STUDENT PERCEPTIONS OF STUDENT-CENTERED LEARNING IN MUSIC

by

DANIEL JEFFREY-KALLAS BERMEL

(Under the Direction of REBECCA ATKINS)

ABSTRACT

The merits of student-centered approaches to instruction are becoming more and more recognized by faculty at all levels of education. For this experiment two different intact orchestra classes at a high school in the Southeastern United States participated in approximately two weeks of student-centered lessons to create an arrangement for the fiddle tune “Goodbye Liza Jane” and two weeks of teacher-centered lessons to create an arrangement for the fiddle tune “Cindy Cindy.” During teacher-centered lessons, the teacher taught and made all artistic and arrangement decisions. During the student-centered lessons, the teacher allowed students to problem-solve and gave them autonomy in deciding how the arrangement should go. Students rated their engagement, enjoyment, learning and other factors in a Student Reflection. They also wrote about their experiences in an End of Unit Reflection. Their ratings and responses indicate students preferred some guidance from their teacher, but also wanted to retain autonomy in their learning processes. Ratings also indicate students feel they learned more in their first attempt at solving a new problem than they did in the subsequent attempt, regardless of whether the lesson was a student-centered or a teacher-centered lesson. Results support findings from previous research about student-centered learning. Results also further

validated Vygotsky's theory of the Zone of Proximal Development from the learner's perspective, in that students enjoyed autonomy more when they already had some experience arranging.

INDEX WORDS: student-centered, teacher-centered, problem-based learning, engagement, autonomy, transfer

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DEDICATION

This dissertation is dedicated to my Family: Mom, Dad, my brother Mark, and my wife Valery. Thank you for all the love and support you have given me throughout this journey!

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CHAPTER 1: INTRODUCTION

Though researchers and scientists have come a long way in their efforts to figure out how the brain works, there is still much to learn. Cognitive research is important because knowing how the human brain works gives important insights into how humans learn. Theories such as the Cognitive Learning Paradigm attempt to explain in basic terms how information is processed and stored. The way a person perceives an experience and learns from it is formed by a combination of past experiences, and knowledge pertaining to those experiences. The knowing of information in conjunction with a meaningful experience causes a person's knowledge-base and perception to change over time (Dewey, 2015; Page, 1990; Piaget, 1964).

Rousseau was the first prominent contributor to human metacognitive theories in modern history. Living during the Age of Enlightenment, he wrote extensively about learning. In his most famous book *Émile* he made an argument for balance between the incidental learning that occurs in nature and the scripted curriculum of formal schooling (Page, 1990; Rousseau, 1899). Rousseau rejected the passive, lecture-based environment of schools in his day and argued for a change in formal schooling (Rousseau, 1899).

Contemporary theorists have attempted to describe the learning process by creating models that describe how learning occurs. Authors such as Kolb, Jarvis, Boud, Keogh, Walker, and Davies have varying thoughts on the order of processes and inputs, and even how knowledge is acquired. Kolb's model contains four main parts: a concrete experience, reflective observation, abstract conceptualization, and active experimentation (Davies, 2008; Wurdinger & Allison,

2017). The model designed by Boud, Keogh, & Walker asserts that learning happens with a two-way connection between experience and reflection (Boud et al., 1985). The model by Jarvis agrees with the thought that learning involves the experiences and reflection but clarifies the possibility that new learning may not occur if an experience doesn't introduce new information or contradicts previously learned information (Atherton, 2010). The Davies model of learning builds on the work of Jarvis and other theorists, codifying what Davies believed to be all the possible inputs within a person's environment that may contribute to their learning processes (Davies, 2008). Despite the differences that appear in learning model theories, they all agree on one fundamental concept about learning: learning requires the assimilation of knowledge (thinking) applied to an experimentation process (doing).

For learning through experience to be able to occur, contemporaries of Rousseau such as Piaget and Dewey emphasized the need for autonomy in the learning process. They advocated for a shift away from lecture-based teaching methods and towards a more balanced approach to teaching and learning that allows the learner to have more autonomy in their learning experiences (Dewey, 2015; Page, 1990; Piaget, 1964; Rousseau, 1899). Furthermore, they believed when learners must think critically and apply their knowledge to solve real problems within a curriculum, they commit new knowledge to their long-term memory and connect new experiences to the things they already know (Dewey, 2015; Page, 1990; Piaget, 1964; Rousseau, 1899). More recently, this balanced approach in which the students take charge of their own learning by solving real problems has been labeled "active learning." Dewey and Piaget used similar terms to describe the process such as "informed doing" and "critical thinking" (Dewey, 2015; Page, 1990; Piaget, 1964). Rousseau, Piaget, Dewey, and many others believed that

optimal learning occurs in what has more recently been termed a student-centered learning environment (Wiggins, 2001).

Recently there have been a few studies in the education field that support the implementation of student-centered learning projects (Gundala et al., 2018; O'Hara & Shaffer, 1995; Parsons, 2009; Ribeiro, 2011). Ribeiro (2011) documented a professor's perceptions of a student-centered learning project in engineering classes at their university. The professor reported high student enjoyment and engagement in the learning process. He noticed students were excited to participate in projects where they made their own decisions. Gelisli (2009) compared projects with student-centered instructional methods to those with teacher-centered methods. Scores for student-centered projects were significantly higher than scores for teacher-centered projects, indicating that student-centered methods were a more effective approach to learning. Gundala et al. (2018) implemented a student-centered project in which students were asked to create real products or services for their marketing and product development courses. Students were then asked to create a marketing plan to launch these products or services. Students perceived high engagement during the projects and thought they were useful learning experiences. Students also felt the projects were worth the time and effort required to complete them. Parsons (2009) compared student perceptions of real projects vs. theoretical projects in a marketing research class. Results affirmed previous research indicating active participation in project-based small group work, whether theoretical or real, elicits high engagement, motivation, teamwork skills and perceived learning.

O'Hara & Shaffer (1995) studied student-perceptions in experiential learning projects using one class with sellers who had to pitch a product to two prospective buyers in another

class. Students perceived their efforts in the project to be worthwhile, and they perceived improvement in their buying and selling skills.

Based on research results and scholarly writings it is clear the education field has come to a consensus that student-centered learning projects and activities are worthwhile and provide students with meaningful learning experiences (Dewey; 2015; Garrett, 2013; Gelisli, 2011; Gundala et al., 2018; O'Hara & Shaffer, 1995; Page, 1990; Parsons, 2009; Quinlan, 2003; Ribeiro, 2011; Smith, 2018; Vernon, 1995; Wiggins, 2001). Like the education field at large, authors in the music field such as Green (2016) & Gordon (2012) rejected a traditional instrumental music setting in which students are strictly taught to read music that has already been arranged/composed according to the musical interpretation of the teacher. Instead, music philosophers and pedagogues advocate for a student-centered approach to all music instruction in which students have autonomy in the learning process and where the concepts learned are more important than the exact content (Green, 2016; Green et al., 2017; O'Neill, 2014; Wiggins, 2001). Green (2016) and Green et al. (2017) talked about informal learning processes and how they should play out in a music classroom. Green believed teachers should attempt to create environments that emulate organic learning occurring in popular music bands and jam sessions. Schwartz (2019) gave anecdotal evidence of her success with a student-centered approach to teaching her classes. She described how she guided her students through the process of creating their own arrangements of their music. Scott (2006) also provided some anecdotal evidence for student-centered approaches to teaching. Scott (2006) followed the work of Mr. Cruthers as he guided his students through the process of creating their own accompaniments to a piece of music.

Need for this Study

While there are a few studies in the education field at large supporting a student-centered learning environment, and there is anecdotal support for a student-centered approach to teaching music (Gelisli, 2009; Green, 2016, Green et al., 2017; O'Hara & Shaffer, 1995; O'Neill, 2014; Parsons, 2009; Ribeiro, 2011), there have been no studies as of the present time that measure differences between student-centered and teacher-centered learning environments in a music classroom. I have observed in my own classroom when students do their own learning and make decisions, they tend to fill in their own learning gaps, make connections I never thought of, and say things like "that was fun" with much more frequency. When I guide my students and allow them some control over their own learning, they seem to be self-motivated to learn and proud when they are successful at solving their musical problems. In most cases, when students have the freedom to come up with solutions to musical problems, they seem to know when they need the help of a more experienced peer or the teacher to figure something out during their learning processes. Over time, creating a student-centered learning environment with my classes has seemed to produce self-sufficient musicians who can function in any music situation whether it's a jam session or a classical music concert. My goal has always been to help students get better at learning music, and not just help them become more proficient at playing their instruments.

Since there have been no studies in music education measuring student perceptions in a student-centered learning environment against their perceptions in a teacher-centered learning environment, such a study would offer vital documentation to either support or refute the anecdotal observations made by educators in the field (Green, 2016; Green et al., 2017; Schwartz, 2019; Scott, 2006; Wiggins, 2001). In addition to student feedback, such an

experiment could provide another opportunity for teacher feedback on a student-centered learning experience. The perceptions of the students and the teacher could then be compared to research on student-centered learning in other disciplines to determine the usefulness of student-centered approaches in music classes.

Research Questions

In the endeavor to contribute to just such a study, I have formulated the following research questions:

1. How do students and teachers perceive their environment during student-centered lessons vs. teacher-centered lessons?
2. How do students and teachers perceive student learning in student-centered lessons vs. teacher-centered lessons?

CHAPTER 2: RELATED LITERATURE

Understanding the learning process is important for both formal and informal educational experiences. The idea that past experiences shape perception of present experiences and future experiences, is known as the Cognitive Learning Paradigm. This term was first coined by famous education philosopher Jean Piaget (Page, 1990; Piaget, 1964). Piaget believed children progress through different developmental stages in which they slowly gain the ability to mold abstract thought. He rejected the idea knowledge comes from a person outside the learner and posited that it comes from a person's experiences and the way they connect learned information to those experiences (Dewey, 2015; Page, 1990; Piaget, 1964; Rousseau, 1899). In addition to developing four stages of cognitive development, Piaget researched the formation of "structures" in what was later termed schema (Piaget, 1964). A schema is an individual's network of information surrounding one concept or topic. As each person gains life experience in different settings, they build upon their own personal schema of a particular concept or subject. Vinney (2019) provided a great example of a schema:

> ...when a child is young, they may develop a schema for a dog. They know a dog walks on four legs, is hairy, and has a tail. When the child goes to the zoo for the first time and sees a tiger, they may initially think the tiger is a dog as well. From the child's perspective, the tiger fits their schema for a dog (Vinney, 2019, p. 4).

As new information is learned, the information contained in a schema and its connections will continue to evolve. For example, a child may not know what a tiger is, but it looks similar in some ways to their dog. To help the child understand a tiger is not a dog, the child needs to know the differences between the two animals. The tiger is not a dog because it doesn't bark, it doesn't live in people's houses, and it hunts for its food. After learning the differences between a tiger and a dog, the child will modify their existing dog schema and create a new tiger schema. As the child grows older and learns more about animals, they will develop more animal schemas. At the same time, their existing schemas for animals like dogs, birds, and cats will be modified to accommodate any new information they learn about animals. This is a process that continues into adulthood for all kinds of knowledge (Vinney, 2019).

Wiggins (2001) also discussed the schema theory noting, "a schema for something we know consists of everything we know and understand about an idea—or all the concepts we hold about the idea" (Wiggins, 2001, p. 4). The network of thought surrounding each concept, idea, or subject represents one schema. Figure 2.1 below denotes a typical illustration of a schema. This example of a schema depicts a person who participates in Bluegrass and Folk jams. The large bubble of a schema example typically depicts the subject of that schema. The surrounding bubbles represent the thoughts and knowledge pertaining to that schema.

Figure 2. 1

Possible Schema: Concepts of a Jam Session

In schema theory, each schema is connected to other schema by shared information. When new information is learned or a person has a new experience, this information is connected to things already learned or believed. Because each individual has a different well of experience, the individual may perceive a new experience differently than the people around them, even if two or more people experience the exact same event. For example, if two friends Jack and Jill go to Disney World together, Jill might agree with Jack about the way some things happened but disagree with him about other aspects of the experience. Jack and Jill both love water rides because they grew up on the beach. Jack loves rollercoasters because his family has been taking him to theme parks since he was little. Jill is a bit scared of rollercoasters because of her vertigo

and lack of experience riding them. When they both rode the Space Mountain rollercoaster, Jack loved it, but Jill thought it was scary and jerky. Their different life experiences may explain their differences in emotions and perceptions of the rollercoaster event, and their similar experiences with water rides explain why they both enjoyed them. The way that Jack and Jill experienced the rides and the emotions tied to those experiences were a result of their current knowledge base or schema. They both learned/added to their personal schema in different ways depending upon their prior knowledge bases.

Take notice that Piaget's schema theory is formed by two component parts that are equally important in the formation of new knowledge. These components are prior knowledge which forms current perception, and the current experience or event that is perceived (Piaget, 1964). In addition to the word schema, Piaget often used the term "structure" to describe a current level of knowledge or truth with a given topic, and "assimilation" to describe how new experiences add to or create more structures (Piaget, 1964). Rousseau, a predecessor of Piaget, was one of the first philosophers to poignantly articulate ideas about learning. He postulated that experience without information (knowledge) would make an uneducated person by societal standards. Conversely, receiving information in complete isolation from experience would produce a person who knows information but cannot apply that information to different situations because they have not practiced (experienced) application (Dewey, 2015; Rousseau, 1899). In other words, theoretical knowledge must be accompanied by an experience where the learner is actively responding to a stimulus (Piaget,1964). Rousseau, Dewey, and Piaget all believed the teacher should prepare the learning environment in such a way that would allow students do their own learning (Dewey, 2015; Page, 1990; Piaget, 1964; Rousseau, 1899).

Learning Models

Rousseau was among the first to describe the necessity for both knowledge and experience in the learning process, but he certainly was not the last. Contemporaries of Rousseau such as Kolb, Jarvis, Boud, Keogh, Walker, Davies, and others have created models that attempt to identify the inputs of both knowledge and experience that happen during learning (Atherton, 2010; Boud et al., 1985; Davies, 2008; Page, 1990; Rousseau, 1899).

Kolb was among the first to create a model describing the learning process. Kolb's model of experiential learning begins with a concrete experience, followed by reflective observation, abstract conceptualization, and finally active experimentation. Concrete perception involves a person's perception of an event based upon all the sensory input they receive when the event occurs. Reflective observation in the Kolb model is when a person is thinking about the event that was witnessed or happened to them. Abstract conceptualization includes making sense of the thoughts which occurred during the reflection phase and drawing conclusions about what might be learned from these events. The last step in the Kolb experiential learning model is active experimentation during which the learner tests conclusions drawn in the abstract conceptualization phase to see if they are appropriate or correct (Davies, 2008; Wurdinger & Allison, 2017).

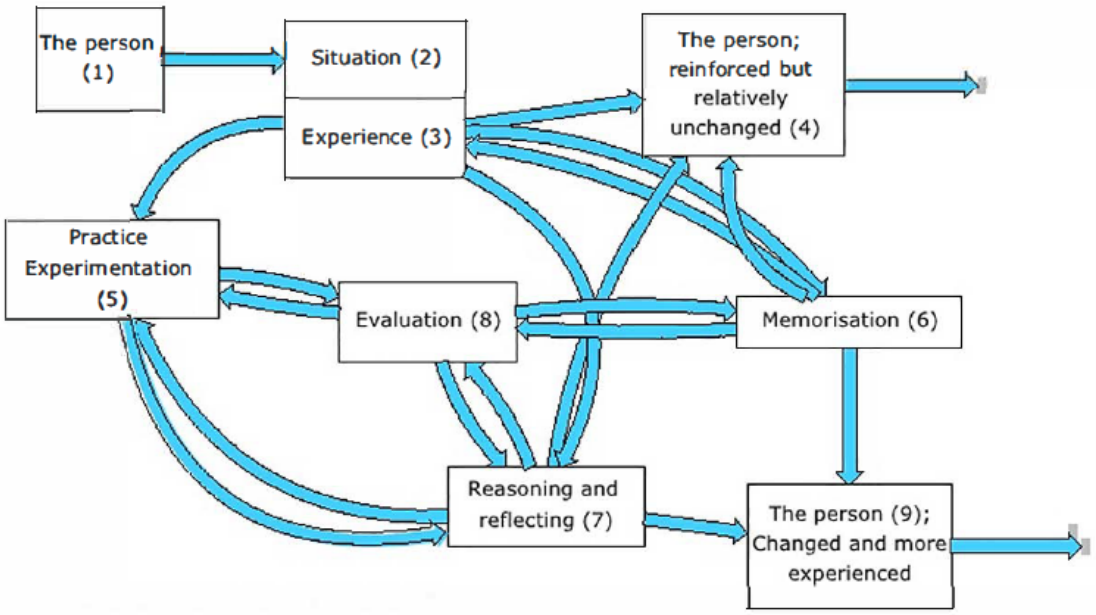
Another learning model by Boud, Keogh, & Walker (1985) posited a two-way connection between experience and reflection (synthesis of knowledge), that goes back and forth until a conclusion is drawn about a given topic over time. Just like the anecdote presented earlier about Jack and Jill, Boud et al. (1985) noted a learner's past experiences play a role in their current perception of an experience, and reflection upon that experience. This interplay between

experience and reflection described by Boud et al. (1985) seems to match the "pattern of inquiry" described by Dewey (Dewey, 2015; Page, 1990). The similarities between the two are not by accident, as Boud et al. (1985) referred to Dewey quite often in *Reflection: Turning Experience Into Learning.* Dewey's pattern of inquiry is a process in which a person is curious about a subject and explores different avenues for solving a problem (Dewey, 2015; Page, 1990). Under Boud, Keough, & Walker's model, there is constant assessment of outcome from an action or event that occurs (Boud et al., 1985).

