Forum

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One function of research is to translate something that is commonly believed or sensed, but vaguely defined, into relatively concrete procedures, which then may be subjected to empirical trial. Defining something in operational terms, comparing the judgments of independent observers, and testing effects of variables that manifest sets of beliefs or hunches are necessary stages in building research bases for pedagogical practices.

This issue's "Forum" article illustrates refining a general construct regarding enthusiasm for what one is doing connected with teacher competence. Although others have researched similar constructs, I believe that Clifford Madsen, Jayne Standley, and Jane Cassidy have cleverly defined, taught, and assessed the results of what they refer to as *teacher intensity*. As a student, a teacher, and a professor, I have observed (and demonstrated) varying degrees of enthusiasm for teaching and learning tasks. I have observed ensemble directors whose gestures and expressions send forth a message of enthusiastic support for the performers under their leadership, and I have observed directors who look as if they would rather be someplace where their students were not. A legendary university band director under whom I performed would often exclaim: "Get interested in what you're doing!" An experienced teacher of music methods for elementary education majors asserted that students who feigned enthusiasm for musical activities in the interest of "scoring points" with her often would develop genuine enthusiasm as a result of their initial pretenses. Going well beyond exhortation and anecdotes, Madsen, Standley, and Cassidy have determined how intensity might be defined and used in a teaching situation and, more important, have demonstrated that it can be systematically taught.

To know what one is seeking and how it will be recognized, to assess whether others can agree that they recognize it, and to compare how particular defined groups may differ regarding it are long-established conceptual bases of experimental research. The "Forum" feature applies those conceptions to folk wisdom to produce important documented findings that are rich sources for future research and practice.

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The purpose of this study was to investigate teacher intensity, *the global attributes of enthusiasm combined with an astute sense of timing in relation to classroom management and effective subject presentation and delivery. The authors also tried to ascertain whether high and low contrasts in teacher intensity could be taught to and then demonstrated by prospective music education student teachers* (n = *20) and whether other music education majors untrained in the concept of intensity could recognize these contrasts (freshmen,* n = *23; seniors,* n = *22; and graduate students,* n = *29). Results of the study indicated that intensity as a concept could be operationally defined, easily taught to prospective student teachers, ably demonstrated, and recognized with an extremely high degree of reliability across levels of sophistication within the music education major.*

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Demonstration and Recognition of High and Low Contrasts in Teacher Intensity

The ability of a teacher to initiate and maintain a high level of student attention has been of major concern to researchers and teacher educators for years. To prepare future teachers for productive and effective teaching, it is necessary to identify those observable, quantifiable characteristics that separate expert teachers from novices (Brandt, 1986). Berliner (1986) has suggested a number of attributes needed for high teacher effectiveness and, therefore, high teacher intensity.

When used to refer to teacher presentation of subject matter, the terms *enthusiasm, magnitude,* and *affect* are used somewhat interchangeably, suggesting that teacher behavior can be executed and observed in varying degrees. Collins (1978) developed a measurement device that operationally defined eight teacher behaviors under low, medium, and high levels of enthusiasm. Behavioral descriptors were used in a training

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session designed to increase enthusiasm level of preservice elementary teachers. Collins's data, in the form of observer enthusiasm ratings, showed that experimental subjects increased their display of enthusiasm after training and that control subjects changed little from pretest to posttest, indicating that it is possible to train preservice teachers to increase teacher enthusiasm. McKinney et al. (1983) used the Collins model in an experimental training session. After treatment, teachers were asked to display high, medium, or low enthusiasm in the classroom on demand. Observers of these performances correctly assigned ratings to virtually all teachers across the three categories of enthusiasm, but the level of enthusiasm had *no* effect on posttest student achievement on a social studies task.

Music teacher behaviors of eye contact, closeness to students, volume and modulation of voice, gestures, facial expressions, and pacing were first operationally defined and differentiated as high and low levels of magnitude by Yarbrough (1975). In a choral rehearsal setting, the effects of high and low magnitude on student behavior were reliably observed. Students seemed to prefer and were more attentive during high magnitude conditions, although magnitude had *no* significant effect on performance level. Sims (1986) varied teacher affect (high versus low) and student activity (active versus passive hand movements) during music listening activities with preschool children. Changes in student off-task behavior were more obvious when high affect was followed by low affect than under the opposite condition.

