientific inquiry examining many aspects of effective teaching: Teacher characteristics, teacher behaviors, student behaviors, the lesson format, the classroom environment, and interactions and relationships of combined aspects. Early research efforts involved teacher ratings, teacher qualities, and observations of teachers and students. Gradually, process-product studies, those examining some process of teaching in relation to the resulting product or student outcome, began to question effects and relationships of variables on effective teaching (Medley, 1977). Examination of multiple process variables followed. Recently, a more complex level of research has developed patterns or clusters of behaviors as models or theories of teaching, such as direct instruction. Ethnographic studies offered a viable alternative to behavioral research, and much descriptive information about teaching and schools has resulted. Attitudes of teachers and students have also been examined to determine the influence of perceptions in educational settings.

After an abundance of studies of teachers, the role of students in the learning process became an area for investigation and analysis. Student achievement, attitude, behaviors, perceptions, personal characteristics, and demographic data have all been observed in controlled research settings. The twenty year period from 1965-1985 produced a large body of research on effective teaching as educational researchers attempted to isolate those factors contributing to the success or failure a teacher experienced in producing high-achieving students. Contributions to the body of effective teaching research have come from specific subject matter areas in addition to investigations generalizable to the total education population.

An analysis of effective teaching variables across fifty studies has identified teacher behaviors which consistently had a significant effect on student achievement (Rosenshine & Furst, 1973). Effective teachers were task oriented, business-like, enthusiastic, and indirect. Lessons were marked by clarity, variability, and opportunities for student learning of the criterion material through structured comments and multiple levels of questions followed by criticism (or feedback) . Many studies small in scope have also isolated effective teaching variables within specialized content areas. Lessons of expert teachers were scrutinized to identify effective math teaching behaviors in an effort to provide improved instruction for undergraduate math teachers. Several conditions were found to be embedded in expert math teaching: Good use of time and coverage of the material; good sense of constructing a strong lesson from multiple lesson segments; and specific teaching of content through use of content-based agendas, goals, and supporting action. Lessons by expert teachers were said to be "clear, accurate, and rich in examples and demonstrations" (Leinhardt, 1986; p. 32). The use of routines was a common factor which was discussed in all three conditions. In other work on effective teaching, Berliner also has cited use of routines as a key difference between effective teachers and less expert ones (Brandt, 1986).

Five conceptions of the effective teacher have also been identified in research by Medley (1979): Possesses desirable personal traits, uses effective methods, creates a good classroom atmosphere, demonstrates mastery of a repertoire of competencies, and is a professional decision maker who has not only mastered needed competencies but knows when to apply them and how to orchestrate them. Specific instructional skills of effective teachers were isolated through analysis of effective teaching research. Six teaching functions developed by Rosenshine (1986), which have been labeled "the scientific basis for the

art of teaching" (p. 64) include: Daily review, presentation of new material, guided practice, feedback and correctives, independent practice, and weekly/ monthly reviews. The second teaching function, presentation of new material, included specific guidelines for procedure which reflect many direct instruction criteria: State lesson goals, focus on one point at a time and complete it, teach in small steps, give step by step directions, model behaviors by going through the directions, organize the teaching sequence and master each step before proceeding, and avoid digressions.

As educational reform has grown into a national movement, reports of research on these and other effective teaching variables have become the map for charting new directions in school organization, school practices, and teacher training and retraining. One negative outcome of the intense demands placed on educators for increased teaching effectiveness has been the desire for "generic, quick-fix" teaching packages (often a workshop-like approach) (Goodlad, 1990).

Effective Teaching

Early studies often focused on teacher characteristics deemed important by teachers, administrators, and students. Researchers reached some consensus on desirable traits but few relationships of these traits to such variables as student achievement were explored (Brophy & Good, 1986). On occasion, teacher characteristics were correlated with student learning measures, with teacher characteristics defined by personality measures and demographic characteristics (such as number of years in teaching). Some comparisons were made of these teacher characteristics between various groups, such as elementary versus secondary teachers, or math versus reading teachers. Further

investigations examined the influence of teacher characteristics on teacher attitudes and behaviors. However, few early studies examined the impact of teacher characteristics on student achievement (Powell & Beard, 1984).

Researchers turned to studies comparing achievement of classes taught with differing methodologies and found that most results were either inconclusive or conflicting (Powell & Beard, 1984). In addition, research difficulties and analysis errors further confounded results from research comparing methodologies (Brophy & Good, 1986).

Behavioral observation provided data about teachers, students, and classroom environments. Concerns for good classroom climate and a desire to investigate teacher competencies and behaviors as related to student achievement fostered research emphasizing a plethora of teacher observation techniques (Brophy & Good, 1986). Codes for categorizing behaviors observed at specified intervals of time (such as 3 seconds or 10 seconds) were developed and used to record teacher and student behaviors and interactions. Flanders' Interaction Analysis method, an important contribution to research procedure, investigated ratios of direct and indirect teaching. Flanders anticipated that teacher talk would have a negative correlation with student achievement and indirect questioning would have a positive relationship with student achievement (Powell & Beard, 1984). However, Flanders reported a positive correlation between teacher talk (defined as the following direct instruction behaviors: Lecturing, giving directions, criticizing, and justifying authority) and both achievement and attitude. The primary focus of this investigation was comparison of direct and indirect instruction when correlated to student achievement and attitude, and direct instruction correlations indicated stronger relationships with student attitude and achievement than indirect instruction. However, this finding was complicated by difficulties in isolating the

observations of direct and indirect instruction, and results have tended to match later research when clear definitions of what was measured and how it was compared are considered (cited in Brophy & Good, 1986). Regardless of the results, the Flanders study provided a useful research model for examining instructional processes. The number of new procedures and instruments for recording behavior has continued to grow. Various teacher behaviors have been studied independently and in cluster groups, and reliability of observations has become an extremely important issue as observational data has been used for examining both verbal and nonverbal behaviors (Powell & Beard, 1984).

Researchers concerned with forcing teacher and student behaviors into restrictive categories during observational sessions turned to the practice of conducting ethnographic studies. Rather than looking for specified behaviors in the classroom (possibly recorded through time-sampling observation), the ethnographic researcher records all student and teacher occurrences during extended classroom observations. A narrative or story can be used to record the data, the researcher then seeks to develop themes or hypotheses to explain these happenings. Used in educational settings, this "discovery" methodology has several positive features: No prior conceptions have been formed by the investigator, the investigator can view events (even controversial topics) through the eyes of the participants, and comprehensive observation periods allow examination of multiple factors (Biddle & Anderson, 1986). Ethnographic studies like the California Beginning Teacher Evaluation Study have provided important descriptive information about classroom environments, and the resulting twenty one variables isolated as significant predictors of effective teaching made a worthy contribution to the research literature. One major contribution to research examining effective teacher variables which was added by this study was affective in nature. Results showed that academically effective

teachers could also be warm, student-oriented people who established positive attitudes in their classrooms (Berliner & Tikunoff, 1976).

Process-Product studies have investigated the classroom processes or behaviors which result in student learning or other student outcomes. A variety of studies are included inthis category, with a large number examining the relationship between various teacher behaviors and student learning (Medley, 1977). Research teams began to undertake a series of related studies. Combined results from The Canterbury Studies of the 1970's indicated that academic content affects student achievement more than teacher delivery, that younger students need more active participation than older students, and that teacher structuring of content, especially in reviewing, is beneficial. There was not a unified acceptance of the stability of data gathered through classroom observation procedures, as noted by Rosenshine (1970), but gradually the observation systems became more sophisticated with much greater reliability (Brophy & Good, 1986).

Educational researchers eventually concluded that investigation of single characteristics and/or behaviors was not an accurate examination of an effective teacher. Research in learning was often viewed as an activity of the teacher rather than the effect of the teacher behavior on the learner's behavior (Medley, 1977; p. 70). Within the classroom, teacher behaviors operate simultaneously with and are impacted by other behaviors and characteristics (Powell & Beard, 1984); thus, multiple relationships came under scrutiny.

Studies gradually began to investigate clusters and multiple factors which resulted in patterns. Berliner (1979) reported relationships between teacher instructional time, subject mastery, and student learning. Researchers developed models of teaching, such as the direct instruction model, which were based on patterns or clusters of three characteristics: Teacher task

presentation, student engagement, and teacher feedback (Powell & Beard, 1984). Project Follow Through, a large-scale examination of direct instruction, studied student achievement resulting from the pattern of instruction. One measurement determination concerned reinforcement. Feedback expressed as raw frequencies was found to be less meaningful than feedback expressed as a proportion of the whole (such as proportion of all correct answers which were praised by teachers).

Teacher perceptions, as related to student expectations, and teacher planning, as related to student achievement, were studied by educational researchers resulting in focused attention on the student. Student behaviors, student perceptions, teacher-student interactions, and student expectation, for example, were defined and studied in research settings, but relatively speaking, studies of students have been few in number (Powell & Beard, 1984). A study exploring student perceptions of effective teaching in a music setting was conducted to determine what knowledge and philosophy pre-intern teachers bring to their student teaching experiences after completing a research based behavioral curriculum (Brown, 1989). Results suggested that students were much more attentive to how classroom teachers delivered academic information to students than to teacher preparation/planning tasks or personal characteristics of the teacher. Apparently, instruction in behavioral observation presented during college methods courses affected student perceptions of classroom activity.

Research documenting differences in experienced and novice teachers has shown that novice and expert teachers process information and behave differently (Berliner & Tikunoff, 1976). In the Brown (1989) study mentioned above, differences were noted between experienced and novice teachers in

classroom problem-solving behaviors. Another recent study observed a common practice among effective teachers which was not usually present in novice teachers, and this common practice evolved into a model known as Reflective Teaching. (Kirby & Teddlie, 1989). This decision making procedure has three steps: Diagnosis, testing, and personal causation. Diagnosis involves ability to "set" the problem based on past experiences, professional knowledge, and other personal resources. The second step, testing the problem, requires evaluation of the multiple aspects of the problem, such as how it can be solved, possible consequences, importance of solving the problem, etc. The third step for reflective teaching involves personal and professional commitment to the values involved in the testing step. A strong sense of self belief, often strengthened with experience, is vital for this step. It was postulated that lack of professional experience has hindered the novice teacher in effectively making decisions in an educational setting.

Direct Instruction

A new method of educating teachers, as reported by Rosenshine (1979), was explored by Becker, Engelmann, Carnine, & Rhine (1981), Carnine (1979), Engelmann (1980), and others. This teaching method was labeled Direct Instruction. Direct Instruction was originally designed for reading and math curriculums for slow learners and required the following elements: An academically focused classroom, a teacher-directed classroom, sequenced materials, clear goals for students, adequate time for instruction, extensive coverage of the course content, operation at a low enough level of cognition to provide a high rate of student success, and specific academically-related feedback. For low achieving students, the use of prompting questions and thinking processes (inference) carefully modeled by the teacher seemed to be of great importance (Gersten & Carnine, 1986). A Direct Instruction curriculum required a warm,

pleasant environment, with the interaction between students and teacher serving as a critical link in successful learning by students. Direct Instruction also required additional factors, such as guided practice; thus, increased time for student engagement was needed (Berliner, 1979; Rosenshine, 1979, 1986). Direct Instruction methodology was designed to maximize learner success, provide efficient instruction, increase student retention, and provide opportunity for successful transfer of learning (Carnine, 1979).

Direct Instruction was one of six instructional models in a large experiment called "Project Follow Through", an enrichment program for 5,000 low income preschool children which was operated in 139 cities. Student progress was tracked from one to four years and results of project effectiveness were then reported. Measurements comparing basic skills, cognitive skills, and affective measures were strikingly higher for the Direct Instruction model students. Student achievement measurements in reading, spelling, language, and math further indicated the success of this model; scores outpaced those of students taught under other models slightly in spelling, and by one-fourth standard deviation, three-fourths standard deviation, and one full standard deviation in reading, language, and math, respectively (Gersten, Woodward, & Darch, 1986).

A longitudinal study observed students from four high schools which graduated the first students taught under the Direct Instruction model in the "Project Follow Through" program as elementary students. Positive long term results concerning the critical issues of reading level achievement, dropout rates, and application to college were found among all students in all locations; the students often surpassed national medians and greatly surpassed achievement of similar educationally at-risk students. One disturbing outcome of this study was a dropout rate of over 40% in an inner city New York City school.

Although this was an improvement over local comparison rates of 57% and higher, this is still an unacceptable rate. The researchers noted many social conditions which impact all instruction: Indirect segregation, low teacher expectation, apathy, sarcasm, and even latent hostility. Recommendation was made for all at-risk children to receive Direct Instruction because documented student achievement results warranted the commitment (Gersten & Keating, 1987).

While many reviews of research on teaching have strongly suggested that Direct Instruction is the most effective method of teaching, there has been criticism of the method. Researchers making comparisons between Direct Instruction and open classroom environments (defined in this study as more indirect) have reported little difference in academic achievement (as measured by standardized tests), but slightly higher results (one tenth of one standard deviation) in the open classroom settings regarding student attitude to teacher, independence, and creativity. Based on effective teaching research, Peterson (1979) suggested that scientific investigation results have indicated students should be exposed to both approaches—Direct Instruction and open. Peterson (1979) has also suggested that reading and math might be scheduled for Direct Instruction with other courses using alternative approaches fostering more independent thinking and creativity.

In response to critics of the rigidity of Direct Instruction, a study by Adams, Carnine, & Gersten (1982) indicated that students personalize the learning process once skills have been learned, selectively leaving out steps in the process which are deemed unnecessary by the learner. The investigators applauded this use of Direct Instruction, provided performance level remained constant or improved. Research by a Virginia middle school language arts teacher supports the use of Direct Instruction to teach tasks requiring higher

level thinking skills (Jackson, 1986). Past critical thinking instruction in this school had been delivered through teacher modeling followed by carefully structured questioning. Although all students tried, only a few students learned. Through the use of Direct Instruction, all students demonstrated achievement, though at varying levels. Through the use of structured skill descriptions, the teacher was able to develop a five step model for directly teaching thinking skills: Introduce the skill, explain the skill, demonstrate the skill, apply the skill, and reflect on the skill. Achievement was noted with mainstreamed students as well as students of unusually high ability.

