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Explicit Instruction in Self-Regulatory Skills and Deliberate Practice

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EXPLICIT INSTRUCTION IN SELF-REGULATORY SKILLS AND
DELIBERATE PRACTICE

A Monograph

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Musical Arts

in

The Department of Music and Dramatic Arts

by

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This document is dedicated to the many teachers, friends and family members that have supported me along this journey:

In loving memory of my mother, Mary Ann Gedde

Father Gary Gedde

Ted Andresen

Laura Menden

Anna, Nicholas and Margaret Heisler

Teachers: James Thulien, Steven Jordheim, Dr. John Sampen, and Dr. Griffin Campbell

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All participants

Dr. Griffin Campbell

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ABSTRACT

The purpose of this investigation was to explore explicitly teaching self-regulation for musical practice. The study consisted of a pre-test, intervention, and post-test design in a case-study format. Three participants completed a pre-test practice task where they were asked to sight-read an excerpt of music, practice for 25 minutes and then perform the excerpt again. Following the pre-test participants completed five instructional sessions explicitly teaching them to self-regulate during musical practice using a cyclical model of component steps. Immediately following the five instructional sessions all participants completed a post-test practice task, which was identical to the task from the pre-test. Recommendations include expanding the model of self-regulatory steps to be a model of self-regulated practice for teachers and students. Behavior analysis indicated that there were observable changes in practice behavior, self-regulatory ability and performance achievement after instruction.

CHAPTER 1. REVIEW OF LITERATURE

Polished performances are what the world sees of musical endeavors. Performance is the public face of music. The more covert enterprise is the many hours musicians spend practicing per minute, even per second of music for a performance. Practice comprises the majority of what musicians do, but ironically research suggests that it is not a heavily addressed area in teaching music performance.

In a survey regarding the practice attitudes and expectations of 127 college level applied teachers and 134 students, Kostka (2002) found that 100% of the teachers surveyed believed they addressed practice in lessons. However, only 69% of the students surveyed believed practice had ever been addressed in their applied lessons, leaving 31% of students who believed that practice had *never* been addressed. The above discrepancy highlights a clear difference in the perceptions of teachers compared to students in regards to addressing practice in applied lessons.

Koopman, Smit, Vugt, Deneer and Ouden (2007) found similar results in an observational case study of applied music instruction. The researchers studied 5 students with their corresponding applied instructor via observations, video recordings, questionnaires and journals across several dimensions: structure of lessons, topics addressed, initiative and practice/homework. All 5 teachers believed that they addressed practice and gave explicit instruction in how to practice; however, only one teacher was actually observed giving instruction in how to practice. Additionally, only three of the students believed that practice had ever been addressed. Obviously, a discrepancy exists between what teachers and students think is happening regarding teaching musical practice. Further, a clear discrepancy exists between what

teachers *think* they do and what they *actually* do in teaching practice during the course of applied study.

These discrepancies raise the question, how *is* practice being addressed? More specifically, is practice being addressed in a way that students are able to identify and transfer to their independent practice sessions? Is the manner in which deliberate practice is addressed effective and if not how do we need to change our instruction? It would seem from the above investigations that as teachers we may not be effectively addressing practice and our students would benefit from some adjustments to our instruction. Further, what about practice is important to address—time spent, various techniques, the whole process? Since practicing is an essential factor for preparing performances and for musical improvement, it seems logical that directly and specifically addressing practice in lessons would benefit students.

In an effort to begin to answer the above questions regarding practice Gruson (1988) examined whether changes in practice behavior and cognition occurred as musical skill increased. Forty conservatory students were observed practicing two pieces of appropriate difficulty. Practice sessions were scored for effectiveness using the Observational Scale for Piano Practicing (OSPP) and participants were interviewed post hoc about techniques used in their practice sessions. Participant practice scores increased as musical skill increased suggesting that more advanced musicians were practicing more effectively. These results further suggest that what is done in musical practice is significant and that the time spent practicing is not the only factor contributing to improvement.

Williamon and Valentine (2000) examined the monotonic benefits assumption, which states that time spent on a task leads directly to increased skill level. They conducted practice observations of 22 piano students of varying skill level, culminating in a standard performance

examination where students were scored for musical understanding, communicative ability and technical skill proficiency. Their results contradicted the monotonic benefits assumption; instead they found that the time spent practicing did not significantly differ across ability levels and examination scores. Their investigation, like Gruson's, suggests that what happens during practice, rather than the amount of time spent practicing, determines the amount of improvement made. Participants with higher skill levels had greater variation in the amount of time they spent practicing which suggests the possibility of a more goal-oriented approach to practice, that is practice revolving around specific improvement goals. Research by Peter Miksza (2007) yielded the same results. He found no correlation between the time participants spent playing and their achievement results, suggesting again that what happens during practice is more significant than the amount of time spent engaged in practice.

If the amount of time spent practicing is not the most influential indicator of musical improvement, perhaps goal-oriented practice would be a stronger indicator. Sloboda (1996) illustrates this point. He found that students who were high achieving practiced in a more formal and task-oriented manner. In a preceding study that investigated time spent practicing compared to actual practice behaviors, Geringer and Koska (1984) conducted observations and student interviews across 8 weeks. Students were asked questions requiring them to analyze the amount of time they spent practicing and what they did during practice. Students overestimated the amount of time spent per practice session on actual practice behaviors as well as the amount of time they spent working on technical issues. Students' misconception of how time was used suggests that they lack awareness of what they are *actually* doing during practice sessions and that a time-based approach to practice may not be the most effective. Further, instructional intervention in self-regulation and a more goal-oriented approach to practice could be beneficial.

Consistent with Gruson and Kostka's findings, Miksza (2007) examined three practice sessions of 60 high school band students and found a discrepancy between the level of effectiveness that students self-reported and their actual performance achievement. After practicing an excerpt selected by the researcher, students rated each of their practice sessions for effectiveness using a 10-point Likert style scale. After rating their practice students performed the excerpt for a performance score. For each initial practice session, the students overrated their practice effectiveness, and with each subsequent practice session, the discrepancy between the students' effectiveness rating and their actual achievement increased. As students became familiar with the piece, they thought their practice was increasing in effectiveness but in reality they were actually making fewer improvements. Miksza suggests that students lack a clear understanding of the differences between effective and ineffective practice and that students should be explicitly taught to distinguish them (2007).

In a case study of the practice habits of novice musicians practice behaviors were recorded and then analyzed for comparisons. Pitts, Davidson and McPherson (2000) found that the students did not really understand why they needed to practice or how to approach practicing. In addition, the students reported feeling frustrated after practicing and their progress was slow and cumbersome. Basically, students were attempting to practice but had no clear idea of how to identify problems and no clear knowledge of practice strategies to fix their problems. The investigation shows that even beginning students would benefit from direct instruction in practice strategies and in identifying problems. Pitts et al. stated that "...Teachers have an important role in fostering skills of self-criticism and evaluation," and "Practice strategies need to be systematically taught by example and by explanation with the child given the responsibility

for identifying problem sections and the teacher providing a variety of methods for tackling them” (2000, p. 54).

A more goal-oriented approach to practice makes what students do in practice extremely important, that is, the problems they choose to solve, and the strategies they choose to solve those problems are vital to their improvement. To examine the relationship between the strategies students identify and use in practice and their musical performance Rohwer and Polk (2006) examined 65 eighth-grade students. Students verbally described practice strategies, sight-read an excerpt, practiced and then took a post-test performance exam. A positive correlation existed between the number of strategies students could verbalize and their performance improvement score from pre-test to post-test. In other words, if a student could articulate more practice strategies their performance gains on the post-test were greater than for students who articulated fewer practice techniques. Further, those students who practiced by choosing target areas to practice and who applied practice strategies analytically had the highest performance gains. Rohwer and Polk’s findings suggest that if teachers spend time specifically teaching students how to select problem areas and use specific practice strategies improvements they make during practice could increase.

Hallam further investigated strategy use in deliberate musical practice and its relationship with the development of musical expertise (2001b). Hallam recorded 55 college freshman music majors practicing a piece of appropriate level for ten minutes and then performing a post-test scored for overall impression and accuracy. Students were then interviewed regarding their approach to practice and categorized into three groups based on their level of practice cognition: low, moderate, or high planning. In general, as the proficiency level of the student increased so did the level of practice cognition and strategy use. More advanced students exhibited high levels

of planning, such as rapid identification of problem areas, concentrated effort on problem areas, decontextualization of difficult items and a gradual recontextualization. Students in the middle category demonstrated practice with more focus on just repeating large sections of music with less concentrated effort on problem areas. The group of less advanced students also exhibited very minimal levels of planning and problem areas were frequently not improved. Throughout the study planning behaviors seemed to refer to self-regulatory steps, problem identification, strategy selection, and self-evaluation. The more advanced the musician the more able they were to self-regulate, or to identify and plan what to do during the course of their practice session. This begets the question, which came first? Was it the students' achievement level that made them more effective practicers or was it their ability to self-regulate during practice that increased their skill level? Either way, the study provides indication that the ability to self-regulate would increase practice effectiveness. It may not be time alone or a specific strategy that begets improvement but skillful and thoughtful use of various strategies.

Hallam's findings regarding self-regulatory skills were in keeping with a previous study conducted by Sullivan and Cantwell (1999). They examined the planning behaviors during a practice task of 53 university students using a process questionnaire and scored participants for high, middle or low level planning behaviors. Again, in this study planning behaviors refer to the students' identification of problems, use of strategies and self-evaluation of effectiveness. They found that students exhibiting higher levels of planning were thinking more deeply and were therefore able to use a wider array of strategies. Both studies suggest that a degree of self-regulation or problem solving is required for the most effective practice. If self-regulation is necessary for the most effective practice, what component steps does it involve and what can we do as music educators to instill use of those steps in our students?

To examine the idea of self-regulation in practice more deeply Nielson (2001) studied the practice tendencies of two advanced university students. She specifically described the self-regulatory steps used by the students in “real time” practice. She observed participants practice behaviors, had them watch their recorded practice sessions and give verbal commentary immediately following each practice session. Both students planned strategically based on specific pieces, had very specific goals for each practice session and their practice was driven by these goals. For example, in a particular practice session if the student was most concerned about ballistic finger technique they chose strategies to address and improve ballistic finger movement. Students also frequently used self-instructions or think aloud strategies to help guide what they were doing such as, “the melody is actually in the pedal so I should emphasize it,” and then practiced in that manner. Another self-regulatory step used consistently was simplifying tasks to work on problem areas and then gradually putting them back into their original context, referred to as decontextualization and recontextualization. The self-regulation strategies exhibited by the students in this case study suggests that self-instruction/think aloud, decontextualization and recontextualization are effective and that students would benefit from explicit instruction in these two strategies.

Additionally, both students consistently identified problems, selected strategies, evaluated improvements, revised strategy selections as appropriate and then repeated the process in a cyclical fashion. Based on the prominence of these steps, Nielson suggests a circular model of self-regulation containing the following steps: identification of problems, prioritization of problems, selecting strategies, evaluations of improvement, and then revision of strategy selection or moving to a new problem as applicable (2001). The model she presents seems reflective of the cognitive steps involved in self-regulation and it seems logical that if students

are adept at completing each step of the model then their practice could be more effective. Several questions remain; are these skills universal, are they natural, do we already give instruction in these steps, or do we need to be more explicit in teaching them?

Hallam (1997a) makes a case for more explicitly teaching self-regulatory skills in her investigation of how novice and expert musicians practice. Hallam found that the biggest difference between experts and novices was the extensive meta-cognitive abilities of the experts. The expert musicians had a wide range of strategies that they adapted and applied to meet their needs and the needs of the repertoire being practiced. Hallam states, “Meta-cognitive activity was central in determining the nature of practice undertaken by these musical experts” (1997a, p. 93). If meta-cognitive or self-regulatory abilities are central to what expert musicians do, then providing instruction in self-regulation could be important for producing expert musicians.

Hallam (1997a) also found that 69% of novices reported practicing pieces in small sections but in actuality 67% of them practiced merely by playing through the music repetitiously. These findings reaffirm Flavel, Beach and Chinsky’s theory of production deficit, which states that children may have knowledge of strategies but do not always use them appropriately (Hallam, 1997a; Flavel, Beach & Chinsky, 1966). They have the theory without the ability to produce.

Byo and Cassidy (2008) further demonstrates Flavel’s idea of production deficit and makes a firm argument for directly addressing self-regulatory skills and practice in the context of applied instruction. The researchers surveyed 38 university music students regarding the amount of time and strategies used during the course of musical practice. Practice sessions for 9 of the students were observed to determine what they actually did in their “real time” practice sessions compared to what they self-reported. Students were able to articulate potentially effective

practice strategies including repetition, reducing tempo, changing rhythm, using a metronome, and score analysis. During observations students used many of the techniques mentioned but were not doing so effectively. For instance, students would slow down for an error but not really fix the problem and return to a quick tempo too soon. Instances such as this, demonstrate the gap between what students know and what they can do. Students are not automatically able to transfer their knowledge of practice strategies to their actual practice successfully; hence, their practice is not as effective as possible.

The problem could be that students are not able to self-regulate when using various practice strategies. They are not able to effectively select problems to work on, choose strategies and then evaluate the success of the strategy. In a general review of the research into self-regulation, Zimmerman (2002) states that the body of research across disciplines shows that self-regulation can and should be modeled and taught explicitly but that few teachers are actually teaching it. If lack of self-regulatory skill impedes students practice, can be taught, and could be of benefit to students, then why are more teachers not teaching it?

In an attempt to address the above questions, the purpose of this study was to explore explicitly teaching students self-regulatory skills using a model of specific steps to determine if the instruction was viable. The primary research question for the study was does specifically teaching students to self-regulate during musical practice seem practical and effective. Related questions included:

- 1) Does the manner of teaching self-regulation used for the study, particularly the model of self-regulatory steps, seem to be accurate, useful and inclusive enough?
- 2) What, if any, observable changes occur in students' practice sessions and subsequent performance achievement after instruction?

CHAPTER 2. METHODS

This investigation was an exploration into teaching explicit steps for self-regulation during musical practice to college music majors. As shown in Figure 1.0, the study consisted of three parts, a pre-test consisting of a practice task and practice behavior questionnaire, a treatment period consisting of five instructional sessions and a post-test consisting of the same two parts as the pre-test.

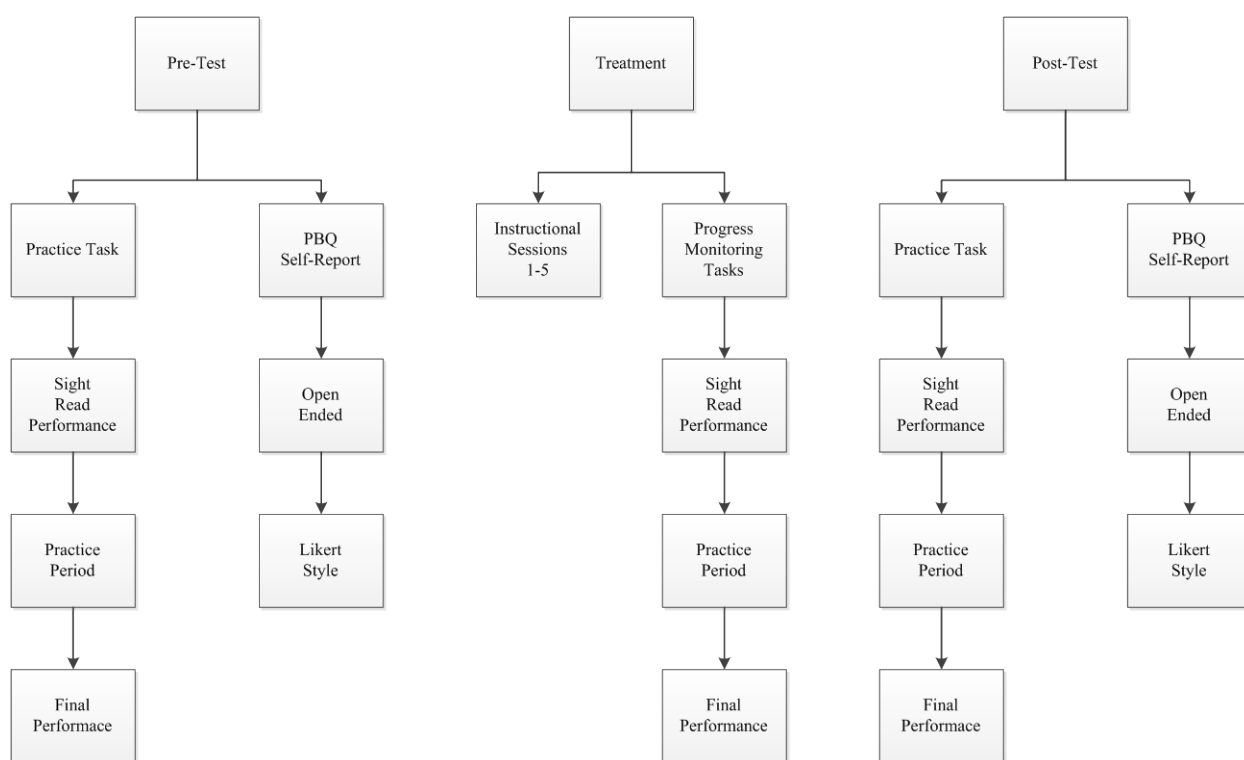


Figure 1.0. Flow chart of the methods used for the study.