Jarvis created a model of learning that is probably one of the more complex models of experiential learning. It is important to note that Jarvis focused his career on adult education. Jarvis explained that perhaps learning may not occur in every instance because an experience or event offers no new information or contradicts previously learned information (Cornu, 2016; Davies, 2008). Figure 2.2 summarizes the Jarvis model, showing inputs either caused a change or reinforced something a person already believed.

Figure 2. 2

The Jarvis Model Including Both Learning and Non-Learning Inputs



(Adapted from Atherton, 2010, p.1)

Like Jarvis, the Davies model presented 12 possible inputs that help a person make sense of their experiences (Davies, 2008):

1. Expectations---Including previous experience, formal knowledge, and others' views
2. Emotions
3. Oppportunity
4. Learning orientation and memory
5. Reflection and insight
6. Credibility checking
7. Experience bank
8. One's own observations

9. Fellow participant's observations
10. Informed non-participants' observations
11. Formal knowledge
12. Own experience

With the Davies model, experience and data gathering are at the center of the learning process (Davies, 2008). This combination matches the two major factors of the Cognitive Learning Paradigm: experience and knowledge (Dewey, 2015; Page, 1990).

Though these philosophers may have disagreements on the process of assimilation, they all seem to agree on the presence of both knowledge and experience in the learning process. When one of these two components is absent, active learning cannot occur. In his writings, Rousseau cautioned against traditional teaching methods that only employ use of the knowledge portion of the Cognitive Learning Paradigm and neglect the experience portion almost entirely (Page, 1990; Rousseau, 1899). Page (1990) also defined the learning that takes place in a traditional learning environment as passive learning (no application of knowledge). Piaget's argument was this model of teaching and learning would not be effective because the stimulus (an input of solely information) would rarely encourage an active response from the student (Piaget, 1964). Passive learning is not project-based or activity-based, but entails learning through lecture, reading, writing, and tests. Petress (2008) pointed out that students existing in a passive learning environment become disinterested in the material being taught when they cannot connect it to a real experience. When a child says something like, "I'm never going to use this information. Why do we have to learn it?" The combination of statement and question implies two clues about a probable learning environment:

1. The current activity, from the student's perspective is solely informational.
2. The student is probably not connecting this information to any knowledge outside of the classroom environment, and has most likely compartmentalized the current information into a knowledge base that only exists in order to satisfy an external motivator such as a grade.

Because traditional learning environments emphasize external motivators, they may inhibit the connection of knowledge to experience outside of the curriculum. Petress (2008) noted this lack of natural motivation towards learning in passive environments. Worthern (1968) had a similar view of the traditional teaching method, describing it as a repository teaching method. The word repository also refers to the place within a library where the material related to one topic is stored. In a passive environment, the teacher is the repository of information and the students are empty vessels to be filled with information shared by the teacher (Worthern, 1968).

Active learning, on the other hand, requires students to direct their own learning and assimilate prior knowledge with a current learning problem (experience). Active learning refers to students learning something for themselves through doing (Dewey, 2015; Page, 1990). In an active learning environment, students must discover new knowledge through activities in which they solve a problem by engaging in what Piaget called "critical thinking" (Page, 1990; Piaget,1964). According to Piaget, critical thinking requires that a student draw their own conclusions about a situation, or as the colloquial terminology coined by Pestalozzi implies, "think for ones-self" (Page, 1990). The models for learning introduced earlier in this document describe the acquisition of both the experiences and the inputs associated with knowledge

outside of those experiences. As Piaget noted “Learning is possible only when there is active assimilation” (Piaget, 1964, p.185). Piaget often used the word “assimilation” to describe the acquisition of new knowledge. A passive learning environment is too heavily reliant upon information without experience, and places control for exactly what will be learned in the hands of the teacher. Dewey, Piaget, and others cautioned against this amount of control exhibited in teaching and learning for that exact reason. They believed passive learning inhibits meaningful and lasting construction of new knowledge because it fails to provoke an active response from the student (Dewey, 2015; Piaget, 1964).

Rousseau also acknowledged that complete adherence to either end of the teacher-centered or student-centered spectrum would not be advisable or adequate. Rogers & Frieburg (1994) fleshed out a theoretical continuum that Rousseau, Dewey and Piaget imagined in their writings (Piaget, 1964; Dewey, 2015; Rousseau, 1899). The activities near the top of Table 2.1 below match a teacher-centered classroom environment. Activities towards the bottom of the continuum most closely match the look and feel of a student-centered classroom environment.

Table 2. 1

Instructional Continuum Moving from Teacher-Centered to Student-Centered

Instructional Continuum	
Teacher-Centered	
Lecture	Teacher takes an active role and presents information to the entire class while the students' main role is to listen to the new information being provided
Recitation	The classroom interaction follows the specific pattern of teacher initiates a question, student responds and teacher evaluates the response
Drill and Practice	The teacher provides a series of independent tasks to reinforce a concept
Demonstration	The teacher helps the child's learning by showing him or her how to use materials and special tools, or how to accomplish a particular task
Discussion	Conversation designed to stimulate students to respond divergently and at higher cognitive levels to what they have been learning.
Cooperative Group	Small group work that features positive interdependence, individual accountability and collaboration skills
Guided Discovery	The teacher structures an experience or problem for students and provides a series of steps for students to follow to discover the principle, rule or generalization
Contracts	The teacher and student form a written agreement about what work will be completed and when
Role Play	Students act out real life dilemmas or decisions to solve problems
Projects	An investigation is undertaken by a student or group of students to learn more about a topic
Inquiry	An instructional strategy where the teaching begins with questions and relies on them heavily thereafter as ways to stimulate student exploration, discovery and critical thinking about subject matter
Self–assessment	The student has responsibility for evaluating his or her own work as a means of learning Student-Centered
Student-centered	

(Adapted from Rogers & Frieburg, 1994, p. 190)

If this continuum represents many of the different environmental possibilities to teachers, then where is the appropriate level for each class at any given moment in a learning process? Ideally, the teacher should prepare an environment for experiences where there is a balance of guidance and structure present to elicit optimal construction of new knowledge and active experiences at each stage of a unit. Piaget noted that emphasis should be placed on students actively responding to stimuli in the educational environment (Piaget, 1964). Just like Piaget,

Rousseau and Dewey also believed that educators should implement student-centered approaches (bottom half of continuum) as much as possible, to optimally facilitate new learning (Dewey, 2015; Page, 1990; Piaget, 1964; Rousseau, 1899). Although they used different terminology, Rousseau, Dewey, and Piaget were all in agreement that a student-centered approach is one in which the teacher carefully prepares a learning environment with a problem to be solved sequentially in such a way that allows students to do their own learning and think critically as an individual, and in a group of peers (Dewey, 2015; Page, 1990; Piaget, 1964; Rousseau, 1899).

Careful guidance by the teacher throughout students' learning processes helps them sequence their learning and elicits optimum levels of motivation so students can maintain their roles as active learners. Vygotsky's Zone of Proximal Development described this balance between guidance and complete learning autonomy in the learning process. Through the lens of student-centered instruction, the Zone of Proximal Development for each child is the area in which the optimal level of challenge is presented in a problem-solving situation to gain and sustain each student's focus on the problem at hand. The optimal level of challenge for each student is the point at which enough new information is explored to peak the child's interest, but not so much new information that it overwhelms the student's working memory (Verenikina, 2003; Vygotsky, 1978; Wiggins, 2001). Vygotsky described the process of "scaffolding" as information presented in a way that helps guide students sequentially to gain more and more independence in their learning processes. Teaching within students' Zone of Proximal Development keeps them engaged and motivates an active response in students, leading to a lasting change in schema (Piaget, 1964; Vygotsky, 1978). Scaffolding cannot occur as intended by Vygotsky in a passive learning environment, because as teachers allow students more

independence in their learning processes, students must make more and more decisions. Ideally, problems presented to students should unfold in a sequenced manner that allows students to use their existing knowledge to solve each portion of a larger task. As their schema develops in the solving of a larger problem, students ideally will gain the knowledge necessary to continue in their pursuits (Dewey, 2015; Piaget, 1964; Page, 1990; Verenikina, 2003; Wiggins, 2001).

The idea of student-centered instruction is a topic of note in all levels of education, including higher education settings. One widely discussed method for student-centered instructional approaches is the Problem Based Learning Method (PBL). Wiggins (2001) argued that units of instruction must present problems for students to solve for deep learning to occur. Because student-centered learning requires students to solve problems with some level of independence, student-centered approaches change the role of the teacher from a disciplinarian and authority figure to a manager and facilitator (Dewey, 2015; Garrett, 2013; Page, 1990; Ribeiro, 2011 Wiggins, 2001). In existing studies, this change in relationship where the teacher became more of a facilitator than authoritarian was scary for teachers (Garrett, 2013; Gelisli, 2009; Ribeiro, 2011). But teacher reluctance to implement student-centered methods dissipated once they were implemented. Ribeiro (2011) documented one teacher's thoughts about executing the problem-based learning model throughout one semester in four engineering classes at a university. The content of the case study was based upon both the observations of the teacher and the observer upon implementing PBL. For the study, there were a total of 13 classes participating in 50-minute PBL segments. Students in small groups (4-5) were presented with a problem. They had to identify the problem, the source or cause of the problem, and come up with possible solutions. During the beginning of each subsequent class, groups presented and defended their

proposed solutions in front of the class, followed by teacher feedback. According to the professor, PBL aligned with what should be the goal/vision of the university for student learning outcomes. The professor noted that he and the students obtained more enjoyment using the PBL method than with a traditional lecture-based class. The professor also reported that students were more engaged, and that each class was excited to learn because the entire class wasn't scripted from beginning to end as a lecture would be (Ribeiro, 2011).

Although there were many advantages to the PBL method, the professor was also quick to point out that it was quite unpredictable. The unpredictable nature of PBL may be a bit unsettling for teachers implementing the method for the first time. For instance, topics strayed from the material the professor might have covered during a lecture and students brought up subject matter that was less familiar to the professor. In contrast, during a lecture-based lesson, most professors can be reasonably certain that they know almost all available information pertaining to the slides they present to a class. Ribeiro (2011) also noted that PBL's unpredictability may be a major reason why professors are hesitant to adopt this style of teaching and learning. According to him, teachers may be afraid they will not be able to cover the syllabus exactly as it was written, or afraid of being put in a position where they must admit to their students that they don't know something. In addition, the instructor noted that conducting class in the style of PBL was more time intensive on the part of the professor because it required more specific feedback (Ribeiro, 2011).

Quinlan (2003) also examined the effects of PBL implementation through a synthesis of existing research to see if it affected faculty learning in their content area. Similar to the thoughts expressed in Ribeiro (2011), Quinlan acknowledged that the time required to engage in teaching

PBL was sometimes perceived to be at odds with requirements of research and scholarly writing needed to secure promotion and tenure. Quinlan (2003), however, suggested that perhaps faculty could accomplish both at the same time. Smith (2018) also noted how much work professors put into redesigning their classes to facilitate PBL and small group learning. The extra work, however, seems to be worth the effort. Smith (2018) described how professors noted the success of small group and problem-based activities, and completely redesigned their courses to effectively turn their large classes into many small groups. Vernon (1995) also noted that despite concerns about the time restructuring courses may take, faculty favored PBL over a traditional lecture style of teaching. Quinlan (2003) also acknowledged that faculty learn new information about their content area because with PBL, students made some of their own decisions that resulted in incidental learning outside of the intended curriculum. Quinlan (2003) acknowledged that PBL learning methods, regardless of content area, encourage knowledge construction in ways not previously thought of by professors.

Gelisli (2009) conducted a study to explore the effectiveness of student-centered instructional methods versus those from teacher-centered methods. The participants consisted of 30 students in a control group and 30 students in an experimental group in a pre-test, post-test design on furniture decorating and machine teaching. There was a significant difference found between control and experimental groups in test scores between the pre-test and post-test phases, indicating that both methods of teaching resulted in an increased knowledge in the area of instruction. It is important to note that there was also a significant difference between the post-test scores of students in the student-centered experimental group and the teacher-centered control group, indicating that student-centered instructional approaches were more effective than

the teacher-centered approaches. However, students were learning in two different subject areas between the experimental and control groups which introduces the possibility of an internal validity problem to the study (Gelisli, 2009).

Another example, is a case study conducted by Gundala et al. (2018) in which graduate level marketing students in two different courses participated in experiential learning projects. Students enrolled in the Customer Centric Innovation course and the New Product Development course were broken up into small groups and asked to create a new product or service using the guidelines outlined in their course texts. At the end of the semester each group pitched their product ideas to potential clients, who could then decide whether to use the idea to launch a new product. The next semester, students from both classes were combined into a single class called Contemporary Issues In International Marketing. The same student groups were then required to create a marketing plan to launch their product ideas from the previous semester to the market area where that product was most likely to succeed.

Throughout the process, students received feedback on their projects from peers, their professor, and the potential clients. After the projects were complete, students were asked to participate in a perceptions survey about the experience of working on real-world product development and marketing. Out of 86 project participants, 33 students completed the Likert survey. This Likert survey contained four main sections of questions:

1. Student Motivation to Learn
2. Project as Learning Device
3. Skills and Personal Benefits
4. Overall ‘Real Company Project’ Assessment

Results indicated most students thought the projects improved their engagement, made discussions more enjoyable, and thought the projects were worth the effort and time they took to complete. Results also indicated students agreed or strongly agreed that real-life projects were a useful method for learning. Students were also largely in agreement the projects helped them develop teamwork skills. Results also indicated students agreed or strongly agreed the projects in Gundala et al. (2018) should continue to be requirements in coursework for those classes. Students valued real world projects in their graduate coursework.

Parsons (2009) compared how undergraduate students perceived group projects when they involved work for real clients versus projects that involved a hypothetical situation. Participants in the study were 293 sophomores through seniors from two liberal arts colleges. Like Gundala et al. (2018), projects included a Strengths, Opportunities, Weaknesses and Threats (SWOT) analysis. They similarly included a marketing research plan, and results and conclusions. The design of this questionnaire contained similar question groups those in Gundala et al. (2018). These main headings were:

1. Student Motivation to Learn
2. Project as Learning Device
3. Project Contribution to Marketing and Marketing Research Knowledge
4. Skills and Personal Benefits

Student perception ratings were similar between the two different projects in regard to the topic: project as learning device. Students felt both types of projects contributed to their marketing and research skills. Responses also indicated project-based instruction motivated students to learn more than other methods of instruction such as lecture-based. Surprisingly,

students felt even more motivated with theoretical projects than with the real ones. Students' high ratings indicated projects increased their teamwork, report preparation, and interpersonal skills in both the theoretical group (M = 3.8) and the client-based group (M = 3.6). High means for both the theoretical and the client-based group reaffirmed prior studies indicating project-based small group instruction was beneficial to student engagement, motivation, teamwork skills, and perceived learning. Although there were many positive outcomes in the experiment conducted in Parsons (2009), some of the same drawbacks occurred that were present in other research. These projects proved time-consuming for the professor to facilitate and required vigilance between the student groups and the clients.

O'Hara & Shaffer (1995) studied student perceptions of experiential learning projects that included the interaction of students in a selling class with the students in a purchasing class. The participants for this project included 36 mostly Junior and Senior marketing majors. Each seller had the opportunity to create a proposal for two different prospective buyers. Similarly, each buyer had the opportunity to meet with two prospective sellers. Prior to meetings, sellers made a sales pitch report about their product/service and buyers made a report about their needs as a potential client. At the end of the semester, students in both classes were given a Likert questionnaire regarding their experiences. Students in both classes believed the effort was worthwhile. They perceived they had a better understanding of buying and selling after these experiences. Students were also in agreement their primary encounters and follow-up encounters were realistic representations of the real world, and feedback they received between the first and second encounters was valuable in helping them prepare for a second meeting. Though students were less confident about their buying and selling abilities and the value of these projects at the

beginning of the semester, by the end of the semester most students strongly agreed the experiences were worthwhile and their buying or selling skills improved.