Effective Teaching in Music

Teacher Modeling. Teacher modeling has long been an established instructional method used primarily to demonstrate a behavior. Bandura (1977) has defined modeling as the presentation of live or recorded subject matter which can then be imitated by another person. The effects of indirect modeling easily can be observed in children's games and other forms of child play, such as "playing house" or "war games" as well as in learning to talk, learning to write, learning to smoke, etc. (Zurcher, 1975). Modeling is still a key factor in private instruction in music because instructors must rely heavily on teacher demonstration (task presentation), student observation, and student attempt to reproduce the act. One potentially restricting factor of teacher modeling, the fact that students must be in the presence of the teacher for increased observation of instruction, has been examined. Zurcher (1975) investigated the use of audiotaped teacher models for students to use in at-home practice, and found that in four of six variables, the model-supportive practice was more effective than the traditional teacher model and at-home independent practice.

Modeling has been effectively used with students of varying ages and is a primary factor in basic developmental skills. Classes of third grade

students learning recorder under different conditions made the greatest improvement when receiving peer modeling and social approvals from the teacher (Kostka, 1989). Peer modeling of guitar skills among undergraduate students was incorporated into a study examining the hierarchy of task presentation in teaching cycles (Duke and Blackman, 1989). Some students taught peers by a prescribed process, while others taught traditionally by modeling guitar skills. Results indicated students receiving task presentation in an orderly sequence (hierarchical tasks) were less frustrated than students receiving teacher modeling. Another study involving undergraduate students and teacher modeling focused on child development majors. Students observed a teacher-modeled lesson, and then half were mentored in subsequent lesson preparation by a graduate music student. Analysis of on-task teaching indicated that the mentored students more closely matched the teacher model (Flowers & Codding, 1989). Computer technology has provided new methods for production and measurement of musical instrument models which has expanded modeling research. Children's ability to replicate articulation but not dynamics on a piano modeled by a midi keyboard stimulus has been observed using these advanced technological procedures (Yarbrough & Parker, 1990; Yarbrough & Speer, 1990).

Modeling is an important facet of vocal pitch matching studies, which often employ the use of pre-recorded vocal stimuli. These models appear to have an impact on student responses. First grade students responded no differently to male and female vocal models (Small & McCachern, 1983), while elementary students responded more accurately to a child model and a female model than to a male model (Green, in press). A follow-up study examining response mode to the same models reported that students responded more accurately to models when using some system (such as solfege syllables or

Curwen hand signs) than with rote response, with greatest accuracy of pitch recorded in response to the female model (Yarbrough, Green, Benson, & Bowers, 1989). Elementary students responding to a child model, a female singing straight tone, and a female singing vibrato experienced much less accuracy when responding to the vibrato model (Yarbrough, Bowers, & Benson, in press).Investigation of factors impacting the accuracy of adolescent male singers involved the presentation of two models by a female singer, one model of an unchanged male voice, and one model of an adolescent baritone (Bowers, 1989). Results indicated that students more accurately modeled the female singing in high register and the adolescent baritone than the unchanged male voice in high register or the female singing in low register.

Modeling of effective teaching has been the central focus in two studies aimed at self-evaluation and modification of skills of both preservice and experienced teachers. An experienced string teacher used teaching models provided by expert string teachers for comparison with her own to pinpoint teaching behaviors to be modified (Benson, 1989). Results indicated that teaching behaviors pinpointed for increased occurrence during teaching sessions more nearly matched the models. Using one's self as a model was used in a series of pilot studies involving pre-intern music therapists (Staum, 1989). Each student observed videotapes of her own best teaching, edited and spliced by the instructor, to view as a correct teaching model. Results showed the use of self as a model effectively increased good teaching behaviors in two studies and was as effective as observation forms in a third study. This approach has not been contrasted to other modeling approaches, but seems to be preferable to the analysis of novice teaching tapes which are filled with numerous errors.

Teacher Delivery. Teacher behaviors which impact the lesson presentation have functioned as delivery style and have been researched with regard to

teacher effectiveness. The effect of teacher affect, defined as eye contact and the magnitude of facial expressions, and active versus passive activity were investigated with preschool children in a listening activity. Students were more attentive in high affect than in low affect sessions and active listening activities elicited more on-task behavior than passive listening activities (Sims, 1986).

Style of delivery, defined by Yarbrough (1975) as teacher magnitude, was investigated in high school choral settings to determine its effect on performance achievement and student attitude and attentiveness. Behaviors manipulated for teacher magnitude contrasts included eye contact, body proximity, voice volume, voice pitch, voice speed, conducting gestures, facial expressions, and the rehearsal pace. Magnitude did affect student attitudes, with higher teacher ratings given during high magnitude sessions. Though performance achievement and attentiveness were not significantly different under all conditions, higher scores for both measures were given under high magnitude conditions (Yarbrough, 1975).

The specific delivery variable of pacing in musical settings was observed through analysis of sequential patterns (i.e., task presentation, student response, and reinforcement) among a high school choral director, a junior high choral director, a high school band director, a junior high band director, an elementary general music teacher, and an expert professional conductor. By observing the length of time spent in each part of the sequential pattern and assigning a note value to represent that duration (whole notes represented teaching bits exceeding 100 seconds, etc.), teaching trends could be observed. Most teaching bits for all teachers were quite short, and for the expert conductor, over 75% of the teaching bits were sixteenth, eighth and quarter notes, with only 16% of the teaching bits spent in whole notes or double whole notes. Shorter bits (sixteenth, eighth, and quarter notes) for other directors were:

Elementary, 89%; junior high band, 70.6%; junior high choral, 89%; senior high band, 76.5%, and senior high choral, 68.6% (Yarbrough, 1988).

Teacher Intensity. A line of research in the investigation of effective teaching practices has sought to examine and analyze teacher intensity, which has been defined as "sustained control of teacher/student interaction evidenced by efficient, accurate presentation and correction of the subject matter with enthusiastic affect and effective pacing" (Madsen and Geringer, 1989). Teacher intensity research has focused on refining procedures for teacher observation which measure the synergistic use of effective teaching variables, followed by investigations of instructional methods for training teachers to use varying degrees of intensity.

Early studies attempted to determine if teacher intensity was absent or present across teaching situations, or if it could be taught and learned for specific settings (Standley & Madsen, 1987). In the first study, students were videotaped during two 30 second performances: (1) A statement of personal goals for a music career, and (2) a song leading task with preschool children. Videotape analysis yielded results which indicated low correlations between speaking of self and leading a song, with higher intensity related to the music teaching situation. A follow-up study assessed differences across training which could be observed as subjects (freshmen, seniors, and pre-intern seniors) taught a song by rote to preschool children. Freshmen scored significantly lower in teacher intensity than either group of seniors. From these two studies, the authors concluded that "intensity is a teaching skill that can be measured, and that performance of a musical task may enhance the intensity of the teaching interaction"(Standley and Madsen, 1987, p. 3).

An investigation of the relationship between expert and novice teachers' observation and evaluation skills was examined in a study involving student

teachers in various music settings. Self-assessment by the student teachers was completed for approvals and disapprovals, teacher intensity, student on-task, student active engagement, and effective teaching behaviors such as eye contact. Videotapes were also evaluated by expert teachers for overall effectiveness and then correlated to the student observations. Results indicated that the two highest relationships between expert and novice teacher assessments were on teacher intensity and student on-task (Madsen, Standley, Byo, & Cassidy, 1989).

Madsen and Geringer (1989) investigated the relationship between teacher intensity and effective teaching using videotaped lessons made by senior students in the final week of student teaching. A panel of judges independently rated the lessons on a 5-point scale for overall effectiveness. The same lessons were then evaluated (from 0 to 10 using intensity variables) by two different expert teachers. The two sets of scores, from the panel of judges and expert teachers, were compared resulting in .92 correlation coefficient. This suggests that intensity is an important aspect of effective teaching.

The relationship of teacher on-task (high intensity) and perceived effectiveness was investigated using a group of experienced teachers in a workshop setting. Classroom management training included the observation of extreme contrasts in teacher intensity as modeled by the teacher during various activities. Workshop participants taught peers three times for practice and then attempted to incorporate intensity skills into lessons in their teaching fields (choral, instrumental, or general music). Final 20 minute videotapes of their best teaching were made using their own student groups and then evaluated using the intensity criteria learned in the workshop. Additionally, teachers were asked to give an overall effectiveness rating using a 5-point scale. The intensity

scores and effectiveness ratings were compared resulting in a correlation coefficient of .84. Teacher effectiveness self-ratings were determined to be higher than the group mean rating (Madsen, 1988).

Further intensity research examined whether intensity contrasts (high intensity and low intensity) could be taught to prospective student teachers and then incorporated into teaching by these same students. Following intensity training, a stimulus videotape was developed which showed subjects demonstrating specified intensity contrasts on command. This videotape then was observed by music majors untrained in intensity observation to determine whether intensity contrasts were recognized. Results of the study indicated that intensity could be operationally defined, taught, demonstrated, and recognized with 82.7% accuracy by freshmen, seniors, and graduate students (Madsen, Standley, et al, 1989).

Two additional studies, large in scope have focused on teacher intensity in music environments. Byo (in press) videotaped and analyzed undergraduate conductors' ability to demonstrate intensity contrasts. These videotaped undergraduate conducting segments were then observed by graduate music majors, undergraduate music majors, undergraduate nonmusic majors, and high school band and choir students to ascertain whether high/low contrasts in intensity could be recognized. Results indicated an overall accuracy rate of 77% and significant differences among the groups (graduate music majors were significantly more accurate than all other groups). This substantiated previous research (Madsen, Standley, & Cassidy, 1989) in that nearly everyone can identify intensity in teaching. Another extensive study dealt with sustained use of intensity by subjects also involved in learning musical subject matter (Cassidy, in press). Elementary education majors made five music teaching presentations of rote songs and lessons, with one group receiving no specific teacher

effectiveness training and an experimental group receiving intensity training. Results indicated that treatment had no effect on increasing high intensity, but both groups made improvements over time, probably due to practice at teaching. It was theorized that poor singing interfered with teacher effectiveness. The treatment group seemed to incorporate more musical activities which would affect active participation time or student engagement.

Teaching Cycles in Music

Sequential Patterns. Teaching cycles which incorporate attributes of direct instruction and have evolved and been investigated across music settings. Music teaching cycles called sequential patterns of instruction have included the direct instruction three step process: Teacher task presentation, student response, and teacher reinforcement. Investigation of the three step teaching cycle has undergone gradual refinement through continued research of effective practices of teacher training.

Direct instruction and teaching cycles were investigated in a variety of music settings. A comparison was made of students learning to play the recorder through a directly structured teaching environment and in a free discovery setting with no teacher but clear instructions. The structured teaching environment was effective in teaching the basic skills for playing recorder (Dorow and Greer, 1977). Teaching units were implemented in elementary music methods classes to train undergraduates for the effective delivery of musical (or academic) information and the increased opportunity for student engagement (Rosenthal, 1982; 1989). Teaching cycles used in similar music teacher training programs have labeled task presentation and teacher reinforcement as antecedent and consequent (Jellison and Wolfe, 1987). High school choral rehearsals (Yarbrough and Price, 1981), and symphonic band rehearsals have been analyzed based on use of teaching cycles. Band directors using a

teaching unit with a task presentation, student performance, and immediate related feedback were effective in producing good performance while maintaining high student attentiveness and positive student attitude (Price, 1983). A study examining the effect of mentoring on undergraduate music teaching used a 1-2-3 teaching cycle including task presentation, student response, and response (Flowers & Codding, 1989). Percentages of time spent in the components of the teaching cycle were evaluated and compared to percentages of time spent in cycle components modeled by the teacher. Mentored students most nearly replicated the cycles of the modeled lesson.

Various labeling systems have been used to describe a similar three step teaching procedure. Use of an "A, B, C" cycle has involved an antecedent ("A"), a behavior ("B"), and a Consequent ("C"). In a study examining the effects of visual prompts to elicit targeted therapist responses, music therapy sessions using guitar, recorder, or keyboard included the use of a teaching cycle (teacher verbal antecedent, a student response, and a teacher verbal consequent) (Wolfe, 1989). Visual prompts appeared to decrease general verbal approvals and increase descriptive verbal approvals but had little effect on use of the appropriateness of the antecedent or consequent in cycles of inexperienced preservice therapists. Jellison and Kostka (1987) found that elementary school students recalled more specific musical information than nonspecific social information when the antecedent/student response/consequent teaching patterns were used. Teaching cycles involving clearly defined subcategories of a three part structure including teacher antecedents, student responses, and teacher consequent behavior were used by music students in elementary methods courses (Rosenthal, 1989). Eight teacher antecedents were specified (attention signal, music, academic music information, directions, etc.), with two student response categories (performance and verbal) and six teacher

consequents specified (specific, nonspecific, and errors of both approval and disapproval). Results showed that the control group remained relatively stationary while the experimental group made pronounced changes, particularly in the teacher antecedent involving music presentation and in the consequent involving specific reinforcement.

Music education students as well as experienced teachers have been evaluated extensively by Yarbrough and Price (1989) using teaching cycles called Sequential Patterns of Instruction. Teaching cycle terminology here consists of a 3 step process: (1) Presentation of task, (2) student responses, and (3) reinforcement. Specificity of each component further categorizes teacher/ student tion: Musical information=1m; directions=1d; social information=1s; questioning=1q; and interruptions=1i. Student responses are coded 2p for student musical performance, 2v for student verbalization, or 2nv for any nonverbal student participation. The reinforcement functions include approvals and disapprovals, which can be further defined as specific or nonspecific and related or unrelated to the task presentation (Price, 1989; Yarbrough, Price, & Bowers, 1990). A reinforcement code 3sra would indicate a specific approval which was related to the original task presentation. Correct cycles were identified as those following a 1-2-3 sequence. Incorrect cycles included the presentation of directions only in the task presentation, the use of interrupting directions between musical information and student response, the use of reinforcement unrelated to the task, and reinforcement errors.

Rehearsals of 79 undergraduates, band directors, and choral directors were analyzed for sequential patterns. Reported task presentation percentages revealed a very low rate of musical information, with high rates of directions, leading more to structured practice than to musical instruction in the rehearsal setting. Between 40 and 50 percent of all rehearsals were consumed with task

presentation by choral directors, band directors, sophomores trained in sequential pattern use, and freshmen untrained in pattern usage. However, musical information was presented in less than 25% of the lesson. Directions, interruptions, and off-task behavior accounted for the remaining task presentations.