2.1 Pre-Test

The study began with a pre-test scenario to first select the most appropriate study participants and to collect baseline data for each participant. Informed consent was obtained from a sample of convenience of four undergraduate saxophone music majors at a large southern

university. Each of the four participants was given a pre-test to determine their eligibility to participate in the study. The aim was to select two students to complete the full study—one who exhibited low levels of self-regulation during practice and one who exhibited higher levels of self-regulation during practice, to explore if explicit instruction in self-regulation would benefit students at both developmental levels.

Practice Task

Each potential participant sight-read an excerpt of appropriate difficulty. The excerpt was selected and edited to present different types of challenges to participants. It also required them to make various practice decisions and utilize different practice techniques in order to make performance improvements. The need for various types of practice and different practice techniques enabled the collection of baseline information about each participant's self-regulatory abilities.

The excerpt that participants sight-read for the pre-test was from the Karg-Elert Sonata contained in his *25 Capricen und Sonate, opus 153*, volume II etude book (Karg-Elert, 1965) (See appendix A). In particular, the work was chosen because it was difficult enough that it could not be perfected in the 25-minute practice period.

The first section of the excerpt (see Appendix A) was chosen because it was lyrical and *molto espressivo* with written and implied phrasing. In this section participants could practice interval connections, phrasing, control of sound, and dynamic contrasts. This section was also chosen because it provided rhythmic challenges for participants to navigate. The four over three beats in measure 8 (see Figure 2.1) could be a significant challenge that would require participants to engage in rhythmic practice and decision making.



Figure 2.1 Pre-test measure 8 example of rhythmic complexity.

Additionally, the long notes in measures 13-20 could be a challenge for participants to perform for an accurate number of beats (see Figure 2.2). In the context of the whole excerpt, participants could possibly gloss over this section, deeming it simple, which would expose the participants' thinking and process.

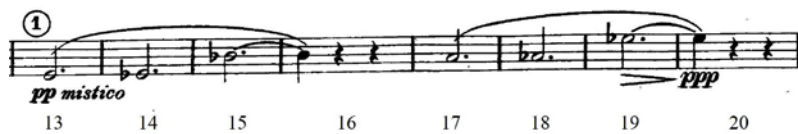


Figure 2.2 Pre-test measures 13-20 example of rhythmic challenge.

The second section of the pre-test excerpt was one of the *Energico* sections from the Karg-Elert Sonata contained in his *25 Capricen und Sonate, opus 153*, volume II etude book, as listed above (Karg-Elert, 1965). The *Energico* section was chosen because it presented rhythmic, articulation, ballistic finger, intervallic and musical challenges. For example the rhythmic pattern as displayed in Figure 2.3 would be challenging to perform accurately and the articulation and dynamic contrasts would require attention to detail.



Figure 2.3 Pre-test measure 26, example of rhythmic articulation and dynamic challenges.

Also, the articulation pattern at the start of the *Energico* section (see Figure 2.4) would require significant attention as the pattern of staccato, slurred and regularly tongued notes is quite intricate, and would expose different kinds of practice decisions.



Figure 2.4 Pre-test measures 22-23 example of articulation complexity.

The 16th note passage from measure 24-26 of the *Energico* section of the excerpt, as shown in Figure 2.5, would also be quite difficult and require attention to intervallic connections. The leaps to the low register (F-C, E-B) would require attention to finger motion as well as control of embouchure and air stream, especially at the marked piano dynamic.



Figure 2.5 Pre-test measure 24, example of ballistic technique and tonal control challenges.

Further, the technical passage would require attention to dynamic contrast and phrasing, as the whole section is a crescendo from piano to fortissimo.

After sight-reading the excerpt each initial participant was given 25 minutes to practice the excerpt for a final performance. Frequently, researchers have used practice time spans from between 30 seconds and 10 minutes, for their investigations. In this case the 25-minute practice period was chosen, as opposed to a shorter practice time span, to minimize the stress of an immediate performance and allow participants greater freedom and comfort to really engage in a

more typical, “real time,” practice session. The 25 minute practice session, also gave participants enough time to make some genuine practice decisions and giving more authentic baseline data about the participants thinking process. The time frame also allowed participants to make some significant improvements but not so much time that they were able to completely perfect the excerpt.

Precedence for the 25 minute practice period was set by previous researchers, who determined through pilot study that 25 minutes was the amount of time needed to observe significant practice gains (Fortney, 1992; Miksza, 2005 & 2007). After the practice period, participants performed the excerpt again allowing the researcher to determine the amount and type of improvements made after practice.

Practice Behavior Questionnaire

Immediately following the pre-test practice task participants completed an adapted version of the Practice Behavior Questionnaire (PBQ) (see Appendix B). The idea of a PBQ was developed in earlier studies and analyzed practice behavior with questions regarding students’ thinking and process during musical practice (Hallam, 1997a, 2001a, 2001b; McPherson & McCormick, 1999, 2000; McPherson & Renwick, 2001; Renwick & McPherson, 2002a). For the present study the questions on the PBQ were created based on previous research and then adjusted to more clearly incorporate the component steps involved in the self-regulatory process.

Participants completed two separate sections of the PBQ to help determine their initial self-regulatory ability. The first section of the PBQ, contained open-ended free response questions such as, “Describe your typical practice routine?” “What is your process for learning a new piece of music?” and “How do you choose what to practice at a specific moment?” The

open-ended questionnaire was given first to allow participants the chance to write whatever best reflected their actual behavior, without the power of suggestion inherent in a more leading question. Participants were instructed to answer each question fully and in any way that best reflected their actual practice sessions.

The second section of the PBQ consisted of 25 Likert style rating questions such as, “When I practice I tell myself this is getting better,” or “When I practice I ask myself what do I most need to work on.” Other questions from the Likert style PBQ included questions regarding time compared to a goal-oriented approach to practice, identifying problems/mistakes, and strategies used. Questions such as, “I usually practice for a set amount of time,” or “When I am practicing I think about how many mistakes I am making and how I should correct them,” and “When I am practicing sections that are difficult for me I slow them down and gradually speed them back up.” To answer the questions, participants rated themselves on a 1-5 point scale stating how closely the statement reflected their actual thinking. Participants circled number one if they “strongly disagreed” with the statement, number 3 if they were “neutral” about the statement and 5 if they “strongly agreed” with the statement for their behavior and thinking.

Both free-write and Likert styles of questioning were included in the PBQ because each section would provide important information and together they would provide a greater breadth and depth of information regarding the participants practice and self-regulatory abilities.

2.2 Selection of Participants

Sight-read and post-practice performances of all 4 potential participants were video recorded and scored using a modified Watkins-Farnum scoring procedure, which will be discussed in detail later in this chapter (Watkins & Farnum, 1954). Video recorded practice

sessions for all potential participants were viewed and behaviors recorded using an informal Antecedent, Behavior, and Consequence (ABC) recording style, to obtain a global view of each individuals' self-regulatory skills (Van, Houten & Hall, 2001). ABC recording is used in observations of behavior to help determine antecedent and consequent behaviors surrounding behaviors of interest. The style of recording is meant to give a global view of behavior to aid in determining areas for further attention (Van Houten & Hall, 2001). For this study, ABC recording was completed with particular attention towards finding evidence of problem identification, strategy selection, performance trial and self-evaluation, which are the component steps involved in self-regulation (Nielsen, 2001; Tovani, 2004). For each potential participant, PBQ responses were read and analyzed to gain a global view of the participants' current self-regulatory ability. After general analysis the participants for the case study were selected.

The intent was to select two participants for the full case study, one who exhibited a high level of self-regulatory ability and one who exhibited a lower level of self-regulatory ability, to determine if instruction would benefit students at both levels. However, after viewing the pre-test information for evidence of self-regulatory ability, three participants emerged as participants for the full case study. The participant with the lowest self-regulatory ability was clearly identified based on having the lowest performance gain score, lack of clear direction during his practice session, and clear dependence on a time-based approach from the PBQ questionnaire. Of the other three participants pre-tested, one seemed to have a higher ability than the lowest scoring participant, but not nearly as high as the other two participants pre-tested, so he was eliminated from the study.

For the remaining two participants pre-tested no clear delineation for inclusion or exclusion over the other participant existed. One had the highest performance gain scores, and

the other had much higher scores on the PBQ, so it was determined that both participants should be included in the full study. Therefore, the study proceeded to the instructional phase with three participants.

2.3 Pre-Test Scoring and Analysis

After selecting participants to complete the full study each participants' pre-test information was analyzed in greater detail, using four factors; performance gain scores, general practice behaviors, self-regulatory behaviors, and the PBQ self-report of practice behavior. Below is an overview of how each factor was scored.

Performance Gains Scores

Scored with modified Watkins-Farnum Performance Scale (Watkins & Farnum, 1954).

Practice Behaviors

Coded for frequency and duration using Scribe4.2 Software (Duke & Stemman, 2011).

Self-Regulatory Behaviors

Coded for frequency of specific component step using Scribe4.2 Software.

PBQ Responses Analyzed globally for evidence of self-regulation and behavior trends.

Performance Gain Scoring

Pre-test practice task performances were scored for accuracy using a modified version of the Watkins-Farnum Performance Scale (Watkins & Farnum, 1954). The performance scores from the sight-read and final performances of the excerpt were used to determine performance gain scores for each participant. Accuracy referred to the number of pitches, rhythms, articulations, and notated expression markings each participant performed correctly on the sight-read and final performance of the excerpt. Accuracy scoring for each musical element; pitch,

rhythm, articulation, and notated expression markings, are further defined with more specificity for operational purposes.

Pitch

Pitch refers to the note/fingering that should be played at any given moment. If any pitch is incorrect for a single beat, the whole beat will be considered inaccurate. Examples of missed pitches include, inaccurate fingering, inaccurate sounding pitch, or pitches that are left out due to fingering error, breathing or other issue.

Rhythm

Rhythm refers to all rhythms notated in the excerpt. Inaccurate rhythm refers to rhythms played incorrectly for any reason and inappropriate fluctuations in the performers starting tempo. Tempo fluctuations should only be counted on the note where the fluctuation occurs. Tempo fluctuations that occur and become new tempos should only be counted as one error. If any rhythm on a single beat is played incorrectly the whole beat shall be counted as inaccurate.

Articulation

Articulation refers to any written articulation mark. A note with no written articulation mark should be a regularly tongued articulation. Inaccurate articulation will be any missed tongued articulation as above, and any other missed marking such as temporary slurs, legato and staccato markings. If any articulation is incorrect in a single beat the entire beat will be counted as an error.

Notated Expressive Markings

Expressive markings refer to any stylistic notations such as the words *allegro*, *largo*, or *marcato*, written phrasing markings, and dynamic markings. Expressive markings will be scored per beat, with the initial moment of inaccuracy counted as the missed marking. For example, a crescendo that extends for 12 beats would be counted as inaccurate for only the first beat of inaccuracy. If the performer completed a crescendo for beats 1-4 and was already at their max capacity, beat 5 would be counted as erroneous but beats 6-12 would not be counted inaccurate for that specific element.

The standard Watkins-Farnum Performance Scale (Watkins & Farnum, 1954), accounts for various musical elements as listed above. If any element is performed incorrectly during a single measure of music the *whole measure* is counted as inaccurate. For this study, each *beat* was analyzed for accuracy and if any element of a beat was performed incorrectly the whole beat was scored as incorrect. Scoring by beat instead of by measure gave each participant a chance to get the rest of the measure correct. Since the focus of this study was on practice behavior and

self-regulation, performances were scored by beat, as opposed to full measure scoring, to ensure that participants could receive points for as many post-practice improvements as possible.

Miszka (2007) set precedence for this type of modification, when he scored participants by beat instead of full measure for the same reason; to account for all practice improvements.

Performance gain scores, showed how much each participant had improved from sight-read performance to final performance of the excerpt. Performance gain scores were calculated for each participant by subtracting the score of their sight-read performance from the score of their final performance, which resulted in the number of improvements or gains made after practice.

Coding for Type of Practice Behavior

Each participants' 25 minute practice session was video recorded and then coded using Scribe4.2 software (Duke & Stammen, 2011) for the frequency and duration of certain practice behaviors exhibited. Scribe4.2 is a software program that enables users to attach a video and set terms to analyze it. The user has the freedom to set-up the program to analyze any behavior(s) that they would like to examine, and then as they watch the video users select the behaviors to code as they happen. For any behavior selected for coding, the Scribe4.2 program automatically records both the frequency and duration of the behavior.

For this study each participants' practice session was coded first for the existence of practice frames or play throughs. A play through was an area of practice where the participant played without interruption for at least 5 seconds and did not have a clearly observable practice goal. A play through could have a single repetition of a note or measure but without clear strategic application.

Conversely, rehearsal frames divide behavior into sections of rehearsal that work towards a specific goal (Duke, 1994). For example, a rehearsal frame could be 20 seconds of a teacher guiding a participant through repeating a single technical passage or 4 minutes of singing a particular rhythm, playing the rhythm on one note, playing it as written slowly and gradually speeding up the tempo. For the present study rehearsal frames were called practice frames and consisted of areas of practice that targeted a clear improvement goal (Maynard, 2006). For the purpose of coding play throughs and practice frames several operational definitions were needed.

Practice Frames

Practice behaviors strategically targeting a specific improvement goal. Frames may begin with an explicit and clearly observable end goal such as repeating a technical passage slowly many times and gradually speeding it up, or the goal may be more implicit playing through a passage and stopping to repeat an interval several times perhaps for intonation or learning the interval combination. In all cases the behavior must be strategically applied to a specific and clearly observable performance goal. A practice frame ends when the practicer moves on to another musical passage and performance goal (Maynard 2006, Duke, 1994).

Uninterrupted Play Through

Consisted of a performance of a section of music lasting for at least a 5 second interval without strategic stops, and without a clear end goal. Play throughs could include single repetitions of beats or patterns, typically for correction of errata but without clear strategic application of repetition.

Each practice frame was further coded using Scribe4.2 (Duke & Stammen, 2011) for the frequency and duration of certain practice behaviors. The behaviors coded were taken in part from the Observational Scale for Piano Practice (OSPP) (Gruson, 1988). The OSPP consists of categories of various practice behaviors such as repetition of measure, slowing tempo or singing rhythm. In studying, the OSPP and in completing ABC recording of the pre-test practice sessions, it became apparent that there were really four main categories of behavior involved in targeted practice; repetition, decontextualization, recontextualization, and performance trials.