There is very limited research in student-centered learning. What little research does exist indicates student-centered learning helps students construct knowledge in a meaningful and long-lasting way and helps teachers increase their own knowledge about their subject area of expertise. More empirical data is needed to determine exactly how methods such as PBL can help students (and teachers) think critically and solve problems (Gelisli, 2011; Quinlan, 2003; Ribeiro, 2011; Smith, 2018; Vernon 1995). While these few studies indicate teachers are in favor of student-centered processes once they implement them, more research is needed to determine why teachers are so reluctant to implement student-centered strategies such as PBL, and what could be done to alleviate these apprehensions (Gelisli, 2011; Quinlan, 2003; Smith, 2018; Vernon 1995). Admittedly, one major issue at the collegiate level is that some instructors have had little or no background in teaching prior to entering the profession, and tenure requirements often seem at odds with the time intensity required for implementing student-centered instruction (Gelisli, 2011; Quinlan, 2003; Ribeiro, 2011; Smith, 2018; Vernon 1995). More research about student-centered learning projects is needed to glean information about both teacher and student perspectives in different disciplines. To change this narrative, perhaps more student-centered instructional training could be implemented for both professors and pre-service teachers.

The previous studies clearly support the notion presented by theorists that student-centered instructional methods such as PBL or other active learning instructional strategies help students to create new schema and make lasting connections within the existing schema in their brains. Petress (2008) pointed out that active learners readily connect prior knowledge (existing

schema) to newly learned information or new situations (transfer). Active learners tend to be enthusiastic about their learning. In addition, active learners are not overly reliant upon teachers for everything, but rather become partners in the learning process. The teacher of an active learner must act as a more experienced peer. They should serve as a resource for new ideas and answers to questions the student might have in their search for the solution to a problem (Petress, 2008). Regardless of the difficulties presented to teachers in creating an active learning environment, such an environment is important to implement because it can give students deep and meaningful learning experiences (Dewey; 2015; Garrett, 2013; Gelisli, 2011; Gundala et al., 2018; O'Hara & Shaffer, 1995; Page, 1990; Parsons, 2009; Quinlan, 2003; Ribeiro, 2011; Smith, 2018; Vernon, 1995; Wiggins, 2001).

Student-Centered Learning in Instrumental Music

While there is some research and scholarly writing on the topic of student-centered learning in other disciplines in education, there is even less scholarly information available in the area of music education. A search of music education sources yielded no empirical studies of student-centered learning in music education, and only a few pedagogues who have written about student-centered learning in music anecdotally.

Although he did use the term student-centered learning, Edwin Gordon wrote extensively about music learning and developed Music Learning Theory (Gordon, 2012). Gordon (2012) cautioned against a traditional instrumental music learning environment in which students can play music but do not comprehend aurally what they or their peers are playing on any level. In addition to rejecting a passive music learning environment, he asserted that informal guidance is critical to the learning process, because it facilitates exposure to experiences that cause incidental

learning to occur. According to Gordon, informal learning is a process that does not have a specifically planned direction. Informal learning may take place without the presence of a helper or teacher, but informal guidance takes place when a parent or other leader is present to guide learning. The role the more experienced guide plays during informal guidance is like the expectations of a teacher as guide in a student-centered learning environment. While Gordon may not have used the word student-centered in his descriptions, the keywords used to describe student-centered learning environments are pervasive throughout his descriptions of an ideal learning process in MLT, especially as it pertains to teaching young children (Gordon, 2012).

In agreement with Gordon (2012), who noted a need for music learning on a deeper level, Green (2016) noted there needs to be a shift away from the way music is taught and consumed in the secondary instrumental music classroom. Green described the problems in a traditional learning environment in music that philosophers such as Rousseau, Dewey, and others, cautioned against (Dewey, 2015; Gordon, 2012; Green, 2016; Page, 1990; Rousseau, 1899). Additionally, Green (2016) noted not all students are suited for learning in the curricular environment in which music teachers currently function: a curriculum that is largely notation-based. Green (2016) had similar thoughts to Rousseau's and Dewey's philosophy that curriculum should not be completely controlled by the teacher (Dewey, 2015; Page, 1990; Rousseau, 1899). Just like studies in other disciplines, Green presented the need for more peer-directed small group work and creativity (Garrett, 2013; Gelisli, 2011; Green, 2016; Green et al., 2017; Gundala et al., 2018; O'Hara & Shaffer, 1995; Parsons, 2009; Quinlan, 2003; Ribeiro, 2011; Smith, 2018; Vernon, 1995).

But what exactly does an ideal active learning environment look like? Green argued that teachers could glean a good understanding of what active music learning environments look like from informal music settings such as a folk music session or a band setting (Green, 2016; Green et al., 2017). These small groups tend not to have a single teacher but a group of peers learning together. Small groups such as those of a jam session also usually have players with different skill levels. For instance, a session may have a few experienced players participating at a higher level than the beginners. Green (2016) & Green et al. (2017) asserted these settings are particularly conducive to learning that is not traditionally thought to take place in a formal music education environment. For example, in a band or jam session setting learners may be creating/composing new riffs, arrangements, or compositions. In these settings, Green noted the creation process is most often a collaborative effort that is molded by the input of each player in a group or session (Green, 2016; Green et al., 2017).

Green (2016) also argued that motivation is different for learning within small group, informal settings than it is for formal music instruction in schools. When students begin formal music instruction in the school, unnatural motivators to learn may be presented such as tests and quizzes, performances, projects, and consequences for not meeting a specific deadline for an assignment chosen by the teacher. In most informal music learning opportunities, there is no due date for projects unless there is a performance in which the musician chooses to participate. The curriculum consists of the material the musicians in a group want to learn, and musicians' practice is based on the need to learn the material they or their group have chosen to perfect (Green, 2016; Green et al., 2017).

In addition to differences in motivation, O'Neill (2014) spoke about the increased engagement and excitement towards music learning that occurred in an informal, student-centered environment. Engagement in an educational sense includes a range of problem-solving actions/activities that students do in the process of constructing new knowledge. Meaningful engagement in an activity is in essence, active learning. O'Neill (2014) argued that informal learning also allows students to fill in gaps in their knowledge that the teacher or student might not have noticed in a teacher-centered learning environment.

Though there is no empirical evidence of the effectiveness of student-centered learning in music, Green (2016) and Petress (2008) discussed the need for more engaging, immersive, student-centered experiences in music curriculums. Green (2016) suggested that while there is evidence that the repertoire in formal secondary music instruction settings has expanded and become more eclectic, music teachers are largely teaching this content in the same way they always have (teacher-centered methods from the podium), rather than adapting their teaching methods to match the musical genre they are teaching (Green, 2016). If a teacher simply teaches students to play the notes and rhythms of a piece of music, it doesn't matter what type of music is being taught: the learning that will take place will be low level and passive (Gordon, 2012; Petress, 2008).

Wiggins (2001) noted that for students to be engaged in active learning, they must be making decisions throughout their learning processes. Green (2016) & Green et al. (2017) argued that autonomy (making decisions throughout the learning process) on the part of the learner is key to the creative process. In a strictly passive music learning environment, the role of the teacher and their autonomy over the class does not change much. In an active learning music

environment, however, the teacher may retain slightly more autonomy at the beginning stages of a musical process and release autonomy over time as students become more and more comfortable with their knowledge base. The idea that levels of autonomy should be fluid to optimize instructional sequencing matches the intentions of Vygotsky in his writings about scaffolding and the Zone of Proximal Development (Verenikina, 2003; Vygotsky, 1978; Wiggins, 2001). According to Wiggins (2001), the teacher must act as a more experienced guide at the beginning stages of introducing a new music problem/concept and then slowly pare down their role as an active guide to become more of a resource available throughout the problem-solving process. Within this relationship, students must be the ones solving musical problems, as Dewey and Gordon would agree (Dewey, 2015; Gordon, 2012; Green, 2016, Page, 1990; Wiggins, 2001).

Although there are no empirical studies on student-centered learning in music, there are several anecdotal articles supporting the scholarly writings of Gordon, Green, Dewey, Rousseau, Piaget, and others. For example, Blair (2009) described student-centered instruction in the music classroom through descriptions of what a student-centered lesson/unit should look like to an observer. According to Blair (2009), Dewey (2015), & Page (1990), student-centered classrooms require students to be creative and solve musical problems through a process of informed doing. Blair (2009) argued that a teacher should not be the person that makes all the musical decisions, but rather a facilitator of students who go through a process in which they make decisions to create a unique musical product.

Schwartz (2019) also described her approach to student-centered learning through anecdotes and an explanation of teaching strategies that facilitated student ownership of music

learning in her band classroom. Schwartz began a typical unit by facilitating a student-led repertoire selection process. Schwartz acknowledged that after the selection process, she carefully studied the music chosen by her students before leading them in creating an arrangement. Schwartz then created sheets with several options and students were asked to decide what chord progressions they would like to use for the arrangement. If a progression ended up being too difficult, Schwartz modified or split parts to make them developmentally appropriate for students. Once a song was chosen, students chose which part to sing or which instrument to play. In Schwartz's classroom, peer modeling and peer teaching in small groups was heavily emphasized. Schwartz's students had to make decisions and solve real musical problems starting with repertoire selection and going all the way to the concert.

Scott (2006) offered another example of a student-centered approach to instruction by observing the work of Mr. Cruthers, an elementary music teacher with a reputation for student-centered instruction. Scott (2006) described how Mr. Cruthers guided his students through the process of creating musical accompaniments to the tune "Enchanted River." Mr. Cruthers guided his students through the process of creation by offering suggestions and asking students to explain their reasoning for making one musical decision over another. In some cases, he offered insight from the perspective of what an experienced musician might do in a specific composing situation. Scott (2006) acknowledged that while teaching can never be a completely democratic process, Mr. Cruthers' approach in this situation encouraged students to engage in deep thought, be creative, and reflect upon their musical choices to refine their accompaniments. Mr. Cruthers' approach utilized social constructivism, a term most associated with Vygotsky, which includes a student-centered approach to teaching in which the learners share ownership and responsibility

for their learning (Scott, 2006). Scott (2006) warned against a shallow approach to constructivist teaching methods. When applied well, implementation of social constructivism "provides students with opportunities to link new learning with previous understandings and to interpret this new knowledge through experience" (Scott, 2006, p.1). Therefore, in order to properly apply social constructivism to a classroom setting, a music teacher must utilize some form of student-centered instruction. The anecdote of Mr. Cruthers in Scott (2006) provided a story similar to the anecdotes of Schwartz (2019) & Blair (2009).

In summary, while teacher-centered instruction allows students to participate in doing music, the teacher makes almost all the decisions about how music should be played and what arrangement will be performed. In contrast, when students participate in student-centered music learning processes, they slowly gain independence and improve their ability to solve musical problems over time. Informal learning and guidance are critical to language acquisition, music development, and other abilities in young children (Gordon, 2012). The natural motivations for learning music in an informal setting allow the music development process to occur as a result of personality, interests, and organic social interactions (Davies, 2008; Gordon, 2012; Green, 2016; Green et al., 2017). Additionally, emulating informal music learning that occurs in popular and folk music settings may be a valuable tool for teaching skills that are often overlooked by music educators (Gordon, 2012; Green, 2016; Green et al., 2017). Finally, participating in student-centered music experiences fosters a deeper understanding of any musical concept or skill used by students in the creation process. The parameters for student-centered musical problems must be carefully constructed by the instructor who should seek to give students the appropriate amount of guidance in their learning efforts. Through the experience of learning about music in a

student-centered environment, students will learn concepts they can successfully transfer to future musical experiences (Wiggins, 2001).

Rationale for the Study

Although there are a few empirical studies about student centered instruction for disciplines other than music, there are very few that address the perspective of the student (Gelisli, 2009; Ribeiro, 2011). More research is needed to support current findings that indicate student-centered instruction methods help students create deeper, more meaningful connections in the learning process (Garrett, 2013; Gelisli, 2011; Green, 2016; Green et al., 2017; Gundala et al., 2018; O'Hara & Shaffer, 1995; Parsons, 2009; Quinlan, 2003; Ribeiro, 2011; Smith, 2018; Vernon, 1995; Wiggins, 2001).

Furthermore, I was unable to find any published experiments on student-centered learning in music education. This area of research has only been discussed in informal anecdotal form (Blair, 2019; Green, 2016; Green et al., 2017; O'Neill, 2014; Scott, 2006; Schwartz, 2019). A systematic investigation is needed to collect both student perspectives and teacher perspectives on student-centered approaches to learning music.

To fill this gap in the research, I designed a study with these two questions in mind:

1. How do students and teachers perceive their environment during student-centered lessons vs. teacher-centered lessons?
2. How do students and teachers perceive student learning in student-centered lessons vs. teacher-centered lessons?

CHAPTER 3: METHOD

Overview

There is much uncertainty regarding how students perceive student-centered projects in music. In order to provide some valuable data in this area, I designed a project that asked students to create an arrangement and provide feedback on several data instruments I developed. The study design laid out in this chapter compares perceptions of a student-centered set of lessons versus those of a teacher-centered set of lessons. This data was analyzed for means and emerging categories to identify overarching trends and figure out how students perceived the instructional environment and their learning in the two different interventions. The perceptions of the teacher were also analyzed.

Participants

The participants ($N = 98$) consisted of two different intact classes of orchestra students at a highly regarded high school orchestra program in the Southeastern United States. These two classes were selected because the students had similar experience levels. Data was collected during the Spring of 2021 and pandemic protocols were still in place in the school system, including hybrid models of in-person and zoom classes. Therefore, it was difficult to obtain responses from all participants for any of the data collected, including demographic data. I received a total of 87 out of 98 (88.78%) demographic responses. The average age of all respondents was $M = 16.85$ years, $SD = 0.843$. Participants consisted of 46 students in Class I and 52 students in Class II.

Out of 46 participants in Class I, 42 responded to the demographic questionnaire. The 42 participants that responded in Class I were an average age of 16.55 years (*SD* = 0.832) at the time of the study. Out of participants who responded in Class I there were 30 female participants, 11 male participants, and one who preferred not to reveal their gender. The participants who responded in Class I reported an average of 6.38 years (*SD* = 1.41) of playing experience. Class I had 10 out of 42 participants (23.81%) who reported having private lesson experience, and 25 out of 42 participants (59.52%) who reported having music experiences outside of their regular class time. Class I also had 11 out of 42 participants (26.19%) who auditioned for All-State or other honors groups, and 7 out of 42 participants (16.67%) who had been accepted to All-State or other honors groups.

Class II participants were a little bit older and had a bit more experience than Class I participants. Out of 52 participants in Class II, 45 students responded to the demographic questionnaire. The 45 participants who responded in Class II were an average age of 17.13 years, (*SD* = 0.757) at the time of the study. Out of participants who responded in Class II there were 25 female participants and 20 male participants. The participants who responded in Class II reported an average of 6.93 years (*SD* = 1.18) of playing experience. Class II had 15 out of 45 participants (33.33%) who reported having private lesson experience, and 31 out of 45 participants (68.89%) who reported having music experiences outside of their regular class time. Class II also had 17 out of 45 participants (37.78%) who had auditioned for All-State or other honors groups, and 11 out of 45 participants (24.44%) had been accepted to All-State or other honors groups.

The study occurred in the Spring of 2021 during the height of the COVID-19 pandemic. During the time of the study, different participants were present for in-person learning on any given day. Remaining students were either present virtually or were simply not present. An average of 21.5 (*SD* = 1.87) out of 46 participants (46.74%) from Class I were present for in-person learning on any given lesson during the teacher-centered portion of the unit. Similarly, an average of 21.33 (*SD* = 2.42) out of 46 participants (46.38%) from Class I were present for in-person learning on any given lesson during the student-centered portion of the unit. There was a slightly lower proportion of Class II students present for in-person learning during both portions of the unit. An average of 18.6 (*SD* = 1.52) out of 52 participants (35.77%) from Class II were present for in-person learning on any given lesson during the teacher-centered portion of the unit. Similarly, an average of 18.4 (*SD* = 2.30) out of 52 participants (35.38%) from Class II were present for in-person learning on any given lesson during the student-centered portion of the unit. Keep in mind that while in-person attendance numbers were consistent, the teacher acknowledged that different students were present for in-person learning on any given day during the study.

Prior to the experiment, an IRB process was conducted with both the school district where the study took place and with The University of Georgia (Appendices M and N). Because IRB requirements were more stringent in the height of the COVID-19 pandemic, participant responses could not be traced to individual participant IDs, making it impossible to link participant data between the different data instruments described below. The participants could only be analyzed by the groups in which they were collected (Class I vs. Class II, Lesson I vs. Lesson II, and student-centered vs. teacher-centered).