After analysis of sequential patterns used by experienced band and choir teachers was completed, instruction in sequential patterns was presented in university methods classes to determine if music education students could improve teaching skills by improving sequential pattern skills. Vocal and instrumental music education majors enrolled in an introductory teaching course were involved in practice and field experience after receiving training in sequential patterns of instruction. The patterns reflected a 1-2-3 direct instruction procedure, with specific designations for type of task presented (academic, directions, social, questions, off-task), type of student response (performance, verbal, non-verbal) and quality of reinforcement (specific or nonspecific approvals and disapprovals presented in 80/20 ratio). Students received 50-minute teacher feedback prior to a second field experience. Time spent in task presentation dropped from 52.1 to 45.4 percent of the rehearsal, and use of 1-2-3 cycles increased significantly. A second similar experiment was conducted without teacher feedback across four teaching sessions (pretest, 2 practica, and a posttest). Use of complete cycles and specific approvals increased significantly from pretest to posttest, as well as a decrease in time spent giving directions during task presentation. A third study examined the impact of added practica after training in patterns to allow students more opportunity to develop skills needed for teaching with the sequential patterns model. Students taught three practica and received no teacher feedback. Significant gains were made in the use of complete cycles and specific approvals (Price 1989).

A self-study involving analysis of sequential pattern use and conductor magnitude skills (eye contact, facial expression, and speech variables) yielded additional information. An experienced director gathered baseline data on conducting skills in a choral rehearsal and pinpointed areas for improvement during a series of practica rehearsals. Analysis of a videotape of the final rehearsal provided data for comparisons, and although no change in pattern usage was observed, the experimenter noted improvement in the quality of the task presentation of the cycles and made recommendations for future study. The individual task presentations were decreased (fewer examples given, fewer tasks presented at one time, etc.) which allowed for quicker student engagement and improved lesson pace (McDaniel, 1990).

In an effort to ascertain perception of "good teaching" two independent studies asked subjects to evaluate scripted teaching scenarios which were presented with differing styles of instruction. The style deemed most representative of effective teaching was a pattern approach which included a musical (academic) task presentation by the teacher, a student response, and teacher reinforcement of the response (Jellison and Wolfe, 1987; Price and Yarbrough 1989). Two research studies have examined sequential patterns as evaluated by pre-service and experienced music teachers to provide a foundation for analysis of the impact of pattern usage on perceived teacher effectiveness. Experienced teachers, graduate students and undergraduates rated transcripts of rehearsals with respect to various pattern excerpts. Results indicated that sequential patterns which included both academic task presentations and specific related positive reinforcement were rated as significantly superior to the other patterns (Price and Yarbrough, 1990). Another study investigated whether experienced teachers would make changes in pattern usage after receiving instruction in research based techniques. In a two-week workshop setting, teachers

prepared a baseline conducting tape and then received training in sequential patterns of instruction and observation techniques prior to a choral conducting practicum designed to pinpoint effective teaching variables for modification. In addition, the teachers gave ratings to forty-eight randomly ordered excerpts of music teaching. The final teaching tape was analyzed for increase or decrease in use of sequential patterns. Results showed an increase in complete and correct patterns, academic (musical) information, approvals, and specificity of reinforcement. Decreases occurred in use incomplete and incorrect patterning, time spent giving directions, the amount of disapprovals, and amount of non-specific reinforcement. The correlation between the patterns demonstrated and pattern preferences was .56 for the pretest and a significant .94 on the posttest (Yarbrough, Price, & Bowers, 1990).

Individual Cycle Components. The individual components of a teaching cycle have been examined singly in numerous studies. Academic task presentation has been isolated in a variety of musical settings in which musical information was measured by counting and timing directions, demonstrations, modeling, questioning, and instruction of musical elements. The effect of task presentation on evaluation of music instruction was observed in a study involving music majors and nonmusic majors (Prickett and Duke, 1989). Subjects were assigned a specific focus of attention while observing an eleven year old student and an instructor. Subsequent to the observation, evaluation forms were completed regarding teacher approvals, teacher disapprovals, and overall effectiveness of the lesson, the three general areas of focus. Results varied for musicians and nonmusicians, but suggested that the focused task did impact the lesson evaluations. Those assigned to observe teacher approvals consequently reported the highest number of approvals .

The relationship of teacher verbalization time to off-task student

behavior has underscored the importance of effective and efficient task presentation in lessons/rehearsals. A study of five choral rehearsals indicated that conductors devoted an average of 40% of teaching time to verbal communication (Thurman, 1978). Of this verbalization, between fifty and sixty percent was academic task presentation. Another study noted that experienced teachers gave fewer directions than inexperienced teachers (Wagner and Strul, 1979). Rosenthal (1989) reported the most frequent error in training preservice teachers, excluding the lack of reinforcement, was the presentation of directions without musical academic material.

The sequence of task presentations may also have considerable impact on the success of the learner, and thus the effectiveness of the lesson. Tasks should be presented in a logical order, with gradual increase in difficulty to insure that student learning occurs without excessive frustration or failure. A textbook definition of successive approximations reads "Behavioral elements or subsets each of which more and more closely resemble the specified terminal behavior" (Madsen, 1980; p. 157). Successive approximations in clinical/music therapy settings have structured progressively the achievement level required by the therapist for the subject to gain reinforcement upon successful completion of the task. The achievement level required for successful task completion then continues to become more demanding until the subject reaches the completion of the original targeted behavior. In the instructional setting, the use of successive approximations allows the teacher to structure the task so students frequently reach a goal and experience success while continually providing more difficult goals leading to the completion of the original objective. Educational research has provided evidence that effective teachers present questions which can successfully be answered about 75-80% of the time. As students experience success, motivation to continue is nurtured and yet the remaining

20% of the questioning is more challenging material which might not be successfully answered by students (Rosenshine, 1986).

In addition to musical information and directions, teachers have often chosen questioning techniques for use in task presentation. Appropriate and inappropriate questions were examined (Jellison and Wolfe, 1987) and results suggested that inappropriate questions ("Can you tell me . . .?") resulted in no student response more frequently than appropriate questions ("What is . . .?"). Questioning has been an important component of the direct instruction model for well structured content areas (reading and math), but may not play the same role with respect to teaching patterns in less explicit content areas, such as composition, literature analysis, or discussion of social issues (Rosenshine, 1987). Current research in music has suggested that a modified teaching cycle can produce effective teaching and learning in musical settings.

The student response or performance phase of the teaching unit has also been examined. Educational research across subject matter lines has supported the theory that student achievement appears to increase in tandem with the amount of time spent in active student engagement (Fisher, Marliave, and Filby, 1979; Brophy, 1979; Rosenshine, 1979). This phase of the teaching cycle has been observed in music ensembles. An analysis of average student response time in a choral rehearsal resulted in 57.3% of time spent with students actively engaged. However, one third of the student engagement time was spent working on less than one musical phrase of music (Thurman, 1978). Yarbrough and Price (1989) noted that student engagement time varied among band directors, choral directors, trained undergraduates, and untrained freshmen conductors. Choral conductors averaged 53.06 percent of rehearsal time with students actively engaged. Band directors averaged 47.9 percent, trained undergraduates averaged 45.6 percent, and untrained freshmen conductors

averaged 40.88 percent of time spent in student active participation (including performance, verbal, and non verbal responses). Additionally, student preference for active engagement may influence attitude. In response to open ended questions about likes and dislikes of general music teachers, middle school students reported they preferred active musical involvement, with passive activities (note taking, film watching, and test taking) listed as unpopular activities (Gerber, 1989). Perhaps due to this attitude and the high engagement time in music class, students have been found to be more on task in music activities than and appear to be more on task during classroom activities requiring participation, such as singing and playing instruments (Forsythe, 1977) . Attentiveness in music class has likely been a function of active versus passive student participation (Madsen and Alley, 1979; Sims, 1986; Yarbrough and Price, 1981) with other examinations of student responses concluding that active and musical responses were favored (Madsen and Geringer, 1983; Moore, 1981; Sims, 1986; Spradling, 1985).

An important assumption of direct instruction was reported by Engelmann (1980): A student will tend to enjoy the material and work more diligently if the good performance and hard work are reinforced. Some implications about the task (Is it "do-able"?) can be made, but of great importance is the final stage of the teaching cycle involving feedback to the student, the reinforcement. Many research documents have verified the importance of reinforcement in student learning. Rosenthal (1989) reported studies which supported the belief that positive reinforcement is essential to effective teaching: Altman and Lenton, (1971); Forsythe, (1975); Kuhn, (1975); Madsen and Alley, (1979); Madsen and Madsen, (1983); and Rosenshine, (1987). In an examination of attitude by Murray (1975), it was reported that approving reinforcement significantly increased positive attitudes of students toward choral rehearsals.

Thurman (1978) noted that four of five choral conductors whose rehearsals were timed and analyzed used disapprovals more frequently than approvals. In addition, all five conductors spent more time on a disapproval than on approvals. The author further explained that most approvals were very nonspecific in nature, such as "good" or "right". Disapprovals, however, were very specific and required more time to deliver.

Yarbrough and Price, (1989) obtained percentages of rehearsal time spent in reinforcement for choral, band, sophomores trained in sequential patterns, and freshmen not trained in patterns. Though all groups spent from 6 to 9% of the rehearsal reinforcing students, differences were noted in the ratio of approvals and disapprovals: Band directors, 19/81; choral directors, 41/59; trained sophomores, 73/27; and, untrained freshmen, 89/11. Three experiments using preservice teachers (Price, 1989) produced reinforcement levels of 7.7% (with 5.8% approval), 8.0% (with 7.7% approval), and 7.9% (with 5.7% approval).

Madsen and Madsen (1983) noted a discrepancy between intentions and behaviors, in that many who have professed a desire for a positive classroom environment often provide predominantly negative feedback. Duke (1989) has suggested that perhaps this discrepancy results from the reaction of teachers to student behavior rather than structuring the learning environment with specific tasks which would likely provide more opportunity for approval (proactive teaching).

The effect of delayed versus immediate feedback became an issue of concern as various teaching methodologies (independent study, programmed instruction, use of videotape and television in instructional settings, small classes with graduate instructors versus large classes with a professor, etc.)

were developed. In a review of literature regarding effective college teaching, McKeachie and Kulik (1975) surmised that research does not support the generalization that feedback enhances learning in the college setting. Feedback could possibly have multiple effects including increased anxiety and resulting defensiveness, provision of information, or a decrease in motivation to change, and that combinations of these effects could interfere with learning. A review of research by Kulik and Kulik (1979) reported a single study, followed by independent replications, that resulted in lower achievement by students receiving delayed rather than immediate feedback. Additional studies reported by these authors have indicated that the timing of the feedback was more consequential than the type of feedback (written, oral, teacher, proctor, etc.). Alternately, a group of studies examining the DRE Effect (Delay-Retention Effect) appeared to challenge the value of the immediate feedback research. Results indicated that subjects receiving immediate feedback retained less academic material than did learners with delayed feedback, but this held true only when the material greatly exceeded the learners' ability. Kulik and Kulik (1979) concluded their summary of college teaching research literature with three steps found to be important for effective teaching: (1) Sequential instruction with proficiency examined at each step, (2) immediate feedback for each examination, and (3) required restudy and then retaking of any substandard examination. Furthermore, the type of reinforcement given may need to be varied for the academic or the social behavior demonstrated.

Several music-specific studies have found that some music performance skills may not lend themselves to improvement due to adult reinforcement and/or contingent rewards. Vocal pitch matching did not improve with reinforcement in studies by Madsen, Wolfe, and Madsen (1975), and Greer, Randall, and Timberlake (1975). Similar conclusions were reached by Geringer, Nelson,

and Kostka (1981) after their study of increased vocal ranges of children and adults. In a study examining the effect of three techniques of "good teaching" (use of academic approval, use of social approval, and use of peer modeling of correct performance) on low achievers, results indicated no difference in musical performance among the three, yet all three groups improved more than the children who received traditional instruction with no feedback or no third grade student teacher. Thus the presence of reinforcement, rather than the type of reinforcement, seemed to be the most important issue (Kostka, 1989).

Video Analysis

Various aspects of music teaching have been studied through the analysus of video-taped teaching segments (Benson, 1988; Cassidy, 1988; Greenfield, 1980; Hanser and Furman, 1980; Madsen, et al, 1989; Price, 1983; Prickett & Duke, 1989; Rosenthal, 1989; Standley & Madsen, 1989; Staum, 1989; Wolfe, 1989; and Yarbrough & Price, 1989). Advances in technology have allowed for innovative evaluations of student performance, with a greater emphasis on self-evaluation by students. Videotaping teaching sessions with VCR playback equipment available for self-analysis by students has become a common procedure. With training in observational skills, students can observe their own behavior, analyze the results, and determine the effectiveness of their performances, thus providing a knowledge base for pinpointing and improving skills in the next teaching task.

Studies examining the effectiveness of self-analysis versus instructor feedback have reported that instructor feedback may be a less efficient use of faculty time than providing students with operational definitions to guide independent self-analysis (Alley, 1980; Yarbrough, Wapnick, & Kelly, 1979). Students appear to improve equally under teacher feedback and self-analysis. A study comparing the effect of instruction and three methods of feedback on

music teaching skills examined systematic videotape self-observation (counting and recording specified skill completions), unguided video self-observation, and instructor verbal feedback without videotape observation. Results indicated no significant differences among the three groups, but all three were significantly better than the control group which taught lessons with neither instruction on the teaching skills or feedback concerning lesson success (Killian, 1981). There were also no significant differences in student performance when students received immediate field-based feedback for half the semester and video-based feedback for half the semester. Students performed better during the second half of the semester regardless of the type feedback used (Hanser and Furman, 1980).

The relationship of successful self-observation of conducting practica to the final posttest score was observed in an examination of choral conducting students. There was a positive correlation between how accurately students observed and critiqued specific conducting behaviors and the conducting posttest score (Yarbrough, 1987). Another recent study of the effects of training in lesson observation and evaluation on pre-service elementary teachers ability to evaluate music teaching compared evaluations made by trained and untrained students and then compared these data to scores assigned by an expert teacher. Ratings of the expert teacher were not significantly different than scores of the training group, but significant differences did occur between the expert teacher and the control group (Corbin, 1989).

