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Decisions Made in the Practice Room: A Qualitative Study of Middle School Students' Thought Processes While Practicing

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Abstract

The purpose of this study is to describe the decision-making processes of novice band students while engaged in individual practice. Five seventh- through ninth-grade students were videotaped while practicing and subsequently interviewed using retrospective verbal protocol. Students were asked to discuss the goals they had while practicing, their choice of practice strategies, their self-assessment process, and their feelings of efficacy. Analysis of data and prior literature resulted in the construction of a model for effective practice and suggested three implications for teachers. First, student choices about what and how to practice seem more focused when motivations are goal oriented instead of time oriented. Second, practice goals tend to be vague, which leads to difficulty in defining criteria for success and strategies for improvement. Finally, though students have knowledge of various practice strategies, their understanding of the appropriate use of the strategies is lacking.

Keywords

practice, self-regulation, practice strategies, goal setting, practice motivation, self-assessment, middle school, instrumental music

Mr. Terris: Your practice sheet says that you practice an hour a day, but your playing test was only a C. Can you explain why?
Clara Nett: I don't know what happened! I could play the test last night!
Mr. Terris: How many times did you play it?
Clara Nett: 10 or 20.
Mr. Terris: How many times did you play it correctly?
Clara Nett: Umm, I dunno. . . . Once or twice. . . .
Mr. Terris: Hmm. . . . How did you practice it?
Clara Nett: I dunno. I just played it.

Conversations like the one above are commonplace in schools throughout the United States. Music teachers are faced with the problem of not being able to positively influence the home practice of their students. Students are their own teachers during their home practice; however, too often, the results of this practice leave much to be desired. The quality and quantity with which one approaches practicing are key factors in the development of expert instrumental performance skill (Ericsson, Krampe, & Tesch-Romer, 1993). Miksza (2007), Frost and Hamann (2000), and McPherson (2000) have all found that instrumental performance is related to the quality as well as the quantity of practice.

Researchers have looked into specific aspects of practice through the use of questionnaires (Frost & Hamann, 2000; McPherson, 2000; McPherson & McCormick, 2000), interviews (McCormick & McPherson, 2003; McPherson & McCormick, 1999; Nielsen, 2004), pretest/post-test designs (Barry, 1990, 1992; Henley, 2001; Hewitt, 2001; Ross, 1985; Sparks, 1990), and analysis of videotaped practice sessions (Barry, 1992; Hallam, 1997; McPherson & Renwick, 2001; Nielsen, 2004). Topics of these research projects include self-assessment, supervision, modeling, structure, practice time, mental practice, and motivation.

McPherson and Zimmerman (2002) described self-regulation as a form of self-teaching in which students set

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goals, self-monitor, and self-reflect. Students learn these skills through socialization. Self-efficacy, defined as the confidence one has in his or her ability to plan and execute a given task, is considered to be a key factor predicting self-regulation success. McPherson and McCormick (1999) used a questionnaire to analyze the self-regulatory processes of 190 pianists and found that subjects tended to be more motivated and cognitively engaged in practice when it consisted of informal, creative activities; repertoire study; and technique development. In another study, McPherson and Renwick's (2001) videotape analysis of practice strategies of seven primary school children over a 3-year period found low levels of self-regulatory behavior. Learning strategies consisted almost exclusively of playing through pieces once or twice, and most errors were either ignored or corrected by repeating one or two notes.

Other researchers have found that novice adolescent musicians tend to exhibit inconsistent practice habits. Rohwer and Polk (2006) categorized the practice tendencies of students as holistic/noncorrective, holistic/corrective, analytic/reactive, or analytic/proactive. They described analytic practicers as those who were prone to remediate sections of their music both proactively and reactively, and they found that these students made significantly more gains than did the holistic practicers. Barry (1990, 1992) focused on the use of structured practice time and supervision in middle school instrumental students and found that the students were significantly more able to prepare a musical etude when practice was carefully structured and supervised. Like McPherson and Renwick (2001), Barry found that students who engaged in unstructured practice tended to play their music faster, use a metronome less, use fewer mental practice strategies, and self-assessed less than those who engaged in structured and supervised practice.