Design

I designed lessons based upon the guiding principles outlined in the related literature section for student-centered lessons and teacher-centered lessons (Dewey; 2015; Green, 2016; Green et al., 2017 Page, 1990; Piaget; 1964; Rousseau, 1899; Schwartz, 2019; Scott, 2006; Vygotsky, 1978; Verenikina, 2003; Wiggins, 2001). Undoubtedly, my 17 years of experience playing fiddle tunes and 13 years of experience with teaching aided in the formation of the plans for this study. Lessons were taught to all students in both classes as part of their regular instruction. Because I had no contact with students and data was de-identified by their teacher prior to being sent to me, student permission was obtained by their teacher. Students were informed that participation or non-participation in the data analysis would not affect their orchestra grades in any way or cause other penalty.

The teacher who implemented this study was chosen for his expertise. He is nationally known for teaching musical concepts over repertoire content and fostering self-sufficient musicians in his orchestra program. Students in his program learn a variety of music and can play in a variety of settings: classical, fiddle, jazz etc... They have also been exposed to a variety of learning settings, including both large group and small group settings. To control for the consistency of the student-centered versus teacher-centered sessions and maintain a marked difference between the two methods, expectations for each environment were set with the instructor before the start of the experiment (Appendix A).

Each class completed an arrangement using teacher-centered methods, and an arrangement using student-centered methods. Each class participated in seven 45-minute sessions for the student-centered portion, in which the students were asked to create and perform

their own arrangement of a fiddle tune. Each group also participated in seven 45-minute sessions for the teacher-centered portion, in which the teacher taught a teacher-created arrangement of a different fiddle tune. The lesson plans given to the teacher included 8 lessons, but both the student-centered and teacher-centered portions of the unit were completed in 7 sessions. See Appendices K and L for a detailed description of how students progressed through the lessons.

The tunes selected for the study were of roughly the same length, speed, and difficulty. "Goodbye Liza Jane" was used to teach student-centered lessons and "Cindy Cindy" was used for teacher-centered lessons. The same teacher facilitated both the teacher-centered and student-centered treatments for both groups to eliminate reliability issues caused by using two different instructors. The original design of the study had the teacher beginning with the same tune (different method for each class) to control for using two different tunes for the study and any effects based on order. Due to the difficulties of teaching during a COVID year, the teacher had to teach both Class I and Class II the same tune (Cindy-Cindy) for the teacher-centered lessons. Likewise, "Goodbye Liza Jane" was used in both Class I and Class II for the student-centered lessons, but the order in which they learned each tune was different.

Class I started with a teacher-centered unit on "Cindy Cindy" followed by a student-centered unit on "Goodbye Liza Jane." Class II started with a student-centered unit on "Goodbye Liza Jane" followed by a teacher-centered unit on "Cindy Cindy." The student-centered lessons were originally planned in small groups. However, due to the problems with rotating attendance, hybrid online learning, and the required set seating arrangement for contact tracing during the pandemic protocols, the student-centered lessons using the tune, "Goodbye Liza Jane" were taught using a large group setting just like teacher-centered lessons with the tune "Cindy Cindy."

Lesson Plan Overview

The main objective for both the student-centered and teacher-centered lessons was to prepare an arrangement of the fiddle tune to be recorded within two instructional weeks. The student-centered (SC) lesson asked students to create and perform an arrangement with guidance from the teacher, avoiding direct instruction as much as possible. Students were encouraged to make as many decisions as possible about the arrangement they would form. In the teacher-centered (TC) lessons, students learned an arrangement of a tune through direct instruction by the teacher by ear. Students in the TC group were not included in the decision-making process for how the tune would be arranged. Table 3.1 is an overview of the lesson plans. Although lesson plans given to the teacher included eight lessons, groups were able to finish each portion of the unit in seven lessons (Appendices K and L). Additionally, it is important to note that the original design of this study Class I was supposed to experience student-centered lessons with "Goodbye Liza Jane" and teacher-centered lessons with "Cindy Cindy." Class II would have experienced teacher-centered lessons with "Goodbye Liza Jane" and student-centered lessons with "Cindy Cindy." During the implementation of the study however, "Goodbye Liza Jane" was the student-centered tune for both classes and "Cindy Cindy" was the teacher-centered tune for both classes. For additional material to the lesson plans below, see Appendices A, B, C, D, E, F, G, and H to view all the supplemental information shared with the teacher.

Table 3.1

Lesson Plans for Student-Centered and Teacher-Centered Lessons

Student-Centered Lessons	Teacher-Centered Lessons
Main Objective: Students will create their own arrangements of "Goodbye Liza Jane"	**Main Objective**: Students will learn an arrangement made by the teacher for "Cindy Cindy"
Lesson 1 *Goal:* Students will agree upon a melody to use for their upcoming project. *Opening:* Teacher will introduce the overall goal of the project and the lesson 1 goal. Laptops/devices will be handed out (as many as are available). Possible resources will be suggested. *Work Session:* The students will look for different versions of the melody and agree upon one or several versions to mold together for use in their project *Closing:* Students will explain why they chose the version that they chose for the project.	**Lesson 1** *Goal:* Students will learn the melody of the tune from the instructor *Opening:* The teacher will play the tune for the students. *Work Session:* The teacher will teach students their version of the melody. *Closing:* The teacher will review the melody with students.
Lesson 2 *Goal:* Students will agree upon a bassline (chord structure) for their arrangement and research possible harmonies to use. *Opening:* The teacher will introduce a list of materials that will aid students in finding/creating an underlying chord structure to go with their tune. This may include a discussion about chords depending upon the student's prior knowledge level. *Work Session:* Students will learn more about chord structures. Then students should divvy up the task amongst group members to figure out the chords of the A section and B section.	**Lesson 2** *Goal:* Students will learn the chords of the tune from the instructor. *Opening:* The teacher will explain what a chord is (simple tertiary). *Work Session:* The teacher will present a melody of the tune with the chords again and explain how the chords are along with a melody can be used to figure out a harmony. *Closing:* The teacher will ask students to recall information about chords from the lesson.

Chords will then be used to come up with a bassline for the A and B sections of the tune. If they finish this task, they can research how to use a melody and bassline to come up with a harmony. *Closing:* Sharing of materials for continuation	
Lesson 3 *Goal:* Students will find/create a harmony to go along with the chosen melody and chord structure. *Opening:* Students will be tasked with finding basic explanations of what a chord is (basic tertiary) and how to write a harmony based upon chord structure. *Work Session:* Students may split up tasks if they wish. One group could create harmonies for the A section and the other could create a basic harmony for the B section. The teacher will be available offer advice as students work and present challenging questions when they observe possible mistakes. Students will engage with each other and the teacher as needed during this process. *Closing:* Students will check over the work they completed on harmonies.	**Lesson 3** *Goal:* Students will learn how a simple harmony is created given the melody and accompanying chords they learned from the instructor. *Opening:* The teacher will demonstrate how a melody and chord structure can be used to create harmonies for an arrangement/composition. *Work Session:* The teacher will teach students the harmony and explain how it fits the contour of the melody and adheres to the given chord structure. *Closing:* The teacher will ask questions that check to see if students can recall information about harmonies against melodies/chord structures.
Lesson 4 *Goal:* Students will continue the work from Lesson 3 and verify the harmony against the melody and chord structure. *Opening:* Break up into groups again. *Work Session:* Continue checking the work of the previous session. Once finished, put the harmony, melody, and chord structure together by whatever means the group decides. This does not necessarily have to be written out in the traditional format of	**Lesson 4** *Goal:* Students will learn the specific harmonies the instructor wants to use for the fiddle arrangement and how they will be put together. *Opening:* The teacher will review how chords and a melody may be used to create a harmony. *Work Session:* As he teaches the harmony, the teacher will show students how each note in

notation that one would expect from an orchestral arrangement. Students may decide what role written notation does or doesn't play in their arrangement. *Closing:* The class makes final revisions of the harmony and chord structure against the melody. The teacher may also check student work and guide students towards a correct answer if they have any remaining mistakes.	the melody and harmony fit into the scheme of chords for the given arrangement. *Closing:* The teacher will ask questions about how the harmony fits with a melody and chord structure that check for student recall of the information presented
Lesson 5 *Goal:* Students will learn about the arrangement writing process (note this begins to blend with the subsequent lessons and some objectives may be accomplished simultaneously from this point forward especially) *Opening:* Teacher will ask students what they think is next in the process of arrangement creation. If students need help finding material on arrangement creation, the teacher may provide some resources or help them find some good resources. *Work Session:* Students will begin researching structure, and arrangement creation. They will share information with each other as they learn about the process. This interaction will be moderated by group members and guided by the teacher if and when intervention is necessary. If students are stuck on something they cannot figure out, the teacher can be available as a guide to keep the process moving and the environment positive. If this goes well then students can decide on a pre-liminary structure for the arrangement. This may take one class or it could take longer (depending on the experience level of students participating)	**Lesson 5** *Goal:* Students will learn about the arrangement writing process as the instructor discusses the decisions he made to create the arrangement he is teaching them. Opening: The teacher will discuss the design of the arrangement and why he designed it the way he did. *Work Session:* The teacher will teach students the structure of the arrangement by having them play through different parts of the tune and talking about how those parts fit together. The teacher will discuss the decisions he made about how he put the arrangement together. *Closing:* The teacher will ask students questions about how the arrangement was put together and the arrangement techniques he used i.e., layering etc.

Closing: Students will present and critique their ideas for a preliminary arrangement.	
Lesson 6 *Goal:* Students will assign tasks and create a working rough draft (no specific notation style) for their arrangement based upon their ideas for an arrangement structure. *Opening:* Based upon best judgement, the teacher may or may not give some remarks at the beginning of the session to help guide the process of arrangement creation. *Work Session:* This should be led by students as much as possible. The teacher will be there to offer suggestions etc. Students can split up the arrangement work within their small groups and present their progress as needed. The amount of involvement of the teacher even as guide may differ depending upon how much help the students need at any given time. *Closing:* Begin to share and collaborate rough draft material of each part of the arrangement between the members of each group.	**Lesson 6** *Goal:* Students will review the arrangement that the instructor created. *Opening:* Teacher will review how parts of the arrangement fit together. *Work Session:* The teacher will make sure students know the design of the arrangement and practice/make refinements to the arrangement with students. *Closing:* The teacher will check for understanding by having students play through the arrangement one part at a time and fixing mistakes.
Lesson 7 *Goal:* Students will begin to share and refine the ideas they worked on with their small groups *Work Session:* Splice and Dice-Ideas may be written or created by ear in any form or fashion. It would be helpful for students to write down which section should play what part. The teacher may offer input or question artistic decisions when gaps in creativity or other issues are noticed with the arrangement. Closing: Students may decide to perform a rough draft of their arrangement.	**Lesson 7** *Goal:* Students will continue rehearsing the arrangement as the instructor directs and make any changes the instructor deems necessary. *Opening:* The teacher will talk about the rehearsal plan. *Work Session:* The teacher will rehearse and fix mistakes made by students through teacher-led drilling. Students will receive feedback and correction on things that need to be fixed in the rehearsal of the arrangement. The teacher may make some final adjustments if the arrangement is a bit too difficult or a bit too easy.

	Closing: The teacher will have students play the whole piece and then give another round of feedback.
Lesson 8 *Goal:* Students will finalize their arrangement to share with the class. *Opening:* The teacher will ask students to review from where they left off with the arrangement presentations in each instrument section. *Work Session:* Students will have a chance to finalize their arrangement and rehearse their parts. This includes making corrections if there are mistakes. It may also include swapping the parts around and trying them with different sections, or whatever else they can think of. As the teacher notices or has ideas for feedback they may question the decisions students have made etc. or challenge their artistic decisions. *Closing:* Students will present a performance of their arrangement of the tune when they feel they are ready.	**Lesson 8** *Goal:* Students will fix any remaining mistakes at the direction of the teacher and get the arrangement ready to perform. *Opening:* Based upon previous rehearsals the teacher will lay out the rehearsal plan for students. *Work Session:* The teacher will prepare students for an in-class performance of the piece by fixing any remaining mistakes and putting final touches on the arrangement if needed. *Closing:* Students will present a performance of the teacher's arrangement of the tune.

Data Collection and Analysis

On the day before the lessons began, demographic information was collected via a google form to both in-person and online learners. The following questionnaire asked basic demographic information as well as student experience levels before entering the study.

1. What is your current grade and age?
2. What is your gender? Male/Female/Other
3. What instrument do you play?
4. How many years of playing experience do you have?
5. Have you taken or are you taking private lessons and for how long?
6. Please list any music experiences outside of this class in the past or present.

I created a Likert survey (Student Reflection) for students to complete after learning each tune. Table 3.2 below contains one of the surveys I used most heavily to create the Student Reflection (Gundala et al., 2018, p.80-81). A complete list of the surveys I used can be found in Appendix J (Gundala et al., 2018, p.80-81; Cunha, 2018, p.146; Parsons, 2009, p.158; O'Hara & Shafer, 1995, p.6). My project design did not exactly match any of the designs of the survey questions in the studies listed above since none of the aforenoted studies compared projects in music. Therefore, the questions in the survey below had to be modified for the Student Reflection to glean information about aspects of the music learning environment, and perceived music learning outcomes.

Table 3.2

Survey Example Used to Form Preliminary Draft of the Student Reflection

Item	M	SD
Student Motivation to Learn		
This project enhanced my engagement with the course content.	4.33	0.96
This project made discussions in class more enjoyable.	4.32	0.90
This project was worth the time spent on it.	4.33	0.92
Project as Learning Device		
This project made the subject matter realistic.	4.56	0.87
This project integrated concepts in the course.	4.40	0.87
This project illustrated concepts in the course.	4.28	0.84
This project will help me remember the material better.	4.48	0.92
Skills and Personal Benefits		
This project helped me develop my teamwork skills.	3.83	0.96
This project helped my report preparation skills.	4.00	0.91
My understanding of how to obtain information from the library and online databases or websites improved.	3.52	1.01
My understanding of how to write a business report of my findings improved.	3.96	0.79
My understanding of how to conduct a SWOT analysis improved.	4.04	1.02
My understanding of how to analyze the overall dynamics in a product category improved.	4.21	0.72
My understanding of how to analyze the competition in a category improved.	4.17	0.87
Overall 'Real Company Project' Assessment		
This project made the overall course more engaging.	4.48	0.87
This project provided me with the confidence and ability to solve the real-world issue.	4.20	1.04
This project was and will enhance my job performance.	3.92	1.12
This project was and will be helpful in my other business courses.	4.20	0.87
I would recommend that this course continues to require this project.	4.40	0.87

(Gundala et al., 2018, p.80-81)

During the review I made a few important discoveries that helped form the basis of my preliminary draft of the Student Reflection shown below in Figure 3.1. I noticed that Gundala et al. (2018) used a similar Likert instrument to Parsons (2009) to analyze student perceptions of student-centered projects administered throughout the course of a semester. The Likert surveys I reviewed also contained similar choices from a 1-5 rating. (strongly agree = 5, agree = 4, neutral/unsure = 3, disagree = 2, strongly disagree = 1).

Figure 3.1

Preliminary Draft of the Student Reflection

Student Motivation to Learn

1. I felt engaged in most lessons during this learning experience
2. I had meaningful discussions with the teacher that helped me learn during this experience
3. I had meaningful discussions with my peers that helped me learn during this experience
4. I enjoyed this learning experience

Project as Learning Device

1. This experience caused me to learn new things
2. This experience helped me learn about the concept of chords
3. This experience helped me learn about harmony
4. This experience helped me learn about music arranging
5. After this experience I feel like I could write a simple arrangement of a song on my own
6. This experience improved my ability to learn melodies by ear

Skills and Personal Benefits

1. This experience helpted me develop my teamwork skills
2. This experience helped me learn how to arrange a piece of music
3. This experience helped me improve my existing skills and learn new ones
4. This experience helped me understand how the different parts of an arrangement fit together

Autonomy

1. I had the freedom to make my own decisions during this learning experience
2. The teacher made most artistic decisions during this learning experience
3. The ideas of my classmates and I were taken into consideration during this experience
4. I contributed ideas during this experience
5. I had to do my own learning during this experience
6. The teacher told us how and what to play during this experience
7. The teacher guided us during this experience
8. The teacher directly taught us everything during this experience

Overall Assessment

1. This experience was engaging overall
2. This experience increased my confidence as a musician
3. This experience caused me to understand how different elements of music are used to form an arrangement
4. This experience will help me to understand other pieces of music better
5. After this experience I want to write/arrange music more than before this experience

After forming the initial draft of the instrument, I made several revisions upon the review Dr. Skip Taylor and Dr. Rebecca Atkins at The University of Georgia. Lastly, I piloted the Student Reflection with students from the Woodward Academy 6th Grade Orchestra classes. Students assessed the instrument and found several mistakes. They were also asked to make comments if any of the questions or vocabulary were confusing or needed to be changed. The feedback from this analysis was very helpful and resulted in a significant improvement in the instrument. See Figure 3.2 below for the final version of the Student Reflection.