Studies examining the sequential pattern teaching cycles (Yarbrough and Price, 1988, 1989) have relied heavily on student self evaluation. Examination of the teaching unit for research purposes has necessitated precise methods for observation and analysis. Verbal and nonverbal teacher and student behaviors have been effectively categorized by first scripting the teaching segments (Price,

1989; Rosenthal, 1989; Yarbrough and Price, 1983;) and then labeling the transcripts, thus providing frequency data. To determine data for the amount of time spent using specific behaviors videotape observation has required the timing of each behavior to the second for whole lesson analysis. Time sampling observations, frequently used for analysis of effective teaching variables such as eye contact, cannot be used to obtain sequential pattern data for time spent in pattern components.

In summary, evolving research in education has attempted to isolate and identify teaching variables which impact effective teaching. The Direct Instruction model has successfully improved student achievement among low achievers in math and reading, and a variation of this model, sequential patterns of instruction, has been used to examine instruction within music settings. Though teacher modeling is still used quite frequently in musical instruction, the function of teaching cycles has been examined through research in music teacher training settings. Self-observation and analysis by undergraduates have enabled students to successively improve skill in presenting academic material in music settings, providing sufficient student engagement, and responding with appropriate reinforcement.

Thus, previous research has identified a multitude of effective teaching variables. Those which were chosen specifically for this study were the components of sequential patterns: task presentation, student engagement, and reinforcement. Use of these components by elementary education majors was studied in relationship to effective music teaching as defined by previous research.

METHOD

Subjects

Sixty-four elementary education majors enrolled in a required elementary music teaching course at a major Southern university served as subjects. One student was dropped at mid-term and two students withdrew near the end of the semester. A total of 61 completed the study. Assignment to each of three sections was done randomly through computer scheduling during preregistration and during the drop/add period.

All subjects were female and the majority were elementary education majors or early childhood majors taking this course as a degree requirement. The course was also required for one graduate student pursuing teacher certification. Students in junior division and general college were prospective elementary education majors pending acceptance into the college. Students from all classifications were enrolled; 7 freshmen, 21 sophomores, 24 juniors, 8 seniors, and 1 graduate student.

A pretest was given to all participants in the study to gather information about musical experience and current abilities in basic musicianship. Music vocabulary, rhythmic notation, and pitch notation knowledge were very weak for most of the students. The mean score for the Control Group was 19.2% correct. Experimental Group 1 produced a mean score of 18.4%, and the mean score for Experimental Group 2 was 23.2%. Music experiences reported by the students provided information about prior training. Private music instruction was very limited, with three students listing piano lessons of six, seven and ten years and 21 students receiving four years or less of private instruction on piano, organ, and violin. Eighteen students had participated in choral ensembles at school and church and nine students participated in instrumental

ensembles. Two former band students listed seven years of flute experience. Across the three groups, twenty students reported no musical experience other than occasional classroom singing in elementary school. Group membership was similar regarding musical training and experience. The music skills pretest scores were compared using the Kruskal-Wallis One-Way Analysis of Variance. No significant differences occurred in musical knowledge among groups ($H(2, 58) = .21$; $p > .05$).

Course Instructors

Two graduate students in music education served as instructors. The Control Group ($n=20$) was taught by a master's candidate who had both observed and assisted with the course in a previous semester. Experimental Groups 1 ($n=21$) and 2 ($n=20$) were taught by the researcher, a doctoral candidate with twelve years of music teaching experience who had observed and taught the course previously. Forty-five minute conferences between the two instructors were scheduled twice weekly to insure similar material and similar presentation. All teacher modeling activities were planned and practiced during this time, and for additional control, modeled lessons and common activities were audiotaped and/or videotaped.

Elementary Music Teaching Course Description

The focus of instruction for this course was music skills literacy, lesson planning skills (rote teaching and concept lesson teaching), organization skills for lesson delivery (sequential patterns instruction), and practice in three intensity variables: Energy, enthusiasm, and eye contact (the 3 E's). Self-evaluation, peer-evaluation, and teacher feedback were incorporated into the course at appropriate times to provide maximum opportunity for student learning. Additional units in the course curriculum, but not included in the study, were philosophy of music education, classroom management, and an introduction to

musical instruments and voices in conjunction with concert attendance. All textbooks and supplemental materials used by students in the three sections were the same for areas associated with the study except for materials differing due to treatment needs. The same examinations were given on the same days to all students. (See Appendix A for course outlines and materials).

Procedure

All three groups involved in the study met for a 50 minute morning period on Monday, Wednesday, and Friday for 16 weeks. The study was conducted during the first 11 weeks of the semester. All sections used the same classroom, which was equipped with an upright piano, complete stereo system, chalkboards, and a resource room of elementary music instruments (rhythm instruments, Orff instruments, resonator bells, etc.) which were used during some of the music lessons.

Five short teaching presentations were scheduled during weeks 2, 3, 5, 8, and 11 of the semester. Only the final teaching presentation provided data for the study, with the four preceding assignments serving to provide instruction, practice, and video analysis training for subjects. A posttest only design with a Contact Control Group and two Experimental Groups was used. Successive approximations were used to prepare subjects to plan, teach, and analyze videotapes for the final teaching task.

The first three tasks involved rote instruction and the final two tasks involved the teaching of a musical concept, to include the teaching of at least one rote song. All five presentations were videotaped, and subjects observed and analyzed their own presentations using playback equipment in the Music Listening Room of the main library.

Class instruction focused on singing songs with emphasis on pitch matching accuracy and good vocal habits. Prior to each teaching task subjects

were randomly assigned for their teaching order. All teaching tasks were videotaped for subject and teacher analysis and evaluation. The video analysis forms were designed to prepare subjects, through successive approximation, to teach a concept lesson and successfully self-evaluate their teaching.

Teaching Task #1. Previous research documented that students videotaping and analyzing a non-music lesson prior to a music lesson received higher ratings on the music task than students who prepared two music tasks (Moore and Kuhn, 1975). Thus, the first teaching activity included a two step process: (1) A rote teaching presentation to the class of a four line verse of poetry (not having a melody), to be videotaped and analyzed by both the student and teacher, and, (2) a task analysis of the steps, in sequence, used for instructing a person in the socially acceptable method for eating a bowl of oatmeal.

Prior to the poem activity teachers modeled cues and the rote teaching process using a four line stanza to explain "my turn, your turn" technique, chaining, start/stop commands, etc. The importance of eye contact, energy, and enthusiasm in delivery was discussed. Subjects were encouraged to include the "3 E's" (energy enthusiasm, and eye contact) in their teaching throughout the semester because these are behaviors that have been identified in effective teachers. Each subject was encouraged to select a poem well known to herself so that concentration would be on the rote process rather than the text of the poem. There was no time limit for this activity but independent recitation by the class at the conclusion of each subjects "lesson" was required.

The Contact Control Group and subjects in the two Experimental Groups analyzed cues in their own videotapes as correct or incorrect, with incorrect requiring a decision as to why it was incorrect (incorrect gesture or interrupted

cue). Additionally, subjects evaluated (with five choices ranging from poor to excellent) teacher eye contact, and teacher energy and enthusiasm (See Table 1).

The task analysis of steps required for eating oatmeal was another attempt to isolate a process, the planning of a teaching sequence. Very few students were absolutely thorough in describing this process, so extensive feedback from instructors was written on papers, and class discussion highlighted omissions common to the group. Most errors resulted from assumptions made about the competencies of the person instructed—they assumed someone eating would take the spoon out of the mouth after a bite, for example. There was no difference in feedback among the three groups on this task.

Table 1

Video Analysis for Teaching Task 1

Watch your videotape and analyze the effectiveness of your cues. If correct, make a slash (/) through "C" for correct. If cues were incorrect, decide what caused the error. If you interrupted your cue with more talking, then make a slash through the "i", for interrupted. If the error was a result of an incorrect gesture, then make a slash through the "g", for gesture error.

VIDEO PRACTICE

CORRECT	INCORRECT	
c	i	g
c	i	g
c	i	g
c	i	g
c	i	g
c	i	g
c	i	g
c	i	g
c	i	g
c	i	g

Circle the most representative description of your teaching:

TEACHER EYE CONTACT WITH STUDENTS

Excellent Good Average Fair Poor

TEACHER ENTHUSIASM AND ENERGY DURING PRESENTATION

Excellent Good Average Fair Poor

Teaching Task #2. The second teaching activity involved the selection and teaching of a familiar children's song, using the cueing skills learned for the poetry instruction. Subjects prepared a task analysis of all steps, in sequence, needed to prepare the class to successfully sing the song independently. Teacher feedback concerning the procedure was written on the plan and returned for modification. A two minute time limit was required for teaching task #2 and early or late finishes were not allowed. Subjects stopped at the two minute signal.

Video analysis of the teaching segment by the Contact Control Group consisted of completing a general evaluation while watching the tape. The general evaluation form required a three or five option response to questions regarding singing, rote instruction, eye contact, musical information, presentation, and preparation (See Table 2). Additionally, each subject identified a strength and a weakness of her teaching. Teacher observation of student tapes was then completed on the same evaluation form to be certain subjects could make a realistic appraisal of their efforts. The instructor also wrote comments detailing strengths and areas needing improvement.

Both experimental groups viewed and analyzed tapes using cue analysis learned in teaching task #1. In addition, subjects timed all teacher talking/singing and all student talking/singing with total times and percentages computed for the two categories. In addition, each subject evaluated the independence of the class in singing the song and the pitch matching accuracy of her own singing voice on scales ranging from 1, low, to 5, high (See Table 3). The experimental instructor viewed the videotapes both to assign grade points and to examine the completed student analysis forms for problematic areas. Group feedback using transparencies was made to clarify correct procedures used on the analysis forms.

Table 2

Teaching Task 2 Video Analysis Form for the Contact Control Group

ROTE SONG EVALUATION

1. Sang without hesitation or starting over
   Yes Sometimes No

2. Matched starting pitch when singing
   Yes Sometimes No

3. Used starting pitch when singing
   Yes No

4. Pitch level of song (for group)
   Too high OK Too low

5. Clear cues for group to start or stop
   Excellent Good OK Fair Poor

6. Gave clear instructions
   E G O F P

7. Size of teaching steps
   Too large OK Too small

8. Logical teaching sequence
   E G O F P

9. Pacing
   Too fast OK Too slow

10. Eye contact while singing
    E G O F P

11. Eye contact throughout lesson
    E G O F P

12. Estimated % of time with eye contact
    _____

13. Accurate pitches
    Yes Sometimes No

14. Accurate rhythm and/or beat
    Yes Sometimes No

15. If made mistakes, did not show it
    Yes Sometimes No NA

16. Spoke clearly and understandably
    E G O F P

17. Expressive speaking voice
    E G O F P

18. Pleasant facial expression
    E G O F P

19. Enthusiasm
    E G O F P

20. Leadership
    E G O F P

21. Eye contact while speaking
    E G O F P

22. Appropriateness of song choice
    E G O F P

23. Students achieved independence
    Yes Almost No

24. Appeared well prepared
    E G O F P

COMMENTS

Table 3

Video Analysis Forms Used by Both Experimental Groups for Teaching Task 2

ROTE SONG #1 VIDEO ANALYSIS

i=interruption g=gesture p=pitch r=rhythm

	STARTING CUES		TEACHER	STUDENT
	Correct	Incorrect	seconds	seconds
1.	c	i g p r	____to____	____to____
2.	c	i g p r	____to____	____to____
3.	c	i g p r	____to____	____to____
4.	c	i g p r	____to____	____to____
5.	c	i g p r	____to____	____to____
6.	c	i g p r	____to____	____to____
7.	c	i g p r	____to____	____to____
8.	c	i g p r	____to____	____to____
9.	c	i g p r	____to____	____to____
10.	c	i g p r	____to____	____to____
11.	c	i g p r	____to____	____to____
12.	c	i g p r	____to____	____to____
			TOTAL_____	TOTAL_____

starting time_____
stopping time_____

TOTAL TEACHING SECONDS_____(Time between start and stop)

TOTAL TEACHER SECONDS_____
(teacher/total seconds)

TOTAL STUDENT ENGAGEMENT SECONDS_____
PERCENTAGE_____(student/total seconds)

WERE STUDENTS INDEPENDENT? (circle) yes no

WAS TEACHER'S SINGING ACCURATE? 5 4 3 2 1
yes no

Teaching Task #3. The third teaching activity involved teaching a children's song generally considered to be unfamiliar to many children, but not unfamiliar to the subject doing the rote teaching. Specifically, simple nursery rhymes were disallowed. The time limit for this teaching task was three minutes, to be stopped by signal only. A task analysis was submitted and written teacher feedback was provided to allow for modifications by the subjects. Teacher modeling of rote instruction was again provided for all groups.

Prior to Teaching Task #3, Experimental Groups 1 and 2 received instruction in sequential patterns of instruction. Operational definitions were presented (See Table 4) as well as the teaching sequence and related examples (See Table 5).

The video analysis form for the Contact Control Group was identical to the Teaching Task 2 form. Both Experimental Groups used video analysis forms similar to Teaching Task 2 forms, but with the addition of scripted reinforcement (See Table 6).

Table 4

Operational Definitions for Sequential Patterns

Reinforcement. Teacher response to a student behavior or the absence of a student behavior constitutes reinforcement, whether the reinforcement is approving or disapproving.

Approval. Reinforcement positive in character is an approval.

Disapproval. Reinforcement negative in character is a disapproval.

Specific Reinforcement. Reinforcement which clearly indicates to the student what behavior is being reinforced, whether approving or disapproving qualifies as specific reinforcement, whether theresponse is made to a group or an individual.

Nonspecific Reinforcement. A general response which does not pinpoint the exact student behavior being reinforced is classified as nonspecific reinforcement.

Related Reinforcement. Related reinforcement is a response related to the initial teacher task presentation. Included are those tasks which are only implied, such as classroom rules not directly repeated but continuously in force. Relationship to a teacher or implied task is required.

Unrelated Reinforcement. General responses not related to a teacher initiated task or an implied task constitute unrelated reinforcement, whether specific or nonspecific.

