Research in Music Teaching and Learning

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Teaching and learning are both complex processes, but continuing research can help clarify what is involved in good teaching and learning. Learning is defined as change of behavior. Behavior is defined as any overt or covert response that is observable directly or indirectly. Teaching is any process of purposeful intervention either by teacher, parent, computer or textbook that is intended to bring about learning.

Yet research in music teaching is no small undertaking for many reasons, not the least of which concerns how and in what ways students develop. One apparent aspect of formal evaluation concerns the assessment of subject matter mastery and delivery. Yet another aspect concerns the degree of effectiveness that student's bring with them when they enter the curriculum. Sometimes there is also an important subject matter variable as in the case of music (Forsythe, l975) where students have been involved for many years, listening and/or participating in subject matter while developing skills throughout their lives. Often there is a strong teacher variable that transcends or enhances this subject matter; sometimes there does not seem to be any specific aspect to which one might assign the ingredient(s) that cause a person to be a good learner or to be a good teacher.

During the past thirty years we have attempted to provide the methodology for investigating those aspects of effective student/teacher variables that contribute to music teaching effectiveness (Brown & Standley, 1983; Madsen, 1965; Madsen, Greer & Madsen, 1975; Madsen & Madsen, 1970; Madsen & Madsen, 1978; Madsen & Madsen, 1978). Findings from some of the earliest work have endured the test of repeated research, especially those findings relating to student time on task (Madsen, 1971). Indeed, time on task is now recognized as one of the most important aspects contributing to any student learning. However other ingredients (especially relating to how future music teachers should be trained to interact with students) have remained more elusive and have necessitated continuing investigation.

In an attempt to find those aspects relating to effective music teaching detailed studies and observation forms were developed that coded teacher academic and social approval, academic and social disapproval, as well as errors of a teacherís social interaction (i.e., approving a child when the child was actually misbehaving). These forms, combined with the aforementioned student on-task forms, have been extremely useful in providing individual teachers with feedback on how he/she was actually interacting

with each student (Madsen & Madsen, 1983).

There are varying degrees of directness and indirectness concerning a teacherís intervention, yet the intended purpose of changing behavior is the same. Sometimes a highly directive approach is involved. This generally occurs when the teacher is exercising much control over student responses and is concerned with studentís response being either right or wrong. At other times the intervention strategy will be?less obvious, or at least less directive, such as leading a discussion concerning topics for which there may be no right or wrong answers. The teacherís objective may simply be to help students learn a process for analyzing something. In music teaching, having students discuss whether or not a particular piece of music has merit and will stand the test of time would be an example of this kind of process teaching (Madsen & Kuhn, 1994).

For example, teachers intentionally initiate behaviors by giving instructions; modeling, using verbal imagery and asking questions. Clear directions are important for efficiency and clarity, as is the case with classroom rules. Modeling is important because it provides the student with an expert demonstration. This is especially important in music teaching. Using verbal analogies and metaphors to initiate certain behaviors provides a creative, interesting and sometimes humorous approach to developing responses (e.g., ìTake in a breath as though you have just seen a snakeî or ìMake the musical phrase soar like a kite.)î When asking questions the teacher and student must know if the pattern of questioning and responses are to be factual, or if they are to be creative (Madsen & Madsen, 1983).

Unfortunately, when teaching factual information many teachers play a ìguess what teachers thinkingî game without fully realizing what the learning outcome will be. It seems that if factual information from the student is required, then the most direct and efficient instructional approach is to promote this learning with the least possibility of student mistake. For example the teacher should first state ìthe key of G major has one sharpî, as opposed to first asking, ìhow many sharps does G major have?î when the student does not know. Alternately, if the teacher desires that the student give the studentís opinion (as opposed to parroting the teacherís opinion) then a less direct approach would be advisable where a great deal of teacher questioning would be important (e.g., ìHow do you feel about this music.)î Sometimes the teacher might ask a student to develop a strategy in order to gain additional information by asking leading questions. This type of questioning is also appropriate as it forces the student to extend and/or apply previously learned material in gaining new information. For example, ìwithin the circle of 5ths, if the key of G has one sharp, then how many sharps are there in the key of D?î (Madsen & Kuhn, 1994).