Numerous studies have been conducted that look into strategy use in expert and novice practice. Hallam (2001a, 2001b) produced two articles based on a study in which she compared the practice strategies used by novice and expert musicians. Miksza (2007); Duke, Simmons, and Cash (2009); and Leon-Guerrero (2004) found that students demonstrated a variety of practice strategies and that the quality of practice tended to be more important than the quantity of time spent playing. Rohwer (2005) studied three male adult beginners enrolled in a band for seniors, finding that the students used repetition as the main strategy for addressing errors, but they did not break difficult sections into chunks and lacked strategies for improving rhythm skills.

Lehmann and Ericsson (1999) and McPherson and Zimmerman (2002) stress the importance of self-assessment in practice. Studies by Hewitt (2001), Kostka (2000), and Sparks (1990) have found that, although novice musicians have difficulty in accurately assessing themselves, the process of self-assessment does seem to improve performance. Barry and Hallam (2002) argue that this is because novices who have not yet developed strong aural schemata are often unaware of their own errors, whereas more capable musicians are more aware of their strengths and weaknesses. In addition, Woody (2001) states that self-monitoring is difficult for beginning musicians because virtually all their attention is devoted to the production of music.

The ability to self-regulate, or self-teach, is a learned skill requiring individuals to make a number of decisions related to goal setting, self-efficacy, attention, strategy use, and assessment. Researchers have delineated characteristics of effective self-regulation (McPherson & Zimmerman, 2002; Zimmerman & Schunck, 2001), described what happens during novice students' practice (Barry, 1992, 1990; McPherson, 2000; Miksza, 2007), and studied ways in which advanced students mentally engage in practice (Nielsen, 2004). However, little knowledge exists about how novice students make decisions related to effective self-regulation. In order for teachers to improve the way in which they teach their students to practice, it seems apparent that they must first understand the ways in which their students think during practice.

Method

Purpose

The purpose of this study is to describe the decision-making processes that middle school instrumental music students use during their practice sessions. Four critical questions guide this project:

1. In what ways do students set and use goals during practice?
2. What practice strategies are used during practice of novice instrumentalists?
3. In what ways do these students assess their own performance, and how does this relate to furthering practice goals?
4. In what ways do student perceptions of self-efficacy effect decisions made within their practice?

Design

This phenomenological study examined the practice behaviors of five seventh- through ninth-grade band students from a suburban Midwestern community. Participants in the study were a convenience sample of students whom the researcher had access to. The three seventh-grade students included a saxophonist who also played piano for a number of years, a drummer with no experience outside of school band, and an oboist who had taken piano lessons. The eighth- and ninth-grade students were both clarinetists who had taken lessons for 1 and 2 years, respectively. The ninth-grade student had also taken piano lessons for 4 years.

The seventh-grade students were excused by their instrumental music teacher during their regularly scheduled class period to videotape a practice session in the adjoining choir room. At the end of the school day, an eighth-grade and a ninth-grade clarinet student were videotaped during their regularly scheduled private lesson times as they demonstrated how they practice on their own.

Data included one videotaped practice session and one retrospective interview per student, along with a personal research log. After completing the initial transcriptions of the practice sessions and interviews, along with the initial analysis of data for possible themes, I approached the participants once again to clarify meanings and student thought processes. This served as a form of member check. Triangulation was also obtained through the use of peer review as a fellow researcher well versed in qualitative methods evaluated the coding system and the initial themes derived from the data.

Each student conducted what he or she considered to be a normal 20-minute practice routine, as the researcher recorded it using a video camcorder. The students were asked to behave as if they were practicing at home in what they would call a normal practice session. Immediately following each practice session, the researcher and student reviewed the video recording of the student's practice using a retrospective think aloud protocol. Ericsson and Simon (1993) describe this method of data collection as a process in which subjects are asked to describe their thoughts immediately after performing a given task. They recommend that subjects view video recordings of themselves while carrying out the think aloud process to facilitate memory.

Because the interviews were based primarily on questions derived from each student's practice behaviors, the same questions were not asked of all subjects. However, the general path of questions covered the following subjects: (a) choice and quality of goals and the reasoning behind the choices; (b) methods, uses, and accuracy of self-assessment; (c) feelings of self-efficacy; (d) choice of, and reasons for, the practice strategies used; (e) uses of mental practice techniques (analysis, use of rhythmic and tonal solfège, and mental imaging); and (f) decisions related to the use of remedial goals and strategies.