Figure 3.2

Final Version of the Student Reflection

Student Reflection

Please select the rating from 1-5 that best represents your agreement or disagreement or how often an event occurred. The five rating options include:

1) Strongly Disagree, 2) Disagree, 3) Neutral, 4) Agree, 5) Strongly Agree
Questions 1* and 21*: 1) Never, 2) Rarely, 3) Some of the time, 4) Most of the time, 5) The whole time

1. I felt engaged while learning this tune*
2. I had helpful discussions with the teacher while learning this tune
3. I had helpful discussions with my peers while learning this tune
4. I enjoyed learning this tune
5. I learned new things about music while learning this tune
6. After learning this tune I know more about chords
7. Learning this tune improved my knowledge about harmony
8. After learning this tune I could create my own arrangement of a tune
9. My ability to learn melodies by ear has improved from learning this tune
10. My ability to work as part of a team improved while learning this tune
11. I learned how to arrange a piece of music while learning this tune
12. I learned new music skills and improved existing ones while learning this tune
13. I was allowed to make decisions about how to play this tune
14. The teacher made the decisions about how to play this tune
15. My classmates contributed ideas to the arrangement of this tune
16. I contributed ideas to the arrangement of this tune
17. I was responsible for learning this tune and learning how to play it
18. The teacher told us exactly how and what to play in the tune we learned
19. The teacher guided our learning and allowed us to choose how and what to play in the tune we learned
20. I learned everything in this arrangement directly from the teacher
21. I felt interested, active, and engaged while learning this tune*
22. My confidence as an independent musician increased over the course of the learning process
23. Learning this tune helped me to understand how to form an arrangement
24. After learning this tune I want to try arranging more music
25. After learning this tune I have enough knowledge to attempt arranging my own tunes in the future

Upon the conclusion of each arrangement, participants in the current study filled out the Student Reflection to rate their engagement, interactions, and enjoyment, during the learning process and rate how much they perceived to have learned in the process, as well as what they learned on specific topics (arranging, chords, melody, and harmony). The final version of the Student Reflection was given to students via a google form online and filled out on either a personal device or a device provided by the school system at the conclusion of each portion of the unit.

The End of Unit reflection was the third and final data instrument given to students the day after the conclusion of both the teacher-centered and student-centered portions of the unit. Students provided written thoughts on a google form about the two different learning experiences by responding to the following open questions in the End of Unit Reflection:

1. Did you enjoy the learning process for one tune over another? Or did you enjoy them both equally? (Goodbye Liza Jane versus Cindy Cindy) Please explain why.
2. Please compare what you learned about how music is put together in Goodbye Liza Jane versus Cindy Cindy. Did you learn more about music arrangements in one over the other? Please provide specific examples.
3. Did you and your classmates make more decisions in learning Goodbye Liza Jane or Cindy Cindy? Please explain any decisions you and or your classmates made while learning each tune.
4. Did you use different strategies to learn Goodbye Liza Jane than Cindy Cindy? I.e., notation, research, etc. Please explain the different strategies you used to learn each tune.

5. Please share any other details you would like to share about the learning process for either song.

The last data I collected was a reflection by the teacher who had kept a short daily journal during lessons. The teacher organized his daily notes and reflection around the following prompts.

Teacher Reflection

1. Please describe how each treatment played out. You may give a list of strengths and weaknesses for each treatment if that helps.
2. Please provide any other details about teaching in these two methods that might be helpful to researchers and colleagues in the music education field.

The data about student learning was analyzed in both the written End of Unit reflections, and the Student Reflections (Likert) to see if there was a difference in the general trend of learning between the student-centered lessons and teacher-centered lessons. The End of Unit Reflections were analyzed using emergent coding. The Student Reflections (Likert) were analyzed statistically through correlations and ANOVAs using the coding software R and SPSS. A comparison of the statistical results, qualitative coding results, and the Teacher Reflection document were compared and contrasted based on perceptions of environmental factors such as enjoyment, engagement, interactions, and levels of autonomy and learning outcomes.

CHAPTER 4: RESULTS

Student Reflection

After learning/creating each arrangement, students completed (anonymously) a Student Reflection using a google form. Both Class I and Class II completed a Student Reflection after their first set of lessons (Lesson I) and then again after their second set of lessons (Lesson II). These Student Reflections were in the form of a Likert survey that consisted of 25 questions. I exported the student answers to an excel spreadsheet and deleted duplicate answers and answers that could not be assigned to a class. After completing this process, a total of 48 responses remained for Class I, Lesson I (TC) and 39 responses remained for Class I, Lesson II (SC). A total of 31 responses remained for Class II, Lesson I (SC), and 35 responses remained for Class II, Lesson II (TC). I translated the answers A, B, C, D, and E in the google form to numerical answers of 1, 2, 3, 4, or 5 respectively for the purpose of data analysis.

After this process was completed, I began to look for trends in the data by question, by class and by lesson. The questions in the Student Reflection were grouped based upon eight larger categories. These categories were chosen based upon similarities between questions and best alignment with student responses from main categories in the End of Unit Reflection (Figure 4.1). For responses in the Student Reflection, I calculated means and standard deviations for all responses to a given category. I also calculated means and standard deviations for each group of questions by class. These categories included, engagement, interactions, enjoyment, specific learning outcomes (SLO), arranging outcomes, autonomy, teacher, and perceived overall

learning (POL). Refer to the Student Reflection in Chapter 3 for the exact questions in Figure 3.2 on page 50.

The categories of questions are listed below with a description for each:

- **Engagement**-These two questions assessed the percieved engagement felt by students during each tune (Q1, Q21).
- **Interactions**-These three questions assesed whether students perceived meaingful interactions with the teacher, and their peers while learning each tune. One of the questions assessed their perceived improvement in the ability to work as a team for each tune. (Q2, Q3, Q10)
- **Enjoyment**-This question assessed whether students enjoyed learning each tune. (Q4)
- **Specific Learning Outcomes**-These six questions assessed students' perceived improvement of existing skills and learning of new skills for each tune. They also assessed perceived learning for specific concepts such as chords, harmony, learning melodies by ear, and arranging for both tunes. (Q5, Q6, Q7, Q9, Q11, Q12)
- **Arranging Outcomes**-These four questions assessed students' perceived understanding, ability, knowledge of, and willingness to try creating an arrangement for both tunes. (Q8, Q23, Q24, Q25)
- **Autonomy**-These five questions assessed perceived autonomy in regards to the individual student, their peers, and the teacher for both tunes. (Q13, Q15, Q16, Q17, Q19)
- **Teacher**-These three questions assessed whether and how much students perceived that they learned directly from the teacher for both tunes. (Q14, Q18, Q20)
- **Perceived Overall Learning**-This one question addressed students' perceptions of whether their confidence as independent musicians increased for both tunes. (Q22)

After completing this step, I consulted with the statistics department at UGA to see if this organization of the data would yield useful comparisons. The initial consultation included me, Dr. Atkins, a graduate student named Tianyi Zhang, a director of the consulting center named Dr. Xianyan Chen, and two more graduate students who were present to observe the statistics consultation. During that meeting we discussed the comparisons we wanted to conduct and checked whether we had proposed the correct tests for the data. After the initial consultation, we had one more consultation to see if there was anything else we could realistically analyze to yield

useful information for the study. To ensure accuracy, Tianyi Zhang ran our tests through statistics software R. I also ran several of the ANOVAS using the statistics software SPSS.

Analysis

Means were calculated from 8 categories of questions listed above for all students, grouped from the original 25 questions in the Student Reflection. These categories of questions include, engagement, interactions, enjoyment, specific learning outcomes, arranging outcomes, autonomy, teacher, and perceived overall learning. See Table 4.1 for the overall means and standard deviations of all students from both Class I, Class II, Lesson I and Lesson II combined.

Table 4.1

Overall Means and Standard Deviations Across 8 Categories of Questions in the Student Reflection

	Mean	SD
Engagement	4	0.701
Interactions	2.36	0.697
Enjoy	1.92	0.799
Specific Learning Outcomes	2.17	0.523
Arranging Outcomes	2.53	0.76
Autonomy	2.4	0.668
Teacher	3.05	1.33
Perceived Overall Learning	2.16	0.884

Notably, students felt a high level of engagement overall regardless of lesson or tune ($M = 4$, $SD = 0.701$). While perceived overall engagement was high, the average response for enjoyment was low ($M = 1.92$, $SD = 0.799$). The high SD in the perceived involvement of the

teacher suggests variance in perception of the role of the teacher from student to student (M = 3.05, SD = 1.33).

To figure out if there were any relationships between the different categories of ratings in the Student Reflection, I ran correlations using the descriptive statistics in Table 4.1. Table 4.2 below contains the correlations across the 8 categories of questions in the student reflection for all respondents on all types of lessons combined.

Table 4.2

Correlations Across 8 Categories of Questions in the Student Reflection for All Responses

	Engage	*Interact*	*Enjoy*	*SLO*	*Arrange*	*Auton.*	*Teacher*	*POL*
Engage	1							
Interact	-.278***	1						
Enjoy	-.634***	.279***	1					
SLO	-.347***	.445***	.387***	1				
Arrange	-.357***	.421***	.301***	.577***	1			
Auton.	-.154	.474***	.054	.208*	.327***	1		
Teacher	-.227**	-.102	.224**	.109	.018	-.420***	1	
POL	-.452***	.360***	.419***	.499***	.475***	-.295***	.145	1

Pearson's r, $*p < .05$, $**p < .01$, $***p < .001$

There was a negative correlation between engagement and the other groups of questions in the Student Reflection. The strongest negative correlation occurred between engagement and enjoyment, whereas when perceived engagement was higher, perceived enjoyment was lower $r(151) = -.634$, $p < .001$.

Except for the correlation with engagement, there were mostly positive correlations with interactions. The strongest correlation was between interactions and autonomy, whereas when perceived interactions were higher, so was perceived autonomy $r(151) = .474$, $p < .001$.

For enjoyment, most of the correlations were positive. The strongest positive correlation occurred with perceived overall learning, whereas when perceived enjoyment was higher, so was perceived overall learning $r(151) = .419$, $p < .001$. Another strong positive correlation occurred with specific learning outcomes, whereas when perceived enjoyment was rated higher, so were specific learning outcome responses $r(151) = .387$, $p < .001$.

For specific learning outcomes most of the correlations were positive. The strongest correlation occurred with arranging outcomes, whereas when specific learning outcomes responses were rated higher, so were responses for arranging outcomes $r(151) = .577$, $p < .001$. There was also a strong correlation between specific learning outcomes and perceived overall learning, whereas when specific learning outcomes responses were higher, so was perceived overall learning $r(151) = .499$, $p < .001$. There was also a strong correlation between arranging outcomes and perceived overall learning, whereas when arranging outcomes responses were higher, so was perceived overall learning $r(151) = .475$, $p < .001$.

The teacher category was positively correlated with some question categories and negatively correlated to others. The strongest negative correlation was between, the categories of teacher and autonomy, whereas when perceived teacher direction was higher, perceived autonomy was lower $r(151) = -.420$, $p < .001$. The strongest positive correlation was between the categories of teacher and enjoyment, whereas when teacher direction was higher, so was perceived enjoyment $r(151) = .224$, $p = .006$.

There were strong correlations both positive and negative between perceived overall learning and the other categories. The strongest negative correlation occurred between perceived overall learning and engagement, whereas when perceived engagement was higher, perceived overall learning responses were lower $r(151) = -.452$, $p < .001$.

Correlations were also conducted to determine relationships of responses across the 8 categories of questions in the Student Reflection by lesson type (student-centered and teacher-centered). Table 4.3 shows correlations across the 8 categories of questions in the Student Reflection for student-centered responses.

Table 4.3

Correlations Across 8 Categories of Questions in the Student Reflection for Student-Centered Responses

	Engage	*Interact*	*Enjoy*	*SLO*	*Arrange*	*Auton.*	*Teacher*	*POL*
Engage	1							
Interact	-.440***	1						
Enjoy	-.630***	.393**	1					
SLO	-.326**	.387**	.427***	1				
Arrange	-.397**	.410***	.290*	.538***	1			
Auton.	-.518***	.511***	.372**	.411***	.377**	1		
Teacher	-.063	-.098	.016	-.039	.116	-.249*	1	
POL	-.531***	.306*	.501***	.441***	.457***	.496***	.042	1

Pearson's r, $*p < .05$, $**p < .01$, $***p < .001$

As with the correlations in Table 4.2 (all student responses), engagement had a negative relationship with other categories in Table 4.3 (student-centered responses). As engagement responses were higher, responses in the other categories tended to be lower. The strongest

negative correlation was between the engagement and enjoyment categories, whereas when engagement was higher, enjoyment tended to be lower $r(68) = -.630$, $p < .001$.

Other variables tended to have positive relationships with each other. For instance, whereas when interaction responses were higher, so was perceived autonomy $r(68) = .511$, $p < .001$. Every category was significantly correlated with the other categories except for the teacher category. The teacher category was only related significantly to one other category which, not surprisingly, was the autonomy category. As perceived teacher direction was higher, perceived autonomy was lower $r(68) = -.249$, $p = .038$.

Additionally, I conducted correlations for the teacher-centered student reflections. Table 4.4 shows correlations across the 8 categories of questions in the Student Reflection for responses after the teacher-centered lessons.

Table 4.4

Correlations Across 8 Categories of Questions in the Student Reflection for Teacher-Centered Responses

	Engage	*Interact*	*Enjoy*	*SLO*	*Arrange*	*Auton.*	*POL*
Engage	1						
Interact	-.187	1					
Enjoy	-.615***	.231*	1				
SLO	-.353**	.497***	.339**	1			
Arrange	-.384***	.421***	.387***	.636***	1		
Auton.	-.015	.481***	-.051	.184	.258*	1	
Teacher	-.296**	-.064	.279*	.152	.183	-.164	
POL	-.353**	.422***	.308**	.536***	.531***	.293**	1

*Pearson's r, * $p < .05$, ** $p < .01$, *** $p < .001$*

Like correlations in Table 4.2 (all responses), engagement had a significant negative relationship with most other categories in Table 4.4 (teacher-centered responses). As engagement responses were higher, responses to the other categories tended to be lower. The strongest negative correlation was between the engagement and enjoyment categories, whereas when engagement ratings were higher, perceived enjoyment was lower $r(81) = -.615$, $p < .001$.

Other variables tended to have positive relationships with each other. For instance, when specific learning outcomes were rated higher, so were perceived arranging outcomes $r(81) = .636$, $p<.001$. Most categories were significantly correlated with the other categories except in the categories of autonomy and teacher. As perceived autonomy was higher, so were interactions $r(81) = .481$, $p < .001$, arranging outcome responses $r(81) = .258$, $p = .018$, and perceived overall learning $r(81) = .293$, $p = .007$. The teacher category was only significantly correlated to engagement, whereas when engagement was rated higher, perceived teacher direction was rated lower $r(81) = -.296$, $p = .007$. Enjoyment was positively correlated with teacher direction, whereas when enjoyment was rated higher, so was perceived teacher direction $r(81) = .279$, $p = .011$.

Upon comparing the correlations obtained from Student Reflection survey responses of student-centered respondents (Table 4.3) versus those of teacher-centered respondents (Table 4.4), I noticed that while some of the relationships tested between categories of questions were similar, there were several differences. While there was not a strong negative relationship between engagement and interactions in teacher-centered responses, this relationship was very marked in student-centered responses, whereas when perceived engagement was rated higher,

perceived interactions were rated lower $r(68) = -.440$, $p < .001$. There was not a strong relationship between engagement and autonomy for teacher-centered responses, but there was a strong negative correlation for student-centered responses, whereas when perceived engagement levels were rated higher, perceived autonomy was rated lower $r(68) = -.518$, $p < .001$. The opposite was true for the engagement and teacher relationship. There was not a strong relationship between engagement and teacher in the student-centered responses but for teacher-centered responses when perceived engagement was higher, perceived teacher involvement was lower $r(81) = -.296$, $p = .007$.

There was not a strong relationship between enjoyment and autonomy for teacher-centered responses, but there was a positive correlation between the two in student-centered responses, whereas when perceived enjoyment was higher, so was perceived autonomy $r(68) = .372$, $p = .002$. The opposite was true for the enjoyment and teacher relationship. There was not a strong relationship between enjoyment and teacher in the student-centered responses, but there was a positive correlation between them in teacher-centered responses, whereas when perceived enjoyment was higher, so was perceived teacher involvement $r(81) = .279$, $p = .011$.

