

*Teaching Behaviors of Middle and High School
Orchestra Directors in the Rehearsal Setting*

Dijana Ihas, Pacific University, Oregon

Abstract

The purpose of this study was to investigate the frequency and the time that middle and high school orchestra directors engaged in seven specific and operationally defined teaching behaviors in a rehearsal setting: (a) nonmusical behavior, (b) nonverbal instruction (direction), (c) verbal instruction (direction), (d) noninteractive listening, (e) nonverbal feedback, (f) verbal feedback, and (g) conceptual teaching. Of particular interest was the amount of time orchestra directors engaged in conceptual teaching behaviors operationally defined as verbal behaviors of orchestra directors in which they attempt to make students aware of, have an understanding of, and / or be able to transfer any musical concept. Participants ($N = 12$) were full-time middle and high school orchestra directors teaching in three states located in Northwest and Western Divisions according to the six National Association for Music Education (NAfME) Divisions. Each participant submitted a video recording of two regular orchestra rehearsals. Teaching behaviors were analyzed using the *Simple Computer Recording Interface for Behavioral Evaluation (SCRIBE)* of Duke and Stammen (2007). The data were reported in the form of the frequency with which each behavior occurred, the average time for each behavior expressed in minutes and seconds, and the percentage of time used on each behavior.

The results indicated most instructional time was used on nonverbal instruction (28.15%) followed by verbal instruction (27.76%). Orchestra directors observed in this study used the least amount of time (2.42%) on nonverbal feedback. On average, orchestra directors spent slightly more than 5% of the observed rehearsal time on conceptual teaching. The discussion provided implications for practicing music educators and suggestions for future research.

Contact Information:
Dijana Ihas
dihhas@pacificu.edu

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The research that investigated the relationship between teaching behaviors and students' learning outcomes offers evidence that students learn what they are taught during class, what they practice in a given time, and what they think about during and after class (Doyle, 1983; Driscoll, 2005). Madsen and Yarbrough (1985) condensed these findings into a simple observation that "what the teacher does is what the students get" (Madsen & Yarbrough, 1985, p. 8). "What the teacher does" translates into the teaching behaviors and teaching strategies teachers elect to use during instruction time.

Teaching strategies represent "actions and interactions that take place in classrooms and studios after curriculum goals have been established" (Tait, 1992, p. 525). Some teaching strategies are specifically developed to support developmental needs of students, and successful teachers utilize these strategies in their teaching practices (Shulman, 1987).

Piaget's theory of cognitive development (Piaget, 1951, 1970b, 1971) proposes that as adolescents progress through the biological process known as *puberty*, their cognitive abilities transform as well, as they head through a *formal operational* stage of cognitive development. Upper-grade middle and high school students are capable of thinking hypothetically and abstractly, they can evaluate and analyze, they can solve problems and come up with creative solutions -- all higher levels of thinking (Anderson & Krathwohl, 2001; Bloom, Engelhart, Furst, Hill, & Krathwohl, 1956). Piaget's theory of cognitive development also suggests that adolescent students might exhibit homogeneous thinking behaviors.

However, while data from cross-sectional studies of children seem to support Piaget's assertion that biological development drives the movement from one cognitive stage to another (Renner et al., 1976), data from cross-sectional studies of adolescents do not support the assertion that all adolescents automatically move to the *formal operational* stage as they biologically mature (Kuhn, Langer, Kohlberg & Haan, 1977; Martorano, 1977). This research indicated that only 30 to 35% of high school seniors attain this stage of cognitive development. It appears that while maturation establishes the basis, a special learning environment and teaching that aims at development of higher levels thinking skills are required for more adolescents to attain the *formal operational* stage (Beyer, 1997, 2008). One of the teaching strategies that may support middle and high school students' cognitive development is *conceptual teaching* (McClain, 2005).