Analysis

To analyze the data, I first transcribed the videotapes of each practice session and segmented the data based on student stops and starts in their playing or on comments made by the students. The corresponding interviews were transcribed and segmented into complete thoughts. Therefore, some segments may have been a number of sentences in length, whereas other segments may have only been one or two words. Each transcript was then coded individually and compiled into a database (Creswell, 1998). I analyzed these coded statements for breadth and depth of codes and refined the database into a total of 40 sets of codes. Each code was then analyzed by noting where it was found in the data and how often each code appeared. Based on this analysis, four general themes emerged that may shed light on the mental thought processes of middle school band students during practice: motivation, goals, strategies, and assessment. All the themes are highly interrelated and form a model of practice in which each aspect has influence on the others (Figure 1).

Interpretations

Motivation

Three general factors seemed to influence each student's motivation during practice. First, a striking difference appeared between the three seventh-grade students and the two older students about what music to practice. Sandra and Brianna,[1] the two older students, both were involved in private lessons and chose to practice specific spots within their assigned music with the purpose of improving performance. Consequently, they were able to stay focused on a single activity for up to 10 minutes at a time, and only 4 or 5 selections of music were worked on during their sessions. This was not the case with the three seventh-grade students. It became apparent during the retrospective interviews that they did not choose the music they practiced based on a desire to improve performance. Instead, it seems that the motivation to practice was based more on fulfilling the required amount of playing time, and, as a result, the choices of music they made were based on a desire to have fun and to be successful. This finding seems to support similar findings of past researchers (Frost & Hamann, 2000; McPherson, 2000; Miksza, 2007). Much of the music they chose to practice was the music they were most interested in and were already able to play. Though they stated that they knew which pieces needed work, they did not have a specific idea of what aspects of the music needed work. Therefore, little persistence was observed within their practice videos, as exhibited by Andrea (a percussionist) and Jason (a saxophonist), who each played 11 pieces of music during their 20-minute practice sessions. Sarah (an oboe player) only worked on 4 pieces, but she moved quickly from section to section in each piece. Though she had a vague idea that the music she chose needed work, she was unable to express her goals and exhibited little persistence with any single section.

The second major area surrounding student motivation within practice involved the ways in which students dealt