(Gruson, 1988; Hallam 1997a, 2001a, 2001b; Henley, 2001; Mane, Adams, & Donchin, 1989; Maynard, 2006; Miksza, 2007; Nielson, 2001; Rohwer & Polk, 2006).

Repetition was coded when any element of a practice frame was repeated more than one time. Gruson (1988) found that instances of repetition increased as the skill level of the musician increased. Maynard did a similar study to determine the role of repetition in musical practice. She obtained frequency data of repetition during practice frames and found that advanced musicians used repetition extensively and did many more repetitions of elements practiced compared to novice musicians. For the present study, repetition was therefore coded as a primary practice behavior and potentially distinguishing factor.

Decontextualization was simplification of any element of music for targeted practice, such as speaking rhythm, repeating a beat for ballistic finger motion, or slowing down selected measures for a strategic purpose. Recontextualization was any instance where a simplified element was gradually reincorporated into the musical passage or the piece as a whole. A performance trial was playing a complete area that had just been isolated for specific practice (Hallam 1997a, 2001a, 2001b; Henley, 2001; Mane et al, 1989; Miksza, 2007; Nielson, 2001; Rohwer & Polk, 2006). Previous research makes a case for including decontextualization and recontextualization as primary practice behaviors and predictors of practice effectiveness. In a 1989 study Mane et al. found that students who practiced a task first isolating the parts and then putting them gradually back together had the best post-practice performance on a motor skills task. Students who only practiced the parts of the task in isolation and did not recontextualize scored lower on the end task compared to those who spent time recontextualizing all of the component parts (Mane et al., 1989). Nielson (2001) found similar support for including decontextualization and recontextualization as primary components of musical practice. She

investigated the self-regulatory behaviors of professional-level musicians and found that they frequently practiced by isolating components of a piece and then gradually put them back into the context of a musical passage.

In the current study repetition, decontextualization, recontextualization, and performance trial were the practice behaviors coded for all practice frames and further operational definitions of each were created to facilitate coding.

Performance Trial

Strategic performance of any element that has just been practiced.

Repetition

Strategic repetition of a pattern, passage, full section, or full piece of music.

Decontextualization

Any exercise strategically applied to simplify a portion of music (reduce the degrees of freedom) with a specific performance improvement goal in mind. These can pertain to any element of improving performance of a piece of music. Behaviors to include:

- Altering rhythm
- Altering a technical passage
- Speaking/conducting a rhythm
- Fingering a passage of music
- Any articulation exercise
- Any tone exercise, including intonation
- Interval isolation exercises for either tone quality or finger technique
- Phrasing/dynamic exercise
- Slowing down or altering tempo for any specific reason
- Studying or marking features in music

Recontextualization

Strategically and gradually moving any element of a piece from its simplified state back into the original context of the piece. Behaviors to include:

- Gradually removing any alterations (ie: rhythmic, technical, phrasing)
- Strategically increasing speed of any previously reduced element
- Performance Trial of element previously decontextualized

Coding for Self-Regulatory Skills

To further ascertain each participant's self-regulatory ability each practice frame from the 25-minute practice session was coded for the presence of specific self-regulatory steps. Only the portion of each participant's practice that had already been coded into practice frames was coded for the presence of self-regulatory skills. For self-regulatory skill to be present a clear goal needed to be observed, and by definition practice frames were the areas of practice that contained strategic areas of work toward a clear improvement goal.

The self-regulatory steps coded were the component steps involved in the self-regulatory process. The steps consist of identification of the problem, strategy selection, performance trial and self-evaluation (Nielson, 2001; Tovani, 2004). Operational definitions for each behavior were created to facilitate coding.

Self-Regulatory Behaviors

This area of analysis only applied to practice frames. By definition, practice frames are areas strategically selected for focused work and therefore constitute self-regulatory behaviors. Uninterrupted play throughs for the purpose of this study are defined as unstrategic and in this case do not constitute self-regulatory behaviors.

Identification of Problem

Participant clearly decides on a problem area for targeted, focused practice. Each rehearsal frame constitutes identification of a problem and within each rehearsal frame there could be further instances of problem identification. Practicers could choose a sub-problem within the context of a larger problem or revision of problem area.

Strategy Selection, Decontextualization, and Recontextualization

Any learning strategy that a participant chooses to use to address a problem area within a practice frame. Learning strategies include any kind of decontextualization, recontextualization or repetition.

Performance Trial

Any instance where a practicer performs a practice strategy, all repetitions were counted as individual performance trials.

Self-Evaluation

Any verbalization that indicates a judgment of practice such as, “That was better,” “I need to remember that sharp,” and any instance where participant clearly proceeds to a new problem or new strategy.

Problem identification, performance trial and self-evaluation were frequency recorded using Scribe4.2 (Duke & Stammen). Each practice frame was also coded for effectiveness to further examine possible behavior changes. An effective frame was a frame where clearly observable improvements had been made to the area practiced. An ineffective frame was a practice frame where no observable improvements had been made; the area stayed the same or in some cases was made worse by practice. An undetermined frame was a frame where it was not clear if the practice had or had not improved. Operational definitions for each area of behavior change were created to facilitate coding.

Effective Practice Frame

Frame where strategic practice efforts had improved the targeted problem(s) in a clearly observable manner. For example, an improvement could be fewer missed notes, corrected rhythm, corrected articulation, or improved dynamic contrast.

Ineffective Practice Frame

Frame where strategic practice efforts failed to improve targeted problem(s). The targeted problem area either remained the same or was made worse by the practice efforts.

Undetermined Frame

Frame that cannot be deemed as effective or ineffective, it is unclear if the frame has improved or if it has not improved. For example, instances where the participant does not complete any kind of performance trial or simply does one trial of a few notes.

Analysis of PBQ Responses

Participants’ responses on both sections of the PBQ were analyzed to examine self-reported practice behaviors for evidence of self-regulatory skills, behavioral trends and changes.

2.4 Treatment: Instructional Period

Following the pre-test the three selected participants received five instructional sessions across approximately six-weeks. All instructional sessions were administered by me, the researcher, and provided explicit instruction in self-regulatory skills for deliberate practice in an applied lesson format. The instruction consisted of teaching participants specific steps to use to guide their thinking as they practiced; each step was a component step of the self-regulatory process. Previous studies provide evidence for breaking thinking tasks into specific steps and practicing each step as sub-skills to increase the efficiency of completing the learning task (Mane et al., 1984). Mane et al. suggest that if we were to teach each component skill involved in self-regulation we could make learning to self-regulate and the learning task of practicing more effective as well.

For the present study, self-regulation was divided into component steps that constitute a circular model created in part from the model proposed by Nielson (2001) in a study of the practice of advanced musicians and from the model of thinking strategies for reading comprehension proposed by Tovani (2004). Each step of the model is discrete but also interconnected and may be repeated at various points throughout the model and in totality after each step is completed in sequence, hence the cyclical nature of the model (see Figure 2.6).

Step 1: Identification of a Problem

In this step students must determine specifically what problems they have or may encounter in a given performance task (technical exercise, etude, repertoire). Next, students must prioritize problems and select the issue most pertinent to address in that moment. Inherent in this step is the need for students to be able to evaluate their current skills and error detect within the task.

Step 2: Strategy Selection

Here, students must choose a strategy to use to address the problem identified. They must think about all possible techniques and choose the one most suited to improve their selected issue.

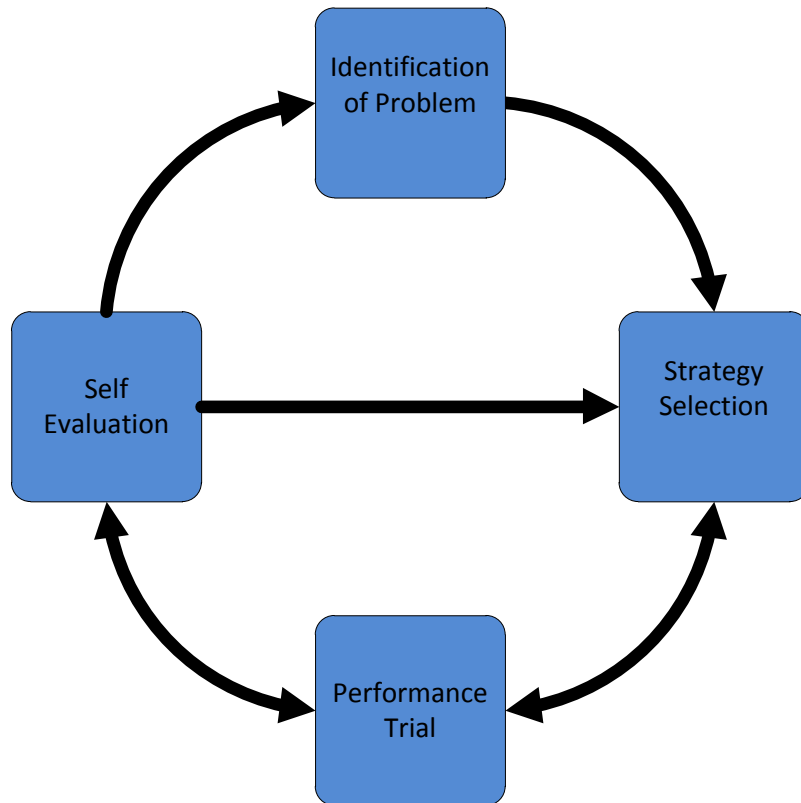


Figure 2.6 Circular model of the component steps involved in self-regulation.

Step 3: Performance Trial

The performance trial is the student skillfully using the strategy to actively improve the problem area.

Step 4: Self-Evaluation

In this step, the student must evaluate their performance trial to determine:

- 1) If improvement was made and they can move on.
- 2) If their choice of strategy was effective and the issue needs continued effort and work.
- 3) If their choice of strategy was ineffective and they need to further adapt or select a new strategy.

After the student evaluates their performance trial and strategy selection they must proceed accordingly and either continue with their current strategy and repeat performance trials, switch to a new practice strategy and try a new performance trial or return to identification of the problem and select a new area to work.

Teaching methods for the instructional interventions followed the tenants of direct instruction (Hunter, 1994) and Vygotsky's three teacher-scaffolding strategies-demonstration, simplification, and reduction of the degrees of freedom (Vygotsky, 1987). Instruction was sequential and included specific strategies for each step of the model and the full model for generalization. Varied guided practice opportunities were given to each participant, in order to facilitate the transfer of the self-regulatory process to various practice tasks.

Previous studies suggest that we can improve students' ability to practice by modeling ineffective and effective practice, practicing identifying problems and errors and by modeling self-evaluation (Hallam, 1997a, 2001a, 2001b; Hewitt 2002; Miskza 2007). Therefore, each of these techniques was included in the instructional sessions for all participants. Teacher model and guided practice were the two primary instructional strategies used for the instructional sessions and think aloud and questioning were the primary learning strategies used.

Think aloud is a strategy where the teacher or student actually speaks aloud what they are, or would be thinking at that moment. Other fields of education use this strategy frequently to teach learning strategies or reading comprehension. Kline, Deshler and Shumaker (1992) establish 7 steps for learning strategies that use think aloud to, "expose covert enterprises." They outline a learning process where the teacher models each step of the process, utilizing think aloud so students can see and hear what they should be doing. After modeling, the teacher provides guided practice for students to practice each step and finally students practice all steps together for generalization (Kline et al., 1992).

Bringing the strategy to a musical context, Nielson (2001) had participants speak aloud their thoughts during practice. She suggested that this technique of verbalizing thinking could be very useful for teaching students self-regulatory skills. She detailed that students could be taught

to answer specific questions such as, “What is my problem?” “How can I solve it?” and “How am I doing?” in order to learn to self-regulate.

In the present study, think aloud was used to model and guide students through each step of self-regulation, and the full model. As Nielson suggests, students were taught to ask themselves specific questions for each step of the self-regulatory thinking process. For problem solving they were taught to ask themselves, “What are all the problems?” “Which problem is most important to fix first?” and “Can I fix this problem now?” For strategy selection students were taught to ask themselves, “How can I fix this problem---what are all of the ways I know and which do I think will work best?” For self-evaluation participants were taught to ask themselves, “Was that performance trial actually better and if so how, and if not why not?” They were also taught to ask themselves questions regarding what they should do next, “Should I repeat the strategy, switch to a new strategy or move on to a new problem area?”

For each session, lesson plans were created and used as a guide and adjustments were made in the context of each individual session based on the specific needs of the participant (See Appendix C). The first session served as an introduction of the self-regulatory steps, with guided practice opportunities for each step, moving into generalization. In the second session, identification of the problem was a focus and in the third, strategy selection was addressed in detail. During the fourth and fifth sessions various steps of the model were highlighted and then participants had significant guided practice opportunities to incorporate the full model into their independent practice.

At the end of the third and fourth instructional sessions, participants were given a practice task to monitor their progress. Each practice task consisted of a sight-read performance, a timed practice session and then a final performance. Excerpts for the practice tasks consisted of a few

phrases of music that were chosen to provide specific challenges, similar to the excerpts from the pre-test and post-test practice tasks. Each excerpt posed some ballistic technique, rhythmic, articulation and musical challenges (see Appendix A).

The progress monitoring practice tasks were video recorded, analyzed and scored for changes in practice behaviors using three of the four factors and scoring procedures discussed above in section 2.3 regarding analysis of the pre-test.

Performance Gains

Scored with modified Watkins-Farnum Performance Scale (Watkins & Farnum, 1954).

Practice Behaviors

Coded for frequency and duration using Scribe4.2 software (Duke & Stammen, 2011).

Self-Regulatory Behaviors Coded for specific self-regulatory component skill for frequency using Scribe4.2 Software.

Analysis of Instructional Sessions

For each participant all five instructional sessions were coded using Scribe4.2 software (Duke & Stammen, 2001) for self-regulatory skills addressed and for teaching strategy used. The duration of time spent addressing each step of the self-regulatory model; problem identification, strategy selection, and self-regulation were recorded for further analysis. Teaching strategies, teacher model and guided practice were recorded separately. The primary learning strategies used, think aloud and questioning, were fully incorporated into the teaching strategies and were not coded separately. Saxophone technique was duration recorded and was only addressed when it was absolutely necessary for moving the participant's concept of practice or a particular strategy forward.

2.5 Post-Test

After the fifth instructional session, participants completed a post-test practice task consisting of the same procedures used for the pre-test, to determine any pre-test/post-test changes in performance gain scores, practice behaviors and self-regulatory skills. Participants sight-read an excerpt of appropriate difficulty consisting of different but equivalent selections from the same Karg-Elert Sonate that was used in the pre-test (Karg-Elert, 1965) (see Appendix A). The excerpt was chosen to allow participants to complete various types of practice and to expose different kinds of practice thinking.

The first section of the excerpt was again lyrical and presented rhythmic and musical issues that would require practice (see Figure 2.7). For example, the triplet rhythms combined with rests, as in measure 1, and ties as in measure 2 presented opportunity for participants to practice rhythmic concerns. The tenuto markings in measure 2, and crescendo, decrescendo in measure 3 and 5, presented musical intricacies that were likely to require practice and expose participants' thinking.



Figure 2.7 Post-test measures 1-10 example of rhythmic and musical intricacies.

The second section was a *Con Moto* section that provided rhythmic, articulation, ballistic finger and musical challenges similar to the second section of the pre-test (see Appendix A). As shown in Figure 2.8, the rhythms in measure 11-13 would provide a chance for the participant to practice rhythmic issues. Measures 11-13 also provide articulation challenges for the participant to navigate during practice and expose other kinds of practice decisions.



Figure 2.8 Post-test measures 11-13 example of rhythmic complexity.

Measures 4-6 present ballistic technique challenges, as shown in Figure 2.9 and would reveal related practice decisions.



Figure 2.9 Post-test measures 14-16 example of ballistic technique challenges.

The leaps to low notes in measures 17-20, as shown in Figure 2.10, provide interval connection challenges and dynamic contrasts provide musical complexity that would also expose participants' thinking and practice decisions.



Figure 2.10 Post-test measures 17-20 example of intervallic and musical challenges.