There was not a strong relationship between specific learning outcomes and autonomy in teacher-centered responses, but there was a positive correlation between specific learning outcomes and autonomy in student-centered responses, whereas when perceived specific learning outcomes were higher, so was perceived autonomy $r(68) = .411$, $p < .001$. There was not a strong relationship between autonomy and teacher for the teacher-centered responses however there was a negative correlation between autonomy and teacher in the student-centered

responses. Surprisingly, when perceived autonomy was lower, perceived teacher involvement was higher $r(68) = -.249$, $p = .038$.

After calculating different groups of correlations, ANOVAS were calculated using the same categories of questions to figure out if there were any significant differences between all student-centered responses and all teacher-centered responses in the Student Reflection. Table 4.5 shows the means, standard deviations, *F* statistics, and *p*-values of the ANOVA that compares the teacher-centered means vs. the student-centered means in each category.

Table 4.5

Means, Standard Deviations, F Statistics, and p-values for Teacher-Centered vs. Student-Centered Lessons

	Teacher-Centered		Student-Centered		F	*p*-value
	Mean	SD	Mean	SD		
Engagement	4.1	0.643	3.89	0.747	3.69	.057
Interactions	2.4	0.766	2.31	0.604	0.671	.414
Enjoy	1.78	0.699	2.09	0.88	4.08	.019*
SLO	2.12	0.545	2.23	0.494	1.37	.232
Arr. Outcomes	2.62	0.816	2.42	0.679	2.55	.112
Autonomy	2.65	0.649	2.09	0.559	31.6	<.001 ***
Teacher	2.21	0.864	4.05	1.06	139	<.001 ***
POL	2.07	0.867	2.27	0.9	1.94	.166

*One-way ANOVA, *$p < .05$, **$p < .01$, ***$p < .001$*

Perceived engagement was rated very high in the student-centered lessons ($M = 3.89$, $SD = 0.747$) and even higher in the teacher-centered lessons ($M = 4.10$, $SD = 0.643$). Despite this difference, there was not a significant difference between engagement for student-centered

lessons and teacher-centered lessons, $F(1, 151) = 3.69$, $p = .057$. Reported enjoyment on the other hand was rated very low for both student-centered lessons ($M = 2.09$, $SD = 0.880$) and teacher-centered lessons ($M = 1.78$, $SD = 0.699$). The ANOVA for enjoyment indicated a higher level of enjoyment in student-centered lessons $F(1, 151) = 4.08$, $p = .019$. Surprisingly, student responses indicated a higher level of perceived autonomy in teacher-centered lessons ($M = 2.65$, $SD = 0.649$) than student-centered lessons ($M = 2.09$, $SD = 1.06$). The ANOVA for autonomy indicated a significant difference between the means, $F(1, 151) = 31.6$, $p < .001$. There was an even bigger difference between the means for responses in student-centered lessons for the teacher category ($M = 4.05$, $SD = 1.06$) and responses in teacher-centered lessons for the teacher category ($M = 2.21$, $SD = 0.864$). The ANOVA comparing means in the teacher category indicated ratings were significantly higher for student-centered lessons than they were for teacher-centered lessons, $F(1, 151) = 139$, $p < .001$.

To get an idea of whether the first arranging experience played a role in student ratings for the second arranging experience, ANOVAS were conducted to compare the means of ratings between Lesson I and Lesson II. Table 4.6 shows the means, standard deviations, *F* statistics, and *p*-values for responses in Lesson I and then for Lesson II in both classes.

Table 4.6

Means, Standard Deviations, F Statistics, and p-values for Lesson I vs. Lesson II

	Lesson I		Lesson II		*F*	*p*-value
	Mean	SD	Mean	SD		
Engagement	4.08	0.751	3.93	0.639	1.76	.186
Interactions	2.37	0.618	2.34	0.777	0.087	.768
Enjoy	1.96	0.775	1.88	0.827	0.417	.519
SLO	2.22	0.479	2.11	0.564	1.66	.199
Arr. Outcomes	2.69	0.757	2.35	0.73	7.76	.006 **
Autonomy	2.48	0.625	2.31	0.705	2.67	.104
Teacher	2.91	1.28	3.2	1.36	1.86	.175
POL	2.35	0.934	1.96	0.784	7.97	.005 **

*One-way ANOVA, *$p < .05$, **$p < .01$, ***$p < .001$

Surprisingly, students rated arranging outcomes higher in Lesson I ($M = 2.69$, $SD = 0.757$) (first set of lessons chronologically) than they did in Lesson II ($M = 2.35$, $SD = 0.73$) (second set of lessons chronologically). The ANOVA comparing arranging outcome means was significant $F(1, 151) = 7.76$, $p = .006$. Students believed that they learned more in Lesson I ($M = 2.35$, $SD = 0.934$) than they did in Lesson II ($M = 1.96$, $SD = 0.784$) for perceived overall learning. The ANOVA comparing perceived overall learning means was significant $F(1, 151) = 7.97$, $p = .005$.

I also ran an ANOVA for each class's student-centered responses from the Student Reflection. Class II experienced student-centered lessons first and Class I experienced the student-centered lessons second. See Table 4.7 for the means, standard deviations, *F* statistics,

and *p-values* for ANOVAS across 8 categories of questions for Class I student-centered responses vs. Class II student-centered responses in the Student Reflection.

Table 4.7

Means, Standard Deviations, F Statistics, and p-values for Student-Centered Responses by Class

	Class I SC		Class II SC		*F*	*p*-value
	Mean	SD	Mean	SD		
Engagement	3.97	0.678	3.77	0.835	1.23	.272
Interactions	2.35	0.607	2.25	0.614	0.493	.485
Enjoy	1.97	0.873	2.23	0.884	1.42	.238
SLO	2.12	0.534	2.36	0.408	4.29	.042*
Arr. Outcomes	2.25	0.582	2.64	0.738	6.02	.017*
Autonomy	2.09	0.596	2.1	0.519	0.014	.906
Teacher	4.01	1.04	4.1	1.11	0.118	.732
POL	2.03	0.707	2.58	1.03	7.16	.009**

*One-way ANOVA, *$p < .05$, **$p < .01$, ***$p < .001$

Three different categories of questions in the ANOVA comparing student-centered responses in Class I vs. student-centered responses in Class II yielded significant results. Students in Class II ($M = 2.36$, $SD = 0.408$) rated specific learning outcomes higher than they did in Class I ($M = 2.12$, $SD = 0.534$). The ANOVA comparing specific learning outcome means was significant $F(1,68) = 4.29$, $p = .042$. Students in Class II ($M = 2.64$, $SD = 0.738$) also rated arranging outcomes higher than students in Class I ($M = 2.25$, $SD = 0.582$). The ANOVA comparing arranging outcome means was significant $F(1, 68) = 6.02$, $p = .017$. Perceived overall learning was also rated higher by students in Class II ($M = 2.58$, $SD = 1.03$) than it was in Class

I (M = 2.03, SD = 0.707). The ANOVA comparing perceived overall learning means was significant $F(1, 68) = 7.16$, $p = .009$.

I also ran an ANOVA for each class's teacher-centered responses from the Student Reflection, regardless of when they had the teacher-centered unit first or second. Class I experienced teacher-centered lessons first and Class II experienced the teacher-centered lessons second. See Table 4.8 for the means, standard deviations, *F* statistics, and *p-values* for ANOVAS across 8 categories of questions comparing teacher-centered responses between classes in the Student Reflection.

Table 4.8

Means, Standard Deviations, F Statistics, and p-values for Teacher-Centered Responses by Class

	Class I TC		Class II TC		*F*	*p*-value
	Mean	SD	Mean	SD		
Engagement	4.27	0.627	3.87	0.598	8.53	.005 **
Interactions	2.45	0.613	2.32	0.941	0.559	.457
Enjoy	1.79	0.651	1.77	0.77	0.017	.897
SLO	2.14	0.504	2.11	0.604	0.045	.832
Arr. Outcomes	2.72	0.774	2.47	0.859	1.96	.165
Autonomy	2.73	0.567	2.55	0.744	1.5	.224
Teacher	2.15	0.648	2.30	1.1	0.682	.411
POL	2.21	0.849	1.89	0.867	2.87	.094

*One-way ANOVA, *$p < .05$, **$p < .01$, ***$p < .001$*

Only one category of questions had means that were significantly different in the ANOVA comparing teacher-centered responses in Class I vs. teacher-centered responses in Class

II. Students in Class I ($M = 4.27$, $SD = 3.87$) rated their engagement higher than students in Class II ($M = 3.87$, $SD = 0.598$). The ANOVA comparing the engagement means was significant $F(1, 81) = 8.53$, $p = .005$.

I also ran an ANOVA to compare ratings between student-centered and teacher-centered lessons in Class I. Table 4.9 contains means, standard deviations, *F* statistics and *p-values* for ANOVAS across 8 categories of questions for Class I student-centered responses vs. Class I teacher-centered responses in the Student Reflection.

Table 4.9

Means, Standard Deviations, F Statistics, and p-values for Class I Student-Centered vs. Class I Teacher-Centered Responses

	Class I SC		Class I TC		*F*	*p*-value	
	Mean	SD	Mean	SD			
Engagement	3.97	0.678	4.27	0.627	4.47	.037	*
Interactions	2.35	0.607	2.45	0.613	0.589	.445	
Enjoy	1.97	0.873	1.79	0.651	1.25	.267	
SLO	2.12	0.534	2.14	0.504	0.02	.888	
Arr. Outcomes	2.25	0.582	2.72	0.774	10	.002	**
Autonomy	2.09	0.596	2.73	0.567	26	<.001	***
Teacher	4.01	1.04	2.15	0.648	105	<.001	***
POL	2.03	0.707	2.21	0.849	1.15	.286	

*One-way ANOVA, *$p < .05$, **$p < .01$, ***$p < .001$*

Not surprisingly, a significant difference was found between the means of ratings for student-centered and teacher-centered lessons in Class I in four different categories. Students in Class I rated their engagement higher in teacher-centered lessons ($M = 4.27$, $SD = 0.627$) than

they did in student-centered lessons (M = 3.97, SD = 0.678). The ANOVA comparing engagement means was significant $F(1, 85) = 4.47$, $p = .037$. They also rated arranging outcomes higher in teacher-centered lessons (M = 2.72, SD = 0.774) than they did for student-centered lessons (M = 2.25, SD = 2.72). The ANOVA comparing arranging outcome means was significant $F(1, 85) = 10$, $p = .002$. Surprisingly, students in Class I also rated their autonomy higher for teacher-centered lessons (M = 2.73, SD = 0.567) than they did for student-centered lessons (M = 2.09, SD = 0.596). The ANOVA comparing autonomy means was significant $F(1, 85) = 26$, $p < .001$. The opposite was true for the teacher category. Students rated teacher direction much higher in student-centered lessons (M = 4.01, SD = 1.04) than they did in teacher-centered lessons (M = 2.15, SD = 0.648. The ANOVA comparing means for the teacher category was significant $F(1, 85) = 105$, $p < .001$.

Just as I did for Class I responses, I ran an ANOVA to compare ratings between student-centered and teacher-centered units in Class II. Table 4.10 contains means, standard deviations, F statistics, and *p-values* for ANOVAS across 8 categories of questions for Class II student-centered responses vs. Class II teacher-centered responses in the Student Reflection.

Table 4.10

Means, Standard Deviations, F Statistics, and p-values for Class II Student-Centered vs. Class II Teacher-Centered Responses

	Class II SC		Class II TC		*F*	*p*-value	
	Mean	SD	Mean	SD			
Engagement	3.77	0.835	3.87	0.598	0.301	.585	
Interactions	2.25	0.614	2.32	0.941	0.149	.701	
Enjoy	2.23	0.884	1.77	0.770	4.98	.029	*
SLO	2.36	0.408	2.11	0.604	3.8	.056	
Arr. Outcomes	2.64	0.738	2.47	0.859	0.697	.407	
Autonomy	2.10	0.519	2.55	0.744	7.76	.007	**
Teacher	4.10	1.11	2.30	1.10	43.5	<.001	***
POL	2.58	1.03	1.89	0.867	8.9	.004	**

*One-way ANOVA, *$p < .05$, **$p < .01$, ***$p < .001$

There were also four categories of questions with significantly different means in the ANOVAS comparing Class II student-centered responses to Class II teacher-centered responses. Students in Class II rated their enjoyment higher in student-centered lessons ($M = 2.23$, $SD = 0.884$) than they did for teacher-centered lessons ($M = 1.77$, $SD = 0.770$). The ANOVA comparing enjoyment means was significant $F(1, 64) = 4.98$, $p = .029$. Surprisingly, students in Class II perceived higher autonomy in teacher-centered lessons ($M = 2.55$, $SD = 0.774$) than they did in student-centered lessons ($M = 2.10$, $SD = 0.519$). The ANOVA comparing autonomy means was significant $F(1, 64) = 7.76$, $p = .007$. Like responses in Class I, the opposite was true for teacher ratings. Students in Class II rated teacher direction much higher for student-centered lessons ($M = 4.10$, $SD = 1.11$) than they did for teacher-centered lessons ($M = 2.30$, $SD = 1.10$).

The ANOVA comparing means in the teacher category was significant $F(1, 64) = 43.5$, $p < .001$. Lastly, Class II students rated perceived overall learning higher in student-centered lessons ($M = 2.58$, $SD = 1.03$) than they did in teacher-centered lessons ($M = 1.89$, $SD = 0.867$). The ANOVA comparing perceived overall learning means was significant $F(1, 64) = 8.9$, $p = .004$.

End of Unit Reflection

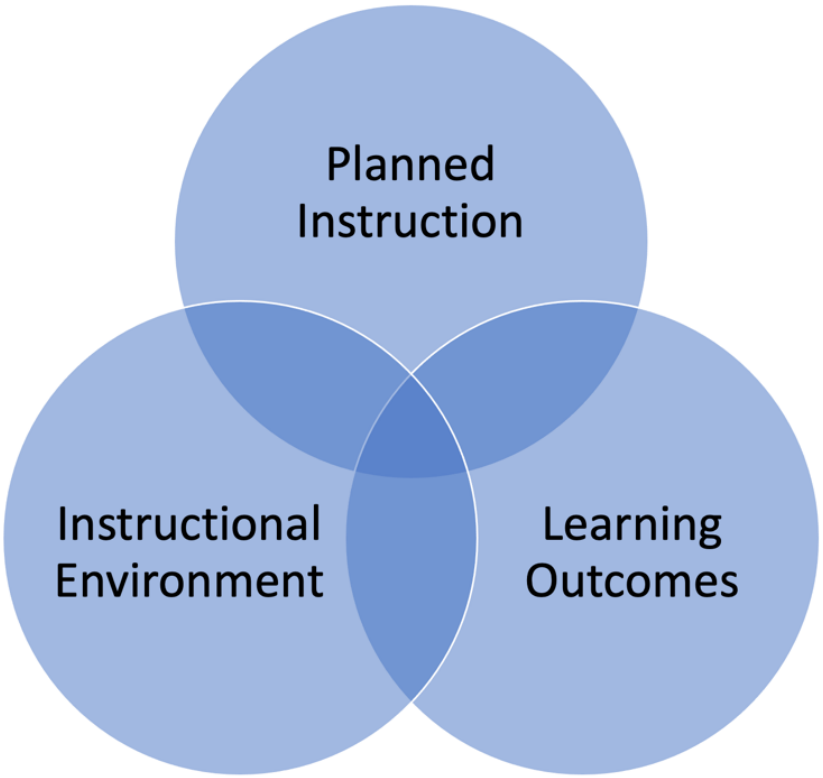
At the end of the entire unit after learning both songs, students completed an End of Unit Reflection of open-ended questions using a google form. I exported the student answers to an excel spreadsheet, read through the responses to delete duplicate answers or answers that were not completed by students, and sorted the responses by class. One participant in Class II stated he/she was only present for the Cindy Cindy lessons (teacher-centered) so I deleted this student's data from the analysis leaving a total of 58 respondents who completed all parts of this form for both lesson units. There were 30 respondents out of 46 participants in Class I (65.22%) and 28 respondents out of 52 participants in Class II (53.85%).

Analysis

Written responses to the End of Unit Reflection were coded and themes emerged related to three main categories: Planned Instruction, Instructional Environment including two main types of interaction, and Learning Outcomes. Each main theme was broken into appropriate sub-categories (codes) based on the wording within responses. The three main categories of responses are depicted in Figure 4.1.

Figure 4.1

Main Categories of Student Responses in the End of Unit Reflection



If responses did not fall within these three main categories, they were labeled under the category Other. Some students wrote more than one statement which sometimes pertained to several categories. The answers in these categories were then presented in a way that would highlight the main trends that emerged in each question. These trends were then summarized with supporting quotes.

The analysis of student responses for each question in the survey is below. Combined responses were reported first for each question and then broken down by class. After responses to the main question were addressed with accompanying graphs and charts, student responses

were broken down by their codes based on the language students used in their responses. I included a few student comments representing each code.