Table 5

Instruction in Sequential Patterns

I. The teaching sequence (direct instruction).

1	2	3
teacher presents task	student responds	teacher provides feedback (reinforcement)

II. The reinforcement component.

APPROVAL	DISAPPROVAL

III. Type of Approval

SPECIFIC	NONSPECIFIC
"You sang the words correctly, Susan."	"good"

IV. Type of Specific Approval

RELATED			UNRELATED		
related to teacher or implied task			unrelated to task		
1	2	3	1	2	3
"work hard to sing words"	student sings.	**"you sang the words"**	"get out your music & sing p. 30"	student sings	**"you sang words correctly Susan"**

REVIEW OF APPROVAL AND DISAPPROVAL REINFORCEMENT CATEGORIES

APPROVALS		DISAPPROVALS
specific related	1-2-3 s	specific related
specific unrelated	1-2-3 sr	specific unrelated
nonspecific	1-2-3 ns	nonspecific

Table 6

Video Analysis Forms Used by Both Experimental Groups for Teaching Task 3

ROTE SONG #2 VIDEO ANALYSIS

_____ _____
starting time stopping time

	STARTING CUES		TEACHER	STUDENT
	Correct	Incorrect	seconds	seconds
1.	c	i g p r	____to____	____to____
2.	c	i g p r	____to____	____to____
3.	c	i g p r	____to____	____to____
4.	c	i g p r	____to____	____to____
5.	c	i g p r	____to____	____to____
6.	c	i g p r	____to____	____to____
7.	c	i g p r	____to____	____to____
8.	c	i g p r	____to____	____to____
			TOTAL_____	TOTAL_____

REINFORCEMENT

Approval		Disapproval	
Spec	Non	Spec	Non

_____
_____
_____
_____

TOTAL TEACHING SECONDS_____(Time between start and stop)

TOTAL TEACHER SECONDS_____ PERCENT-AGE_____
(teacher/total seconds)

TOTAL STUDENT ENGAGEMENT SECONDS_____
PERCENTAGE_____(student/total seconds)

WERE STUDENTS INDEPENDENT? (circle) yes no

WAS TEACHER'S SINGING ACCURATE? 5 4 3 2 1
yes no

Teaching Task #4. Prior to the fourth teaching task, subjects in all three groups were instructed in the procedures for writing behavioral objectives to be used in developing music concept lessons. A sample lesson plan was also provided for each student and music textbooks and materials available for planning lessons were also introduced through discussion and brief activities highlighting textbook resources. Completed lesson plans received written feedback from the instructors in an effort to provide revision opportunities for the students.

Subjects were assigned a concept to be presented to class members in a 6 minute lesson. Subjects were allowed to end the lesson at any point beyond a signal given at five minutes, but were not allowed to stop before the five-minute signal. The teaching of one new rote song was required, but unlimited other songs could be included as appropriate for the concept. Instructors attempted to match an appropriate concept to each subject based on student ability. For example, a student unable to match pitch accurately would have been assigned a concept requiring limited melodic skill.

Prior to Teaching Task #4, each subject in the Contact Control Group was assigned a task related to music skills, based on weaknesses noted by the teacher in previous classes. Subjects were videotaped for one minute while demonstrating the assigned music skill task. This activity was included to control for practice time in front of the group.

The treatment for the experimental groups differed (active versus passive learning) prior to Teaching Task #4 to isolate time requirements for instruction in sequential patterns. Experimental Group 1 subjects participated in a sequential patterns writing activity which used the sequential patterns instruction sheet (presented in Table 5) to review the pattern categories: Approvals

with 1-2-3 s, 1-2-3 sr, 1-2-3 ns and Disapprovals with 1-2-3 s, 1-2-3 sr, 1-2-3 ns. Students were then assigned two tasks: (1) Write a brief non-musical example demonstrating each approval and disapproval pattern, and (2) based on your lesson plan for the music concept lesson, write brief musical examples demonstrating each pattern. This activity consumed approximately 30 minutes of class time. During the next class period, students traded papers twice and graded all the pattern examples for two other class members. All answers were to be marked right or wrong, and all wrong answers were to be corrected by the graders and the subject, thus providing three correct examples of the pattern. Many subjects earned perfect scores and all scored above 90%.

Experimental Group 2 participated in a videotaped activity involving demonstrations of sequential patterns. During a preceding class, each subject was given a card containing four sequential patterns which were designated as music examples or non-music examples. Pattern orders had been rotated on the cards to control for order effect. Subjects were to develop a 15 second teaching segment which would demonstrate each of four assigned patterns and to be prepared for videotaping these during the next class period. Taping order was specified to control the order of music and non-music examples. During the taping session, subjects were signalled to change patterns by the ringing of a bell. Three errors occurred due to demonstrating disapprovals rather than approvals, but the intent of the activity was not affected. During the next class period, students were given evaluation sheets and were asked to label (within 15 seconds) each pattern demonstrated on the tape. The tape was only stopped by request after the subject had demonstrated all four patterns. Many students scored perfect papers and all but one student who misunderstood the task scored above 90%.

The Contact Control Group used a general video analysis form which focused on teaching skills, eye contact, personality, music skills, and preparation (See Table 7). Students were also asked to write comments about strengths and weaknesses of their teaching and their lessons. Immediately upon completion of the teaching presentation, all other class members completed a brief peer evaluation by marking a five point scale regarding the following topics: Clear instruction, appropriate materials and activities, acted like a teacher, and appeared well prepared. Four positive comments and two suggestions for improvement were also requested. Upon receipt of the completed video analysis forms, the teacher observed the tapes with the student evaluations to insure realistic self-appraisal and to assign grade points for lesson effectiveness.

Both experimental groups used video analysis forms which called for timing of teacher talk with the indicator 1 (task presentation) or 3 (reinforcement) marked, timing of student engagement, with 2 to be marked, and scripting of all reinforcements-3's (See Table 8). Computation of teacher talk and student engagement percentages were required in addition to the evaluation of singing accuracy, cue accuracy, and student independence on the rote song. Peer evaluations were also completed during class for both experimental groups. The teacher later viewed the tapes while observing the student evaluation forms to insure accurate analysis of the lesson and to assign grade points for lesson and teaching effectiveness.

Table 7

Video Analysis for Teaching Task 4 by the Contact Control Group

CONCEPT LESSON EVALUATION FORM

Teaching

1. Gave clear instructions
   Excellent Good OK Fair Poor
2. Size of teaching steps
   Too large OK Too small
3. Logical teaching sequence
   E G O F P
4. Pacing
   Too fast
5. Opportunities for student involvement
   E G O F P
6. Materials appropriate & effective
   All Most Some Few
7. Activities appropriate and effective
   All Most Some Few
8. Students achieved independence
   Yes Almost No

Eye Contact

9. While speaking
   E G O F P
10. While playing (if instrument used)
    E G O F P
11. Throughout lesson
    E G O F P
12. Estimated total % of time _____

Personality

13. Spoke clearly and understandably
    E G O F P
14. Expressive speaking voice
    E G O F P
15. Pleasant facial expression
    E G O F P
16. Enthusiasm
    E G O F P
17. Leadership
    E G O F P
18. Appropriate feedback to class
    E G O F P
19. Positive verbal interactions
    E G O F P
20. Number of approvals_____
21. Number of disapprovals_____
    OK Too slow Music Skills
22. Starting pitch clear and accurate
    Yes Sometimes No NA
23. Matched starting pitch when singing
    Yes Sometimes No NA
24. Used starting pitches consistently
    Yes No NA
25. Pitch level of song
    Too high OK Too low NA
26. Clear cues for group to start or stop
    E G O F P
27. Accurate pitches sung
    E G O F P
28. Accurate rhythm and/or beat
    E G O F P
29. Played without hesitation or restarts
    Yes Sometimes No NA
30. If made mistake, continued smoothly
    Yes Sometimes No NA
31. If mistakes, no face/body reaction
    Yes Sometimes No NA
32. Playing volume (if instrument used)
    Too loud OK Too soft

Preparation

33. Appeared well prepared
    E G O F P

COMMENTS:

Table 8

Video Analysis for Teaching Task 4 by Experimental Groups

CONCEPT LESSON #1 VIDEO ANALYSIS

_____ starting time _____ stopping time

Pattern	TEACHER seconds	STUDENT(S) seconds	REINFORCEMENT Script
1 2 3	____to____	____to____	_____
1 2 3	____to____	____to____	_____
1 2 3	____to____	____to____	_____
1 2 3	____to____	____to____	_____
1 2 3	____to____	____to____	_____
1 2 3	____to____	____to____	_____
1 2 3	____to____	____to____	_____
1 2 3	____to____	____to____	_____
1 2 3	____to____	____to____	_____
1 2 3	____to____	____to____	_____
1 2 3	____to____	____to____	_____
1 2 3	____to____	____to____	_____
1 2 3	____to____	____to____	_____
	TOTAL=_____	TOTAL =_____	

TOTAL TEACHING SECONDS_____(Time between start and stop)

TOTAL TEACHER SECONDS_____ PERCENTAGE_____
(teacher/total seconds)

TOTAL STUDENT SECONDS_____ PERCENTAGE_____
(student/total seconds)

WERE STUDENTS INDEPENDENT? (circle) yes no

WAS TEACHER'S SINGING ACCURATE? 5 4 3 2 1
yes no

DID TEACHER USE CLEAR AND ACCURATE CUES?
5 4 3 2 1
yes no

Teaching Task #5. The final teaching task for each student was a 6 minute music concept lesson, self-selected, independently planned, and receiving no teacher feedback. Teacher modeling for this final lesson was provided to all groups through observation of a videotaped lesson taught by a master teacher. This final lesson was videotaped for analysis and also audiotaped for the scripting class project.

Prior to Teaching Task #5, a final practice session served to provide teacher modeling for the Control Group, reinforce sequential patterns with the two Experimental Groups, and prepare for the independent project for all three groups. This practice involved the observation by all groups of a videotaped concept lesson taught by a master teacher instructing first grade students. Students in the Contact Control Group were subsequently given a verbatim script of the lesson and instructed to script their final lesson using the same format. Both Experimental Groups observed the lesson and also received verbatim scripts of the lesson with instructions to use the same format when scripting the final teaching task. Additionally, these students were instructed to label each block of script as a 1, 2, or 3, and specify the reinforcement type. After checking the patterns, students computed totals for each pattern category and the class discussed the patterns used by the master teacher: 55% using specific related reinforcement, 22% using no reinforcement, and 23% using nonspecific reinforcement. Students agreed that the lesson was well done and observed that combinations of all patterns were effectively used in the lesson. Most notable to both classes was that specific, related reinforcement was used in more than half the patterns of the modeled lesson. Students were instructed to combine in their own lessons the sequential patterns they deemed appropriate for the learning involved rather than for a deliberate use of predetermined patterns .

Videotapes for the Contact Control Group were analyzed using the general form (See Table 7) and both Experimental Groups analyzed their videotapes using the sequential patterns analysis forms (See Table 8). Because data for the study was generated from Teaching Task 5, the Contact Control Group lessons were subsequently analyzed using the sequential patterns video analysis form by the instructor.

An individual project (a class requirement) for this semester consisted of a complete script of the final teaching task. The lessons for Teaching Task #5 were audiotaped (and videotaped) so that students could have an individual record of the lesson. Each student typed her audiotaped lesson verbatim, using designated procedures: Triple spacing, label the speaking/singing as either teacher or class/student, indent each time the script changes from teacher or student. These scripts were used in analysis of sequential patterns of instruction.

Equipment

Videotaping for all five teaching tasks was done with a Sony GCS-1 Super Betamovie camcorder with a Sony AC-M110 power adapter. Beta tapes were copied onto VHS format so that beta tapes could be placed in the library for student analysis while the researcher used duplicate tapes for analysis. Audiotaping was done on a Sony CFSW-303 cassette recorder. Videotapes for Beta recording were Sony L-500 ES HGn and Sony ES-HG/T120 tapes were used for VHS dubbing.

Dependent Measures

Data were obtained from the final videotaped lesson through three different processes. First, all lessons were observed by a master teacher who was instructed to judge overall effectiveness of the lesson using a range of grades from 0 to 10. Nine variables were selected by the master teacher

(independently from the researcher) as factors influencing the effective teaching score (See Table 9). These grades became the effective teaching score for comparison and correlation with other factors in the study. Fifteen randomly selected lessons were evaluated (0 to 10) by a second teacher for overall lesson effectiveness. These ranked lessons were compared to scores of the master teacher using the Spearman Correlation Test. Reliability was .97 (N=15; rho=.97; Z=3.62; p=.0003).

Table 9

Grading Procedure for the Teacher Effectiveness Scores

Students received points ranging from 0-10 based on effective use of the following:

Singing Voice
Rote Teaching Procedure
Understanding and Presentation of the Concept
Good Musical Examples of the Concept
Student Participation/Understanding of the Concept Presented by Teacher
Eye Contact
Reinforcement
Use of Names of Students
Assertiveness and Leadership

A second process for extracting data from the videotaped lessons was the timing in seconds of each component of a sequential pattern throughout the entire lesson. Percentage scores were then computed for total seconds spent in task presentation, total seconds spent in student response, and total seconds spent in reinforcement. Video analysis forms used for student analysis provided this data (See Table 8).

The third process for obtaining data involved frequency of completed patterns and pattern components. Total patterns were determined from the lesson scripts. With regard to task presentation, all scripting coded as a "1" was evaluated as to appropriate or inappropriate information. All tasks involving singing had been reviewed on the videotapes to determine pitch accuracy. Inaccurate tasks were defined as inaccurate singing, inaccurate or incomplete information, repetitive statements, and misuse of musical terminology. Accurate tasks were described as correct information which was appropriately used in the "1" of the teaching pattern (academic, direction, social), as defined in previous research of Yarbrough and Price (1989). Frequencies of accurate and inaccurate tasks were then summed to provide totals for task presentations.

The frequency of specific reinforcement and nonspecific reinforcement was calculated and observed in two functions: Percentage of total reinforcement, and percentage of cycles using specific or nonspecific reinforcement. In addition, this information determined total number of reinforced cycles (any "3" in a pattern).