In totality, the edited excerpt presented many challenges for participants and exposed participants' thinking process during practice.

Each participant practiced the excerpt for 25 minutes (Miksza, 2007), and then completed a final performance of the excerpt. Immediately following the practice task participants completed the same PBQ self-report of practice behaviors and self-regulatory skills, as was used in the pre-test. Participants filled out each section of the PBQ to illustrate any changes in self-reported practice behaviors that may have occurred after the instructional period.

Post-Test Analysis

Participants' post-test practice tasks were video recorded, and scored using the procedures detailed in section 2.3, regarding scoring of the pre-test data. Post-test data were analyzed according to the same four factors as the pre-test; performance gain scores, practice behaviors, self-regulatory behaviors and the PBQ self-report of practice behavior. All factors were compared within individual participants and across participants for observable changes.

CHAPTER 3. ANALYSIS OF INSTRUCTIONAL SESSIONS

All three participants received five sessions of explicit instruction in self-regulatory skills, taking place across approximately six weeks. The explicit instruction consisted of teaching students to use specific thinking steps to self-regulate during practice. Steps were constructed from models proposed by Nielson (2001) and Tovani (2004). The steps in the model consisted of identification of problem, selection of a strategy, performance trial and self-evaluation as detailed in Figure 2.7 in chapter two.

3.1 Description of Sessions

For each instructional session, a lesson plan was created to serve as guide and instruction was adjusted based on the needs of each participant. Each session focused on practicing the individual steps of self-regulation and the full model in order for students to generalize each step. Students were given multiple and varied practice opportunities to encourage transfer of self-regulatory skills to various contexts. In the instructional sessions teacher model and guided practice were the primary instructional strategies. Within the instructional strategies of teacher model and guided practice, think aloud and questioning were used as the primary learning strategies (Hallam, 1997a, 2001a, 2001b; Hewitt, 2001; Kline et al, 1992; Miksza, 2007; Nielson 2001).

Each session was video recorded, and Scribe4.2 software (Duke & Stammen, 2011) was used to record duration of time spent on each step of the model, and instructional strategy used; teacher model, guided practice and saxophone technique. Think aloud and questioning was used as specific learning strategies for both teacher model and guided practice and were therefore not coded separately. Instruction on specific saxophone technique was given when it was deemed

absolutely necessary for the participant to be able to practice something effectively or use a specific kind of strategy, and was coded separately from teacher model and guided practice.

The objectives of the first instructional session were to introduce each of the self-regulatory steps using teacher model with think aloud and questioning to show the participant how to complete each step. Teacher modeling using think aloud and self-questioning allowed the students to see and hear what the teacher was thinking as they completed each self-regulatory step (Nielson, 2001; Kline et al, 1992). The session began with a self-evaluation task to expose any possible discrepancies in what the participant thought they were accomplishing during practice and what they really were accomplishing (Byo & Cassidy, 2008; Miksza, 2007; Pitts et al, 2001). The participants practiced for 5 minutes and the teacher video recorded their practice. The participant was then asked to describe what they were trying to accomplish during the mini practice session and what improvements they had made. Participants and the teacher immediately viewed the mini practice session and the teacher asked the question, “did you actually make improvements” at important points in the video. For all participants the answer was no, the improvements each participant thought they were making were actually not happening. The teacher then introduced the concept of self-regulation and the steps to self-regulate during practice using modeling and think aloud. The student was given guided practice opportunities for each step alone and the full model. Further, the participant was taught guiding questions for the problem identification and strategy selection steps. Questions used for problem identification included “What are all the problems?” “Which problem is most important to fix first?” and “Can I fix this problem now?” For strategy selection students were taught to ask themselves, “How can I fix this problem---what are all of the ways I know and which do I think will work best?”

The plan for instructional session two focused on the problem identification and strategy selection steps of the self-regulation model. For the area of problem identification activities included error detection and problem identification practice, with the teacher modeling common mistakes in repertoire and then leading the students in guided practice to identify them. Another problem identification activity included teacher model and guided practice in identifying problems in performance trials of repertoire and technique. At the conclusion of the performance trial a list of all problem areas that needed to be addressed was created. Modeling and guided practice on specifically prioritizing which problem to address was provided as well. To isolate the strategy selection step of the model, the teacher and participant created a list of different musical elements that could need practice, such as rhythm, phrasing, ballistic finger motion, and sound, and created a corresponding list of strategies for each area. The goal was for participants to be able to add to this list throughout their instructional sessions and beyond. Strategies that were new to students were first modeled by the teacher and then practiced by the participant. The teacher also modeled choosing a strategy in the context of actual practice and then the participant practiced identifying problems and choosing strategies in the context of the repertoire or technique that they were working on for their applied lessons. In session two the guiding questions for self-evaluation, “Was that performance trial actually better and if so how, and if not why not,” “Should I repeat the strategy, switch to a new strategy or move on to a new problem area,” were introduced using teacher model with think aloud and questioning. The participant was given opportunities for guided practice using the questions within the context of the full self-regulation model.

The objectives for session three were to provide practice opportunities on each specific step of the model and on generalizing all steps of the model. The session began with another

error detection activity, where the teacher and student played passages of repertoire with errata, generated lists of problems to be fixed and strategies to address them. The teacher modeled using guiding questions for problem solving and strategy selection and the students practiced using the questions. Also, for the step of strategy selection the teacher and participants added strategies to the strategy list that they had begun in session two. To facilitate practice of self-evaluation the teacher modeled using guiding questions and then participants practiced using the questions in the context of practicing their repertoire. As a part of session three, the teacher also modeled creating a practice plan prior to a practice session and participants practiced creating their own practice plan for repertoire they were studying.

Instructional session four provided further practice on planning a practice session using problem identification and strategy selection and enacting that plan. Participants were assigned to choose an independent practice session to create and use a practice plan to guide their practice. Additionally, students completed a problem identification and strategy selection activity for approaching a new piece of repertoire. The teacher modeled creating a plan to approach learning new pieces. Participants then practiced creating an outline of how to approach a new piece of repertoire that they wanted to learn in the future. Participants practiced self-evaluation in a mini-practice session where they used the full model and asked themselves the self-evaluation guiding questions aloud. At the end of the practice time, they evaluated if they had actually made the improvements they thought they had, similar to the activity from session one. This time, all participants were much more aware and knew when a strategy had worked and when one had not worked. During session four participants also had guided practice time using the full model, where the instructor only intervened with a guiding question as necessary to keep practice as effective as possible.

Most of session five was spent practicing using the full self-regulation thinking model, as this was each participants last instructional session before the post-test. Discussion of practice planning and how using a plan had effected each participant's independent practice session occurred at the start of session five. The session varied a bit from the intended plan in that, most of the session was devoted to full model practice with necessary interventions and modeling from the teacher. Self-evaluation and practice planning were addressed using guided practice in the context of the full self-regulatory model.

3.2 Analysis of Time Spent

The total amount of time spent on each component skill and generalization of the self-regulatory model across all five participants for all sessions further indicated that the instructional plan for the sessions was followed. Time was spent on each component skill, saxophone technique was addressed as necessary, and plenty of opportunity was given for participants to practice generalizing the instructional model. The total amount of time spent on each component and generalization of the proposed model across all participants and all five instructional sessions is detailed in Figure 3.1.

The most time was spent in practice of the full self-regulatory model, generalization. Time spent on each different step was very close to equivalent. The amount of time spent on identification of problems and self-evaluation were basically equivalent at 11% and 12% respectively. Slightly more time was spent on strategy selection than on the others components across all sessions. The additional time spent on strategy selection could be explained by the need to increase all participants' awareness and application of different methods of working on problem areas, so that they could decontextualize and recontextualize specific problems effectively.

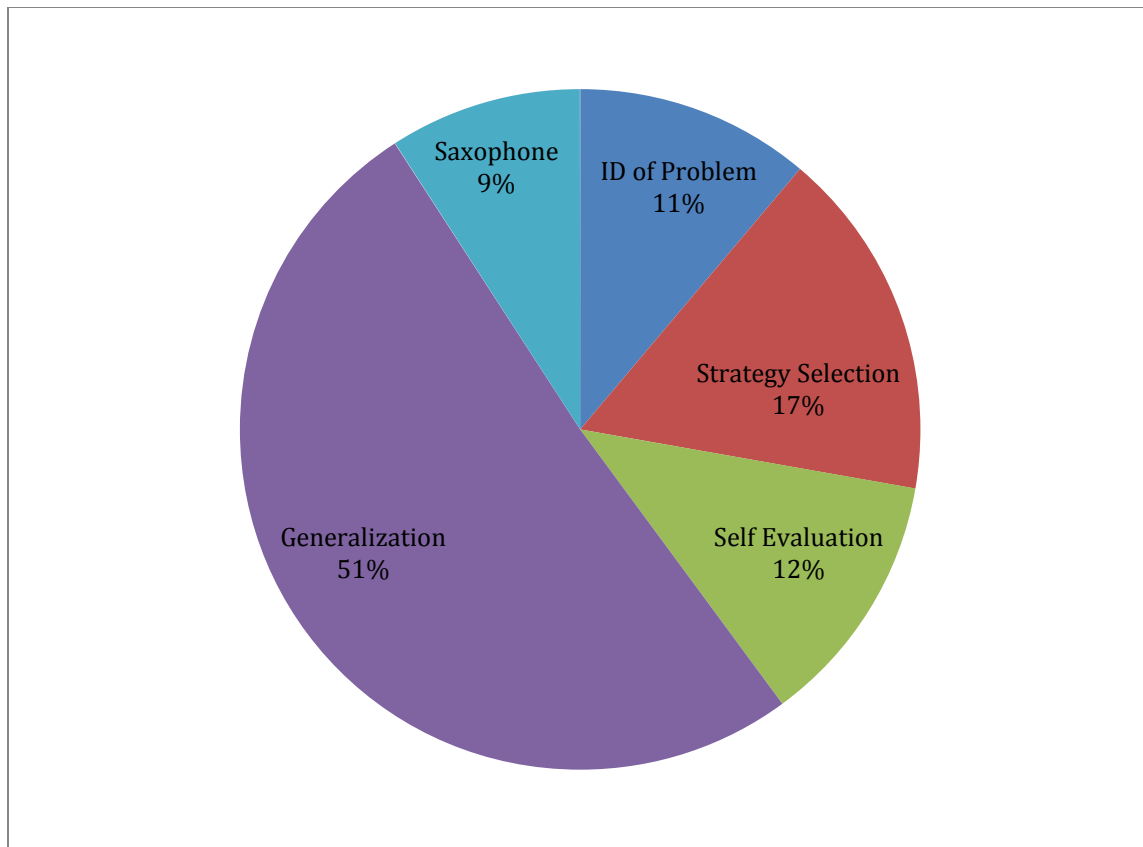


Figure 3.1 Total percentage of time spent.

The findings of Pitts et al. (2000) supports the additional time spent on building a strong base of strategies for participants to select from in their independent practice. Pitts et al. studied the practice of novice musicians and discovered that they had no knowledge of strategies for correcting problems that arose; therefore, their practice was very minimally effective and caused frequent and sometimes terminal frustration. The study emphasizes the fact that teachers need to spend time teaching students strategies for correcting problems that may arise during practice.

The time spent on each of the two primary instructional strategies; teacher model and guided practice, showed that participants had significant time to practice self-regulation in situations where they could get corrective feedback. The total time spent across all sessions with the teacher modeling was 2% and the time spent giving participants a chance for guided practice

was 92%. Teacher model and guided practice were used as intended to provide the participants with varied opportunities for supervised practice of all self-regulatory steps to encourage them to transfer self-regulatory skills. In an instructional essay Bob Duke details the importance of providing many opportunities for students to practice and apply skills in varied contexts, if we want students to be able to transfer skills from one context to another. In addition to the amount of time, the nature of the time spent on guided practice for all sessions was consistent with Duke's suggestions. Students' practiced varied repertoire and saxophone technique, in many contexts that required identifying problems and using strategies that produced many different types of self-evaluation.

The amount of time that each individual participant spent on the component steps of self-regulation across all five instructional sessions showed that adaptations were made for the needs of each individual participant as intended (See Table 3.1) Of particular interest, participant 2 spent slightly more time on each component skill in isolation and less time on generalizing the model. Participant 2 also spent the most time on saxophone technique, meaning that they had to address more specific saxophone issues to keep moving forward with specific practice behaviors.

TABLE 3.1 Distribution of Time Spent - Session Totals

Participant	Session Totals - Percent of Time				
	ID of Problem	Strategy Selection	Self-Evaluation	Generalization	Saxophone
One	10%	16%	11%	55%	8%
Two	17%	20%	16%	35%	12%
Three	6%	13%	9%	66%	7%

In contrast, participant 1 spent the least amount of time on saxophone technique at 8%.

Compared to other participants, participant 3 spent the least amount of time on identification of the problem and the most on generalization of the full self-regulatory model.

CHAPTER 4. RESULTS

4. 1 Performance Gain Scores

Performance gain scores were tabulated from the pre-test, progress monitoring, and post-test practice tasks. All performance gain scores came from the practice tasks, each consisting of a sight-read performance, practice period, and final performance of a short excerpt of music. All of the sight-read and final performances were scored for accuracy using a modified version of the Watkins-Farnum Performance Scale (Watkins & Farnum, 1954). For this study, the performance scale was modified to score each element per beat, instead of per measure, to better reflect the actual number of performance improvements participants made (Mikzsa, 2007).

Performance gain scores are the number of improvements participants made from the sight-read to the final performance of the excerpt. For all practice tasks, gain scores were calculated by subtracting the number of correct beats in the sight-read performance from the number correct in the final performance of the excerpt. Percentages for each performance score were tabulated to control for the different number of beats in each excerpt. Percentage points gained from pre-test to post-test were calculated by subtracting the percentage correct on the sight-read performance from the percentage correct on the final performance. Performance gains are expressed as percentage points gained to account for the fact that each participant had a different level of current performance ability on their instrument.

Pre-Test Performance Gain Scores

The excerpt performed and practiced in the pre-test consisted of 97 beats. Scores were tabulated as number of beats correct out of 97 and then converted into percentage points. Each

participant's raw scores, percentage correct, and percentage points gained from sight-read to final performance of the pre-test excerpt are shown in Table 4.0.

TABLE 4.0 Pre-Test Performance Gain Scores

Participant	Sight-Read		Final Performance		Gain	
	Beats Correct	Percent Correct	Beats Correct	Percent Correct	Beats Gained	Percent Points Gained
One	44/97	45%	51/97	53%	7	8
Two	48/97	49%	67/97	69%	19	20
Three	56/97	57%	73/97	75%	17	18

As you can see, participant 1 had the lowest gain score from sight-read to final performance. Participant 1 performed 45% of the beats in the excerpt correctly on the sight-read performance, and improved to 53% correct on the final performance. After 25 minutes of practice, participant 1 improved his accuracy by only 8% of the beats in the excerpt. Participant 2 had the highest gain score, meaning he made the greatest number of improvements from sight-read performance to post-practice performance. Participant 2's sight-read performance score was 49%, and his final performance score was 69%. The participant performed 20% more beats correctly on the final performance of the pre-test practice task. Participant 2's percentage points gained from sight-read to final performance of the excerpt was 12% more than participant 1's and 2% more than participant 3's. Participant 3 had the highest initial performance score on the sight-read performance at 57% correct. On the final performance, participant 3 performed 75% of the excerpt correctly with an improvement of 18% from the sight-read performance. Participant 3's gain score (18 %) was 2% less than participant 2's (20%) despite having the

highest percentage correct for the sight-read performance. Participant three's gain score (18%) was 10% higher than the gain score of participant number one (8%).

Progress Monitoring Performance Gain Scores

In order to monitor their progress participants completed two practice tasks during the intervention period, one that took place after instructional session three and one that took place after instructional session four. The progress monitoring practice tasks took place after session three and four because those sessions were the midpoint of the intervention period. Further, it gave participants two sessions and related independent practice to become acclimated to using the steps from the self-regulatory model before progress was assessed.