While recently an investigation of conceptual teaching received some attention at higher education levels (Feldman, 2003; Klausmeier, 1992; Mackenzie, 2008; Maclellan, 2005; Mayer, 2002) and in academic subjects in K-12 settings (van Boxtel, van der Linden, & Kanselaar, 2000; Gunel, Hand, & McDermott, 2009; Khalil, Lazarowitz, & Hertz-Lazarowitz, 2009; Lawton, 1977; Pugh, Linnenbrik-Garcia, Koskey, Steward, & Manzey, 2010), the research on conceptual teaching in music education settings has been very limited. The importance of this teaching strategy in music education settings is based not only on cognitive needs of adolescent students but also on the premise that "all of music teaching should occur for one overriding purpose: to instill in our students the ability to conceptualize music as a craft, an art, a body of knowledge, and a medium of self-expression and creativity" (Froehlich, 1992, p. 563). Of particular interest to the present study was the amount of time that middle and high school orchestra directors engage in conceptual teaching operationally defined as "verbal behaviors of orchestra directors in rehearsal settings by means of which the directors attempt to make students aware of, have an understanding of, and/or be able to transfer any musical concept" (Blocher, Greenwood, & Shellahamer, 1997, p. 459).

One way to organize the studies in music education concerned with the utilization of time would be by the co-relational variable. Certain studies that took place in varied music education settings simply reported the amount of time teachers used on different teaching behaviors (Blocher, et al., 1997; Brendell, 1996). Other studies investigated the use of time in relationship to different variables, such as the level of instruction and type of class (Caldwell, 1980; Madsen & Geringer, 1983; Watkins, 1993, 1996; Witt, 1986) or the level of teaching experience (Goolsby, 1996, 1997, 1999; Henninger, Flowers, & Council, 2006; Wagner & Struel, 1979). The general conclusion was that music teachers at the elementary level use more time on instruction, while secondary music teachers spend more time on performance.

Music education researchers have also examined verbal and nonverbal teaching behaviors of music teachers. The findings of studies on verbal behaviors of music teachers in relationship to the use of time were not consistent. While some studies reported that more than 50% of the time during applied lessons and ensemble rehearsals was spent on teachers' verbal behaviors (Carpenter, 1988; Kostka, 1984; Yarbrough & Price, 1989), other studies hold that verbal department occupied less than 50% of the total instructional time in the same instructional settings (Caldwell, 1980; Strauser, 2008). In either instance, it appears that music teachers spend most of their instructional time on some kind of verbal behaviors.

Various forms of nonverbal behaviors such as performance, modeling, conducting, and listening were also the subjects of research in music education. In general, when it comes to time spent on performance, across various music education settings, students perform for approximately half of the total time (Hendel, 1995; Kostka, 1984; Schmidt, 1985). Interestingly, the overall proportion of the students' performance time does not appear to be positively related to learning outcomes (Siebenaler, 1997; Speer, 1994; Yarbrough & Price, 1989).

The music education community in the 1960s recognized the need for teaching practices that would support developmentally appropriate learning at all ages. For instance, prompted by the translation of Piaget's research into English, Bruner (1960, 1966) introduced the theory of *conceptual teaching* and developmentally sequenced curricula known as *spiral curriculum*. Both of his theories were discussed at the Tanglewood Symposium (1967) and three sessions of the Ann Arbor Symposium (1978, 1979, & 1981). Soon after, *spiral curriculum* and *conceptual learning* became the foundations of elementary music classes (Mark, 1996). In addition, Bruner's theory of conceptual teaching served as the basis for developing teaching strategies that would promote the goals of Reimer's aesthetic education (Teatle & Cutietta, 2002).

Harding (1986) investigated the application of Piaget's fourth stage of cognitive development, the *formal operational* stage, on undergraduate music majors. He used the *Classroom Test of Formal Reasoning* (CTFR) (Lawson, 1978) to test 195 undergraduate music majors for their ability to think at the formal operational stage of cognitive development. Harding found that only 40% of the participants in his study demonstrated thinking consistent with this stage. His recommendations for music education practitioners included the suggestion that methods should be developed to help learners' progress from the lower stages of cognition to the stage of *formal operations*.