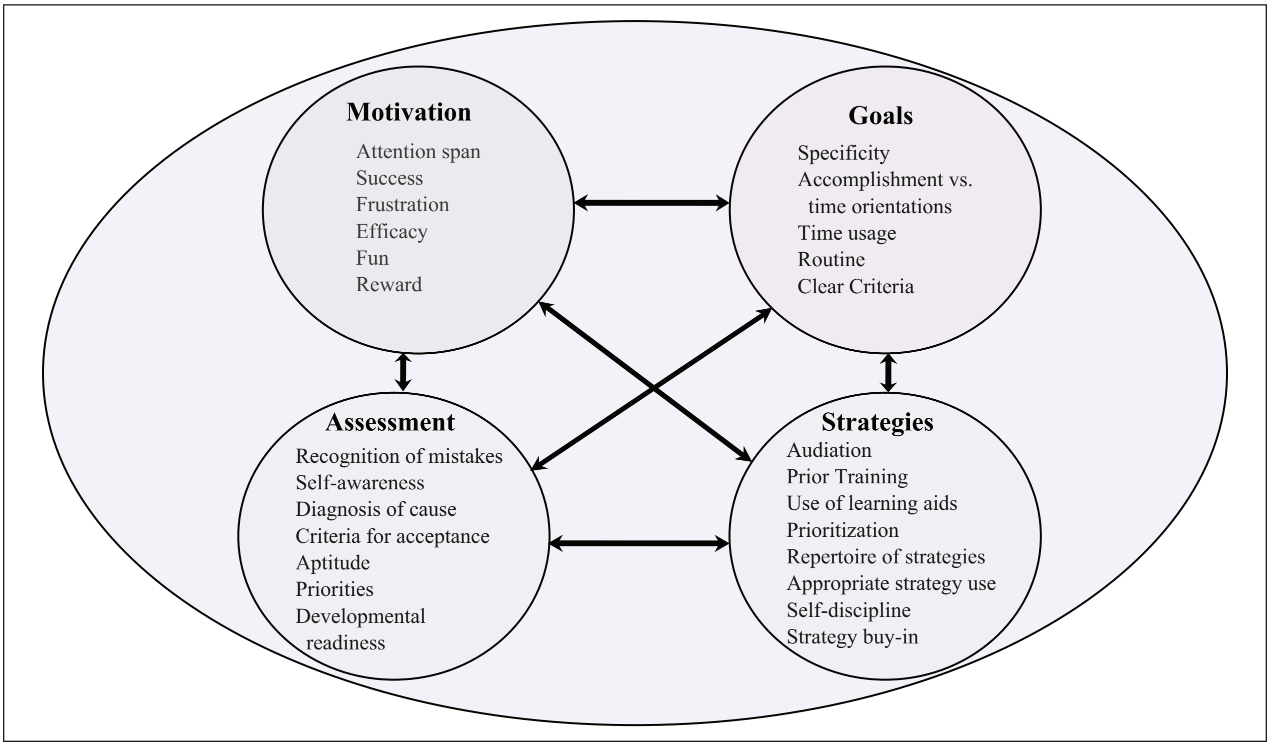

Figure 1. The process of practice

with difficult music. All five students expressed positive self-efficacy with regard to the music they had chosen to practice, and four of the five said that they generally have a "can do" attitude with regard to learning new music. Jason, a saxophonist, expressed his confidence in his ability to learn new music by stating, "I know I can do most anything, but sometimes it takes a really long time." Sarah, an oboist, admitted to generally being "pessimistic" about learning new music.

When students encountered difficulty, they reacted in one of three ways. First, although each student exhibited different levels of tolerance for frustration, at some point they each demonstrated the tendency to move on to a new activity when something began to cause frustration. Jason played one section of music only three times before moving on to something else. During the think aloud, he said, "I was frustrated and then I was like, 'Ok. I'll practice that at home tonight and I'll use the metronome.' because I knew I wasn't getting the beat." Sarah stated that she knew it was time to move on to a new activity when "either I get bored of it or it sounds ok." On further discussion, it appears as if her definition of "bored" in this context is closely related to frustration.

Second, students would retreat to easier passages when things became too difficult. In focusing on a particularly difficult measure, Brianna would repeat it and the surrounding measures many times. Twice, as she became frustrated, she went back to the beginning of the piece and played through the section she was able to play, stating, "I just stop for a couple seconds and try it again. Like a couple times I went back to the beginning and just played through that. I'm guessing I just did that to take a little break." Once she encountered this small amount of success, she returned to the difficult section and tried again. At one point, she stated, "I played it lots of times right before. So I felt that I could just go past it and like when I would get frustrated with that one and start over at the beginning." Again, it seems that her focus on improved performance helped her persist and return to the challenging section and deal with difficulty without avoiding it.

Finally, student ability to maintain focus over the span of the practice period also affected motivation. The practice sessions were pragmatically designed to be 20 minutes long to allow for practice and an interview to take place within one class period or private lesson. Generally, each student's attention span seemed to wane after 8 to 12 minutes of practice, as exhibited by a decrease in student persistence when performing difficult sections, an increase in the span of time between performance attempts, and an increase in student distraction. Though students did not quit practicing before the end of the time period, they were obviously less effective at the end of their session. This finding is supported by the research of Lehmann and Ericsson (1997), who found that deliberate practice can only be sustained for limited periods of time because it requires great effort and concentration. Brianna and Sandra, who are in eighth and ninth grade, seemed to be able to maintain their focus slightly longer than the other students, which could be because of their ability to set more specific goals than the younger students or because of expanded self-control resulting from greater maturation.

The five students exhibited varying levels of motivation as they played. In general, it seems that the three most influential factors involved within the practice sessions studied were the purposiveness of goals, the ways in which students dealt with difficult music, and their ability to maintain attention. Although the ability to maintain attention and self-efficacy may be beyond a teacher's realm of direct influence because of the unique personalities of the children, it appears that teachers can improve student motivation by providing students goals for improvement rather than simply recording practice time.