The first progress monitoring practice task consisted of 10 measures, 40 beats of Etude Number 8, from the H. Klose etude book, *Etudes pour Saxophones* (Klose, 1928) (see Appendix A). Participants sight-read the excerpt then had 5 minutes of practice time before giving a final performance. Raw scores, percentage correct and percentage points gained from sight-read to final performance were tabulated for each participant and are presented in Table 4.1.

On the first progress-monitoring task, participant 1 and 2 increased their percentage of improvement, while participant 3's percentage of improvement decreased from pre-test to the first progress-monitoring task, by 5%. Participant 2's percentage of improvement increased by 2% and participant 1's percentage of improvement increased by 7% from the pre-test practice task.

TABLE 4.1 Progress-Monitoring Task One, Performance Gain Scores

Participant	Sight-Read		Final Performance		Gain	
	Beats Correct	Percent Correct	Beats Correct	Percent Correct	Beats Gained	Percent Points Gained
One	22/40	55%	28/40	70%	6	15
Two	24/40	60%	33/40	82%	9	22
Three	26/40	65%	31/40	78%	5	13

Of interest, participant 2 still had the highest percentage of improvement at 22% from sight-read to final performance of the excerpt. Also interesting, is that on the first progress-monitoring task participant 1 improved by 15% after *only* 5 minutes of practice but after 25 minutes of practice in the pre-test he only improved by 8%. Participant one made 7% more improvement in only 5 minutes, than after 4 times the amount of practice in the pre-test. Participant one did not have the lowest percentage of gain for the first progress monitoring task, it was participant three who made the least amount of improvement on this practice task.

The second progress monitoring practice task took place after session 4 and consisted of a short Prelude and Allegro Moderato (Public Domain) (see Appendix A). The excerpt consisted of 17 beats from the Prelude and 32 from the Allegro section for a total of 49 possible beats correct. For this practice task participants had 10 minutes to practice before their final performance of the excerpt. As you can see from Table 4.2, participant one had the highest gain score of all three participants for this progress-monitoring task.

TABLE 4.2 Progress Monitoring Task Two, Performance Gain Scores

Participant	Sight-Read		Final Performance		Gain	
	Beats Correct	Percent Correct	Beats Correct	Percent Correct	Beats Gained	Percent Points Gained
One	25/49	51%	38/49	78%	13	27
Two	30/49	61%	36/49	73%	6	12
Three	25/49	51%	37/49	75%	12	14

Participant one's sight-read performance score was 51% correct and their final performance score was 78% correct, for a gain score of 27%. As shown in Table 4.3, participant 1's percentage points gained for the second progress-monitoring task, are 12% higher than his gain scores on the first progress-monitoring task and 19% higher than his scores on the pre-test practice task.

TABLE 4.3 Progress Monitoring Task One & Two, Performance Gain Scores

Participant	Percentage Points Gained	
	Task One	Task Two
	Gained	Gained
One	15	27
Two	22	12
Three	13	14

Post-Test Performance Gain Scores

The excerpt participants sight-read, practiced and performed for the post-test practice task was 73 beats long, and was different but equivalent to the pre-test practice task excerpt (Karg-Elert, 1929) (see Appendix A). As shown in Table 4.4, raw scores, percentage correct and percentage points gained were calculated for each participant.

TABLE 4.4 Post-Test Performance Gain Scores

Participant	Sight-Read		Final Performance		Gain	
	Beats Correct	Percent Correct	Beats Correct	Percent Correct	Beats Gained	Percentage Points Gained
One	18/73	25%	43/73	58%	25	33
Two	39/73	53%	58/73	79%	19	26
Three	28/73	38%	62/73	84%	34	46

In the post-test participant three had the largest gain score with a gain percentage of 46% after 25 minutes of practice. Participant one had a gain score of 33%, which was a 6% increase in percentage points from his score on the second progress-monitoring task.

All participants improved their percentage points gained from the pre-test to the post-test practice task. A comparison of the pre-test and post-test practice task percentages for all participants is shown in Table 4.5.

TABLE 4.5 Pre-Test & Post-Test Performance Gain Scores

Participant	Percentage Points Gained		
	Pre-Test	Post-Test	Pre to Post
	Gain	Gain	Gain
One	8	33	25
Two	20	26	6
Three	18	46	28

Participant 3 had the greatest increase in percentage points gained from pre-test to post test with a 28% increase. Participant 2 increased his percentage of improvement by 6% from pre-test to post test, and participant one increased his percentage of improvement by 25%. Especially noteworthy is that participant 1 started with only 8% improvement in the pre-test moving to 33% in the post-test. Participant 1 made more than double the amount of improvement in the post-test, then they did in the pre-test in the same amount of practice time. Also interesting, is that participant one had a larger number of percentage points gained from sight-read to final performance on the post-test than participant 2, who had the highest percentage of gain on the pre-test practice task.

4.2 Practice Behaviors

For each participant the practice sessions from the pre-test, progress-monitoring and post-test practice tasks were video recorded and behaviors from each session were analyzed. As detailed in chapter 2 practice behaviors for all practice sessions were coded using Scribe4.2

software (Duke & Stemann, 2011) and duration for all behaviors and frequency of occurrence for certain behaviors was recorded.

Practice Frame Compared to Play Through

Practice was first analyzed and coded into sections of practice frames (Duke, 1994; Maynard, 2006) or play throughs. Practice frames were areas of practice that focused on a specific improvement goal and play throughs were areas of practice where the participant played through a section of music with no apparent strategic goal. For both behaviors, the duration of time spent using each type of practice was recorded and the percentage of time spent was calculated to allow for comparisons from pre-test, progress-monitoring and post-test practice sessions. Percentage points of increase or decrease were calculated across practice tasks by subtracting the first duration from the second.

Participant 1 and 2 increased the duration of time spent using practice frames, or goal oriented practice, and decreased the duration of time spent using play throughs for their practice, as depicted in Table 4.6. Participant two had the largest increase in the time spent using practice frames, or goal oriented practice, and the largest decrease in the amount of time playing through the excerpt. He increased the duration of time spent in practice frames by 19% from the pre-test to the post-test practice session and decreased play throughs by 25.47%. Interestingly, from the pre-test to the first progress-monitoring task participant two had an even greater increase in the amount of times spent using practice frames. He used practice frames for 90.71% of the practice time in the first-progress monitoring task for an increase of 44.71% from the pre-test. Participant 1 increased the time he spent in practice frames from pre-test to post-test by 5.2% and decreased the amount of time spent playing through the excerpt by 4.78%.

TABLE 4.6 Duration of Practice Frames and Play Throughs

Participant	Behavior	Percent of Time Spent			
		Pre-Test	Progress Monitoring 1	Progress Monitoring 2	Post-Test
One	Practice Frame	39.95%	36.48%	39.24%	45.15%
	Play Through	49.93%	54.72%	51.77%	45.15%
Two	Practice Frame	46.00%	90.71%	93.78%	65.00%
	Play Through	48.47%	0.42%	1.50%	23.00%
Three	Practice Frame	75.25%	80.60%	78.51%	62.53%
	Play Through	15.41%	17.60%	15.90%	24.96%

Participant 3 had a different outcome than participant 1 or 2 for the duration of time spent in practice frames compared to play throughs for the pre-test, progress monitoring and post-test practice tasks. As shown in Table 4.7 the duration of time participant 3 spent in practice frames decreased by 12.72% and the duration of time spent playing through the excerpt increased by 9.55% from the pre-test to post test practice tasks.

TABLE 4.7 Duration of Practice Frames and Play Throughs Participant Three

	Percent of Time Spent			
	Pre-Test	Progress Monitoring 1	Progress Monitoring 2	Post-Test
Practice Frame	75.25%	80.60%	78.51%	62.53%
Play Through	15.41%	17.60%	15.90%	24.96%

Practice Behaviors Within Rehearsal Frames

All practice frames for each participant were further coded using Scribe4.2 software (Duke & Stammen, 2011) for the rate of occurrence per minute and for the duration of time spent using decontextualization, recontextualization, repetition and performance trials. Frequencies are reported as rate per minute and duration is expressed as percentage of time used. Differences between pre-test and post-test were calculated by subtracting the pre-test value from the post-test value, and are expressed as rate per minute and absolute percentage of time.

As discussed in chapter two, decontextualization is simplifying an element and working on it out of context. Recontextualization is gradually putting the element decontextualized back into the context of the measure, phrase, section or piece as a whole. Repetition is strategic repetition of any aspect of the excerpt and as such, a behavior could be coded as repetition *and* another behavior. A performance trial is a trial where the item being practiced is performed back in context as a part of a larger portion of the excerpt. These categories of behavior were chosen because in previous research high levels of each were found in the practice of professional musicians, who exhibited high levels of self-regulatory ability (Gruson, 1988; Hallam 1997a, 2001a, 2001b; Henley, 2001; Mane et al, 1989; Maynard, 2006; Nielson, 2001).

For each participant, the duration of time spent using decontextualization and the frequency of occurrence per minute of decontextualization during practice frames increased from the pre-test, to the post-test. Each participant decontextualized more and for a longer portion of their practice time in the post-test. Table 4.8 depicts the duration and frequency of occurrence of decontextualization for all participants.

TABLE 4.8 Duration and Rate of Frequency of Decontextualization

Participant	Decontextualization							
	Pre-Test		Progress Monitoring 1		Progress Monitoring 2		Post-Test	
	Percent of Time	Frequency per Minute	Percent of Time	Frequency per Minute	Percent of Time	Frequency per Minute	Percent of Time	Frequency per Minute
One	36.48%	1.80	41.96%	3.28	38.82%	1.29	49.70%	2.96
Two	18.20%	1.37	45.58%	1.19	65.18%	1.08	48.24%	2.76
Three	39.24%	0.87	51.85%	0.99	57.78%	0.99	91.14%	2.80

Participant 3 had the largest increase in their use of decontextualization from the pre-test to the post-test practice tasks. The amount of time participant 3 spent using decontextualization during practice frames increased by 51.9% and the frequency of occurrence increased by 1.93 occurrences per minute from the pre-test to the post-test. Participant two also had large increases in the amount of time and frequency of occurrence of decontextualization from the pre-test to the post-test. He increased the duration of time spent by 30.04% and the frequency of occurrence by 1.39 occurrences per minute.

For the other primary practice behaviors coded, recontextualization, repetition and performance trial, there was greater variability within and across participants for both duration and frequency of occurrence of the behavior. Table 4.9 depicts all participants' frequency of occurrence and duration of recontextualization for all practice tasks.

TABLE 4.9 Duration and Rate of Frequency for Recontextualization

Participant	Recontextualization							
	Pre-Test		Progress Monitoring 1		Progress Monitoring 2		Post-Test	
	Percent of Time	Frequency per Minute	Percent of Time	Frequency per Minute	Percent of Time	Frequency per Minute	Percent of Time	Frequency per Minute
One	17.91%	0.78	17.85%	2.64	12.23%	0.97	0.14%	0.10
Two	13.06%	0.88	22.79%	1.19	21.49%	1.75	14.94%	1.05
Three	11.79%	0.40	29.22%	0.50	33.01%	0.56	16.65%	0.70

Participant 2 and 3 increased their use of recontextualization from the pre-test to the post-test practice tasks, while participant one decreased his use of recontextualization. Of interest, participant 3 had the largest increase in the duration of time spent using recontextualization, with a 4.8% increase.

Similarly, participant 3 had the largest increase in the amount of time spent using repetition within practice frames from the pre-test to the post-test practice task, as detailed in Table 4.10.

TABLE 4.10 Duration and Rate of Frequency for Repetition

Participant	Repetition							
	Pre-Test		Progress Monitoring 1		Progress Monitoring 2		Post-Test	
	Percent of Time	Frequency per Minute	Percent of Time	Frequency per Minute	Percent of Time	Frequency per Minute	Percent of Time	Frequency per Minute
One	46.23%	1.17	43.75%	3.28	72.87%	1.94	22.84%	1.60
Two	44.72%	2.01	46.51%	1.79	77.26%	1.04	41.40%	1.70
Three	58.82%	1.40	37.44%	1.24	37.97%	0.85	101.40%	1.67

Participant 3 increased the amount of time spent using repetition from pre-test to post-test by 42.58%. In contrast, participant 1 and 2 decreased the amount of they time spent using repetition by 23.39% and 3.32% respectively.

For the practice behavior of performance trial, participant 1 and 3 increased their frequency of occurrence and their duration of time spent using performance trials from the pre-test to the post-test practice task (see Table 4.11). Participant 1, had the largest increase in his use of performance trials with a 17.98% increase in the duration of time spent and a 1.16 increase in frequency of occurrence from pre-test to post-test. Participant 3 increased the time he spent using performance trials within practice frames by 11.91%. From pre-test to post-test participant two remained consistent in the time spent and frequency of occurrence of performance trials.

TABLE 4.11 Duration and Rate of Frequency for Performance Trial

Participant	Performance Trial							
	Pre-Test		Progress Monitoring 1		Progress Monitoring 2		Post-Test	
	Percent of Time	Frequency per Minute	Percent of Time	Frequency per Minute	Percent of Time	Frequency per Minute	Percent of Time	Frequency per Minute
One	3.52%	0.19	16.96%	1.32	0.00%	0.00	21.51%	1.35
Two	15.69%	0.88	26.04%	0.59	2.13%	0.21	15.52%	0.99
Three	10.21%	0.30	0.00%	0.00	0.00%	0.00	22.12%	0.77

4.3 Self-Regulatory Behaviors

In addition to general practice behaviors, all practice frames from each practice task were coded for the presence of the self-regulatory steps as used in the instructional model; identification of the problem, strategy selection, performance trial and self-evaluation (Nielson, 2001; Tovani, 2004).

As detailed in chapter two, each step of the model was operationally defined to assist with coding each behavior. Identification of the problem was defined as an area where the participant clearly chose a problem to focus their practice on. Each practice frame would, by definition, have at least one problem area because choosing a target area to address is identification of a problem. An individual practice frame could have multiple instances of problem identification if the participant chose sub problem areas within the area being targeted. Strategy selection constituted any strategy a participant used to address a problem; any form of decontextualization, recontextualization, and repetition was included in the definition. In the context of self-regulatory behaviors the definition of performance trial was slightly different than the definition used in the context of general practice behaviors. Here, performance trial was *any* attempt or performance of a strategy within the context of a practice frame. Self-evaluation was defined as any instance where the participant verbalized a value judgment about what they were practicing, such as “That was better,” “I am still not playing that correctly,” “Ok, now let’s try that a bit quicker,” or “Now I need to work on the articulation.” Self-evaluation was also coded any time the participant moved on to a new problem area or chose a different strategy, as they were then evaluating that they could move onward.

Each step from the self-regulatory model was frequency recorded and the rate of occurrence per minute was tabulated for comparison purposes. Each practice frame was also coded for improvement as effective, ineffective or undetermined. Effective frames were those that improved any aspect of the performance, ineffective frames were those where the performance clearly stayed the same or actually worsened. Undetermined frames were those where no determination of improvement could be made, it was not clearly observable if

improvements had been made or not. The absolute percentage of effective, ineffective and undetermined practice frames was calculated for each practice session.

As depicted in Table 4.12, participant 1 and 3 increased the frequency of occurrence from pre-test to post-test for all self-regulatory behaviors, while participant two only increased occurrences for two of the behaviors.

TABLE 4.12 Self-Regulatory Behaviors

Participant	Frequency per Minute		Frequency per Minute		Frequency per Minute		Frequency per Minute		Percent of Occurrence	
	ID of Problem		Strategy		Performance Trial		Self-Evaluation		Effective Frame	
	Pre-Test	Post-Test	Pre-Test	Post-Test	Pre-Test	Post-Test	Pre-Test	Post-Test	Pre-Test	Post-Test
One	1.75	2.55	3.01	4.04	5.24	9.25	2.04	2.55	25%	32%
Two	2.88	1.18	3.65	2.93	10.01	11.37	1.67	1.95	60%	66%
Three	0.52	0.56	1.55	1.80	8.32	9.00	0.76	1.75	40%	77%

All participants increased their frequency of self-evaluation, with participant 3 having the largest increase at .99 occurrences per minute. Participant 1 made his largest increase in the area of performance trial, with an increase of 4.01 occurrences per minute from the pre-test to the post-test practice task. All participants increased their percentage of effective frames and decreased their number of ineffective frames from the pre-test to the post-test practice tasks. Participant 3 increased his percentage of effective frames by 37%, which was the largest increase of all participants. Participant 1 increased his percentage of effective frames from pre-test to post-test by 7% and participant 2 increased his by 6%.