Although research in teaching strings and orchestra has investigated the use of time (Allard, 1992; Colprit, 2000; Duke, 1999; Witt, 1986), verbalization (Coding, 1987; Colprit, 2000, 2003; Duke, 1999; Salzberg & Salzberg, 1981; Witt, 1986), and teaching strategies in various string teaching settings (Andrews, 2004; Gholson, 1998; Mishra, 2000; Nelson, 1983), no study conducted in school orchestra rehearsal settings measured those behaviors in a

comprehensive way. Furthermore, there is no study in orchestra settings that investigated the use of time on conceptual teaching. The aforementioned reasons warrant the need for a study concerned with teaching behaviors in orchestra rehearsal setting.

The present study is a replication of the descriptive study conducted in middle and high school band rehearsal settings by Blocher, Greenwood, and Shellahamer (1997) in which they investigated the time allotted for the seven specific teaching behaviors (nonmusical, nonverbal instruction, verbal instruction, non-interactive listening, nonverbal feedback, verbal feedback, and conceptual teaching), with particular attention given to the time spent on conceptual teaching. Operational definitions of seven teaching behaviors observed in this study are presented in Figure 1.

The present study sought answers to the following three questions:

1. How frequently do middle and high school orchestra directors engage in each of the seven specific teaching behaviors during the typical rehearsal time?
2. How much time (average time and percentage of time) do middle and high school orchestra directors engage in each of the seven specific teaching behaviors?
3. Of particular interest to this study was how often and how much time do middle and high school orchestra directors engage in conceptual teaching as operationally defined?

Figure 1.
Operational Definitions of Seven Teaching Behaviors

Teaching Behavior	Operational Definition
Nonmusical	Teacher disciplines students. Down time. Nonmusical directions. Announcements. Interruptions from office, messengers, visitors.
Nonverbal instruction (direction)	Teacher gives instruction through proactive conducting. Teacher's facial expressions, body language, and other nonverbal cues instructor elicit responses
Verbal instruction (direction)	Teacher gives verbal instructions or directions that deal with specific musical attributes of the performance at hand.
Non-interactive listening	Teacher purposely listens to student performance but takes no active part in the performance. Students play with no visible or aural teacher interaction. Teacher beats time but does not attend to musical performance through conducting gestures, facial response, eye contact, or verbal response.
Nonverbal feedback	Teacher provides nonverbal reaction that is based on student responses that reinforces, shapes, or changes further student responses. Teacher responds in a nonverbal manner to something students do in such way that the teacher lets the students know something about their performance.
Verbal Feedback	Teacher provides verbal reaction to student response that reinforces, shapes, or changes further student performance. Teacher verbally responds to something that students do in such a way that the teacher lets the students know something about their performance.
Conceptual teaching behaviors	Verbal behaviors of orchestra directors in rehearsal settings by means of which the directors attempt to make students aware of, have an understanding of, and /or be able to transfer any musical concept.

Methodology

The participants in this study ($N = 12$) were six ($n = 6$) full-time middle school and six ($n = 6$) full-time high school orchestra teachers teaching in states of Washington ($n = 1$, middle school orchestra teacher), Oregon ($n = 10$, five middle school and five high school orchestra teachers), and California ($n = 1$, high school orchestra teacher). One of the four string instruments was the primary instrument of all participants. Two independent observers in this study were recruited from the pool of the senior Suzuki teachers teaching

applied and group lessons in the university's Suzuki program because of their seniority in teaching strings and their experience in teaching strings in music education settings.

Participants were given three weeks to record two of their regular orchestra rehearsals in their entirety. The participants were instructed to follow the specified recording directions and were asked to record both rehearsals within the same week. The instructions asked that the recording device be positioned in the back of the room so that it captured only the teacher's body and face.

Using MPEG *Streamclip* (freeware program for splitting and transcoding video clips), the researcher segmented each source file into the maximum number of consecutive 20-minute segments, ranging from two to eight segments per rehearsal depending of the length of the rehearsal. Each segment was then transcoded into *QuickTime* format and saved to a file. To establish a random play order of the segments, the researcher used 12 computer-generated, random numbers and sorted them along with numbers 1-12 which resulted in a random sequence. Segments ordered in this fashion were loaded on a new *SCRIBE* file for the independent observers to start their observations.