Summary

In summary, groups received treatment prior to Teaching Task #5. All groups observed a teacher modeled concept lesson by their own instructor. The Contact Control Group members each were videotaped demonstrating some aspect of music skills to provide equivalent practice time. Experimental

Group 1 received instruction in which sequential patterns were defined and demonstrated. Following instruction they wrote their own examples of patterns and peer-assessed two sets of patterns for correctness. Experimental Group 2 received identical instruction in sequential patterns. However, they were required to prepare a demonstration of assigned patterns. Thus, they planned four sequential patterns, demonstrated them for the class, and were videotaped. Students then peer-assessed the video tapes by identifying and grading each pattern viewed on the videotape. Two experimental groups were used in this study to isolate instructional time used in teaching sequential patterns. Experimental Group 1 passively learned the material, whereas Experimental Group 2 was actively engaged in learning the material. Prior to Teaching Task #5, additional practice in identifying sequential patterns was provided to both Experimental Groups during the training session for completing the scripting project. All groups viewed a videotaped concept lesson taught by a master teacher and observed a script of the lesson. Subjects in the Control Group viewed the script as a model for their independent project. Experimental Groups 1 and 2 then labeled the patterns on the script and determined the use of sequential patterns during this master lesson. Data for comparison was derived only from Teaching Task #5. The first four Teaching Tasks, through successive approximations, led subjects to the competencies needed for teaching, observing, and analyzing their lessons in Teaching Task #5.

RESULTS

The primary focus of this study was to examine the relationship of sequential patterns and the individual components of these patterns to the effective teaching evaluations of a master teacher. The final teaching task of a music teaching course designed for elementary education majors served as each student's example of her very best independently planned and presented music concept lesson. Each student selected a concept for this teaching task and independently developed a lesson plan for presentation to the class. The Contact Control Group video analysis did not involve observation in sequential patterns; therefore, lessons were later analyzed by the course instructor. Video analysis of Teaching Task #5 for the two Experimental Groups required subjects to label all student engagement seconds (number "2" in the teaching cycle) and classify all teacher seconds as either teacher initiating behavior (a "1" in the teaching cycle) or teacher feedback or response behavior (a "3" in the teaching cycle). All reinforcement seconds were scripted on the analysis sheets.

In addition to the videotaped record, the final lesson was also audiotaped on cassette in order that each subject be able to transcribe the lesson accurately and produce a verbatim script. All teacher talk and student talk was grouped in paragraphs based on the function of "1", "2", or "3" in the pattern. Students in Experimental Groups 1 and 2 then labeled the function of each paragraph as 1, 2, or 3, with appropriate reinforcement codes included for the 3 category. This script was completed as the independent project for each class.

Due to the complexity of the teaching process, a detailed analysis of the data was warranted to thoroughly examine the function of sequential patterns within the global process of effective teaching. Data consisted of (a) effective teaching scores, which were ratings from 0 (low) to 10 (high) assigned each

student by a master teacher; (b) percentage of time spent in each individual component of the observed patterns: task presentation, student response, and reinforcement; and, (c) percentage of occurrence of teaching patterns with and without reinforcement. In addition, task presentations were further categorized as appropriate or inappropriate and counted.

Effective Teaching Ratings

Effective teaching scores were analyzed using the Kruskal-Wallis One-Way Analysis of Variance. Results indicated no significant difference among the three groups in effective teaching scores [$H(2, 61) = 3.377$; $p > .05$] suggesting that training in use of sequential patterns did not effect overall lesson effectiveness. However, mean ranks of the three groups indicated that Experimental Group 2 earned the highest ratings (Rank M=35.38; Raw Score M=5.25), followed by the Contact Control Group (Rank M=32.43; Raw Score M=4.85) and Experimental Group 1 (Rank M=25.48; Raw Score M=3.62). Experimental Group 2, which practiced sequential patterns, earned the highest mean score, but Experimental Group 1, which did not practice sequential patterns, earned the lowest mean score.

Relationships Between Teacher Effectiveness Scores and Sequential Patterns

A series of Spearman Rank Correlation Coefficient tests compared teaching effectiveness scores to percentages of time spent in each component of the patterns and to percentage of occurrence of various types of patterns. Results demonstrated a:

(a) non-significant, low, and negative correlation between effectiveness scores and time spent in task presentation (N=61; rho= -.05; Z=-.37; p=.71);

(b) non-significant, low, and negative correlation between effectiveness scores and time spent in student response (N= 61; rho= -.01; Z= -.10; p=.92);

(c) significant, moderately low, and positive correlation between effectiveness scores and time spent in reinforcement (N= 61; rho= .33; Z= 2.54; p=.01);

(d) non-significant, low, and positive correlation between effectiveness scores and frequency of specific, related reinforcement (N=61; rho= .24; Z= 1.84; p= .06);

(e) non-significant, low, and negative correlation between effectiveness scores and frequency of nonspecific reinforcement (N=61; rho= -.23; Z= -1.80; p=.07);

(f) significant, moderate, and negative correlation between effectiveness scores and frequency of the 1-2 pattern (N=61; rho= -.45; Z= -3.45; p=.0006);

(g) significant, moderately low, and positive correlation between effectiveness scores and frequency of 1-2-3 patterns with specific reinforcement (N=61; rho= .38; Z= 2.96; p=.003);

(h) non-significant, low, and positive correlation between effectiveness scores and frequency of 1-2-3 patterns with nonspecific reinforcement (N=61; rho= .18; Z= 1.36; p=.17);

(i) significant, moderately low, and positive correlation between effectiveness scores and frequency of reinforced patterns used in the lesson (N=61; rho= .38; Z= 2.96; p=.003);

(j) non-significant, low, and positive correlation between effectiveness scores and frequency of patterns used in the lesson (N=61; rho= .03; Z= .19; p=.85);

(k) significant, moderately low, and negative correlation between effectiveness scores and frequency of inappropriate task presentations (N=61; rho= -.31; Z= -2.37; p=.01)

(l) significant, moderately low, and positive correlation between effectiveness scores and frequency of appropriate task presentations (N=61; rho= .35; Z= 2.67; p=.007).

Thus, it would appear that there may be some association between teaching effectiveness and five aspects of sequential patterns: (1) time spent in reinforcement, (2) use of the 1-2 pattern, (3) use of specifically reinforced patterns, (4) levels of appropriate task presentation, and (5) levels of inappropriate task presentation.

Comparison Among Groups

All group comparisons were calculated using separate analyses of variance. All means and standard deviations are reported in Appendix B.

A one-factor analysis of variance comparing percentage of time spent in task presentation demonstrated a significant difference among the three groups ($F(2, 58)=8.12$; $p= .0008$) (See Table 10). Subsequent comparison of means using the Scheffé F-test showed a significant difference between the Contact Control Group and Experimental Group 1, which received instruction without practice in sequential patterns, and no other significant comparisons between means (See Table 11).

Table 10

Summary Table: ANOVA on Percentages of Time Spent in Task Presentation

Source	DF	SS	MS	F	p
Between Groups	2	914.36	457.18	8.119	.0008
Within Groups	58	3265.776	56.306		
Total	60	4180.135			

Table 11

Scheffé F-test on Mean Percentages of Time Spent in Task Presentation

Experimental 1	Experimental 2	Control Group
52.55	56.58	61.98

Underlining indicates no significant difference ($p > .05$)

Further study of task presentation was conducted to isolate the impact of appropriate and inappropriate task presentation on lesson effectiveness. A one-factor analysis of variance comparing appropriate task presentation demonstrated no significant differences among the three groups [$F(2, 58)=.51$; $p= .60$]. Although Experimental Group 2 produced the highest mean percentage of appropriate task presentations ($M=82.39$), the other two groups also presented a similar percentage of appropriate tasks (approximately 79%). Thus, while Experimental Group 2 had less than 20% of inappropriate task presentations, the other two groups had slightly greater than 20% of inappropriate task presentation.

Comparison of time spent in the student response component of teaching patterns was also analyzed across groups using a one-factor analysis of variance. Results indicated a significant difference in the amount of lesson time spent in student response [$F(2, 58) = 6.588$; $p< .05$] (See Table 12). Post hoc analysis using the Scheffé F-test indicated the Contact Control Group spent significantly less time in the student response component of the cycle than Experimental Group 1 and less time (but not significantly) in student response than Experimental Group 2 (See Table 13).

Table 12

Summary Table: ANOVA for Percentage of Time Spent in Student Response

Source	DF	SS	MS	F	p
Between Groups	2	814.328	407.164	6.588	.0026
Within Groups	58	3584.71	61.805		
Total	60	4399.038			

Table 13

Scheffé F-test Comparisons of Mean Percentages of Time Spent in Student Response

Control Group	Experimental 2	Experimental 1
34.54	39.04	43.46

Underlining indicates no significant difference ($p > .05$)

The percentage of time spent providing reinforcement in lessons was also analyzed with a one-way analysis of variance comparing groups. Results indicated no significant differences among the three groups in the amount of time spent reinforcing students while teaching [F (2, 58) = .784; p=.4614]. Group means indicated that both Experimental Groups provided more reinforcement than the Contact Control Group (M=3.48), with highest ratings earned by Experimental Group 2 (M=4.38), which received instruction and practice in providing reinforcement. Experimental Group 1 (M=4.15) scored slightly lower than Experimental Group 2.

One-way analyses of variance were used to compare the use of specific reinforcement across groups and nonspecific reinforcement across groups. Results of both tests indicated no significant difference in the use of reinforcement among groups [F (2, 58)=1.418; p=.2506] and [F (2, 58)=1.417; p=.2506]. Both Experimental Group 1 (M=24.68) and 2 (M=29.03) produced a greater percentage of specific reinforcement than the Contact Control Group (M=21.25), while the Contact Control Group (M=78.19) showed a greater percentage of nonspecific reinforcement than either Experimental Group 1 (M=68.61) or 2 (M=65.54).

Comparisons of pattern usage among the three groups using one-factor analysis of variance indicated no significant differences in the occurrence of 1-2 patterns, [F(2, 58)= 2.41; p= .10] and the 1-2-3 patterns with specific, related reinforcement [F(2, 58)= .614; p= .54]. Comparison of occurrences of 1-2-3 patterns with nonspecific reinforcement, however, yielded significant differences among groups [F=(2, 58)=4.07; p=.02] (See Table 14). Subsequent comparison of means showed a significant difference between the Contact Control

Group and the Experimental Group 1. The Contact Control Group mean was also higher than the mean for Experimental Group 2, though not significantly so (See Table 15). The Contact Control Group used a greater percentage of nonspecific reinforcement than did both Experimental Groups.

Table 14

Summary Table: ANOVA on Percentage of Patterns Spent in the 1-2-3 ns pattern

Source	DF	SS	MS	F	p
Between Groups	2	2010.785	1005.393	4.067	.0222
Within Groups	58	14339.327	247.23		
Total	60	16350.112			

Table 15

Scheffé F-test on Mean Percentages of the 1-2-3 ns Pattern .

Experimental 1	Experimental 2	Control Group
30.18	30.35	42.49

Underlining indicates no significant difference ($p > .05$).

Total pattern occurrences (all 1-2 and 1-2-3 patterns) and percentage of total reinforced patterns (all 1-2-3 patterns) were examined across groups using one-factor analyses of variance. Results showed no significant differences in the frequency of pattern usage among the three groups [$F(2, 58) = .08$; $p = .92$]. Similar findings resulted from comparison of percentages of reinforced patterns [$F(2, 58) = 1.53$; $p = .23$].

Testing for Uniform Course Content

The focus of this study was to examine the relationship of pattern use to effective teaching scores. A secondary purpose was to ascertain whether nonmusicians could learn teaching skills such as sequential patterns and music skills during one semester. To determine whether academic course content remained the same in all three sections, regardless of time requirements for treatments, a music skills posttest measuring musical knowledge similar to the pretest was given during week 12. Posttest scores were compared using the Kruskal-Wallis One-Way Analysis of Variance. No significant differences occurred in posttest musical knowledge among the three groups [$H(2, 58) = .68$; $p = .71$]. Posttest grades for the Contact Control Group, Experimental Group 1, and Experimental Group 2 were 91.2%, 91.7%, and 92.7%, respectively, which was a considerable increase from pretest scores which averaged approximately 20% for all groups.

In summary, groups were compared to isolate differences in time spent in pattern components resulting from group treatment. Results regarding the components of sequential patterns indicated:

1. The amount of time spent in task presentation was significantly different among the three groups, with the Contact Control Group reporting significantly more time spent than Experimental Group 1.

2. Time spent in the student response component also differed significantly between the Contact Control Group and Experimental Group 1. Experimental Group 1 spent more time in student response than the other groups.
3. There were no significant differences among the three groups regarding reinforcement usage.

Frequency of pattern usage provided additional group comparison information. Results indicated that:

1. There were no significant differences in the use of the 1-2 pattern among the three groups.
2. There were no significant differences in the use of the 1-2-3 pattern with specific, related reinforcement across the three groups.
3. The 1-2-3 pattern with nonspecific reinforcement was used significantly more by the Contact Control Group than Experimental Group 1.
4. The total number of patterns used in the lesson did not differ significantly among the three groups.
5. The total number of reinforced patterns used in the lesson was not significantly different among the groups.

Thus, results suggest that treatment may have impacted the teaching performance of the three groups in several ways. First, training in sequential patterns appears to decrease the amount of lesson spent in task presentation. The Contact Control Group spent more time presenting tasks than both Experimental Groups, and significantly more time than Experimental Group 1. Secondly, the amount of time students are engaged in the lesson appears to increase as a result of training in sequential patterns. The Contact Control Group had less time in the student response component than both Experimental Groups, with significantly less time spent than Experimental Group 1. A third

possible impact of treatment involves the use of the 1-2-3 pattern with nonspecific reinforcement. The Contact Control Group, which earned the lowest teacher effectiveness scores, used more patterns with nonspecific response than both Experimental Groups, with significantly more nonspecific patterns than Experimental Group 1. In all group comparisons of time spent in pattern components or pattern usage, there were no significant differences between Experimental Group 1 and Experimental Group 2, suggesting that the instructional method selected for sequential pattern training is not of consequence.

DISCUSSION

Teacher preparation remains a central issue in educational reform because the influence of the teacher on the educational interaction is paramount in creating effective schools. Though teacher modeling remains a valuable method for communicating knowledge and skills, the use of direct instruction has produced some promising results across the educational community at large. The development of sequential patterns of instruction has moved direct instruction into the music content area.