Goals

The ability to clearly define goals that are specific, proximal (short term), and moderately challenging is a major component of effective practice (McPherson & Zimmerman, 2002). Although the students in this study were usually able to choose moderately challenging music, they were, by and large, unable to describe with specificity the aims that they intended to accomplish or to plan their practice time productively.

After each practice session, students were asked what goals they had attempted to accomplish. Andrea's response to my question was "to get better," whereas Sarah's was "to make the song sound better." Jason's response to the question was

> to achieve stuff that I really didn't do so great on . . . And then my main goal would be to get better on parts that were difficult for me, like here in *The Pink Panther*. That's very difficult, so I practiced that.

Though he was able to choose music to improve, he did not explain specifically what needed improvement.

Students tended to choose things needing improvement in a reactive instead of a proactive manner. Sarah's method of choosing a goal involved playing through a song until she encountered a problem. She then practiced it until she could either play it or she became "bored". Brianna said, "When I started missing, I tried to play it again, but I didn't really think of it as a goal. I just thought I needed to work this out." The result of this method of choosing goals led to hit-and-miss practice sessions in which students were unable to clearly state what they had accomplished.

Having a warm-up routine was beneficial for some of the students. Jason, who is the son of two professional saxophonists, had the most well-defined warm-up routine. He began by playing four scales throughout the range of the instrument, moved to reviewing his vibrato while playing long tones, and then worked on playing overtones from low D to low Bb. He was able to define the purpose for the vibrato exercise and scales but only gave a vague purpose for playing the overtone exercise. It is interesting to note that the quality of his performance of the first two exercises was much stronger than the latter.

Andrea had a sheet of snare drum rudiments that she played through. She was able to describe a vague purpose for the routine and gave an equally indistinct performance of each of the exercises. The other three students each played one scale at a relatively quick tempo and were unable to give a clear reason for doing it, apart from saying that they always play a scale to warm-up. With the exception of Jason, none of the other students addressed tone quality in their warm-up routine. This lack of deliberate work on the development of tone quality could be the cause of the tone quality problems they encountered during their practice.

Student priorities also seemed to have a large influence on what they chose to practice. As they practiced, it was obvious that fingerings were the main object of focus, but issues relating to their ability to create a steady tone seemed to be the underlying cause of many of their fingering concerns. When asked to prioritize the elements of performance that she focused on while practicing, Sandra said, "First fingers, then rhythm, articulation, dynamics—well tone and dynamics are together." Brianna and Sarah also listed tone at the bottom of their priority lists. Because their minds were focused on fingers, and tone was at the bottom of their priority list, they seemed to be unable to identify an appropriate goal for improving the sections of the music they had chosen.

A final factor influencing the students' ability to set specific goals involves their ability to define the criteria for their goals. Students need to recognize when their goals have been reached in order to know when to move on. When asked how they knew when they had reached their goals, students often responded with comments as vague as their goals, such as Sandra's response of, "When it sounds good." Jason's response was equally vague as he responded, "When I feel that I've played it to the best of my ability for now."

Whereas Brianna and Sandra were able to vaguely identify some progress made in their playing over their practice period and future needs for improvement, the other three students were unable to identify any accomplishment or future goals. On review of the videotapes, I too was unable to determine what improvement was made, if any. The relationship between clarity and specificity of goals and the accomplishments made during practice seems to be an area of concern for all five of the participants.

Strategies

The factors influencing the use of practice strategies can be broken down into three categories: strategy repertoire, appropriate use, and motivation. Using the metaphor of having a "practice toolbox," students need to have a number of tools from which to draw on, but they also need the knowledge and skill to use them appropriately and the motivation and self-discipline to make the effort to take the tools out of the box.

Each student in the study had a number of tools to draw on. All five students recognized the importance of other aids, such as the use of a pencil and a metronome, but none of the students made use of recording equipment to aid in self-assessment. Sandra expressed a sincere distaste for having to listen to her own playing. They also knew that counting rhythms and singing music in their head was helpful, though I observed little of it in the videos.