While some aspects of music teaching/learning seemed clear other aspects of the student /teacher interaction process have remained more troublesome, especially those relating to teacher selection and preparation. More and more observational forms were developed over the years, subsequently tested, and then incorporated into our teacher training curricula. Typically, a new form would be developed that addressed a new issue when someone determined that the basic taxonomic basis was wrong and/or incomplete.

Observational assessment forms covered many different aspects relating to both the teacher/student interaction and the learning environment. For example, some of these forms rated specific aspects of instrumental and choral conducting, or conceptual aspects of teaching elementary music to young students, or how to evaluate appropriate music selections as well as how to develop resource materials relating to effective music teaching (Madsen & Yarbrough, l980). Other research was devoted to investigating learning sequences for persons who are handicapped and providing models of presentation and assessment for our students in music therapy (Madsen, 1981; Madsen & Jellison, 1991).

Effective Teaching from a Global Perspective

After having assembled all of this somewhat compartmentalized knowledge, during the next several years

we attempted to put all of this information together in order to test effects within the last series of classes for prospective teachers, just before they left the university to begin their student teaching. Previously, we had isolated many specific behaviors that seemed necessary for effective teaching that were incorporated into this final ìmodel.î To our surprise putting all of the information together did not produce the complete "whole" that we had anticipated.

At that point in time we decided to begin at the other end of the continuum, as it were, and attempted to assess a more "global" aspect of teaching, apart from any a priori specifics. Thus began another long series of studies that seem quite conclusive in their results concerning the ability to rate effective teaching in its global dimension. This global attribute was defined as teacher intensity and was rated in much the same way as student on-task had been previously assessed (Cassidy, 1990; Madsen, 1988; Madsen Standley & Cassidy, 1989; Madsen & Geringer, 1989; Kaiser, 1998).

Teacher intensity was defined as the "sustained control of the student/teacher interaction evidenced by efficient, accurate presentation and correction of the subject matter with enthusiastic affect and effective pacing" (Madsen & Geringer, 1989, p.90). Problems arose, however, when we asked panels of experts to list the specific attributes of effective teaching. We did this by asking experts to view videotaped teaching interactions and to list the "best" and "worst" aspects of each individual's teaching. While experts had extremely high agreement on their overall global ratings of teacher intensity, their lists of the specific "best" and "worst" aspects for each individual teacher did not coincide with each other or findings from past research (Madsen et. al, 1992). Additionally, a panel of music supervisors who were trained in a standardized teacher assessment instrument was asked to rate the same teaching tapes. This groupís overall ratings of these same videotaped excerpts was almost identically to the other set of experts concerning global effectiveness, yet the specific reasons for their individual ratings did not agree with each other or with the other group of evaluators.

It became apparent to us that while intensity was a global concept that correlated highly with other "global ideas" of good teaching, and while almost anyone can distinguish among various levels of "good versus bad" teaching using a global rating, there was not agreement concerning its specific ingredients. Within our teacher-training program we were also able to have every prospective teacher both recognize teacher intensity and to demonstrate it for a period of fifteen seconds to three minutes (Madsen, Standley, & Cassidy, l989).

Developing a Clear Description of Effective Teaching

After establishing this line of research we again began to investigate those specific teaching behaviors that seemed necessary given the above definition of teacher intensity (Madsen & Geringer, 1989). We were concerned about how to proceed and felt that it was necessary that we proceed slowly in order not to assume that we already knew the specific ingredients of this perplexing skill. We attempted to integrate all of the information from our past research including the information from the above panels of experts.