The inter-observer reliability level (R) between independent observers was calculated at 0.86 ($R = 0.86$) by using standard reliability procedure that has been used in a number of published studies in music education research (Duke & Madsen, 1991; Henninger, Flowers, & Council, 2006; Salzberg & Salzberg, 1981). Observers were given fourteen days (two-weeks) to observe and collect data. The independent observers selected a specific teaching behavior every time they recognized it by clicking on an appropriate color-coded and word-labeled tab. When two or more behaviors occurred simultaneously, observers agreed to select each behavior for its duration in order of occurrence. At the conclusion of each observation session, observers saved and then printed the raw scores and the summary of collected data. The reliability level for the independent observers while doing the study was calculated by randomly selecting three segments (25% of all twelve selected segments) and calculating the overall level of agreement for frequency and time. The reliability level from three observations during the study was 0.76 ($R = 0.76$).

An electronic copy and a printed copy of all observational data were given to the researcher for further data analysis immediately after the last observation was completed. The researcher verified the submitted *SCRIBE* data for both number of observations and inclusion of all specific data analyses such as frequency, time, percentage of time, mean and standard deviation and found that the submitted data were complete.

Results

The observed frequency and duration (minutes and seconds) of each of the seven selected teaching behaviors served as raw data for analysis. The values in Table 2 represent the mean frequency, average time, and percentage of time of two observers' data for each behavior, categorized by middle school only, high school only, and both levels combined.

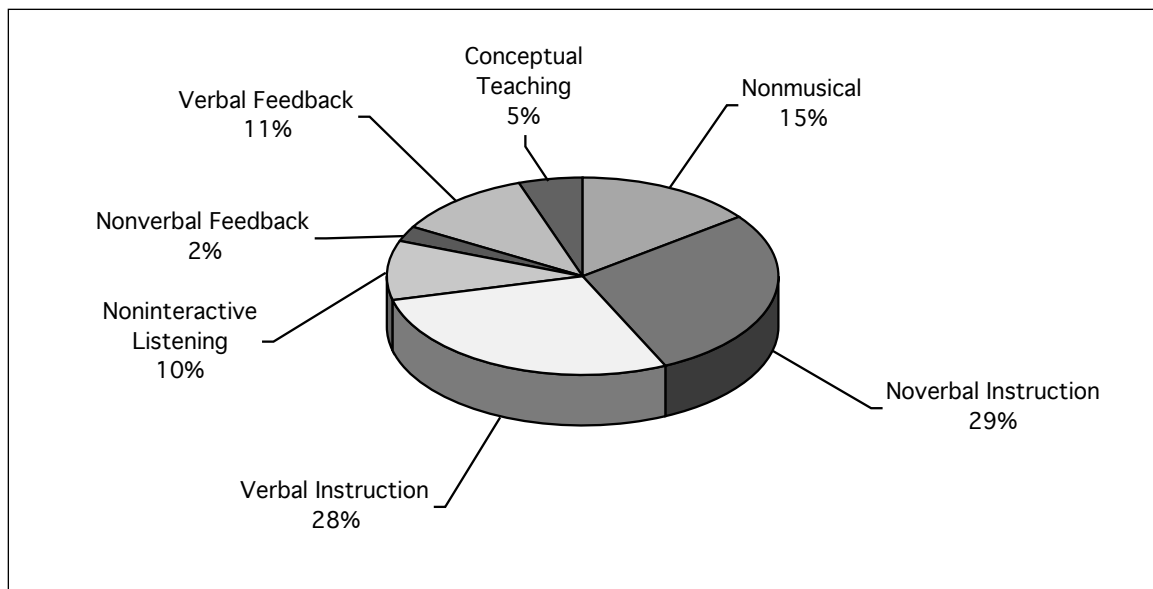
Table 2: Frequency and Use of Time on Seven Teaching Behaviors