Andrea, the only student not enrolled in private lessons outside of the band, seemed to have only one other basic strategy, which was playing the music slower before playing it up to tempo. Sarah, who takes piano lessons, used a lot of repetition and the strategy of simplifying technical sections by ignoring the rhythm, but she did not use the reverse of the strategy by simplifying tough rhythms and ignoring the notes or articulations. Brianna showed that she had a few strategies at her disposal when she said,

> Like repeating it, I do a lot. Or just concentrating on the part I'm having trouble with. And sometimes—I don't do this as often—but sometimes I finger through it . . . so I can watch what my hands are doing. And try to do it slower.

Sandra, who has clarinet and piano lessons, and Jason, who takes piano and saxophone lessons from his parents, both described a number of strategies, such as breaking problems into small chunks, chaining chunks together, changing rhythms, using a metronome to regulate tempo, analyzing fingering patterns and formal structure, repeating sections until they feel comfortable, and separating difficult musical elements. Jason admitted that he needed supervision to use the strategies he knew, saying, "Well, every time I practice, I get a private lesson (from my parents). It's kind of like that."

Though each student had a repertoire of practice strategies at their disposal, they did not clearly understand how or when to use each strategy appropriately. Andrea often played a large section slowly and then played it one more time at performance tempo without gradually speeding it up and without using repetition. Sarah repeated sections up to tempo when it would have been more appropriate to slow them down, whereas Brianna repeated a particularly difficult measure up to tempo when it would have been more appropriate to play one note at a time, focusing on making each note speak clearly. Jason, on the other hand, was able to slow small chunks of his music down when necessary, but he did not put the section back into the context of the music as a whole or repeat the passage a sufficient number of times to solidify the necessary skills.

Although Sarah, Brianna, and Sandra each knew a number of strategies, they were not able to articulate any strategies for improving their tone. This seems to have been an important finding, because an inconsistent tone was the root problem with each of their practice sessions and with each student's overall playing ability.

Finally, students often chose not to use practice strategies that may have been helpful. Though Jason knew of the importance of repetition and stated that his parents would have him repeat things seven times, he never repeated a section more than twice in his practice session. When asked if he was disciplined enough to repeat things seven times when practicing on his own, he said, "Usually not 7 times, but usually more like 4 times." Sarah and Sandra both identified strategies that they knew of but did not like to use because they believed the strategies to be ineffective. Other times, students displayed the disposition to use some strategies, such as feeling the subdivision of pulse, but stopped using them when the music became too difficult. For example, while playing relatively simple passages, Andrea would move to the pulse either with her head or her knee, but when she encountered difficult sections of music, this outward demonstration of beat would disappear.

Assessment

Four factors influenced students' abilities to assess themselves. First, the clarity with which they could define the criteria for successful achievement of goals helped students know when goals have been attained and when to move on to new ones. When asked how she knew when she played something well enough to move on, Sandra responded by saying, "When I'd feel comfortable playing it in front of an audience, I guess." This type of understanding was indicative of all five participants. They each had a general idea of what an acceptable quality was, but none of them was able to clearly express their criteria.

A second factor effecting student self-assessment was their ability to recognize mistakes. Brianna said, "Sometimes . . . I'll think I did something wrong, but I can't really tell." Sandra stated that she tries "to get people to listen to me so they can tell me to stop (when I make a mistake)." During our review of her practice video, Andrea was unable to recognize a number of obvious rhythmic mistakes and basic issues with playing position. This could be because of a combination of reasons, including her lack of one-on-one training and what her band teacher believed to be a moderately low aptitude. Jason, on the other hand, was very astute at detecting mistakes while viewing his video but was also surprised to hear some of the mistakes that he did not catch while practicing. Brianna was also able to recognize mistakes and able to determine if they needed to be addressed. At one point, she said,

> I noticed occasionally I'd play an F# up there instead of a natural. And I know I made a couple of other mistakes throughout, but they're all small things that I've done right a lot of times before. So I didn't stop on them.

Once students were able to recognize mistakes, it became difficult for them to diagnose their underlying causes, making it difficult to know how to make improvements. Sarah expressed this by saying, "Well, it sounds not right but I don't know what it is." Brianna said, "Sometimes I'll think I did something wrong, but I can't really tell . . . Usually I play it over and try to listen better."

Implications

Educational leaders commonly emphasize the importance of teaching students how to critically think and learn on their own. Musical practice is an important way in which music teachers can provide their students with these opportunities. Though this study cannot be generalized beyond the students involved, readers may consider three implications that may guide their students to practice more efficiently and effectively.