One continuing area of investigation related to earlier instructional sequencing. Sequencing of instructional tasks is perhaps one of the most important aspects influencing the success of an instructional paradigm. A teaching sequence was defined as (a) teacher presentation or instruction (b) student behavior, and (c) teacher feedback to the student(s). Teaching observation forms were developed to address these three components sometimes combining findings from previous research. We spent a good deal of time researching (a) subject matter presentation only (Byo, 1990; Cassidy, 1990; Madsen & Geringer, 1983; Madsen, Standley, & Cassidy, 1989; Sims, 1986; Yarbrough, 1975), (b) teacher feedback only (Forsythe, 1975; Kuhn, 1975; Madsen & Madsen, 1983), and (c) the sequence of subject matter presentation, student performance, and teacher feedback (Jellison & Wolfe, 1987; Price, 1983; Yarbrough & Price, 1981; Yarbrough, Price & Bowers, 1991; 1989).

All of the observation instruments that we used shared a common emphasis on the continuous recording of specifically defined aspects of teacher and student behavior. Other forms have been developed that include most of the previous information that proved useful in previous studies regarding ongoing teacher effectiveness (Duke & Madsen, 1991; 1993). For example, the Instructional Sequence Observation Form contains an overall assessment of temporal instructional sequences. For example, the teacher asks a student to perform a certain pitch, the student performs correctly, the teacher says "that's correct" representing one complete cycle.

Additionally, the form contains a detailed procedure to assess separate aspects within each of the three components of each teaching sequence. The first component concerning teacher instruction is divided into four categories: N=teacher verbalizes instruction including the Name of the student; T=teacher verbalizes instruction including specific details regarding the Task to be performed; M=teacher Models the task to be performed; G=teacher instruction is non specific and General; this is, "Start at letter A" or "Try again."

The next classification on the form concerns Student Response and has only two entities 1) student responds correctly, or 2) student responds incorrectly. The third aspect concerns Teacher Feedback and includes eight classifications: A=specific Approval; D=specific Disapproval; a=nonspecific approval; d=nonspecific disapproval as well as mistakes for each of these teacher interactions. For example, a (specific approval) mistake would occur if a teacher stated that a pitch was correct when actually it was not, a specific disapproval mistake occurred if the teacher stated that the pitch was not correct when, in fact, it was.

An additional and important temporal aspect of this observation form includes the temporal direction of each instructional unit: Forward Direction indicates that the sequence is proceeding in the correct direction without the teacher having to back up in the instructional process. A backward direction would be when the teacher advances too quickly leaving out important steps in the learning sequence and then has to state "Oh I forgot, lets go back and put the reed on the mouthpiece before we go on to correct your embouchure." Thus, when the teacher does back up to teach a previous, yet necessary step, the instructional sequence is classified as representing a Backward Direction. Another extremely important classification within this category is a Repeat direction where the teacher says "Again" or "Take it again" (Duke & Madsen, 1991; 1993).

Typically, when using this form a twenty-minute videotaped student teaching excerpt is selected for analysis. Each tape is then analyzed several times by at least two experts until complete agreement is achieved. Total time required for this detailed analysis is approximately two hours per subject.

A Study Using the Sequence Observation Form

In one recent study every lesson/rehearsal was analyzed according to the above classification system comparing freshman level teachers to when they were ready to graduate four years later. All teaching sequences were analyzed regardless of whether or not they were complete sequences which had all three components containing (a) instruction (b) student response and (c) teacher feedback, or only contained instruction and student response, or only teacher instruction.

Many aspects of both appropriate and inappropriate teaching can be observed via this observation method. Most often, unprepared teaching responses are readily identified. Specifically, one freshman student began by asking preschoolers "Do you want to sing?" and received children responses that he/she was not prepared for, when two children said "No!" Another freshman asked "How many of you know the song Twinkle, Twinkle?" and immediately a child started to sing, necessitating a subsequent problem in classroom management. This type of teacher interaction did not occur four years later during these same student's internship teaching.