Teaching Behaviors	Mean Frequency	Average Time	Percentage of Time	Total Time
MIDDLE SCHOOL				
				20:03.2
Nonmusical	7.92	02:29.0	12.38%	
Nonverbal Instruction	34.46	04:38.5	23.15%	
Verbal Instruction	46.79	06:23.4	31.87%	
Non-interactive Listening	15.92	02:08.9	10.71%	
Nonverbal Feedback	7.88	00:26.1	2.17%	
Verbal Feedback	25.88	02:20.2	11.65%	
Conceptual Teaching	3.67	01:29.0	7.40%	
Total		19:55.0	99.32%	
HIGH SCHOOL				
				20:02.3
Nonmusical	8.00	03:24.6	17.01%	
Nonverbal Instruction	36.88	06:38.7	33.16%	
Verbal Instruction	45.08	04:44.3	23.65%	
Non-interactive Listening	12.04	01:43.7	8.63%	
Nonverbal Feedback	10.25	00:32.1	2.67%	
Verbal Feedback	31.58	02:11.4	10.93%	
Conceptual Teaching	1.79	00:38.6	3.21%	
		19:53.3	99.26%	
COMBINED				
				20:02.7
Nonmusical	7.96	02:56.8	14.70%	
Nonverbal Instruction	35.67	05:38.6	28.15%	
Verbal Instruction	45.94	05:33.9	27.76%	
Non-interactive Listening	13.98	01:56.3	9.67%	
Nonverbal Feedback	9.06	00:29.1	2.42%	
Verbal Feedback	28.73	02:15.8	11.29%	
Conceptual Teaching	2.73	01:03.8	5.30%	
			99.29%	

As illustrated in Figure 2, participants in this study spent most of the rehearsal time on nonverbal instruction (a little over 28% of the observed time) followed by verbal instruction (a little under 28% of the observed time). The next most-represented teaching behavior was nonmusical behavior (a little under 15% of the observed time) followed by verbal feedback (a little over 11% of the observed time). Non-interactive listening was the

fifth most-represented behavior (a little under 10%) followed by conceptual teaching (a little over 5% of the observed time). Lastly, participants used the least amount of time on nonverbal feedback (a little over 2% of the observed time). The sum of the two categories of verbal behaviors (verbal instruction and verbal feedback) revealed that the orchestra teachers spent approximately 39% of rehearsal time on some form of verbal behavior.

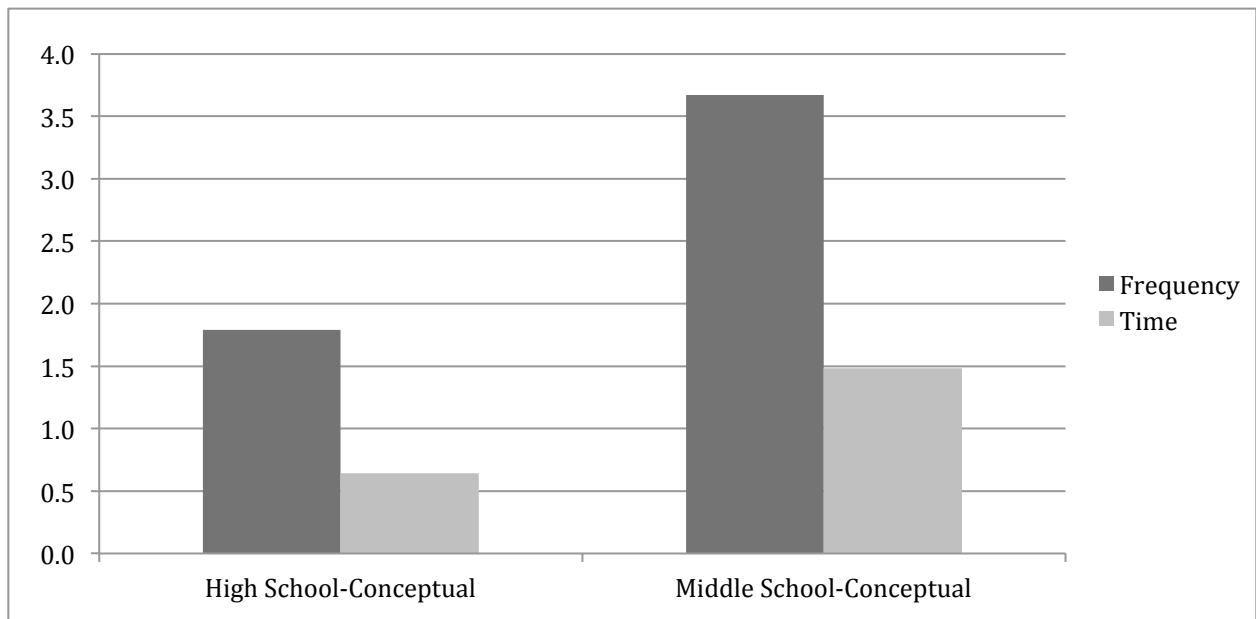
Figure 2. Percentage of time spent on seven teaching behaviors.