A chain of research has examined sequential patterns of instruction, beginning with an analysis of what "good" teachers do in terms of pattern usage. Teacher training experiments followed to determine if subjects could be taught successful pattern usage in beginning teacher practica to bring their teaching pattern usage closer to the levels of "good teachers". Further work was done with experienced teachers and graduate students to examine the function of pattern training on those with more experience and skills. Follow up studies viewed teacher-reported preferences gained from lesson effectiveness ratings of small teaching excerpts assigned by the teachers. Comparisons were made of what teachers say is good teaching and what teachers actually do in teaching practica (which followed research-based training in sequential patterns), with strong relationships generally in evidence. These relationships hint at the value of research for the teaching profession. If classroom behavior of teachers really is a deliberate reflection of the values of each teacher, then continuous education concerning effective teaching practices would seem to be critically important.

The primary focus of this study was the relationship of sequential pattern usage and effective teaching scores based on overall lesson effectiveness.

The "part" played by sequential patterns of instruction in the "whole" of teacher effectiveness determination has not been clearly isolated despite some evidence that the use of teaching cycles improves instruction. Within the sequential patterns data, all variables have not yet been observed and isolated as they relate to effective teaching scores. The identification of reliable predictors for effective teaching would be valuable information for teacher training programs.

A secondary focus of this study was to examine the effect of two treatments involving sequential patterns of instruction on student achievement. If no differences exist, then teachers would have the flexibility of selecting a more abbreviated approach which would require less class time. A one semester course for teaching elementary music to nonmusicians is a challenge at best, and time constraints of the curriculum are great. Thus, time flexibility might allow for brief inclusion of sequential patterns as opposed to no inclusion at all.

Observation procedures from previous research were simplified to accommodate a different population. Specifically, an effort was made to limit the detail of the observation of patterns, with greatest changes occurring in the "1", or task presentation, section. No determination of function was made, such as academic, directions, social. Rather, teacher initiating behavior was all timed together as teacher talk. This was not problematic because the lessons were concept lessons and most teacher talk consisted of presentation of academic information with few directions needed. All student participation, verbal, nonverbal, and performance, was timed and coded as student response.

Videotape analysis of reinforcement categories was more complex than either task presentation or student response, but this was not problematic due to the small percentage of reinforcement in a six minute lesson. Two factors affected the decision for a more precise study of reinforcement. First, students

of all classifications generally enroll in this course and some have not yet taken educational psychology. Those who have completed psychology courses often have not made the transfer from isolated behavior modification techniques to the educational setting. Secondly, because task presentation was not studied in detail, it was hoped that tasks could indirectly be addressed through a focus on reinforcement. If subjects were attempting to use specific, related reinforcement, then cognizance of the task would be necessary. The resulting observation system allowed students to time larger chunks of the lesson for the 1-2 components and to deal precisely with a limited number of brief reinforcements during the reinforcement component.

This rationale seemed appropriate because elementary education majors often possess little musical training. Thus, subject matter of music may be overwhelming in such a short time period. Time is needed to process musical information and practice music skills, and this prohibits compacting all music skills presentations into a short period early in the semester. Time is also needed to develop teaching skills because information and active practice are necessary. Training in sequential patterns is not a lengthy process in itself, but observation training does require more instruction, more practice, and the subsequent self-observations require much time. Music majors can devote this time in methods classes because decisions about correctness of musical information are done almost unconsciously. This is not true for the nonmusician. The greatest challenge for nonmajors is indeed deciding if the music information is correct and devising ways to present this information. Many students do not know or cannot sing the songs which would clearly demonstrate musical concepts. While instrumental music majors may face the same dilemma, certainly it is not to the same degree.

Effective Teaching Scores

The criteria for evaluating teacher effectiveness were independently determined by the expert teacher serving as the evaluator. Teacher influence on the teacher/student interaction becomes clear when pattern components are used to label the evaluation criteria selected by this expert teacher (See Table 16). As can be seen, more than half the criteria selected concerned task presentation. While this delineation does not address the weight given to each of the criteria, it still may be an indication of the importance of teacher behavior in the evaluation of teaching effectiveness.

Table 16

Grading Procedure for Teacher Effectiveness Scores

Component	Evaluation Criteria
task presentation	Singing Voice
task presentation	Rote Procedure
task presentation	Understanding and Presentation
task presentation	Good Musical Examples of the Concept
student response	Student Participation/Understanding of the Concept
task/reinforcement	Eye Contact
reinforcement	Reinforcement
task/reinforcement	Use of Names of Students
task presentation	Assertiveness and Leadership

Although statistical analysis does not document significant differences among groups in teacher effectiveness, some informal observations seem warranted. Experimental Group 2 produced the highest mean score for teacher effectiveness while Experimental Group 1 earned the lowest mean score. A contributing factor to this low score may well have been the weak singing displayed by this class. Although a follow-up comparison of inaccurate information indicated that all three groups had similar amounts of inaccurate information, this data reflected only what percentage of the occurrence of task presentations were wrong. However, poor singing was not isolated from other wrong information. In Experimental Group 1, the wrong information was often delivered by the teacher's singing, which was counted as one bit of wrong information. What was not taken into account was the fact that rote song instruction, which might have indicated 6-8 bits of wrong information, may well have involved over 2 full minutes of the lesson. This amount of wrong singing likely had a great impact on the overall effectiveness rating given by the master teacher. The impact of treatment still is not a clear issue due to poor singing performance possibly resulting in lower scores for Experimental Group 1.

Relationships Between Teacher Effectiveness Scores and Sequential Patterns

Correlations between aspects of sequential patterns and teacher effectiveness scores of the total group of students provided some measure of the relationship between patterns and effective teaching. Significant correlations resulted from comparisons involving use of reinforcement, use of the 1-2 pattern, use of the 1-2-3 nonspecific pattern, total percentage of reinforced patterns used in the lessons, and appropriate/inappropriate task presentation. These variables, all related to either task presentation or reinforcement, strongly underscore the importance of teachers in the learning interaction between teachers and students.

Significant positive correlations occurred between teacher effectiveness scores and the percentage of time spent in reinforcement; the percentage of patterns which included specific, related reinforcement; the percentage of patterns which included any form of reinforcement; and use of appropriate task presentation, which includes correct musical information and correct singing. Although these correlations do not delineate reinforcement type nor examine the quality or length of reinforcement, it is clear that as the number of reinforced patterns increased, the effective teaching scores also increased. The significant, positive correlation of accurate task presentation and teacher effectiveness score is an important consideration when training nonmusicians. If teacher effectiveness scores increase as correct musical information and singing increase, then it appears important to provide adequate preparation in music subject matter and opportunities for singing improvement for the nonmusician.

Significant negative correlations occurred between teacher effectiveness scores and both the use of the 1-2 pattern and the percentage of inappropriate task presentation. In light of the significant positive correlations reported, both of these negative relationships seem logical. As the level of the non-reinforced patterns increased, the teacher effectiveness scores decreased. Likewise, as the level of inappropriate task presentation (inaccurate musical information, inaccurate usage of musical terms, poor singing) increased, the teacher effectiveness scores decreased.

Other correlations, though non-significant, warrant discussion. Virtually no relationship existed between teacher effectiveness scores and both time spent in task presentation and time spent in student response. These correlations are perhaps artificially low because a rote song requirement was included in the teaching task assignment. Time spent learning a rote song provided student response time which was not really a reflection of the patterns used in

the actual teaching of the music concept lesson. The rote song procedure guaranteed approximately 50% of the lesson spent in task presentation and 50% spent in student response time during the rote process. Some subjects used only about one minute to quickly teach the rote song and then proceeded to teach the concept lesson. However, other subjects took over two minutes and a few used over four minutes of lesson time in rote instruction. Time spent in student response for lessons with longer rote songs was high, but the lessons were not necessarily well taught. Frequently the concept was quickly explained with little class interaction due to shortage of time. In early teaching efforts, subjects often get up and "tell" the lesson (in this case, the concept), forgetting that teaching can be an interaction between teacher and student. This was the case for a number of subjects, who taught the rote song, presented all the concept academic information, and then concluded by having students sing again with perhaps some simultaneous activity demonstrating the concept. Thus, all lessons had a base of student response time and a base of task presentation due to the rote song, which interfered with the isolation of teachers talking too much ("telling" the lesson) or students having many opportunities to participate in lesson activities. These correlations would likely have been more representative of lesson effectiveness if only time spent teaching concept lessons had been evaluated.

Relationships between teacher effectiveness and several reinforcement aspects were non-significant. Teacher effectiveness scores, as compared to percentage of both specific and non-specific reinforcement usage, had similar low correlations. However, specific reinforcement was positively related to teacher effectiveness scores and nonspecific reinforcement was negatively related to teacher effectiveness scores. Although these correlations are quite low and nonsignificant, their tendencies support the idea that teacher

0effectiveness scores may increase as specific reinforcement increases and teacher effectiveness scores may decrease as non-specific reinforcement increases. In addition, teacher effectiveness scores maintained a low positive correlation with occurrences of the 1-2-3 ns pattern (non-specific reinforcement). It appears having reinforcement in a cycle, regardless of the type, is preferable to no reinforcement at all. This seems somewhat contradictory to the previously stated function of reinforcement and might be explained by group differences in reinforcement. While both experimental groups were trained to use specific, related reinforcement, the control group only observed specific, related reinforcement during teacher demonstration lessons. Almost 80% of the reinforcement used by Control Group members was nonspecific (as compared to approximately 66% in both Experimental Groups). Despite limited use of specific reinforcement, subjects in the Control Group still earned high teacher effectiveness scores, perhaps due to strong skills in other effective teaching variables and well-planned lessons using correct musical information.

The relationship of teacher effectiveness and total number of patterns used in lessons was almost nonexistent. This relationship was examined to see if increased student engagement opportunity, regardless of the length, would be perceived as a more effective lesson. Total patterns used were similar among subjects, and teacher effectiveness scores evidently were not impacted by the number of patterns used. Pattern occurrences during a rehearsal setting might operate differently than total patterns used to teach a music concept lesson. Further study of total patterns might also address pacing within music concept lessons and rehearsals.

Comparisons Among Groups

Group Comparisons of Time Spent in Pattern Components. Group differences in time spent in each component of sequential patterns (task presentation, student response, and reinforcement) were investigated to observe treatment impact. Comparisons of time spent in task presentation showed significant differences among groups. Both Experimental Groups had less time in task presentation than did the control group. Experimental Group 1 used significantly less time than did the Contact Control Group. Follow-up group correlations highlighted a moderately low, negative, and non-significant relationship (-.39) between Experimental Group 1 and teacher effectiveness scores. This negative relationship indicates that as task presentation increased, teacher effectiveness decreased. Though not directly isolated in this study, based on casual observation Experimental Group 1 may have been victimized by poor singing. It is conjectured that an inverse relationship existed between time spent singing and lesson effectiveness scores. This may be indicated in the effective teaching mean rank scores: Experimental Group 1 earned the lowest rating (25.48), in spite of receiving treatment in sequential patterns of instruction.

Time spent in the student engagement component was higher in both Experimental Groups than in the Contact Control Group. Subjects in Experimental Group 1 (43%) spent significantly more time actively engaged than the Contact Control Group (35%). Experimental Group 2 (39%) spent less time actively engaged than Group 1 and was not significantly higher in time spent than the Contact Control Group. Since both Experimental Groups exceeded the Control Group in student engagement time, it appears that use of sequential patterns may encourage increased student response periods. However, time measurement does not clearly define this pattern component, because some

subjects used a few long periods of student activity rather than numerous short opportunities for participation and still received acceptable percentages for student engagement. If the intent of direct instruction is to keep students on task, then repeated short activities are more likely to keep students interested and engaged than fewer periods of long activities. Regardless, instruction in sequential patterns appears to impact the amount of student response time in lessons, and there is evidence (See Review of Literature) to suggest that student achievement increases in tandem with active student involvement in learning.

Time spent in reinforcement was not significantly different among groups, but both Experimental Groups showed slightly higher mean percentages of lesson time spent in the reinforcement component of sequential patterns. The similarity of reinforcement percentages suggests that teacher modeled reinforcement had some effect on all groups. Perhaps the important issue is not quantity of reinforcement, but quality of reinforcement. The Experimental Groups both used a higher percentage of specific, related reinforcement than did the Contact Control Group. The specificity of reinforcement is an important aspect of sequential patterns training. It appears that treatment considerably decreased the amount of nonspecific reinforcement.

Group Pattern Usage. The role of the 1-2 pattern in the overall sequencing of instructional presentation has not yet been clearly defined. It may be a mistake to consider a 1-2-3 pattern superior to the 1-2 pattern because it is not clear when or how often the reinforcement should occur. It is known that expert teachers use many 1-2 patterns in their teaching. The three groups in the present study did not use significantly different percentages of 1-2 patterns in the lessons, all scoring within 12% of each other.

There were significant differences among the three groups in the use of

the 1-2-3 pattern with nonspecific reinforcement, and these differences appear to be a treatment effect. Both Experimental Groups used fewer patterns with nonspecific reinforcement (Experimental Group 1 used significantly fewer) than the Control Group. However, it should be noted that over 64% of all reinforcement was nonspecific for the three groups. Good teachers do give brief acknowledgements (cheerleader type responses: "good job", "that's right") and rightly so in appropriate instances. However, when students need feedback concerning the correctness of their performances or responses, use of nonspecific feedback becomes less effective.

The significant correlation between patterns using reinforcement and effective teaching scores emphasized the importance of using reinforced patterns within lessons. Although all groups used reinforcement in less than 10% of their total patterns, the Control Group produced the highest mean percentage of reinforced patterns. This finding appears to negate the effect of treatment, which involved instruction and practice in sequential patterns. However, closer observation suggests otherwise. The Control Group may have delivered more patterns with reinforcement, but only 22% were specific in nature, in contrast to Experimental Groups 1 & 2 which produced 31% and 34% specific reinforcement, respectively. Thus, though the occurrence of reinforcement was greatest for the Control Group, the specificity (and perhaps the quality) was greater in both Experimental Groups.