4.4 Practice Behavior Questionnaire

Each subject completed a modified Practice Behavior Questionnaire (PBQ) (Hallam, 1997a, 2001a, 2001b; McPherson & McCormick 1999, 2000; McPherson & Renwick 2001, 2002a) consisting of two parts immediately following both the pre-test and the post-test. As detailed in chapter 2, the PBQ consisted of a section of Likert style responses and an open-ended free write section (see Appendix B). Both the Likert style and free write sections of the PBQ were examined for evidence of self-regulatory skills, behavioral trends and changes in responses from the pre-test to the post-test.

Each participant self-reported changes in behavior and approach to practice from the pre-test to the post-test PBQ. Participant one's responses on both sections of the PBQ for the pre-test exhibit a time-based approach, minimal use of strategies and few instances of self-regulation. However, on the post-test participant one reports a more goal-oriented approach to practice, greater awareness of practice strategies and more evidence of self-regulation. Table 4.13 shows Likert style responses that depict changes in participant 1's thinking and approach to practice.

One of the most important changes in behavior from pre-test to post-test, is the change in response to question number 20, "When I practice I tend to repeat large sections of music over and over again until I can play them correctly." At the end of the study participant 1 disagreed with the statement, which suggests that at the end of the study he practices using a different approach. Responses to questions 2 and 3 show a shift in thinking from a time-based approach to a more goal-oriented approach to practice. Participant one "strongly disagreed" with the statement, "When I practice I have specific goals in mind," in the pre-test suggesting he did not think about practice goals, but answered, "strongly agree," at the end of the study suggesting he is now thinking about practicing towards specific goals.

TABLE 4.13 Likert Style PBQ Responses Participant One

Pre-Test and Post-Test			
	Question	Pre-Test Response	Post-Test Response
1	When I practice I practice for a set amount of time.	Agree	Agree
2	When I practice I have specific goals in mind.	Strongly Disagree	Strongly Agree
6	When I practice I often tell myself that was better, you can move on to something else.	Disagree	Agree
10	When I practice I often tell myself that wasn't correct and ask why not.	Neutral	Agree
11	When I am practicing I frequently catch myself thinking about other things.	Agree	Disagree
13	When I play something incorrectly I stop playing and think about how the music should be played.	Disagree	Agree
17	I have a hard time making myself practice the things that are the most difficult for me.	Agree	Disagree
19	When I am practicing sections are difficult for me I slow down and gradually speed them back up.	Neutral	Agree
20	When I practice I tend to repeat large sections of music over and over again until I can play them correctly.	Agree	Disagree

Participant one went from “disagreeing,” and being “neutral” on questions 6 and 10 from the pre-test to “agreeing” in the post-test, suggesting a greater ability to self-evaluate. For question 11, participant 1 changed from agreeing that they have frequent distractions during practice to disagreeing, suggesting they have fewer distractions and a more focused approach to their practice at the end of the study.

Participant one’s post-test responses on the free write section of the PBQ also depict changes in his thinking and approach to practice. In the post-test the participant articulates changing their routine depending upon his needs or a specific problem. Also of interest, is the

fact that the participant is more able to articulate various strategies to use such as, “looking at the shape of the phrase,” and “isolating difficult sections, slowing down, speaking and clapping, air tonguing.” Also in the post-test, in response to questions regarding choosing effective strategies for practice, the participant articulates an approach that is dependent upon a specific problem, his specific needs, and the requirements of the music. Participant one states, “I ask myself what I am working on and how to best approach it. If I am wrong I will try a new strategy.” Statements like the above could also depict a greater ability and likelihood of self-evaluation during practice.

Table 4.14 shows a comparison of several of the responses that participant one gave on the free-write section of the pre-test and post-test PBQ.

TABLE 4.14 Open Ended PBQ Responses Participant One

Pre-Test and Post-Test			
	Question	Pre-Test Response	Post-Test Response
1	When you are practicing do you have a typical practice routine and if so describe your typical practice routine?	"Yes. Normally, I will do a fifteen minute warm-up with mouthpiece exercises and long tones followed by fifty minutes of scales and an hour and forty-five minutes of repertoire."	"Yes, my typical practice routine varies from day [to day] based on what I need but is usually divided in warm up technique and rep."
2	What is your process for learning a new piece of music for performance?	"Start at comfortable temp and play through several times to identify problem areas..."	I begin by previewing the piece and finding the most difficult spots. I will spend most of my practice time on those areas and spend a small portion of time at the end or easier spots."
5	What are some of your most commonly used practice strategies?	"Slowing down tempo, repetition, and isolation."	"Isolating difficult parts, slowing down, speaking and clapping, air tonguing."
7	How do you decide which strategy to use at which time?	If the passage is fast I will normally slow it down...I will isolate them, repetition is generally used when working on phrasing and expression."	"I ask myself what I am working on and how to best approach it, if I am wrong I will try a new strategy."
10	How do you decide what you should be practicing for each session?	"Based on what my private teacher has assigned me..."	"I look at my technical exercises and repertoire and decide what needs the most work."
11	How do you decide when to move on to practicing something different?	"When I become mentally exhausted or my time is out."	"When I feel I have made progress on the previous element."

On both sections of the PBQ participant 2's responses show small changes in practice approach and behavior from the pre-test to the post-test. In the post-test responses to questions regarding thinking during practice are slightly more consistent than in the pre-test. Participant 2 responds that they "agree" or "strongly agree" to more of the statements that depict self-regulated thinking. Another notable change is the participant's response to the question, "When I am practicing I frequently catch myself thinking about other things." In the pre-test participant 2 agreed with the statement, meaning that he was frequently distracted during practice, and in the post-test participant 2 disagreed with the statement, meaning he was less distracted during practice at the end of the study. For both the pre-test and the post-test participant 2 articulates a time-based *and* goal-oriented approach to practice.

On the free-write section of the post-test PBQ participant 2's responses also show small changes, or a slight refining of approach to practice. Different from the Likert style section of the PBQ, participant 2 reports a greater emphasis on practice goals than on the amount of time practiced. For example, in response to questions about practice routine in the post-test PBQ participant two stated, "I warm-up with generally the same routine...then move to repertoire which is pretty unroutine: just finding problems and fixing them." Also depicting a goal-oriented approach was participant 2's post-test response to questions about choosing what to practice and which strategy to use, " I identify the problem, find out what kind of problem it is, and I apply the appropriate strategy, depending on what exactly the problem is." In regards to practice strategies participant two was able to articulate a greater number and diversity of practice strategies in the post-test PBQ such as, "outline a phrase, slow down, isolation, repetition," compared to those articulated on the pre-test PBQ. Also of interest, is that participant 2 describes decontextualization and recontextualization in both the pre-test and post-test PBQ. Participant 2

articulates, “ I pick the hardest spot and play it extremely slow[ly].....I add one note to either after it or before the fragment,” and, “I slow it down dramatically and gradually speed it back up.”

Participant 3’s responses on both sections of the pre-test PBQ depicted higher initial levels of self-regulatory ability and show a refining of approach and thinking from pre-test to post-test. On the Likert style section of the PBQ participant 3’s answers regarding approach to practice consistently depict a goal-oriented approach. Participant 3 answered “strongly agree” for questions regarding setting goals during practice and “disagree” for the question regarding practicing for a set amount of time in both the pre-test and the post-test. In regards to thinking during practice, participant 3’s responses were more consistent on the pos-test where he answered agree to all questions relating to thought processes.

Participant 3’s responses on the free-write section of the PBQ also depict an increase or refining in approach from pre-test to post-test (see Table 4.15). Of particular interest is participant 3’s response to question number 2, where he initially outlines decontextualization and recontextualization in a rudimentary fashion but refines the description on the post-test PBQ. In the pre-test, the participant gave details about breaking the piece apart into sections and gradually putting them back together. In the post-test the participant detailed previewing the piece, playing it to identify the hardest sections, decontextualizing those specific sections and recontextualizing them. Participant 3’s response to question number 10 in the pre-test compared to their response in the post-test also shows an advancement in their approach to practice. Participant 3 states that he does not plan his practice in the pre-test PBQ, but in the post-test PBQ he articulates planning practice using the items that need work, details how to work on them and sets specific practice goals from those items.

TABLE 4.15 Open Ended PBQ Responses Participant Three

Pre-Test and Post-Test			
	Question	Pre-Test Response	Post-Test Response
2	What is your process for learning a new piece of music for performance?	"I learn it one section at a time. I break each section into little sections (a line or two each) until I learn the sections slowly. Then I bring each section up to tempo and put them together."	"Look it over, then play it, then identify hardest parts, practice hardest parts, put them in context, practice whole piece slowly, speed it up."
4	What is your process for working on phrasing and musical expression?	"Sometimes I'll sing it because singing comes more naturally to me so it helps me understand the music without the technique."	"Think of what it should sound like and then sing it. Then blow air through the instrument in the style of the phrase..."
9	Do you typically plan out your practice session and if so how?	"No, I just have a list of things to do in my head and I do whatever I feel like doing."	"Yes, I think about what I need to work on and how I need to work on it. I also set goals such as a certain tempo or getting to a certain part in the music."
10	How do you decide what you should be practicing for each session?	"Whatever I need to work on for my next lesson/competition"	"I identify problems I'm having and decide which of them is most important."

CHAPTER 5: DISCUSSION AND CONCLUSIONS

In an overview of research regarding becoming a self-regulated learner, distinguished researcher Barry Zimmerman states, “The body of research across disciplines shows that self-regulation can and should be modeled and taught explicitly but that few teachers are actually teaching it” (2002). Zimmerman’s statement is provocative in several regards. First of all, there is the direct declaration that self-regulation is important and “should” be taught. Secondly, the statement that we as teachers are not actually teaching it and the resulting implication that we are neglecting to teach something of significance is quite striking. Zimmerman’s statement depicts a gap between the self-regulation research and actual instruction and highlights the importance of bridging that gap. The present study sought to begin to bridge the gap between research and instruction, by actually applying self-regulation research to the practice of teaching. The purpose of this investigation was to explore explicitly teaching self-regulatory skills in an applied lesson format, to determine if self-regulation instruction was viable. The primary research question for the study was does specifically teaching students to self-regulate during musical practice seem practical and effective. Related questions included:

- 1) Does the manner of teaching self-regulation used for the study, particularly the model of self-regulatory steps, seem to be accurate, useful and inclusive enough?
- 2) What, if any, observable changes occur in students practice sessions and subsequent performance achievement after instruction?

5.1 Instructional Model

The study was an initial exploration into applying research to instruction in as “real-time” a situation as possible. By design, the exploration made no attempt to control for outside influences and no generalizations from the results can be extrapolated. However, in this specific

exploration teaching students to self-regulate using specific steps was viable for me (the instructor and researcher) and there were observable changes in student behavior and performance achievement.

The most important finding of this exploration is that the steps from the model of self-regulation were useful for teaching, but could be more useful if expanded into a model for teaching the whole process of effective practice. The model used for this investigation (see Figure 2.7) was adapted and simplified into four cyclical steps from previous research, (Nielson, 2001; Tovani, 2004) to further simplify and codify a complex process. The four steps (identification of the problem, strategy selection, performance trial and self-evaluation) make the process of self-regulation more digestible for students and therefore easier to incorporate and use while practicing.

Learning is a complex process and essentially musical practice is the task of learning music. In essence, students are required to determine how to effectively learn independently each time they practice, an incredibly advanced procedural and meta-cognitive task. Breaking the process into the discrete but interrelated steps of the self-regulation model helped to de-mystify the process of practice. In other words, it showed participants where to start and what to do next. It helped organize and categorize their thinking guiding them to apply each step and the related thought to their practice. The steps simply increased the likelihood that actual thought was happening in the moment. When they got to the step of self-evaluation they were engaged enough in the task to actually self-evaluate and make decisions, as opposed to simply going through the motions.

Therefore, the model of self-regulatory steps is really just an outline of the steps involved in effective practice. The last step, self-evaluation, is the only truly meta-cognitive step. Each of

the other steps are necessary for effective practice and do increase the likelihood that meta-cognition will occur, but they are not actually self-regulation. In this vein, expanding the model slightly would make it more useful as an instructional tool for teaching students the process of effective practice. Based on my exploration of applying self-regulation research to actual musical instruction, I propose a model of effective practice detailed in Figure 5.0.

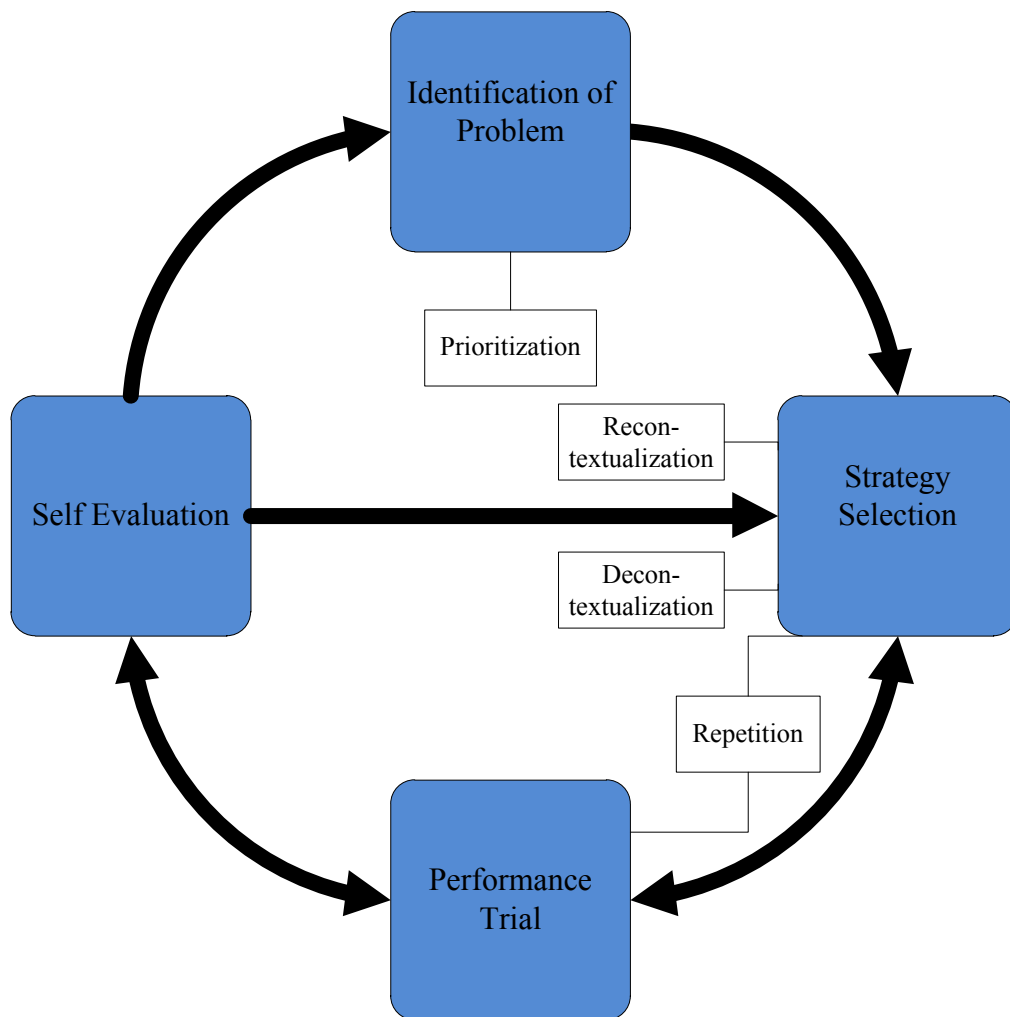


Figure 5.0 Model of Self-Regulated practice steps.