Question 1: Enjoyment of the Learning Process

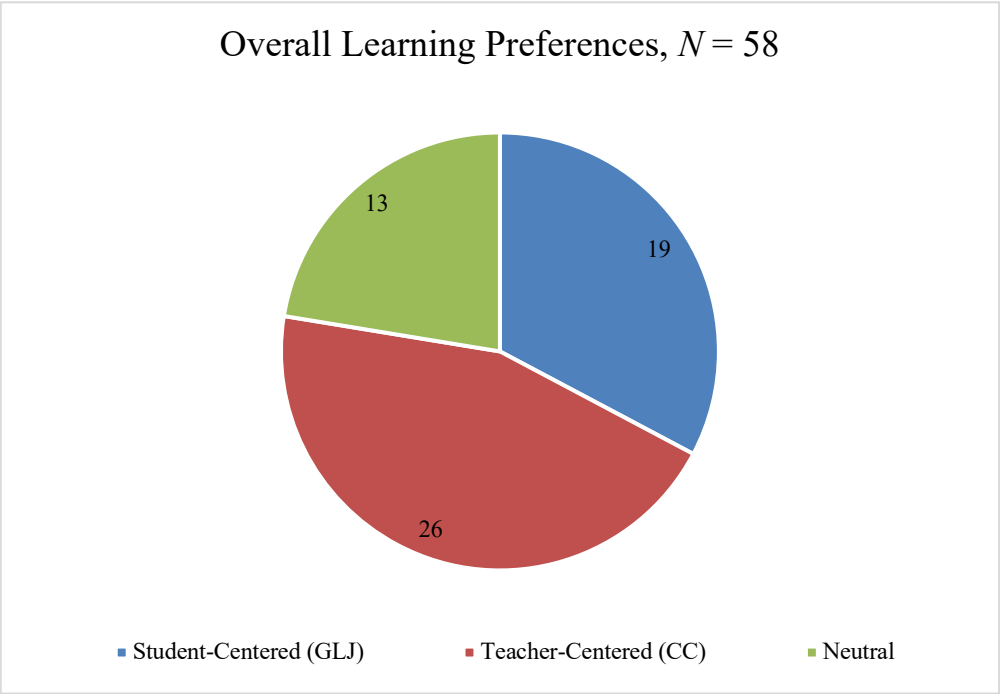
Students answered questions about their enjoyment of the learning process. “Goodbye Liza Jane” (GLJ) was used for the student-centered lessons and “Cindy Cindy” (CC) was used for the teacher-centered lessons. The first question on the End of Unit Reflection asked, “Did you enjoy the learning process for one tune over another? Or did you enjoy them both equally (Goodbye Liza Jane versus Cindy Cindy)? Please explain why.” Three main preferences emerged from the student responses:

1. More enjoyment for the learning process during student-centered lessons (GLJ)
2. More enjoyment for the learning process during teacher-centered lessons (CC)
3. A neutral response (stated no preference or enjoyed equally)

Overall, 19 out of 58 respondents (32.76%) preferred the learning process for the student-centered lessons (GLJ) over the teacher-centered lessons (CC). Some 26 out of 58 respondents (44.83%) preferred the learning process for the teacher-centered lessons (CC) over the learning process for the student-centered lessons (GLJ). Additionally, 13 out of 58 respondents (22.41%) indicated no preference or reported enjoying both learning processes equally (Figure 4.2).

Figure 4.2

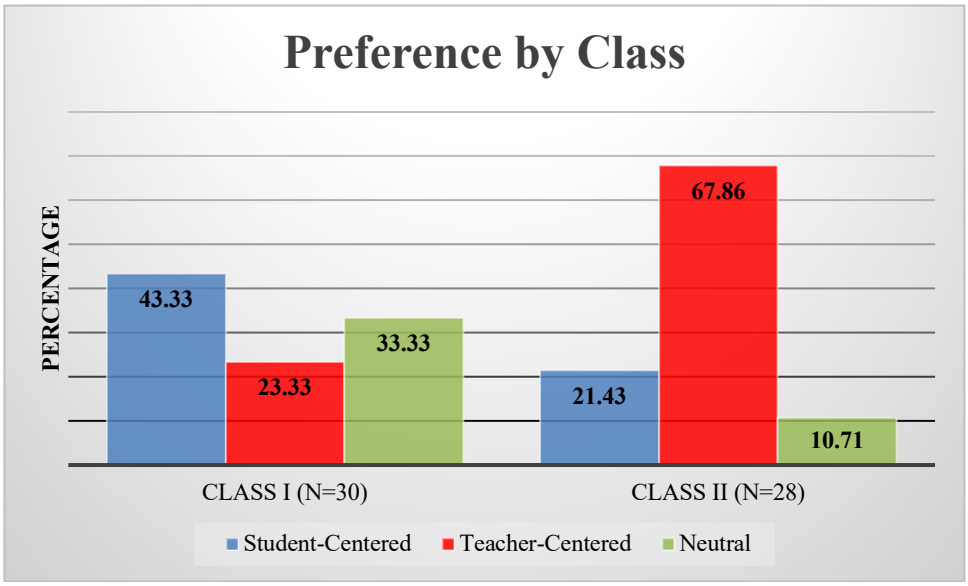
Overall Learning Preferences of Students Between Student-Centered and Teacher-Centered Methods



As Figure 4.2 depicts there were more students overall who preferred the learning process for teacher-centered lessons (CC). When these data were broken down by class, answers revealed that Class I, who experienced teacher-centered lessons first, had a plurality of respondents who preferred the learning process of student-centered lessons (GLJ). The opposite occurred in the Class II who experienced student-centered lessons first. A majority of students in Class II indicated they preferred the learning process of teacher-centered lessons (CC) over the learning process for student-centered lessons (GLJ). See Figure 4.3 for the distribution of learning process preference by class.

Figure 4.3

Percent of Student Learning Preferences Broken Down by Class



Regardless of whether students were in Class I or Class II, more students expressed a preference of enjoyment for the learning process of the second set of lessons that they participated in chronologically. The only difference for results between Class I and Class II is that there was a higher number of students in Class I who expressed a neutral response to Q1.

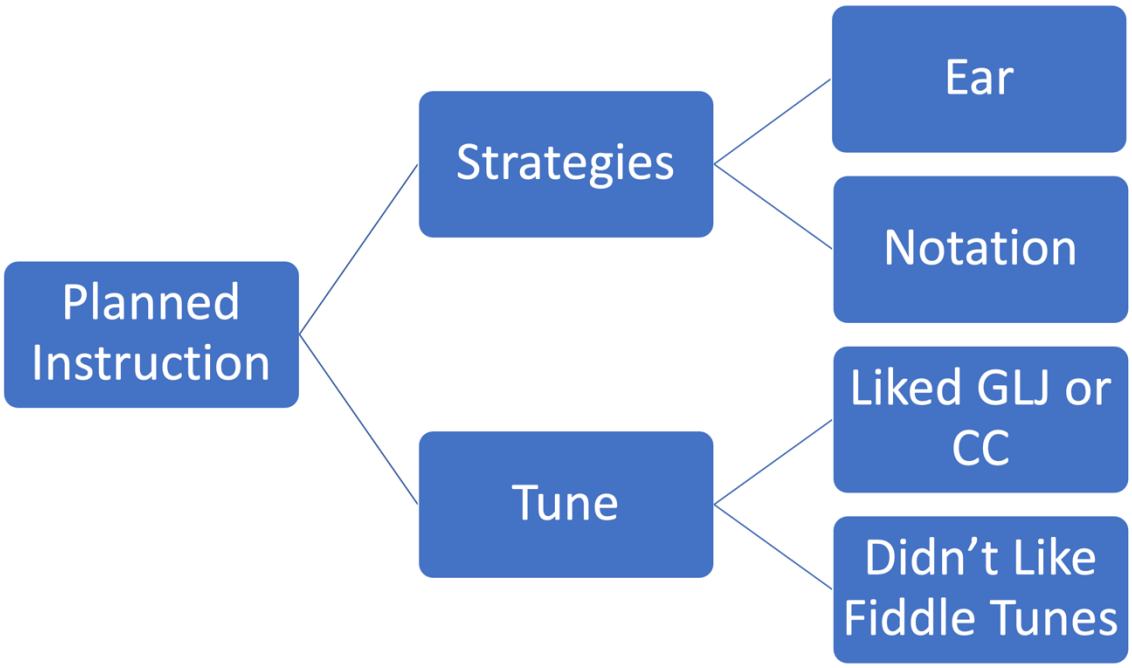
For the second half of Q1 on the End of Unit Reflection I looked for trends in the student responses which described why they preferred one song or learning situation over the other. Below I defined each main category and sub-category, listed the total number of times those codes appeared in student responses, and included quotes highlighting preference and class in parentheses.

Planned Instruction

A student response was coded under the category *Planned Instruction* if the student made comments about the tune itself (planned content), or the learning strategy (planned instruction). Within planned instruction students either talked about the learning strategies implemented during lessons or their preferences for a specific fiddle tune. Some students spoke about learning by ear or learning by notation and often gave some form of comparison statement about the two strategies (Figure 4.4).

Figure 4.4

Student Responses Under the Category of Planned Instruction



Tune

Responses were coded *Tune* when the student specifically talked about liking one tune more than the other tune (n = 13). Out of the 13 respondents who commented about the tune itself, there were 11 comments that indicated students liked one tune over the other. There were 4 students that indicated a preference for the tune "Goodbye Liza Jane" (student-centered) and 7 students that indicated a preference for "Cindy Cindy" (teacher-centered). There were 2 comments that indicated the student didn't really like fiddle tunes. Below are written responses or portions of written responses coded as *Tune*. Information in parenthesis indicate the class and preference of the student.

- I liked Little Liza Jane more because it was a a more entertaining piece to play (Class I, SC)
- I enjoyed playing Little Liza Jane better as I found the piece more fun to play and figure out how to play. (Class I, SC)
- I preferred Goodbye Liza' Jane because … I liked the song more. (Class I, SC)
- I preferred Goodbye Liza Jane because it was a better song in my opinion. sounded better (Class II, SC)
- I enjoyed learning cindy cindy more because I liked the tune of it better, and I liked the way the harmony and melody mixed together (Class I, TC)
- …Cindy Cindy was a more enjoyable tune to learn and play. (Class I, TC)
- I really enjoyed learning Cindy Cindy because…I also enjoyed how it sounded more. (Class II, TC)
- I enjoyed learning Cindy Cindy more. I liked the tune better…(Class II, TC)

Strategy

Responses were coded *Strategy* when the student specifically mentioned learning by ear, or by notation as a learning strategy in their responses (n = 5).

Ear vs. Notation.

- I liked Cindy Cindy better because I got to learn it by ear. Which was more fun than just reading music….(Class II, TC)

- I enjoyed Cindy Cindy better in my opinion, because I prefer learning tunes by ear with a teacher, but they were both enjoyable experiences. (Class II, TC)
- …but more importantly I thought that Mr. Arnold teaching the song to us by ear was a far better way of learning. His experience in teaching and music proved very valuable compared to us learning the piece amongst ourselves… (Class II, TC)
- Both process where equally good. We learned both tunes using different methods. I enjoyed Cindy Cindy a lot more. I loved learning it by ear. I didn't really enjoy Liza Jane. (Class I, N)
- I enjoyed Liza Jane a lot more because we used sheet music which made it easier to create an arrangement and learn the piece overall. (Class I, SC)

Instructional Environment

A student response was coded as *Instructional Environment* if the student made comments about their interactions with others and their perceptions of how they learned during the unit. Dewey and Piaget both described learning environments made up of physical objects (the instrument) to be manipulated by students, and opportunities for collaboration between students, moderated and guided by the teacher (Dewey, 2015; Piaget, 1964; Page, 1990). Responses categorized as *Instructional Environment* were mostly about the various combinations of interactions between peers, learning by oneself, or with a teacher. The analysis focused on comments made about interactions in the student responses which were either reflective (self), between the individual and peer(s) (collaborative), between the individual and teacher or a group and the teacher, or any combination of these. Table 4.11 depicts the categories and relationships that emerged from the comments of the *Interactions*.

Table 4.11

Categories of Interactions Described in Student Responses in the End of Unit Reflection

Self/Peers	Teacher/Group, Teacher/Individual
Autonomy	Structured
Creativity	Guidance
Leadership	Feedback/Help
	Efficiency vs Chaos/Time Wasted

Most comments under the codes *Autonomy, Creativity* and *Leadership* fell under the category of *Interactions* between self and peers. Likewise, most comments under the codes *Structure, Guidance, Feedback/Help* and *Efficiency vs. Chaos/Time Wasted* fell under the category of *Interactions* between the teacher and either a group or individual.

Autonomy

Student responses were coded for *Autonomy* when the student discussed having the freedom to make decisions in the learning process, contributing to the end result, or having independence (n = 17).

- I preferred the independent learning of Liza Jane because it allowed me to think more about how arrangements work and I believe I learned more that way. (Class I, SC)
- I enjoyed Liza Jane a bit more as I felt like I was more involved in the process of learning and arranging the piece. (Class I, SC)
- I enjoyed Goodbye Liza Jane better by a little bit, just because I had freedom in what I wanted it to sound like and got to work with my classmates. (Class II, SC)
- I enjoyed Goodbye Liza Jane. I felt like every one in their own mind had to contribute more than our teacher just teaching us the tune (Class II, SC)
- I preferred playing Cindy Cindy because I had more freedom to mess around with a solo…(Class I, TC)
- I enjoyed learning Cindy Cindy more….we got the best of both worlds with Cindy Cindy because Mr. Arnold let us use our knowledge we had gained from him and our previous knowledge to make some of our own decisions about how and what to play in the arrangement. (Class II, TC)

Creativity

I coded responses for *Creativity* when a student directly mentioned creativity or discussed the creative process that happened when they made decisions (n = 15). This could include things like comments directly discussing being creative, discussing what chord voicings they used, or discussion of any decision they made with classmates or by themselves about how they wanted the arrangement to sound. *Creativity* was related to the code of *Autonomy* because autonomy in the learning environment enabled creativity by giving students' the autonomy to be creative in the lesson.

- I enjoyed Liza Jane more because we got to be more creative throughout. I also liked the aspect of being able to figure it out ourselves. (Class I, SC)
- I enjoyed Liza Jane more because students had more freedom to design the arrangement. (Class II, SC)
- I enjoyed Good Liza Jane better by a little bit, just because I had freedom in what I wanted it to sound like and got to work with my classmates. (Class II, SC)
- I preferred playing Cindy Cindy because I had more freedom to mess around with a solo…(Class I, TC)
- I liked Cindy Cindy more because I was able to hear different rhythms in my head that would compliment the piece a lot more (Class I, TC)
- I preferred Cindy Cindy because the teacher-led instruction provided us with more structure and advice while still allowing students freedom to come up with solos and share ideas. (Class II, TC)
- Although I enjoyed learning both tunes, the process of learning Cindy Cindy was more enjoyable and effective for me….Mr. Arnold's set schedule and goals allowed us to spend the rest of the lessons practicing harmonies and new rhythms behind the melody. This process was more fun for me because it taught me about chords more so than Goodbye Liza Jane and it allowed us to experiment with our own rhythms we liked before he decided on what we will do….(Class II, TC)

Leadership

A student response was coded for *Leadership* when the student directly mentioned that they were a class leader, or that they wrote or contributed musical material for the rest of their class to use (n = 5).

- I enjoyed little liza jane because I got to help lead the class (Class I, SC)
- I enjoyed Liza Jane more. I really enjoy contributing to the music and coming up with creative bass parts to build a steady base for the arrangement to be built upon. (Class I, SC)
- I preferred playing Cindy Cindy because I had more freedom to mess around with a solo but I enjoyed leading goodbye Liza (Class I, TC)
- I enjoyed both equally. Cindy Cindy allowed me to learn things from the teacher and with those things I learned I was able to use that knowledge and become a class leader….(Class I, N)

Efficient

Student responses were coded *Efficient* when a student described an effective or efficient learning process (n = 7).