Treatment Differences. The primary focus of this study was to examine the relationship of sequential patterns of instruction and effective teaching, and results suggest that although effective teaching is a complex act requiring the synthesis of multiple skills, use of sequential patterns appears to affect task presentation and student engagement variables of effective teaching.

The second focus of the study was to examine treatments for differences, because treatment for Experimental Group 1 (instruction and written practice) could be used predominantly as homework assignments, whereas treatment for Experimental Group 2 (instruction and active practice) requires several blocks of class time. Treatment for Experimental Group 1 could be an option for including pattern instruction without sacrificing the class time which treatment for Experimental Group 2 demanded.

The curricular dilemma of a one semester music course for non-majors is to determine what instructional objectives to include and what to leave out. Competence in music skills must be reached at some level in order to provide students with musical subject matter for their lessons. Students must receive instruction in lesson planning, in this case teaching songs by rote and developing concept lessons built on behavioral objectives, task analysis, and evaluation. The teacher effectiveness variables related to delivery are often presented so inexperienced students may gain practice in "good" music teaching behaviors. Whether delivery is approached through teacher modeling or some other system, it takes time for students to gain competence. Music education philosophical issues, such as how to grade creativity, are often included in music teaching courses for nonmajors. The singing voice is another area of focus requiring practice if students are to improve in teaching music lessons.

To add training and practice in sequential patterns to curriculum for nonmajors requires a conscious commitment to instructional training and perhaps a simultaneous commitment to omit something else which is valuable. A case certainly can be made for a two-semester sequence of music skills and music teaching for elementary education majors.

Student Attitude. Although not addressed in the study, another factor of interest is student attitude. Though no attitude measure was built into the

study, informal observations by the researcher suggested an active-passive difference. Experimental Group 1 students were cooperative but seldom excited. During questioning opportunities, students asked "When is it due?", "Must we do examples for both approval and disapproval?", "How much off if it's incomplete?", etc. Students seemed to view the pattern assignments and observation procedures as strictly assignments.

In contrast, Experimental Group 2 students seemed to enjoy working on the projects. Frequently students reported to the class some aspect of their lesson observation done in the library. When assigned patterns to demonstrate on videotape, questions were related to the subject matter, such as "Could our examples deal with classroom behavior or must they deal with subject matter?", or "Can our examples be related to one class setting or must they be independent situations?". Production of the videotape was enjoyable to the class and they enjoyed later evaluating the tape, which they did with a high degree of accuracy. An attitude measure would provide additional information for selecting abbreviated instruction.

Implications for Future Research

It would appear that development of direct instruction strategies would be an excellent beginning experience in teacher training, although there are still many unanswered questions regarding sequential patterns of instruction and its "part" of the effective teaching "whole". It may be that the contribution of sequential patterns is simply the organizational process which it requires of students. The increase in student engagement time is a valuable result, for this is an important link to student learning. In this study, use of patterns also decreased the amount of time used for task presentation in Experimental Groups 1 and 2, both of which reported the two highest teacher effectiveness mean rank scores. Another consideration is that observations and analysis

methods in this study dealt primarily with quantity: How many and how long. Although effective patterns identified in previous research (academic task presentation, student response, and specific positive reinforcement) deal with quality of patterns, incorrectness of academic material and weak delivery could interfere with the effectiveness of the pattern. The interaction of other variables with sequential patterns has not yet been observed.

There is some evidence that use of sequential patterns improves the instruction of both teachers in training and experienced teachers in the field (See Review of Literature). Of interest is the sequencing of effective teaching instruction within the teacher training curriculum. Teaching variables are often new information to music education majors who then struggle with new teaching subject matter much as nonmajors struggle with music subject matter. All learners need time to process and practice before they own new material. Perhaps the role of sequential patterns in this sequence of instruction needs to be investigated.

Direct instruction was developed to systematically improve skills through a controlled procedure. Educational research in direct instruction has progressed far enough to report advanced uses of this simplistic model, through self-selected omission of steps in the task presentations and successful implementation with more abstract subject matter(See Review of Literature). Perhaps the music sequence should begin with a foundation of direct instruction, and then systematically add other documented effective teaching behaviors as students progress through the curriculum.

Future research will undoubtedly provide more insight into sequential patterns of instruction and how they function within the scope of effective teaching. Recommendations for further research include the following:

1. The function of task presentations, as taught by nonmusicians, should

be more specifically analyzed in categories designated by Yarbrough and Price (1989): Academic, directions, social. This would allow for more specific determinations of patterns within the lesson rather than the very broad determinations used in this study. All students had 100% pattern usage because all task presentation was grouped as "1", with a few exceptions of students who ended with a statement of what was learned (1) and a comment that students did very well (2). All other material fell into some pattern, regardless of the task variety included in the task presentations. This type of detailed analysis would be difficult to accomplish within a one semester course, but could likely be completed within a two semester course sequence.

2. Continued focus is needed on task presentation and the sequence in which tasks are presented. Do task presentations function differently in different settings, as does reinforcement with young children and older children? Do task presentations or pattern usages alter with older students, or with more advanced and experienced students?

3. Experimental research might investigate adapting the observation system to include some quality issues not addressed through sequential patterns. Perhaps students could analyze their teaching tapes using quality symbols in addition to pattern notation, such as 1a+ or 3sr-, serving to give immediate feedback to the student that either the pattern component was correct (1a+) or that a specified teacher effectiveness variable, such as eye contact, magnitude, intensity, etc., was absent (3sr-). Students may be unable to address so many issues at once. If a more detailed analysis is overwhelming, perhaps the basic patterns could be learned in a beginning course, with additional indicators added in advanced courses, as skills increase.

Only with continued experimentation in educational settings will an

empirical base be established which can identify and support a wide range of effective teaching practices. The development of direct instruction (and ultimately sequential patterns of instruction) as a teaching model has provided another instructional option for teachers. As effective teaching practices become clearly defined, teacher training programs in university and inservice settings have the opportunity to remodel traditional approaches and actively include research-based effective teaching methodologies into the teacher training curriculum.

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APPENDICES

APPENDIX A

Class Materials

MUS 2170 MUSIC EDUCATION IN THE ELEMENTARY SCHOOL

GOALS:

1. To stimulate thinking concerning the teaching profession and life as evidenced by demonstrating ability to logically analyze, criticize, and/or choose alternatives consistent with some value orientation.
2. To prepare students with competencies necessary to teach music to children; including musical, planning, presentation, and evaluation skills.

TEXTS:

1. Contemporary music education, Harlan Davidson, Inc., 1978.
2. Ready-to-Use Music Activities Kit, Parker Publishing Co., 1984.

OBJECTIVES:

1. Specific objectives relating to the text will be provided on separate handouts.
2. Music Skills - The student will:
   a. Play the melody of an elementary level song on the piano or bells with pitch and rhythmic accuracy.
   b. Demonstrate the ability to explain, define, demonstrate, find, and/or recognize visual and/or aural examples of musical concepts relating to rhythm, pitch, dynamics, form, timbre, texture, and style.
   c. Demonstrate the ability to describe, categorize, and/or recognize visual and/or aural examples of voices and instruments.

3. Music Teaching Skills - The student will:
   a. Task analyze behaviors, including appropriate steps and sequence for teaching.
   b. Lead group singing, including giving correct starting pitch and tempo.
   c. Teach songs to a group using rote teaching techniques.
   d. Plan (in writing according to specified format), organize, teach, and evaluate 6 minute lessons based on one musical concept and including the teaching of one rote song. Song and activities selected should demonstrate awareness of appropriate materials for children at level specified and should be musically accurate.
   e. Within lessons taught, incorporate specified amounts of feedback and calling on students by name.
   f. Objectively and constructively evaluate lessons taught by peers.
4. Become familiar with a variety of texts and methods in elementary music education.
5. Broaden musical observation skills and experiences by attending and reporting on musical performances and an elementary music lesson at the lab school.

ASSIGNMENTS:

All Assignments are due in class on date scheduled (See Calendar).

All Assignments are to be typed (Except as indicated below).

Possible

Points

CB 1. Participate in class discussions and activities.

2. Two exams and one quiz - to be taken on scheduled days - NO MAKE UPS.

10 a. CME and Reading Supplement exam

5 b. Voices and Instruments quiz

25 c. Music Skills exam

CB 3. Three task analyses - handout provided

One video practice

4. Two Rote Song Presentations

5 a. Teach a familiar children's song by rote - 2 minutes

15 b. Teach an unfamiliar children's song by rote- 3 min.

5. Two Music Concept lessons

15 a. One assigned concept lesson- 6 minutes in length.

25 b. One lesson on topic to be decided in consultation with instructor- 6 minutes in length.

Lesson Criteria

Each lesson must include the teaching of one rote song.

For the second lesson, provide a copy of the lesson plan for the instructor and all class members using the prescribed form.

Follow feedback requirements, as indicated by the instructor, for both lessons.

CB 6. All song and lesson presentations will be videotaped.

For each, turn in video reviews, using forms provided.

For Concept Lesson 1, fill out in class and hand in a

short evaluation form on each classmate's music lesson. (Video reviews need not be typed.)

CB 7. Report on 1 concert (specified by the instructor) — about 1-1/2 to 2 pages typed. Report should include a short critique of each piece and a paragraph discussing whether you would take children to a concert of this nature (disregard the length of the concert).

CB 8. Observe one elementary music class Handout will be provided. (Report need not be typed.)

CB 9. Miss no more than 3 classes for any reason.

CB 10. Miss no classes on PRESENTATION DAYS or STAR DAYS.

CB 11. Independent Projects - To Be Announced.

CB 12. Keep copies of all written work - copies turned in will not be returned.

TASK ANALYSIS #1

A person, seated facing a dining table, is to take a bite of oatmeal from a dish set before him/her, using the spoon which lies beside the dish. This action must be performed in a manner which would be acceptable for dining in a public place. What steps, in sequence, must take place? Use a numbered list format.

VIDEO PRACTICE

Class members must learn by memory a four line verse of poetry taught by each student in the class. Using the phrase method and cues, teach the poem and attempt to incorporate eye contact and intensity skills as discussed in class. The instructional goal is for the class to independently recite the poem. Complete video review sheet #1.

TASK ANALYSES #2 AND #3

A seven year old child of normal ability is to learn to sing a simple folk song which he/she has never heard before. What steps, in sequence, must he/she complete to be able to sing the song without assistance? Use the specific song you will be teaching. Use a numbered list format.

CALENDAR

January	
15th	Introduction
17th	Music Activities
	Cues and Delivery
19th	Orientation
	Rote Songs
22nd	Pretest
	Rote Songs
	Task Analysis # 1 due
24th	Video Practice
26th	Children and Adult Voices
	Task Analysis # 2 due
29th	*Rote Song: Teacher Model
	Video Analysis # 1 due
31st	ROTE SONG # 1
	(2 minute presentation)
February	
2nd	Music Skills and Concepts
5th	Singing, concepts, and skills
	Video Review # 2 due
7th	Concepts and skills
	Task Analysis #3 due
9th	*Rote Song: Teacher Model

12th	ROTE SONG # 2
	(3 minute presentations)
14th	ROTE SONG # 2, continued
	music skills
16th	CME, chapter 1
	music skills
19th	Lesson plan instruction
	Video review # 3 due
21st	Music Series, textbooks and records
23rd	CME, chapter 2
	music skills

March

2nd	*Lesson plan practice
	Lesson plan # 1 due
5th	*Lesson plan practice
	Reading Supplement discussion
7th	CONCEPT LESSON # 1
	(6 minute teaching)
	peer evaluation of lessons
9th	CONCEPT LESSON # 1, continued
12th	CONCEPT LESSON # 1, continued
14th	CME, chapter 3
	music skills
16th	music skills
	Video review # 4 due

19th	*Lesson plan practice
21st	*Lesson plan practice
23rd	CONCEPT LESSON # 2
	(6 minute teaching)
26th	CONCEPT LESSON # 2, continued
28th	CONCEPT LESSON # 2, continued
	Review sheet for music skills
30th	NO CLASS

April

2nd	Music Skills Exam
4th	CME, chapter 4
	Review Adult voices
6th	CME, chapter 5
9-13th	SPRING BREAK
18th	CME review
20th	CME exam
23th	Classroom management
25th	Instruments
27th	Instruments
30th	Instruments
	Concert report due

May

2nd	Keyboard
	Review: voices and instruments

4th	Voices and Instruments quiz
7th	activities for the classroom teacher
	FINAL GRADE SHEET DUE

APPENDIX B

Group Means and Standard Deviations

Table 17

Group Means and Standard Deviations

	CONTROL GROUP	EXPERIMENTAL 1	EXPERIMENTAL 2
EFFECTIVE TEACHING SCORE (0 -10)	4.85 (2.80)	3.62 (2.91)	5.25 (3.13)
PERCENTAGE OF TIME SPENT			
Task Presentation	61.98 (4.39)	52.55 (7.36)	56.58 (9.77)
Student Response	34.54 (4.29)	43.46 (6.82)	39.04 (11.02)
Reinforcement	3.48 (2.08)	4.15 (2.03)	4.38 (2.89)
PERCENTAGE OF FREQUENCY			
Specific Reinforcement	21.81 (20.74)	30.91 (25.05)	34.47 (27.31)
Nonspecific Reinforcement	78.19 (20.74)	68.61 (25.85)	65.54 (27.31)
1-2 Pattern	44.21 (18.16)	55.93 (19.54)	51.60 (13.21)
1-2-3 s Pattern	13.30 (13.44)	14.43 (11.95)	18.05 (16.84)
1-2-3 ns Pattern	42.49 (18.93)	30.18 (14.06)	30.35 (13.72)
Reinforced Patterns	9.50 (3.59)	7.33 (4.03)	8.25 (4.28)
Total Patterns	16.95 (3.97)	16.86 (4.91)	16.35 (5.94)
Appropriate Task	79.45 (11.78)	79.36 (10.66)	82.39 (10.09)

VITA

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DOCTORAL EXAMINATION AND DISSERTATION REPORT

Candidate: Judy Kay Bowers

Major Field: Music (Education)

Title of Dissertation: The Relationship of Sequential Patterns to the Music Teaching Effectiveness of Elementary Education Majors

Approved:

Major Professor and Chairman

Dean of the Graduate School

EXAMINING COMMITTEE:

Date of Examination:

7/9/90