Preliminary investigations specifically relating to the current project included three separate experiments. Experiment 1 (Standley & Madsen, 1987) compared videotaped performances of 42 freshman music education majors under two conditions: (a) each student speaking 30 seconds before the entire group of subjects about the individual's personal goals for a music career and (b) each subject leading a familiar song with a group of six preschoolers ranging in age from 4 to 5 years. Intensity, defined as sustained control of the student/teacher interaction with efficient, accurate presentation and correction of the subject matter combined with enthusiastic affect and pacing, was evaluated on a 10-point Likert scale. Correlation analysis indicated that intensity in speaking about oneself was *not* highly related to intensity in a music teaching situation (Spearman Rank Correlation Coefficient $r_s = .43$).

Experiment 2 (Standley & Madsen, 1987) assessed teacher intensity of three groups of music education/therapy majors engaged in a music task similar to Experiment 1: teaching a new song to a group of preschoolers ages 4 to 5 years. Subjects were 15 freshmen in their first semester of study, 15 senior music education majors in their final week of campus study prior to internship in the schools, and 15 senior music therapy majors in their final week of campus study prior to internship in clinical agencies. We rated subjects on intensity using a 10-point Likert scale. Mean scores for each group were compared with a Kruskall-Wallis one-way analysis of variance (ANOVA) and revealed significant differences ($H = 18.73$, $df = 2$, $\alpha < .001$). A Dunn's Multiple Comparison procedure determined the freshmen to be significantly lower in intensity ratings ($\bar{R}$ = 24.1) than both the seniors ($\bar{R}$ = 13.6). There was no statistical significance between the two senior groups. Results of these two studies suggested 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.

Researchers in the third experiment (Madsen & Geringer, in press) focused on the relationship between demonstrated effective teaching and teacher intensity or teacher "on-task." Senior music education majors ($n = 22$) in their last week of student teaching made a videotape of their best teaching, which included both teacher and student responses. A panel of four expert teacher educators independently judged the videotapes using a 5-point Likert scale. Student teachers were evaluated on the basis of demonstrated effective teaching in relationship to student responses. Reliability among judges was $W = .86$. These same videotapes were then independently judged by two different experts trained in judging teacher "on-task" or intensity using an evaluative instrument specifically designed to assess behaviors relating to teacher intensity. These judges viewed videotaped examples of 15-second intervals and marked specific teacher behaviors. They also used a subjective rating scale to evaluate teacher intensity by assigning a rating of *low* (0) to *high* (10) at the end of each minute. Reliability for the judges was $r_s = .85$ on the more subjective rating. We then assessed the correlation between effective teaching and intensity. The Spearman Rank Correlation Coefficient was $r_s = .92$. Thus, results of the study suggested that intensity may be an important attribute of effective music teaching and warrants additional investigation.

METHOD

Our intent in this study was to ascertain whether high and low contrasts in teacher intensity could be quickly taught to and then demonstrated by prospective music education student teachers and whether subjects untrained in the concept of intensity could recognize these contrasts. Subjects were music education majors ($N = 94$) who were divided into one experimental and three control groups. The experimental group (student teachers) consisted of music education majors ($n = 20$) in their final week of on-campus preparation prior to beginning a public school internship with emphasis in general, choral, or instrumental areas. The three control groups were differentiated according to level of preparation in the music education or therapy major: freshmen ($n = 23$), seniors ($n = 22$), and graduate students ($n = 29$).

Prospective student teachers received one afternoon of training in a teaching session of 1.5 hours. Extreme contrasts in teacher intensity were modeled by the instructor across several specific musical activities (e.g., conducting the speaking of accurate rhythmic patterns or the singing of simple chord progressions or several folk songs). Student teachers then emulated these contrasts in teaching the same activities before their peers for short periods beginning with 10–15 seconds and extending to a few minutes.