In a very recent study Kaiser (1998) attempted to control for subject matter presentation and to vary only the intensity of conductor instructions. Video tapes were made that contained three different high school conductors whose instructions were delivered either in an intense enthusiastic manner or in a non-enthusiastic and rather boring manner to a live band performing the 2nd Holtz suite for band. Rather than having the actual band performance recorded on videotape, a professional performance of the same music was dubbed onto the tape to subsequent viewing. Differences between the high versus low conductor instructions were perceived by all persons who participated in the study as being much better and were perceived as demonstrating better teaching. We expected this finding; what we did not expect was that many people perceived the band performances as being better following the high intensity instructions when compared to the low intensity instructions when, in fact, the performances were identical.

Conclusion

A general aspect relating to this paper concerns appropriate methodology in the assessment of effective music teaching and learning. Our methodology, which started over thirty years ago, always took place in the "naturalistic" school setting. Thus, teacher/student observations have continuously been made over many weeks, months and years with as little a priori bias as possible. During this long time period aspects concerning student on- task and teacher approval and disapproval for both academic and social student responses have been isolated as being effective and important aspects effective teaching. Additionally, other ingredients necessary for effective teaching have also been observed, codified, and slowly a taxonomic base has began to be developed.

However, subsequent attempts to put all these positive aspects into teacher training programs continue to be troublesome. The problem does not arise because of difficulty in observing effective teachers in their natural setting and determining what it is that they do which is effective/ineffective; nor does the problem arise because specific effective ingredients are not subjected to experimental testing and subsequent confirmation; the problem comes from trying to put the best of research findings together in order to instruct future teachers. When evaluative measures are taken on beginning teachers across somewhat extended periods of time, it becomes clear that most young teachers have difficulty not in the short term but in the long term when dealing with constant transitions and the ongoing, necessities of more consequential long term instruction.

The major aspect of this paper, therefore, concerns a much larger issue within teacher training. It would seem that often when we attempt to isolate specific attributes in teacher training that have proven effective in the research literature we assume that if all of these individual components are put together that we will have a "complete" teacher. Or we assume that we can "pick and choose" separate research based aspects for young teachers to implement, and thereby insure their success. Unfortunately, this does not appear to be the case.

Problems seem to arise over time within the teaching/learning experience. While some people can be effective for a short duration (a few minutes or teaching one song), the difficulty is maintaining this teacher intensity for a long time i.e., over a complete rehearsal, several days, or months. Perhaps it takes many years for each teacher to make the adjustments necessary for truly effective teaching. Regardless, much more research seems warranted.

References

Brown. A. & Alley, J. M., (1983). Multivariate analysis on degree persistence of undergraduate music

education majors. Journal of Research in Music Education, 31 (4), 271-281.

Byo, J. L. (1990) Recognition of intensity contrasts in the gestures of beginning conductors. Journal of Research in Music Education, 38, 164-174.

Cassidy, J. W., (1990). Effect of intensity training on preservice teacher's instruction accuracy and delivery effectiveness. Journal of Research in Music Education, 38, (3), 164-174.

Duke, R. A., & Madsen, C. K., (1991). Proactive versus reactive teaching. Council for Research in Music Education. (108), 1-14.

Forsythe, J. L., (1975). The effect of teacher approval, disapproval, and errors on student attentiveness: Music versus classroom teachers. In Madsen, C. K., Greer, R. D., & Madsen, C. H. Jr.,. (Eds.) Research in music behavior (49-55). New York: Teachers College Press.

Gardner, M. K. (1885). Cognitive psychological to instructional task analysis. In E. W. Gorden (Ed.), Review of Research in Education, 12, 157-195.

Jellison, J. A. & Wolfe, D. E. (1987). Verbal training effects on teaching units: An exploratory study of music teaching antecedents and consequents. In Madsen, C. K. & Prickett, C. A. (Eds.), Applications of research in music behavior 135-148). Tuscaloosa, Al: The University of Alabama Press.

Kaiser, Keith. (1998). The effect of high versus low intensity teaching on band musicianís evaluation of teaching effectiveness. Unpublished dissertation, The Florida State University, Tallahassee.

Madsen, C. K., (1965). Experimental research in applied music. Music Educators Journal, 51 (6).