First, the required use of practice logs for the participants of this study and the seemingly ubiquitous use of this grading tool in band classes across the nation emphasizes the importance of time students should spend practicing their instruments. The analysis of data from this study supports findings of previous studies that students who are motivated by focusing on practice time tend to be less able to maintain their persistence in learning difficult music and are less likely to set specific goals or recognize improvements made than students who are motivated with a focus on goals (Ericsson, 1997; McPherson, Davidson, & Pitts, 2000). If this is true, it would have important implications in how teachers should use practice logs. Instead of grading practice based solely on time, it may be more effective to place the focus on personal improvement by assessing student progress toward periodic goals or by asking students to self-assess their progress toward their own daily or weekly goals.

Second, authors of practice-related literature stress the importance of setting clear, proximal, moderately challenging goals. The data from this study suggests that students tend to set vague goals, leading to an ineffective use of time. Although students were able to determine a general section within a piece of music that needed practice, they were unlikely to identify specifically what about the music needed to be improved and how they would know they had succeeded in their practice. Further studies must be undertaken that inform teachers of the best methods of teaching goal setting to students and identify the effects of appropriate goal setting on improvement of student performance.

Finally, once students have specific goals that are gauged to improve performance, they need to have strategies at their disposal and understanding of their appropriate use in order to achieve their goals. The participants in this study had various levels of experience and prior training in the use of practice strategies. One commonality, though, was an apparent inability or lack of volition to use their strategies effectively. Further research in the development of teaching methods for introducing proper practice strategy usage is needed to improve practice efficiency.

McPherson (2005) states that "despite the importance for children to develop an armory of task-appropriate strategies to aid their performance, evidence suggests that school teachers do not sufficiently emphasize this in their teaching, particularly during the early years of schooling."

It seems to follow that helping instrumental music students develop self-regulation would result in improved ensembles and more efficient rehearsals. Methods for teaching practice skills to middle school and high school students must be developed through continued research and best practice in order to develop independent musicians.

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1. All names have been changed to maintain the anonymity of the participants.

References

Barry, N. H. (1990). The effects of different practice techniques upon technical accuracy and musicality in student instrumental music performance. *Research Perspectives in Music Education, 44*, 4–8.

Barry, N. H. (1992). The effects of practice strategies, individual differences in cognitive style, and gender upon technical accuracy and musicality of student instrumental performance. *Psychology of Music, 20*, 112–123.

Barry, N., & Hallam, S. (2002). Practicing. In R. Parncutt & G. McPherson (Eds.), *The science and psychology of music performance: Creative strategies for teaching and le*arning (pp. 151-166). New York, NY: Oxford University Press.

Creswell, J. W. (1998). *Qualitative inquiry and research design: Choosing among five traditions.* Thousand Oaks, CA: Sage.

Duke, R., Simmons, A., & Cash, C. (2009). It's not how much; it's how: Characteristics of practice behavior and retention of performance skills. *Journal of Research in Music Education, 56*, 310–321.

Ericsson, K. A. (1997). Deliberate practice and the acquisition of expert performance: An overview. In H. Jørgensen & A. Lehmann (Eds.), *Does practice make perfect? Current theory and research on instrumental music practice* (pp. 9-52). Oslo, Norway: Norges Musikkhøgskole.

Ericsson, K., Krampe, R., & Tesch-Romer, C. (1993). The role of deliberate practice in the acquisition of expert performance. *Psychological Review, 100*, 363–406.

Ericsson, K., & Simon, H. (1993). *Protocol analysis: Verbal reports as data* (Rev. ed.). Cambridge, MA: MIT Press.

Frost, R., & Hamann, D. (2000). The effect of private lesson study on the practice habits and attitudes towards practicing of middle school and high school string students. *Contributions to Music Education, 27*, 71–93.

Hallam, S. (1997). Approaches to instrumental music practice of experts and novices: Implications for education. In H. Jorgensen & A. Lehmann (Eds.), *Does practice make perfect? Current theory and research on instrumental music practice* (pp. 89-108). Oslo, Norway: Norges Musikkhøgskole.