This graph illustrates the use of time of middle and high school orchestra directors' combined on the seven specific teaching behaviors.

As illustrated in Figure 3, a comparison of data between the two levels (middle and high school) revealed a noticeable difference between the average time that middle school participants engaged in conceptual teaching behaviors, in comparison to the average time spent by high school teachers. While middle school participants spent 1 minute 29 seconds, high school participants spent only 38 seconds on conceptual teaching. Middle school participants engaged in conceptual teaching almost twice as long. However, a comparison of frequencies for conceptual teaching at the two levels revealed that middle school orchestra teachers engaged in this teaching behavior about three times while high school orchestra teachers engaged in conceptual teaching a little more than one time, meaning that the duration of episodes of conceptual teaching were approximately the same at both levels.

Figure 3. Comparison of conceptual teaching between high and middle school.



This graph illustrates the difference in frequency and time spent on conceptual teaching by middle school and high school participants.

Summary and Discussion

The purpose of this study was to investigate the frequency and time that middle and high school orchestra directors engage in seven specific teaching behaviors as operationally defined. The orchestra directors' time spent teaching conceptually was of particular interest to this study.

The findings of this study revealed that orchestra directors spent most of their instructional time on nonverbal instruction (direction) followed by time on verbal instruction (direction). These two behaviors, when combined, occupied more than half of the regular rehearsal time. Further findings revealed that orchestra directors used a considerable amount of time on nonmusical behaviors, followed by verbal feedback. Directors utilized much less time on non-interactive listening and nonverbal feedback. While the time spent on conceptual teaching was low, it is encouraging that conceptual teaching was not the least represented teaching behavior among orchestra teachers. The most interesting finding of the study was that middle school orchestra directors used more time on conceptual teaching than high school orchestra directors. The most concerning finding of this study was the significant amount of time orchestra directors used on nonmusical behaviors, especially when this time is compared to the very limited time they used on non-verbal feedback and conceptual teaching.

When compared to the time spent on the other teaching behaviors observed in this study, nonverbal instruction (direction), operationally defined as “conducting and other expressive physical gestures”, was the most prominent teaching behavior among orchestra directors. This supports the findings of a substantial number of studies on the use of time in secondary music classes (Brendell, 1996; Caldwell, 1980; Carpenter, 1989; Hendel, 1995; Witt 1986; Yarbrough & Price, 1981, 1989), which all found that most of the instructional time in secondary music classes is spent on students’ performance and other forms of nonverbal instruction. The finding of the present study, however, is somewhat inconsistent with MacLeod’s (2010) findings; she investigated 12 teaching strategies used by experienced band and orchestra teachers when teaching beginning ensembles an unfamiliar song and found conducting to be the third most represented teaching activity among band directors, and only the sixth most represented teaching strategy among orchestra teachers.

The finding of this study that verbal instruction (direction) was the second most represented behavior during the orchestra rehearsal is consistent with several studies on the use of time on verbal instruction in secondary music classes (Goolsby, 1996, 1997; Witt 1986). Like this study, these studies revealed that “teaching episodes” including verbal instruction represent the second most prominent teaching activity. On the other hand, MacLeod (2010) reported verbal instruction as the most frequently used instructional strategy for both band and orchestra teachers. Consistent with MacLeod’s findings on verbal instruction, Colprit (2000) reported that in applied lesson settings, Suzuki string teachers used most of the instructional time on instructional verbalization (45%). Whether verbal instruction is the most prominent teaching activity as found in MacLeod (2010) and Colprit (2000), or the second most represented teaching behavior as found in this study, as well as in the Goolsby (1996, 1997) and Witt (1986) studies, the conclusion may be drawn that secondary music teachers use a considerable amount of time on verbal instruction, probably because conveying musical information to students through nonverbal means may not be a sufficient way of instructing.