The next day, we asked each subject to demonstrate high and low

music activity. The minute was divided into four 15-second intervals by the ringing of a bell. Differing combinations of high and low intensity had been randomly preassigned for the intervals of each minute and were known only to that subject. The presentation order of high and low intervals was counterbalanced by the experimenters and all possible orders of combinations were assigned.

At the conclusion of the first 20 demonstrations, we asked the subjects to repeat the task with each assigned high or low interval changed to the opposite concept (e.g., high-low-high-low to low-high-low-high). Again, a bell differentiated the four 15-second intervals within each minute. Both 20-minute demonstrations were videotaped, and the videotape included the sound of the bell that separated each 15-second interval. The numbers 1–4 were superimposed on the tape so that they appeared simultaneously with the auditory stimulus, providing an additional means of identifying the intervals. Equipment for this aspect of the study consisted of a VHS portable videocassette recorder (Panasonic, Model AG-2400), a color camera (Panasonic, Model WV3040K), and a character generator for superimposing numbers (Panasonic, Model WV-KB10). Videotapes were shown on two color monitors (Zenith, Model C 1382W and Panasonic, Model CTG-1911), arranged to maximize visibility for each participant.

Following the two demonstrations, the student teacher group was asked to view each 20-minute videotape and, for each 15-second interval, to mark an "H" indicating high intensity or an "L" indicating low intensity. Four intervals a minute for 20 minutes yielded a total of 80 intervals to be marked and a possible correct score of 80. At the end of the observation task, each subject was asked to give a self-rating of his or her own overall ability to achieve high intensity on a Likert-type scale from 1 to 10 (1 indicating *low intensity* and 10 indicating *high*). In addition, the prospective student teachers were asked to vote for the five people in the group they thought would be the best teachers. They were also asked to define "teacher intensity" and to state what they had learned about the particular task of contrasting high and low intensity.

Comparison of the responses ($n = 20$) on Tape 1 and Tape 2 yielded mean correct scores of 73.22 and 72.0, respectively. We computed agreement between the two observations using a Kendall Coefficient of Concordance that resulted in $W = .81$, which was statistically significant ($\chi^2 = 27.68$, $df = 17$, critical value = 27.59, $\alpha < .05$). We determined that the student teachers had adequately demonstrated high and low intensity such that it could be differentiated with accuracy across multiple observations.

Tape 1 was then shown to subjects within the three control groups who marked "H" or "L" at the end of each designated interval. Prior to the control observations, intensity was not taught, demonstrated, or defined. At the end of each four-segment minute, the videocassette recorder was placed in the pause mode for 5 seconds and control subjects gave each student teacher an overall ability to achieve high intensity rating from 1 (low) to 10 (high). At the end of the observation task, we asked the control subjects to define intensity by writing on the back of the observation form

RESULTS

We compared observation scores and overall intensity ratings across groups and analyzed observation errors by interval and by subject. The single most important result was that intensity as a concept was operationally defined, easily taught to prospective student teachers, ably demonstrated, and easily recognized with an extremely high degree of reliability by almost all subjects in the study. The total rate of correct responses across the 15-second intervals was 82.7%. Additionally, the 20 overall intensity ratings (on a scale of 1–10) given by each subject within the control groups were compared for agreement with the Kendall Coefficient of Concordance, resulting in an extremely high reliability ($W = .99$) that was, of course, statistically significant ($\chi^2 = 55.87$, $df = 19$, critical value = 43.82, $\alpha < .001$). This result was considered extraordinary because the task involved rating a concept that was neither taught nor explained, yet agreement was almost 100% across subjects ranging from freshman level to graduate status.