The blue outer squares represent the primary components of self-regulated or effective practice. The inner squares represent large categories of behavior that correspond as sub-steps of the outer squares they are attached to. The model is still cyclical because once the steps are performed in sequence they begin immediately again. Additionally, at any point in the model, the practitioner can make the decision to repeat a step or return to a previous step from either the inner or outer steps. Further definition of each step of the model is detailed below.

Identification of the Problem

In this step the practitioner must identify problems that need to be addressed to improve their performance.

Prioritization of the Problem

Often there are many problems that the practitioner could address and choosing which one to address must occur before they can move onto the next step, strategy selection. Prioritization of Problems can be a very complex learning task and should be included in teaching students how to practice, so I add this step and connect it to the outer square of Identification of the Problem. At a minimum both the instructor and the learner need to be very aware that prioritization of the problem is a part of the process of effective practice.

Strategy Selection

Strategy selection is the practitioner choosing how to address the problem selected for focused practice. There are a plethora of strategies to choose from and the adept creative practitioner may even invent strategies to address a particular problem. All strategies can really be codified into three main areas of behavior, decontextualization, recontextualization and repetition. I add them to the model of effective practice and connect them to strategy selection. All three of these are needed in some capacity for practice to be effective and all or perhaps most other strategies can be categorized into one of these areas.

Decontextualization

Decontextualization refers to isolating a specific element, simplifying it in some manner to focus on improving it alone.

Recontextualization

Recontextualization is taking a simplified element and gradually putting it back into its original context.

Repetition

Repetition is strategically repeating an element for mastery. Repetition is both a strategy and a part of performance trial, as it takes many successful performance trials to improve an area in need of practice. Therefore, repetition is also

connected to performance trial because it is a sub-step of performance trial as well as strategy selection.

Performance Trial

Performance Trial is a performance of the problem/area selected for practice using the selected strategy, a form of decontextualization, or recontextualization and always including repetition for mastery.

Self-Evaluation

Self-Evaluation is the step where the practitioner has to decide if their problem identification and prioritization is appropriate and if their strategy is working or has worked. For each performance trial they must decide to do more repetitions of a particular strategy, choose a new strategy or return to identification of the problem.

The proposed model of effective practice could help to categorize a complex process to make teaching and learning more effective. The model gives both students and teachers a starting point. Understanding of each of the steps and the model in totality could enrich the teachers' understanding of practice, making them more adept and aware of teaching practice to their students explicitly.

The above model also somewhat changes the concept of self-regulation. Self-evaluation becomes *the* key component for skillful application of all strategies. Self-evaluation must occur after each outer *and* inner step of the model. However, all of the other steps must exist to get to the self-evaluative component and for *actual* learning to occur and be effective. Burkoswski and Muthukirshna (1992) describe the process of an independent learner, which is what we require students to be when practicing, as dynamic, and constantly in motion. They explain that an independent learner must know a large number of strategies, have an understanding of where and when to use them, and why they are useful. Further, the independent learner can reflect upon them, monitor and apply them successfully (Burkoswski & Muthukirshna, 1992). Put simply knowledge of strategies or technique of an instrument is nowhere near enough. Students have to be able to identify problems, select strategies, perform them and evaluate their performance of

them. In other words, they need to have an understanding of the whole process of effective practice.

As such the model proposed in Figure 5.0 could be used as a sort of “curriculum,” a guide for teaching students how to be independent learners, learners that can practice effectively *and* be engaged in deep thought and self-evaluation while doing it. Teachers could use the model to teach students the whole process of practicing, increasing their understanding of how to approach musical learning. The process does and should include all the minutia of specific strategies in detail, but the model above allows students to connect the minutia to the bigger picture. Increasing students understanding of the bigger picture of learning music, will help them connect ideas and skills so that they can be more effective independent learners.

Renwick and Macpherson (2000) offers support for the existence and use of a model of effective practice, such as the model proposed in Figure 5.0. The researchers completed a longitudinal study of students beginning and continuing their instruction in music. Across time they found that students never gained knowledge or understanding of how to even begin the process of practicing independently. The steps of the proposed model of effective practice gives the student a method of approaching practice independently and the teacher a method for teaching them how to do it.

5.2 Changes in Participant Behavior

Though by design, it is not possible to determine whether changes in behavior and achievement from pre-test to post-test were due to the instruction received, it is also not possible to determine that the changes were not attributed to the instructional interventions. The secondary finding of this exploration was that in this particular application there were observable changes in participant behavior and subsequent performance achievements from pre-test to post-

test. One of the most important changes from pre-test to post-test is that all participants improved their performance achievements. Each participant increased the number of percentage points gained on the final performance of the practice task from the pre-test to the post-test. The increase in percentage points of improvement from pre-test to post-test is important because improved performance is the end goal of effective practice. Participants also exhibited important changes in their approach to practice and behaviors within practice sessions. Performance gains are compared with the changes in approach and behavior from pre-test to post-test.

First of all from pre-test to post-test, all participants exhibit a shift from a time-based approach to a more goal-oriented approach to practice. Evidence of a change in approach from emphasis on practice time to practice goals is exhibited in the PBQ. Participants made statements on the post-test such as, “My typical routine varies day [to day] based on what I need...” “When I see I have made progress,” “I move on when I have mastered whatever it is, or my practice has become counterproductive,” “It depends on what needs work...” and “...is pretty unroutine: just finding problems and fixing them.” Participant statements show that at the end of the study, they were more focused on solving problems rather than practicing for a set amount of time. Further evidence of a more goal-oriented approach is found in the amount of time participants spent practicing in practice frames.

Practice frames, by definition, are areas of practice where a problem has been identified for focused work and is therefore suggestive of a more goal-oriented approach. Participant 1 and 2 increased the amount of time they spent in practice frames and their performance achievement scores. Their increases in time spent in practice frames and performance achievement is consistent with previous research that showed that practicers who had a goal-oriented approach had greater performance achievements (Hallam, 1997a,; Miksza, 2007; Nielson, 2001). In

contrast, participant 3 increased his performance gain from pre-test to post-test but *decreased* the amount of time spent practicing in practice frames. Also consistent with previous findings, the fact that participant 3 decreased the amount of time spent in practice frames but still increased performance gain from pre-test to post-test, suggests that *how* the time was spent was a more important factor for improvement than simply identifying problems to address (Byo & Cassidy, 2008; Gruson, 1988; Hallam, 1997a, 2001a, 2001b; Nielson, 2001; Sloboda, 1996; Willamon & Valentine, 2001). While a goal-oriented approach may be an important step for effective practice, what strategies are used and how they are applied is the more distinguishing factor for effective practice, which brings us to another important change in participant practice behavior from the pre-test to the post-test of this exploration.

Importantly, all participants increased their use of decontextualization during musical practice. Each participant increased their frequency of occurrence and the amount of time they spent decontextualizing problem areas for improvement from the pre-test to the post-test practice task. In the post-test, participant 3 used decontextualization for 91% of the time spent in practice frames, a 33% increase from the pre-test practice task. In the post-test, participant 3 also had the largest performance gain, and the largest increase in performance gain from pre-test to post-test. All participants also articulate using the process of decontextualization on their post-test PBQ. Participant three refines his ability to describe the process in terms of identifying a problem choosing a strategy, practicing it out of context, and putting it back into context gradually. Decontextualization is simplifying a task in some manifestation. The ability to articulate the process and the increase in time spent using decontextualization, could show an increase in thought about practice strategies. On the post-test PBQ all participants report a greater variety of practice strategies and all of them could be considered a form of decontextualization. Further,

two of the participants increased their frequency of occurrence of strategy selection in the post-test and the other increased the amount of time they spent using strategies in the post-test. Previous studies highlight decontextualization as an important component of effective practice. Hallam (1997a) and Nielson (2001) found that expert practicers spent much time decontextualizing during practice. Rhower and Polk (2006) and Mane et al. (1989) found that participants who isolated tasks into component parts had greater performance gain scores than participants who practiced holistically. Consistent with these findings, the increase in the use of decontextualization and increase in performance gain across the present exploration solidifies decontextualization as an important factor for effective practice (Hallam 1997a, 2001a; Mane et al, 1984; Maynard, 2006; Nielson 2001).

Other important behavior changes from the pre-test to the post-test of the present exploration are that all participants increased their use of the self-regulatory steps of performance trial and self-evaluation. In regards to self-regulation, performance trials are defined as any instance of repetition of a strategy. As such, the increases in frequency of performance trial, here, is an increase in the number of repetitions of a strategy. Increases in the number of performance trials and performance gain scores are consistent with previous studies that suggest that repetition is significant to increasing performance achievement (Gruson, 1988; Miksza, 2007). Duke (2005) further illustrates the importance of repetition in effective practice in his collection of essays, *Intelligent Music Teaching*, where he details the critical need for multiple correct repetitions in order to master any musical skill. Additionally, the fact that all participants increased their frequency of performance trials, is consistent with earlier findings that suggest advanced performers who exhibit high levels of self-regulatory ability utilize large numbers of repetitions in their practice (Maynard, 2006).

The participants' increase in instances of self-evaluation and performance gain scores from pre-test to post-test are important because as previous studies suggest self-evaluation is an important component of effective practice and may be the missing link to skillful application of strategies (Byo & Cassidy, 2008; Hallam, 1997a, 2001a, 2001b; Maynard, 2006; Macpherson & Renwick, 2000; Miksza, 2007; Nielson, 2001; Pitts et al, 2000; Tovani, 2004; Zimmerman, 2002). Self-evaluation is the pivotal meta-cognitive step for actual thinking during practice. Without an evaluation of what is happening, practice would be more automatic and mechanical (Borkowski & Muthukirshna, 1992). Put simply, students need to be able to self-evaluate in order to skillfully apply strategies and increase their performance achievements.

5.3 Weakness of the Study and Areas for Further Research

The primary weakness of the study is that it was not designed to extrapolate generalizations. Further research into teaching self-regulation using specific steps is necessary and warranted. The proposed model of effective practice, as well as each individual step in the model warrants further exploration and study. Further study of expert practitioners with application of the coding techniques used in this investigation and the proposed model of effective practice would be beneficial. Other areas of weakness for the present investigation include the difficulty of coding behaviors without participant commentary of their thinking process. Further research could incorporate participant narration of their practice sessions immediately following the practice session. Narrations following practice would prevent influencing what participants do during practice but would give additional clarity to their process. Another area of weakness in the study was the number of instructional sessions. A longer intervention period would be more useful in analyzing participant behavior changes.

5.4 Summary

The major finding of this exploration is that applying research in self-regulation to actual instruction is viable. As a researcher, teacher and advanced performer I discovered that explicitly teaching students to self-regulate during applied instruction can actually be done in “real time” and that the instructional model used can be expanded to be a model of effective practice. Teachers and students alike could use the newly proposed model as a guide and means to understanding the process of effective practice.

Another important finding of the exploration was that participants increased their performance gain scores and use of several behaviors for the process of self-regulation and effective practice. Pragmatically speaking this exploration makes a strong argument for teachers to use the instructional approach detailed and the proposed model to teach self-regulated practice.

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APPENDIX A

Pre-Test Practice Task Excerpt

(7) Più tranquillo (M. M. ♩ = 96-100)

molto espressivo

1 2 3 4 5 6

7 8 9 10 11

molto espr.

12 13 14 15 16 17 18 19 20

pp mistico *ppp*

21

mf energico

22 23 24

primo p *cresc. e string.*

25 26

ff acuto, quasi Tromba

27 28 29

mf *rfz*

30 31 32

un poco quieto *p*

Progress-Monitoring Task One Excerpt

Nº 8. *Allegro deciso.*

The musical score is written for a single melodic line in treble clef, one sharp (F#), and common time (C). The tempo is marked *Allegro deciso.* The score consists of nine staves. The first staff begins with a measure containing a fermata, followed by measures with triplets of eighth notes. The second staff continues with triplets and includes a measure with a fermata. The third staff features a measure with a fermata and a measure with a triplet. The fourth staff has a measure with a fermata and a measure with a triplet. The fifth staff contains a measure with a fermata and a measure with a triplet. The sixth staff has a measure with a fermata and a measure with a triplet. The seventh staff includes a measure with a fermata and a measure with a triplet. The eighth staff has a measure with a fermata and a measure with a triplet. The ninth staff contains a measure with a fermata and a measure with a triplet. The score includes various musical notations such as triplets, fermatas, and dynamic markings (f, mf, p, ten).

Progress-Monitoring Task Two Excerpt



Post-Test Excerpt

5
cantabile

1

2 3 4 5

6 7 8

9 10

8 Con moto M.M. ♩ = 104

11 a tempo brillante

12 13 quasi

14 15 16

17 18 f energico

19 20

21 22 23

24 25

APPENDIX B

Open Ended Practice Behavior Questionnaire

Name: _____

Directions: Detail your response to the below questions, write as much or as little as you need to fully answer each question, you may use the back side of each page if you need more space.

- 1) When you are practicing do you have a typical practice routine and if so describe your typical practice routine?

- 2) What is your process for learning a new piece of music for performance?

- 3) What is your process for working on technical elements of playing your instrument?

- 4) What is your process for working on phrasing and musical expression?

- 5) What are some of your most commonly used practice strategies?
- 6) What do you think is your most effective practice strategy and give an example of how you use it?
- 7) How do you decide which strategy to use at which time?
- 8) What amount of time do you usually spend practicing per practice session?
- 9) Do you typically plan out your practice session and if so how?
- 10) How do you decide what you should be practicing for each session?
- 11) How do you decide when to move on to practicing something different?
- 12) How much time in a practice session do you spend thinking about other things?

Likert Style Practice Behavior Questionnaire

Directions: Circle the response 1-5 that most accurately reflects your current practice tendencies.

Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1) When I practice I practice for a set amount of time.	1	2	3	4	5
2) When I practice I have specific goals in mind.	1	2	3	4	5
3) I frequently write my practice goals down.	1	2	3	4	5
4) When I practice I ask myself what do I most need to work on.	1	2	3	4	5
5) When I practice I often tell myself that was good, this is getting better.	1	2	3	4	5
6) When I practice I often tell myself that was better, you can move on to something else.	1	2	3	4	5
7) When I am practicing I think about how close I am to playing a piece the way it should sound.	1	2	3	4	5
8) When I am practicing I think about how many mistakes I am making and how I should correct them.	1	2	3	4	5
9) When I practice I tell myself that wasn't correct I should do it again.	1	2	3	4	5
10) When I practice I often tell myself that wasn't correct and ask why not.	1	2	3	4	5
11) When I am practicing I frequently catch myself thinking about other things.	1	2	3	4	5
12) When I practice I can identify why I am not playing something correctly and have specific ideas of how to fix it.	1	2	3	4	5

13) When I play something incorrectly I stop playing and think about how the music should be played.	1	2	3	4	5
14) When I practice I stay with something until I play it perfectly.	1	2	3	4	5
15) I usually practice a section for a set amount of time or repetitions.	1	2	3	4	5
16) I make sure I spend sufficient time on a piece I can't play before moving on to something else.	1	2	3	4	5
17) I have a hard time making myself practice the things that are most difficult for me.	1	2	3	4	5
18) When I am practicing I choose sections that I can't play and practice them separately.	1	2	3	4	5
19) When I am practicing sections that are difficult for me I slow them down and gradually speed them back up.	1	2	3	4	5
20) When I practice I tend to repeat large sections of music over and over again until I can play them correctly.	1	2	3	4	5
21) When practicing I stop frequently to write important information on my music.	1	2	3	4	5
22) Repetition is the practice strategy I use most.	1	2	3	4	5
23) I use singing and/or conducting as a practice strategy.	1	2	3	4	5
24) I spend time previewing pieces to determine the areas I need to practice most.	1	2	3	4	5
25) I think about pieces that I am working on when I am not practicing	1	2	3	4	5

APPENDIX C

Lesson Plans for Instructional Sessions

Lesson Plan Session One

Goals for Six Weeks

- Improve how you think about practicing
- Improve your awareness of what you are thinking or when you are not thinking and make your thinking deeper
- Greater ability to figure out what the problems are and why you are having them
- Arsenal or toolbox of strategies for fixing problems and ability to be creative and think of your own
- Ability to evaluate quickly and accurately if something worked and got better or if it really didn't improve

1) Practice observation:

- T: Explain choose a portion of repertoire to practice for 3-5 minutes, I will video it and we will discuss it at the end of that time
- S practices chosen portion of repertoire for 3-5 minutes
- T videos
- T: Explain, now as we watch the video I want you to tell me what, you were thinking....why you decided to work on something, how you decided to work on it, and if you think it got better
- S narrates what they were thinking and deciding to do
- T: Intervene asking the question—did it work, did x actually get better? And help S assess

2) Introduction of Model

- “When we practice, what we are thinking when we practice is incredibly important to whether or not we make improvements”
- T: Model example---if I am not thinking deeply and making conscious decisions, I may do this---play something incorrectly and get no improvement or I might get some improvement but it might take me a very long time or I am just wasting time....I could probably get x done faster
- T: “Instead if I am make conscious decisions of what and how going to do something---think more deeply about it I may be able to do get more done in less time AND get it done better.
- That's what we are going to explore for the next few weeks.