Madsen, C. K., (1978). Experimental Research in Music 2nd Edition, Raleigh, NC: Contemporary Publishing. Spanish translation by Ana Lucia Frega, marymar, Buenos Aires, 1988.

Madsen, C. K., & Moore, R. S. (1978). Experimental Research in Music: Workbook in Design and Statistical tests, Raleigh, NC: Contemporary Publishing. Spanish translation by Orlando Musumeci, de los Payadores 460, Ituzaingo (1713), Buenos Aires, 1995.

Madsen, C. K., (1971). How reinforcement techniques work. Music Educators Journal, 57, (8).

Madsen, C. K., (1981). Music therapy: A behavioral guide for working with the mentally retarded. Washington DC: National Association for Music Therapy.

Madsen, C. K., (1988). Intensity as an attribute of effective teaching. Research in music education: A Festschrift in Honor of Arnold Bentley. Anthony Kemp (Ed.), ISME, Edition Two.

Madsen, C. K., (1993) Developing prospective music teachers. A Festschrift in Honor of Helmut Moog. Frankfurt am Main: Peter Lang.

Madsen, C. K., & Geringer, J. M., (1983). Attending behavior as a function of in-class activity in university music classes. Journal of Music Therapy, 20 (1), 30-38.

Madsen, C. K., & Geringer, J. M., (1989). The relationship of teacher "on task" to intensity and effective teaching. Canadian Music Educator, 30, 87-94.

Madsen, C. K. Greer, R. A. & Madsen, C. H. Jr., (1975). Research in music behavior. New York: Teachers College Press.

Madsen, C. K. & Jellison, J. A., (1991). Forschung im Bereiche der Musik in der Sondererziehung. Moog, H., Studien zur Music, Band 5, Musizieren mit Behinderten: Forschung, Didakitik, Transfer. Frankfurt am Main: Peter Lang.

Madsen, C. H. Jr. & Madsen, C. K., (1983). Teaching/Discipline: a positive approach for educational development (3rd Ed.) Raleigh, NC: Contemporary Publishing Company (4th ed., 1999).

Madsen, C. K. & Kuhn T. L., (1994). Contemporary Music Education, (2nd Ed.) Raleigh, NC: Contemporary Publishing Company.

Madsen, C. K., Standley, J. M., & Cassidy, J. W., (1989). Demonstration and recognition of high/low contrasts in teacher intensity. Journal of Research in Music Education, 37, 87-94.

Madsen, C. K., Standley, J. M., Byo, J. L., & Cassidy, J. W., (l992). Assessment of effective teaching by instrumental music teachers and experts. Update 10 (2).

Madsen, C. K. Yarbrough, C., (1980). Competency based music education. Engelwood Cliffs, NJ: Prentice-Hall Inc.

Madsen, C. K. & Duke, R. A. (1993). Selection and development of prospective music teachers. Journal of Music Teacher Education, 3(1), 5-11.

Price, H. E. (1983). The effect of conductor academic task presentation, conductor reinforcement, and ensemble practice on performersí musical achievement, attentiveness, and attitude. Journal of Research in Music Education, 31, 245-257.

Sims, W. L. (1986). The effect of high versus low teacher affect and passive versus active student activity during music listening on preschool childrenís attention, piece preference, time spent listening, and piece recognition. Journal of Research in Music Education, 34, 173-191.

Yarbrough, C. (1975). The effect of magnitude of conductor behavior on performance, attentiveness, and attitude of students in selected mixed choruses. Journal of Research in Music Education, 23, 134-146.

Yarbrough, C. & Price, H. E. (1981). Prediction of performer attentiveness based on rehearsal activity and teacher behavior. Journal of Research in Music Education, 29, 209-217.

Yarbrough, C. & Price, H. E. (1989). Sequential patterns of instruction in music. Journal of Research in Music Education, 37, 179-187.

Yarbrough, C., Price, H. E., & Bowers, J. K., (1991). The effect of knowledge of research on rehearsal skills and teaching values of experienced teachers. Update, 9, 17-20.

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