The self-rating given by the student teachers who actually did the teaching task was then compared with the mean rating given by subjects within the untrained groups who had such high agreement among themselves. The Kendall Coefficient of Concordance then dropped to $W = .74$, which was not statistically significant ($\chi^2 = 28.12$, $df = 19$, critical value = 30.14, $\alpha < .05$), indicating low overall agreement. A t test comparing the student teachers versus the combined other groups yielded statistically significant results ($t = 3.88$, $df = 38$, $\alpha < .001$) (see Table 1). These results show that the student teachers rated themselves an average of more than 2 points higher on a 10-point scale ($\bar{M} = 7.25$) compared to the more objective observers ($\bar{M} = 4.41$), who demonstrated highly consistent agreement among themselves. These findings substantiate prior research showing that self-ratings of students are both higher and less reliable when compared with those of other professionals (Greenfield, 1978).

Table 1
Analysis of High Versus Low Errors by Interval

	Beginning intervals		Changing intervals				Overall		
	Begin high	Begin low	Low to high	High to low	High to high	Low to low	Total high	Total low	Total
Intervals									
n	10	10	15	15	15	15	40	40	80
(Percentage)	(.125)	(.125)	(.187)	(.187)	(1.87)	(.187)	(.50)	(.50)	(1.00)
Errors									
n	298	80	371	147	174	232	843	459	1,302
(Percentage)	(.23)	(.06)	(.29)	(.11)	(.13)	(.18)	(.65)	(.35)	(1.00)

Total observers = 94; total intervals = 7,520; total errors = 1,302.

We analyzed high versus low observation errors in Tape 1 by interval across all subjects ($N = 94$). Table 1 shows that almost twice as many errors occurred in recognizing high intensity (843) as in recognizing low intensity (459), with the bulk of the high errors occurring when student teachers were assigned a *change* from low to high (371) or were assigned to *begin* their demonstration with high intensity (298). This finding indicates that either acquisition or perception of high intensity is more difficult when compared to that of low intensity.

The observation errors of the student teachers were analyzed by subject, then rank ordered and compared with the rank of "best teacher votes" as awarded by the student teachers. A Spearman Rank Correlation Coefficient resulted in $r_s = .64$, which was statistically significant ($t = 3.83$, $df = 19$, critical value = 2.861, $\alpha < .01$). The vote for "best teacher" correlated fairly highly with the subject's ability to demonstrate high and low contrasts in intensity.

We asked all subjects to define "intensity." Rates of responses varied. The fewest number of ideas was expressed by the student teachers ($n = 20$, comments = 37, $\bar{M} = 1.9$) followed by freshmen ($n = 23$, comments = 62, $\bar{M} = 2.7$) and seniors ($n = 22$, comments = 99, $\bar{M} = 4.5$), with the greatest number of ideas expressed by the graduate students ($n = 29$, comments = 144, $\bar{M} = 4.97$). Student teachers who were trained to demonstrate intensity were most concise about its definition. Number of expressions increased and varied with the length of time in the curriculum.

Table 2 shows degree of agreement among groups in the major ideas expressed and includes 14 items that accounted for 260 of the 342 total responses. Responses included by fewer than six persons were omitted, including 39 single ideas expressed solely by 39 different persons. Eye contact and proximity (the second and third most frequent responses) were not mentioned by any of the freshman subjects, who also omitted such specific instructional techniques as pacing; short, simple instructions; good posture; and the need for making music as opposed to talking. More advanced students are evidently taught these concepts in the curriculum, and they used such concepts to describe the teaching interactions observed. These items are very similar to the list compiled by Yarbrough (1975) to define high magnitude. Although the words used to define intensity varied greatly, agreement was very high in identifying intensity as either high or low, and it was also high on the overall rating of intensity.

Although they were not of major importance to this study, results were assessed to determine differentiation across groups. Table 3 shows the means and standard deviations of correct observation scores by group. With a possible maximum score of 80, means ranged from 73.22 (student teachers) to 63.04 (freshmen). The student teachers who were trained in demonstrating intensity scored higher than those groups who were untrained. A One-Way Analysis of Variance on these scores yielded significant results between groups ($F = 5.05$, $df = 93$, $p < .001$).

We believe that effective education in any field or area has to do with (a) student selection and (b) the demonstrated effects of teaching.

not made"), the profession must find the important variables that constitute recruitment for effective teaching (as in Experiment 1). If skills can be taught, learned, and measured, the profession still has the same problem: What are the variables necessary for effective teaching?