3) Steps of Model/Modeling

T: Draw and show steps of model on board and itemize (give examples/Model) them for S

- T: Speak through model—mark it's critical features
- T: Explain each step, show it, S try it

S: Write examples on hand-out of the model

4) Guided Practice of all steps

T: Guide S through model a few times selecting items from technical studies and repertoire

5) Practicing the steps---I.D of problem/prioritization of problem

- Now just like we practice notes or rhythm alone, we need to practice each step alone so that we become really automatic at applying it when we practice.
- We will start with I.D and prioritization of the problem
- Asking ourselves questions is one of the best ways to start id/prioritization of the problem
 - T: Write questions on board---What is not correct, what do I want to do better, what is the most important/essential thing to fix right now---so I can play more of the piece, what will makes things better what can I fix in the music now, what is a problem I need to address outside of the music
 - T: Model using them
- T: Guide S in using questions to I.D and prioritize problems
- What we just did was a “think aloud” I actually spoke what I was thinking aloud.
- Think aloud is another very useful tool to help you monitor and improve how you think about something and in this case it can help you make great judgments about what you actually need to address
- T/S: Repeat guided practice of I.D. of problem
- S: Practice I.D of problem using think aloud and questions, Intervene to help ask questions

6) Practice Task

- T: Model practice task----think aloud???
- S: Complete practice task with own repertoire
- S: Narrate thinking

Lesson Session 2:

1) I.D. of problem practice

- Error detection listening practice
- Teacher model repertoire making specific errors
- S, I.D problem area

2) I.D. of Problems and Prioritization of Problems Practice

- T: Model listing problems and prioritizing them
- S: Guided practice
- S: Practice 2-3 different examples

3) Strategy toolbox

- T/S: Look at S strategy list
- T/S: Add strategies as applicable
 - Find a phrase
 - Toneless wind
 - Conducting and speaking/singing
 - Speaking articulation
 - Artic on 1 note
 - Rhythm on 1 note
 - Interval Isolation—sing, slide, or play
 - Finger and speak
 - Play subdivisions
 - Speak subdivisions, clap as written or opposite
 - Singing pitches/intervals
 - Droning
- T: Model using list
 - Pick spot in rep to work, use model choose strategy
 - T/S: Guided practice
 - S: Practice 2-3 different

4) Self-Evaluation Practice

- Intro of guiding questions
 - Did x get better
 - How did x get better
 - Why/why not did x get better
- T: Model use of questions
- T/S: Guided practice
- S: Practice

5) Practice of full model

- T: Model use with strategy list and all guiding questions
- T/S: Guided practice
- S: Practice

6) Practice Test (10 Minutes)

- T: Give S excerpt to practice for 5 minutes
- T: Leave room
- S: Practice
- S: Practice at end narrate thinking
 - What decision did you make and why
 - What was the problem
 - How did you choose to fix it
 - What was your strategy
 - Did it actually work
 - Self-evaluation

Instructional Session 3:

1) I.D of Problem, Prioritization and Strategy Choice Practice

- T: Play excerpts with errors
- S: I.D Problems, Choose most important to work on and select strategy
- T: Model with think aloud (using guiding questions)
- S: Pick spots in repertoire and I.D. probs, prioritize and choose strategies and think aloud with questions

2) Add strategies to strategy list

- T: Have S pick a spot to work on articulation
- T: Model strategy, S try it and add to list
- T: Repeat for phrasing, for intonation or sound and

3) Self-Evaluation Practice

- T/S: Review guiding questions—(*Did x actually get better? How or how not, why or why not?*)
- T: Model practice self-evaluation, think aloud with guiding questions
- S: Practice self-evaluation with think aloud guiding questions

4) Practice Planning/Objectives

- T: Explain when we practice we want to be focused on what we need to accomplish not how much time we are practicing. Time doesn't actually ensure that we are getting better, it's what we do that dictates if we are improving. If we get everything we need to get done in 20 minutes—all the better! But it could take us a bit longer depending on what we need to get done in a specific practice session or a specific day.
- T: So to be the most effective we need to plan our practice.
- T: Model planning practice session: Working on thirds, pitch bends, and tonguing, 2 Ferling etudes, and Mucz Sonata and Lars Erik Larson II.
 - T: Write down rep and a couple of goals for each piece on white board, choose possible strategies
- S: Plan and write down goals with possible strategies for their repertoire with T guidance
- S: Repeat without guidance if possible
- T: Explain “Homework” for next time, write down plan for at least one practice session per day

5) Whole Model practice

- T: Model, steps with think aloud if it seems necessary
- S: Practice with T asking guiding questions
- T/S: Role reversal now S guide T through steps
- S: Use steps and think aloud to practice

6) Practice test

- T: Give S new excerpt
- S: Sight read excerpt
- S: Practice for 5 minutes with think aloud, using model as possible
- S: Perform the excerpt again

Lesson Plan for Session 4:

1) Self-Evaluation Practice

- **Practice Plan Analysis**
 - Look at what plan was
 - Find problems, strategies (sequences)
 - Self-evaluation:
 - Did problem area improve with each strategy
 - To what extent did you follow the plan
 - Did it change your practice, if so how
 - Did it make you more focused, was the practice more efficient, more effective?
- **Journal Practice Sessions**
 - T: For next time, I would like you to keep a journal for 3 practice sessions of what you actually did during practice
 - T: Model journaling: Use steps and write down what I did, and what the result was
 - S: Practice with Guidance
- **Recorded Practice**
 - S: Practice for 5 minutes on any repertoire
 - T/S: Watch practice answer evaluation guided questions
 - Did X actually get better
 - How or how not
 - Why or why not
 - What could you have done instead

2) Problem and Strategy Practice

- T: Part of planning and being able to practice the most effectively depends on our ability to look at new repertoire and decide where, what and how we must approach practicing the piece.
- T: For example, I am going to pull out a piece of rep I have never practiced and examine it to see what I might need to practice.
- T: First I need to get an overall sense of the character and structure of the piece
 - T model
- T: Then I look for areas that may be problematic and decide how I might approach them
 - T model
- T/S Guided practice: Let's Look at this piece together
 - What is the overall structure and character of the piece
 - Now what places may be difficult and why
 - How would you practice them
- T: Give S Rep and have them complete the above steps

3) Full Model Practice with think aloud

- S: Choose a technical element to work on and practice using think aloud and all model steps
- T: Intervene as necessary
- S: Move on to rep/etudes and practice using model steps
- T: Intervene as necessary

4) Practice Test

Session 5: Lesson Outline

1) Self-Evaluation Practice

- Recorded Practice
 - S: Choose area to practice and practice for 5 minutes, no think aloud
 - T/S: Watch Video
 - S: Define Problem, Strategy used
 - T: Ask Guiding questions as necessary
 - S: Answer Evaluation questions: Did x actually get better and if so, how or how not
- Review Practice Documentation
 - T/S: Look at plan
 - T: Ask guiding questions: what were the problems you were going to work on, what strategies did you plan to use
 - Did you follow the plan
 - Did you notice any differences in your practice session
 - Did it change your practice
 - More focused, get more done
- Review Practice Events List
 - T: Ask guiding questions
 - What did you notice about your practice as you were writing it down
 - Did writing down events have any effect
 - Make it more focused
 - Make you realize anything important
 - Can you see your decision making process in what you did?

2) Full Model Practice

- Guided Practice
 - T/S: Guide S through steps of model
 - S: Complete practice with model
- Intervene as necessary practice
 - S: Practice using model
 - T: Intervene as necessary
- Role Reversal
 - T: Practice
 - S: Guide T through steps
 - T: Practice and make common mistakes
 - (practice inaccuracies, practice just repeating making no progress, practice using faulty strategies, practice places that are not priorities)
 - S: Intervene and correct thinking

3) Practice Planning Practice

- T: Model planning—for piece
- T: Give S new repertoire
- S: Create practice plan

4) Guided Practice, Practice Task

- T: Give S practice task (like end task)
- S: Sight-read task
- T: Tell S now you have 10 minutes to practice what do you do
- S: Answer
 - T: Intervene—First come up with a plan of attack
 - T/S: Devise Plan of attack
 - T: Ask questions: What areas are most problematic, why, what do you think you will be able to fix quickly/what is most important to fix, how will you fix them
- S: Carry out plan
- T: Intervene with guiding questions as necessary

5) Practice Test

APPENDIX D

Application for Exemption from Institutional Oversight

Unless qualified as meeting the specific criteria for exemption from Institutional Review Board (IRB) oversight, ALL LSU research/ projects using living humans as subjects, or samples, or data obtained from humans, directly or indirectly, with or without their consent, must be approved or exempted in advance by the LSU IRB. This Form helps the PI determine if a project may be exempted, and is used to request an exemption.

– Applicant, Please fill out the application in its entirety and include the completed application as well as parts A-F, listed below, when submitting to the IRB. Once the application is completed, please submit two copies of the completed application to the IRB Office or to a member of the Human Subjects Screening Committee. Members of this committee can be found at <http://research.lsu.edu/CompliancePoliciesProcedures/InstitutionalReviewBoard%28IRB%29/item24737.html>

– A Complete Application Includes All of the Following:

- (A) Two copies of this completed form and two copies of parts B thru F.
- (B) A brief project description (adequate to evaluate risks to subjects and to explain your responses to Parts 1&2)
- (C) Copies of all instruments to be used.
*If this proposal is part of a grant proposal, include a copy of the proposal and all recruitment material.
- (D) The consent form that you will use in the study (see part 3 for more information.)
- (E) Certificate of Completion of Human Subjects Protection Training for all personnel involved in the project, including students who are involved with testing or handling data, unless already on file with the IRB. Training link: (<http://phrp.nihtraining.com/users/login.php>)
- (F) IRB Security of Data Agreement: (<http://research.lsu.edu/files/item26774.pdf>)



Institutional Review Board
Dr. Robert Mathews, C
131 David Boyd
Baton Rouge, LA 70803
P: 225.578.5785
F: 225.578.5785
irb@lsu.edu
lsu.edu

1) Principal Investigator: Kimberly J. Gedde

Rank: Doctoral Candidate

Dept: Music and Dramatic Arts

Ph: 419-575-0053

E-mail: kgedde1@lsu.edu

2) Co Investigator(s): please include department, rank, phone and e-mail for each
*If student, please identify and name supervising professor in this space

IRB# E6090 LSU Proposal #

- ☒ Complete Application
- ☒ Human Subjects Training

3) Project Title: Explicit Instruction and Self-Regulatory Skills in Deliberate Practice

Study Exempted By:
Dr. Robert C. Mathews, Chairman
Institutional Review Board
Louisiana State University
203 B-1 David Boyd Hall
225-578-8692 | www.lsu.edu/irb
Exemption Expires: 9/16/20

4) Proposal? (yes or no) ☐ If Yes, LSU Proposal Number

Also, if YES, either

- ☐ This application completely matches the scope of work in the grant
OR
☐ More IRB Applications will be filed later

5) Subject pool (e.g. Psychology students) Saxophone Studio Students

*Circle any "vulnerable populations" to be used: (children <18; the mentally impaired, pregnant women, the aged, other). Projects with incarcerated persons cannot be exempted.

6) PI Signature Date August 24, 2012 (no per signatures)

** I certify my responses are accurate and complete. If the project scope or design is later changes, I will resubmit for review. I will obtain written approval from the Authorized Representative of all non-LSU institutions in which the study is conducted. I also understand that it is my responsibility to maintain copies of all consent forms at LSU for three years after completion of the study. If I leave LSU before that time the consent forms should be preserved in the Departmental Office.

Screening Committee Action: Exempted <input checked="" type="checkbox"/> Not Exempted <input type="checkbox"/> Category/Paragraph <u>1</u>		
Signed Consent Waived?: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Reviewer <u>Mathews</u>	Signature <u></u>	Date <u>9/17/12</u>

Study Exempted By:
Dr. Robert C. Mathews, Chairman
Institutional Review Board
Louisiana State University
203 B-1 David Boyd Hall
225-578-8692 | www.lsu.edu/jrb
Exemption Expires: 9/16/2015

Consent to Participate

Study Title: Instruction in Self-Regulatory Skills and Deliberate Practice

Performance Site: School of Music and Dramatic Arts, Louisiana State University and Agricultural and Mechanical College

Investigator: Kimberly Gedde

I am available for questions about this study at any time via e-mail at kgedde1@lsu.edu or via phone at 419-575-0053 between 3-9pm.

Purpose of the Study: To investigate teaching the specific skills involved in the thinking process, to determine if doing so makes musical practice more effective.

Participants:

Phase 1: 6 freshman or sophomore applied saxophone students

Phase 2: Two freshman or sophomore applied saxophone students

Study Procedures:

Phase 1-Participant Selection: Each participant will be given a pre-test performance task, where they will sight-read an excerpt of music, then practice it for twenty-five minutes and perform the excerpt again. The practice task will be video recorded. Participants will then fill out two questionnaires regarding practicing.

Phase 2-Instructional Period: From the pre-test performance task, two participants will be selected to continue with the study. Each of these two individuals will receive six weeks of instruction regarding thinking and musical practice in the context of a one hour applied lesson. At the end of the six weeks each student will take a post-test. The post-test will be structured exactly like the pre-test, participants will sight-read an excerpt, be given twenty-five minutes to practice it and then perform the excerpt again. Each participant will also complete a practice behavior questionnaire at the end of the six weeks. Each instructional session and the post-test will be video recorded.

Benefits: An additional weekly applied lesson per week at no cost. Increased ability to practice efficiently and effectively, leading to increased improvement on their instrument. In addition, the two participants selected for the instructional (main) portion of the study will receive \$50.00 in compensation for their time, attention, and effort throughout the course of the study.

Risks: none

Right to Refuse: Participants may choose not to participate or to withdraw from the study at any time without penalty or loss of benefit to which they might otherwise be entitled.

Privacy: Results of the study may be published, but no names or identifying information will be included in the publication. Participant identity will remain confidential.

Signatures: _____

Date: _____

VITA

Kimberly Joy Gedde, a native of Owatonna Minnesota, currently resides in Prairieville Louisiana and is the Lecturer of Saxophone at Southeastern Louisiana University. She received her Bachelors of Music degree in Saxophone Performance and Music Education from Lawrence University, Appleton Wisconsin in 2002, and her Master of Music in Saxophone Performance from Bowling Green State University, Bowling Green Ohio in 2004. Kimberly anticipates receiving her Doctorate of Musical Arts in Saxophone Performance with a minor area concentration in Music Education.