Hallam, S. (2001a). The development of expertise in young musicians: Strategy use, knowledge acquisition and individual diversity. *Music Education Research, 3*, 7–23.

Hallam, S. (2001b). The development of metacognition in musicians: Implications for education. *British Journal of Music Education, 18*, 27–39.

Henley, P. (2001). Effects of modeling and tempo patterns as practice techniques on the performance of high school instrumentalists. *Journal of Research in Music Education, 49*, 169–180.

Hewitt, M. (2001). The effects of self-evaluation, self-listening, and modeling on junior high instrumentalists' music performance and practice attitude. *Journal of Research in Music Education, 49*, 307–322.

Kostka, M. (2000). The effects of error-detection practice on keyboard sight-reading achievement of undergraduate music majors. *Journal of Research in Music Education, 48*, 114–122.

Lehmann, A. C., & Ericsson, K. A. (1997). Research on expert performance and deliberate practice: Implications for the education of amateur musicians and music students. *Psychomusicology, 16*, 40–58.

Lehmann, A. C., & Ericsson, K. (1999). Research on expert performance and deliberate practice: Implications for the education of amateur musicians and music students. *Psychomusicology, 16*, 40–58.

Leon-Guerrero, A. (2004). *An examination of the self-regulation strategies used by adolescent instrumental musicians while practicing* (Unpublished doctoral dissertation). Northwestern University, Evanston, IL.

McCormick, J., & McPherson, G. (2003). The role of self-efficacy in a musical performance examination: An exploratory structural equation analysis. *Psychology of Music, 31*, 37–51.

McPherson, G. (2000). Commitment and practice: Key ingredients for achievement during the early stages of learning a musical instrument. *Bulletin of the Council for Research in Music Education, 147*, 122–127.

McPherson, G. (2005). From child to musician: Skill development during the beginning stages of learning an instrument. *Psychology of Music, 33*, 5–35.

McPherson, G. E., Davidson, J., & Pitts, S. (2000). Developing effective practice strategies: Case studies of three young instrumentalists. *Music Education Research, 2*, 45–56.

McPherson, G. E., & McCormick, J. (1999). Motivational and self-regulated learning components of musical practice. *Bulletin of the Council for Research in Music Education, 141*, 98–102.

McPherson, G. E., & McCormick, J. (2000). The contribution of motivational factors to instrumental performance in a music examination. *Research Studies in Music Education, 15*, 31–39.

McPherson, G. E., & Renwick, J. (2001). A longitudinal study of self-regulation in children's musical practice. *Music Education Research, 3*, 169–186.

McPherson, G. E., & Zimmerman, B. J. (2002). Self-regulation of musical learning: A social cognitive perspective. In R. Colwell & C. Richardson (Eds.), *The new handbook of research on music teaching and learning* (327-347). New York, NY: Oxford University Press.

Miksza, P. (2007). Effective practice: An investigation of observed practice behaviors, self-reported practice habits, and the performance achievement of high school wind players. *Journal of Research in Music Education, 55*, 359–375.

Nielsen, S. (2004). Strategies and self-efficacy beliefs in instrumental and vocal individual practice: A study of students in higher music education. *Psychology of Music, 32*, 418–431.

Rohwer, D. (2005). A case study of adult beginning instrumental practice. *Contributions to Music Education, 32*, 45–58.

Rohwer, D., & Polk, J. (2006). Practice behaviors of eighth-grade instrumental musicians. *Journal of Research in Music Education, 54*, 350–362.

Ross, S. (1985). The effectiveness of mental practice in improving the performance of college trombonists. *Journal of Research in Music Education, 33*, 221–231.

Sparks, G. E. (1990). The effect of self-evaluation on musical achievement, attentiveness, and attitudes of elementary school instrumental students (Doctoral dissertation, Louisiana State University and Agricultural & Mechanical College). Available from ProQuest Dissertations and Theses Database. (UMI No. 9104174)

Woody, R. (2001). Learning from the experts: Applying research in expert performance to music education. *Update, 19*(2), 9–14.

Zimmerman, B. J., & Schunk, D. H. (Eds.). (2001). *Self-regulated learning and academic achievement: Theoretical perspectives* (2nd ed.). Mahwah, NJ: Lawrence Erlbaum.