While the average percentage of time devoted to conceptual teaching (5.30%) seems low, especially when compared to the time used on nonmusical behaviors (14.70%), this figure is actually a little higher than figures reported in other studies that were concerned with the use of time on various strategies aimed towards the development of higher level thinking skills for students (Strauser, 2008; Watkins, 1993, 1996), or with the use of time spent on conceptual teaching itself (Blocher et al., 1997). These studies reported even lower percentages of time used on this teaching behavior.

Probably the most interesting finding of this study in regard to conceptual teaching was that middle school orchestra directors used over twice as much time on conceptual teaching (1 minute and 29 seconds) than high school orchestra directors did (38 seconds). This finding is contrary to Watkins (1993, 1996) who studied the use of nonperformance time in regard to time spent on developing students’ higher level thinking skills, and who found the exact opposite: high school choir directors used more time (1.30%) than middle school directors (0.84%) on this kind of teaching.

The finding of this study in regard to conceptual teaching and orchestra levels (middle or high school) could be explained by the greater need of middle school students for verbal explanation of musical concepts and playing skills, as they are just beginning to be exposed to them. This assumption is exemplified in string method books that are primarily designed for use in middle schools and beginning high school orchestras in which the authors--string education specialists and scholars--provide pages of suggestions on teaching musical concepts, as well as suggestions for teaching playing techniques in conceptual ways. At the same time, high school music ensembles tend to spend most of

their class time in repertoire performance, which possibly leaves them with less time for teaching concepts or teaching conceptually. Using more time on performance at the expense of conceptual teaching, however, can't justify the low percentage of time used for this kind

of teaching. Several studies (Garafolo & Whaley, 1979; Hendricks, 2010) showed that students in performance classes that utilized conceptual strategies not only developed a higher degree of understanding of the structural elements of music, but also improved the quality of their performance through conceptual learning.

The most concerning finding of this study was the considerable amount of time orchestra directors engaged in nonmusical behaviors, with high school directors spending more time on this behavior than middle school orchestra directors. This finding is in accordance with Witt (1986), who investigated the use of time during secondary band and orchestra rehearsals; she found that, as in this study, "getting ready" time was the third most represented time. In his study on the use of time among experienced, novice, and student band teachers, Goolsby (1996) found that the use of time on non-teaching activities (time spent in preparation, initial and final talk, breaks between musical selections, and the dismissal period) was affected by the teaching experience of the participants.

The least represented teaching behavior in this study was nonverbal feedback, as it occupied only 2.42 % (or 29 seconds) of the instructional time. This finding supports Blocher et al. (1997) as researchers in that study found that middle and high school band directors used even less time on nonverbal feedback (1.21%). Several studies that investigated the use of time spent providing feedback in secondary music classes (Cavitt, 1998; Goolsby, 1997; Price, 1989), all suggested that secondary music teachers tend not provide feedback on students' performance.

Even with the limited scope and applicability of its findings, this study provided intriguing information on the teaching behaviors of orchestra directors. The amount of time used on nonmusical behaviors is concerning, but the amount of time that orchestra teachers use on conceptual teaching seems to be promising as it is higher than in other performance-oriented music classes. Some implications to practicing middle and high school orchestra teachers could be geared towards suggesting that they look for ways to minimize the time spent on nonmusical teaching behaviors and to strive for learning more about conceptual teaching as one of the possible ways to support the cognitive development of their adolescent students. At the same time, researchers should keep investigating teaching strategies that may maximize instructional time in orchestra rehearsal settings, as well as look for ways that would make conceptual teaching more appealing to practicing orchestra teachers for the benefit of students and their future.

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