Table 2
Definitions of Intensity by Group

Comment	Interns	Graduates	Freshmen	Seniors	Total
Enthusiastic, excited expression	5	22	11	11	49
Eye contact	7	15	0	9	31
Proximity; movement toward group	2	15	0	8	25
Concentration; attention to students or teaching; involvement	2	6	8	7	23
Strict, precise body movement or conducting gestures	1	8	3	10	22
Voice volume, pitch, inflection; change in voice	0	9	2	10	21
Energy; effervescence; vigor; pizzazz	3	10	3	3	19
No hesitation in voice; no filler words (uh, ah)	0	8	4	2	14
Planning; knowledge; competence	2	4	3	4	13
Pacing	1	7	0	4	12
Short, simple instructions	2	5	0	3	10
Good posture; change in posture	0	4	0	4	8
Confidence	1	3	2	1	7
Little talk, lots of singing; vary techniques to increase attention; as much time in learning activities as possible	4	1	0	1	6
Totals	30	117	36	77	260

Table 3
Group Means and Standard Deviations of Observation Scores

	Interns	Seniors	Graduates	Freshmen
n	20	22	29	23
Mean score	73.22	66.27	63.56	63.04
Standard deviations	1.93	1.8	2.27	2.24

Other than knowledge of subject matter, two recurring variables concern (a) demonstrated teacher *enthusiasm* (high teacher affect) in live, positive student/teacher interactions and (b) a sense of *timing* in relationship to classroom management and effective subject matter presentation and monitoring. Both of these variables require the ability to "see oneself as others do" or to "know how one is coming across." Therefore, one's social awareness seems paramount. Teacher intensity in some ways seems to blend the attributes of enthusiasm and timing in that people who are perceived as having high intensity are enthusiastic as well as effective in managing the class. It is difficult to imagine an intense teacher who does not possess both these qualities.

Because previous researchers found a strong relationship between teacher intensity and teacher effectiveness, it seems that all issues relating to teacher intensity need to be investigated. These issues include student attentiveness, subject matter acquisition, the degree of intensity associated with the subject matter itself (i.e., the activity of making music), various levels of social and peer interaction that contribute to intensity, and the general level of teacher "on-task."

Issues concerning intensity are important in both selection and training of prospective teachers, especially in relation to student achievement. The experiments described in this article indicate that teacher intensity is an attribute that can be learned and demonstrated by preservice music teachers and that almost anyone can recognize it with very high reliability. Obviously, much more research is warranted.

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The authors of this study sought to determine whether there is an age-related, common level of logic underlying responses to musical and spatial analogical tasks and to characterize these levels of logic in terms of similar intellectual strategies. Children (N = 128) ranging in age from 6.5 to 12.5 years old were individually tested using author-designed Spatial Analogy Tasks (SANTs) and Musical Analogy Tasks (MANTs). Analyses of results indicated that (a) a sequential nature exists in a child's development of musical intellectual strategies; (b) this sequential development in music seems to parallel an age-related sequence in other areas of understanding (i.e., spatial concepts); and (c) a parallel, rather than identical, sequence between musical analogical reasoning and spatial analogical reasoning may be due to the complexity of musical concepts. That is, the musical tasks may have created a conceptual "overload" for this population of subjects.

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Children's Age-Related Intellectual Strategies for Dealing With Musical and Spatial Analogical Tasks

Developmental theory suggests that individuals progress through stages of mental growth at approximately the same time. It also suggests that intellectual growth is a cross-domain phenomenon, displaying an invariance to the acquisition of logical thought processes regardless of specific areas of application. The variance with which children acquire conceptual abilities with respect to many domains of learning, however, has proven to be the rule rather than the exception (Flavell, 1982; Siegler, 1981). Research in music education, especially those studies based on the Piagetian model, has tended to support the presence of such a variance (Nelson, 1987). As a result, researchers do not have a very clear picture of children's understanding of musical concepts as it might correlate with their age and abilities in other domains of learning.

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