- I enjoyed Cindy Cindy more because we learned it and played it at a faster pace than Liza Jane…(Class I, TC)
- I enjoyed learning Cindy Cindy better because it was more engaging, and there wasn't a time where I was sitting around not doing anything. (Class II, TC)
- I enjoyed Cindy Cindy more because we had more of a sense of direction with Mr. Arnold teaching us it. We also learned it faster with him. (Class II, TC)
- Although I enjoyed learning both tunes, the process of learning Cindy Cindy was more enjoyable and effective for me….With Cindy Cindy, our class learned the entire piece within one short lesson and we quickly progressed. Mr. Arnold's set schedule and goals allowed us to spend the rest of the lessons practicing harmonies and new rhythms behind the melody. (Class II, TC)
- I enjoyed Cindy Cindy more because we were more engaged and didn't waste time. (Class II, TC)
- I enjoyed learning Cindy Cindy better because it was more engaging, and there wasn't a time where I was sitting around not doing anything. (Class II, TC)

Chaos/Time Wasted

Student responses were coded for *Chaos/Time Wasted* when a student described a chaotic environment, that time was wasted or that the process took a long time (n = 7)

- …Yes, it was a little bit more disorganized (mainly due to just being thrown in and told "here just do this")… (Class II, SC)
- …I thought that it was easier to learn if there was one distinct leader as opposed to the student led piece, where we had random people trying to put parts together which caused confusion in the group. (Class II, TC)

- I enjoyed Cindy Cindy more because the area seemed more under control than with Goodbye Liza Jane. (Class II, TC)
- …At times with the student led one, it was pretty hard to tell how much we were going to get done in one day since the first few days were a bit chaotic (Class II, TC)

Structured

Student responses were coded for *Structure* when a student directly mentioned structure in their response or mentioned that their experience was teacher-led or guided (n = 18). No students with a student-centered preference in Class I or Class II made comments about preferring or enjoying structure in the learning process.

- I preferred Cindy Cindy. I think currently I prefer a more structured learning to a piece like having you lead us rather than having more freedom. (Class I, TC)
- I liked learning Cindy Cindy better because the learning process had better structure to it and it wasn't all over the place like learning Goodbye Liza Jane (Class II, TC)
- I enjoyed the Cindy Cindy learning process a lot better than I did with the other one. Even though the Cindy Cindy tune was teacher led and I didn't really have a say in how we learned it, I always felt like the learning process was organized. (Class II, TC)
- I enjoyed them both equally. I like having time to do things on my own without a teacher but I also appreciate having a teacher to guide me sometimes. (Class I, N)

Feedback/Help

Student responses were coded as *Feedback/Help* when the student described the teacher providing feedback, help, or guidance during the learning process (n = 14)

- I liked Cindy Cindy…I prefer to get feedback from an adult. (Class I, TC)
- I liked Cindy Cindy because I like to have the teacher help me through the piece. (Class I, TC)
- I enjoyed them both equally. I like having time to do things on my own without a teacher but I also appreciate having a teacher to guide me sometimes. (Class I, N)
- I enjoyed both equally. Cindy Cindy allowed me to learn things from the teacher and with those things I learned I was able to use that knowledge and become a class leader. (Class I, N)
- I preferred Cindy Cindy. I think currently I prefer a more structured learning to a piece like having you lead us rather than having more freedom. (Class I, TC)

- …However, I did enjoy Cindy Cindy quite a bit too, as I was assisted greatly in my attempts to learn a piece, and it made my playing better and understanding more clear….(Class I, N)
- I liked learning from Mr. Arnold better because he did a better job explaining what we were doing and how to best accomplish our goals. (Class II, TC)
- I preferred Cindy Cindy because the teacher led instruction provided us with more structure and advice…(Class II, TC)
- I enjoyed Cindy Cindy more because we had more of a sense of direction with Mr. Arnold teaching it to us. We also learned it faster with him. (Class II, TC)
- …His experience in teaching and music proved very valuable compared to us learning the piece amongst ourselves ….(Class II, TC)
- …This process was more fun for me because it taught me about chords more so than Goodbye Liza Jane and it allowed us to experiment with our own rhythms we liked before he decided on what will will do. His guidance was very helpful for learning the piece. (Class II, TC)

Learning Outcomes

A student response was coded *Learning Outcomes* if the student made comments about something they or their peers learned during the unit. The following codes in student responses fit into the main category, *Learning Outcomes*: *Ease, Faster, Musical Concepts/Skills, Transfer*.

Ease

Student responses were coded as *Ease* if the student mentioned ease in learning or that one learning process was easier than the other (n = 5). Student comments that were coded *Ease* generally fell into other code categories because students discussed ease as a reference to those code categories. The main codes that these quotes were considered part of included *Strategy, Transfer, Time Wasted/Chaos,* and *Musical Concepts/Skills*.

Faster

Student responses were coded as *Faster* when the student reported that the learning process for one tune was faster than the other (n = 3). Student comments that were coded *Faster* fell under other coded categories because students discussed something being faster in a way that

justified another code such as *Efficiency*. Students also referenced faster learning with *Feedback/Help* from the teacher.

Musical Concepts/ Skills

A student response was coded *Musical Concepts/Skills* when the student reported learning about musical concepts or skills such as arranging, chords, rhythms, or harmony (n = 9). Out of 9 students who reported learning a concept or skill 5 mentioned arranging, 2 mentioned chords, 2 mentioned rhythms, and 2 mentioned harmony. Additionally, 2 students mentioned techniques in general, and 1 student mentioned solos in their response.

- I liked cindy cindy more because I was able to hear different rhythms in my head that would compliment the piece a lot more (Class I, TC)
- I preferred the independent learning of Liza Jane because it allowed me to think more about how arrangements work and I believe I learned more that way. (Class I, SC)
- I enjoyed Liza' Jane more, as it focused on musical techniques and concepts, of which I don't understand to well….(Class I, N)
- I really enjoyed learning Cindy Cindy because I learned some new techniques…(Class II, TC)
- I enjoyed learning Cindy Cindy more than Goodbye Liza Jane…I feel that I learned much more about harmonies, chords, solos, and arrangements through this process than the student led one. (Class II, TC)
- I enjoyed learning Cindy Cindy more….Mr.Arnold let us use our knowledge we had gained from him and our previous knowledge to make some of our own decisions about how and what to play in the arrangement. (Class II, TC)
- …With Goodbye Liza Jane, it took our class a long time to find the right arrangement and implement the harmonies….Mr. Arnold's set schedule and goals allowed us to spend the rest of the lessons practicing harmonies and new rhythms behind the melody. This process was more fun for me because it taught me about chords more so than Goodbye Liza Jane and it allowed us to experiment with our own rhythms we liked before he decided on what will will do….(Class II, TC)

Transfer

Student responses were coded *Transfer* when the student mentioned learning over the course of the unit, transferring previous skills or knowledge to the current unit, or transferring learning from the first half to the second half of the unit (n = 3).

- I enjoyed both equally. Cindy Cindy allowed me to learn things from the teacher and with those things I learned I was able to use that knowledge and become a class leader. Without Cindy Cindy I wouldn't have learned Liza Jane as easily. (Class I, N)
- I enjoyed both equally because they were both good experiences and built upon one another. (Class II, N)
- I enjoyed learning Cindy Cindy more.…Mr. Arnold let us use our knowledge we had gained from him and our previous knowledge to make some of our own decisions about how and what to play in the arrangement. (Class II, N)

Table 4.12 depicts all coded student responses from Q1 for the main codes broken down by class and main preference.

Table 4.12

Preference and Number of Student Responses for Each Code Broken Down by Class in the End of Unit Reflection

	Student-Centered (n = 19)		Teacher-Centered (n = 26)		Neutral (n = 13)	
	C1	C2	C1	C2	C1	C2
• Tune	3	1	3	4	0	0
• Strategy	1	0	0	3	1	0
• Autonomy	9	4	1	2	1	0
• Creativity	7	3	2	3	0	0
• Leadership	3	0	0	0	1	0
• Engagement	1	0	0	2	0	0
• Time Wasted/Chaos	0	1	0	6	0	0
• Structure	0	0	3	14	1	0
• Feedback/Help	0	0	3	8	3	0
• Efficient	0	0	1	4	1	0
• Faster	0	0	1	2	0	0
• Ease	1	0	0	3	1	0
• Concepts/Skills	2	0	1	4	1	1
• Transfer	0	0	0	0	1	2

Other

A few responses did not fall under *Planned Instruction, Instructional Environment,* or *Learning Outcomes*, and these were coded under a separate category named *Other.* Three students just gave preference but gave no other comments. One student stated, "They both were fun to learn since it's a new piece and allows me to continue to brush my skills as a musician and have fun so it's very fun for me." (Class II, N). And one student mentioned, "It was ok, I was kinda bored throughout the process." (Class I, N).

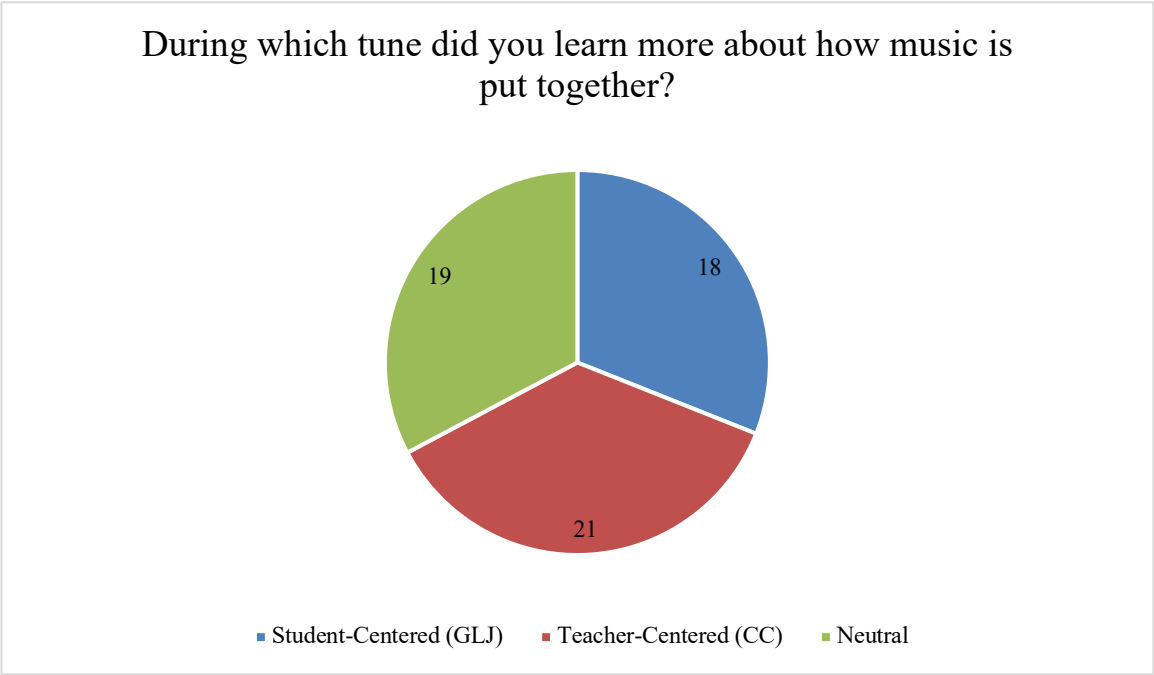
Question 2: During which tune did you learn more about the arrangement process?

The second question on the End of Unit Reflection read as follows: "Please compare what you learned about how music is put together in Goodbye Liza Jane (GLJ) versus Cindy Cindy (CC). Did you learn more about music arrangements in one over the other? Please provide specific examples." Respondents either indicated that they learned more about arrangements during "Goodbye Liza Jane" (SC), they learned more about arrangements during "Cindy Cindy" (TC), or they gave a neutral response that did not indicate learning more about arranging in one over the other.

Figure 4.5 depicts responses to Q2 for both classes combined. There were 18 out of 58 respondents (31.03%) who reported learning more about arrangements in student-centered lessons (GLJ) over teacher-centered lessons (CC). Some 21 out of 58 respondents (36.21%) reported learning more about arrangements in teacher-centered lessons (CC) over student-centered lessons (GLJ). Overall, 19 out of 58 respondents (32.76%) reported a neutral response or did not specify learning more about arrangements in one piece over the other.

Figure 4.5

Student-Perceptions on Learning About Arrangements in Student-Centered Lessons vs. Teacher-Centered Lessons



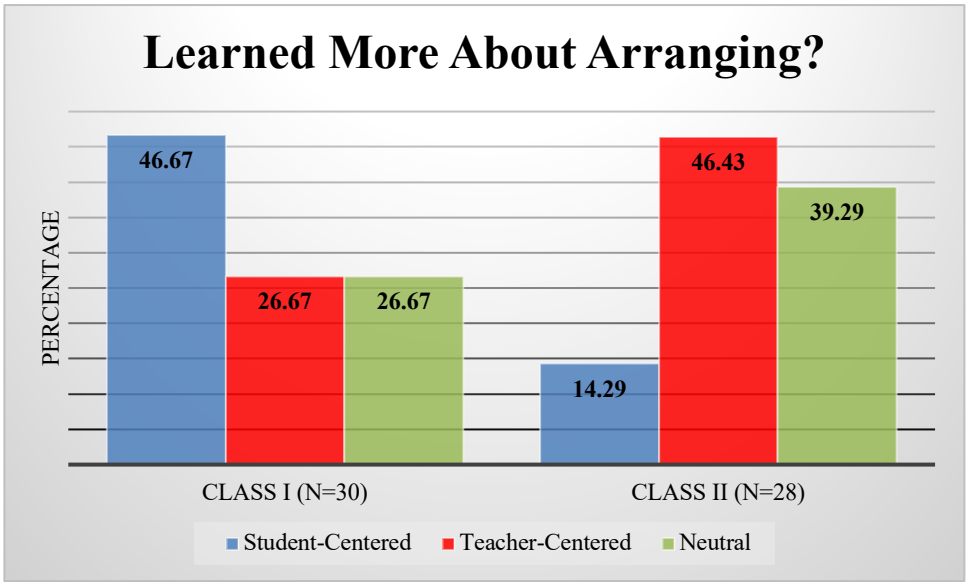
Out of the 18 respondents who reported learning more about arrangements in student-centered lessons (GLJ) than teacher-centered lessons (CC), 13 responses (72.22%) indicated that students thought they learned more about the arrangement process because it was student led and they were actively creating/making decisions. Out of the 21 respondents who reported learning more about arranging from CC (TC) 14 respondents (66.67%) mentioned structure in their justifications for why they learned more about arranging in "Cindy Cindy." One of those respondents mentioned, "I learned more about how music together from Cindy Cindy because Mr. Arnold helped us with chords and explained the harmony, in Eliza Jane we were more reliant on our prior experience and knowledge from classmates." (Class II, TC). One student actually believed the teacher-centered lessons (CC) had less structure than the student-centered lessons

(GLJ). This student commented “I learned more about music arrangement in Cindy Cindy because it wasn’t exactly set in stone. I didn’t have a piece of sheet music so I could add a little more improvisation.” (Class II, SC). This student clearly associated learning by ear with more freedom to improvise on a tune.

Figure 4.6 depicts student responses about the arrangement question broken down by class.

Figure 4.6

Percent of Students Who Perceived More Learning in Each Process Broken Down by Class



Responses in Q2 followed a similar pattern to student responses in Q1. In Class I, more students reported learning more about music arrangements in student-centered lessons (GLJ) than teacher-centered lessons (CC). A sizeable number of students reported a neutral response or did not specify learning more about arrangements in one piece over the other. In Class II, more students reported learning more about arrangements in the teacher-centered lessons (CC) than the

number of students who reported learning more about arrangements in the student-centered lessons (GLJ).

Just like Q1 some responses in Q2 had more than one code represented in the response. Even with some responses having multiple codes, some of the codes for student responses in Q1 were not represented at all by student responses in Q2. This is most likely because Q2 had a much narrower focus than Q1.

Planned Instruction

In the main category of *Planned Instruction* for Q2 there were no student responses within the *Tune* category. There were however, 10 responses that fell under the category of *Strategy*. There were 8 students who mentioned *Ear vs. Notation* in their responses.

Strategy

One student mentioned different strategies in general by noting, “I learned more in both, they equally taught me different strategies and were effective.” (Class I, N).

Ear vs. Notation

- I learned well through both because the were both taught different ways and in one I learned by ear and the other by visual. (Class I, N)
- The Arnold led one was a standard lesson, we’re used to being taught by ear,… (Class I, SC)
- …because while learning Cindy Cindy I was more focused on getting the actual piece right because we learned it by ear. (Class I, SC)
- I learned more in Cindy Cindy as we had no sheet music to play which made us learn the notes by ear. (Class I, TC)
- I learned more how to learn by ear with cindy cindy (Class I, N)
- …We learned how to play it by ear not by music. (Class I, N)
- …In Cindy Cindy, I worked on skills such as learning by ear, which we did not do in Liza Jane. (Class II, N)
- I learned more in cindy cindy because we learned it from ear… and not just the sheet music. (Class II, TC)

One student response within the *Strategy* category discussed the effort involved in memorization. This student noted, "In Liza Jane, I learned a lot about chord progressions and harmonies, while in Cindy Cindy I had to put most of my focus into remembering the tune." (Class I, N).

Instructional Environment

In the main category of *Instructional Environment* for Q2 there were no student responses for the codes *Leadership* or *Engagement*. There were however, 12 responses that fell under the code *Autonomy*. Out of the 12 responses that were coded under *Autonomy*, 2 students made comments that fell under the code of *Creativity*. There were 2 students who mentioned *Leadership* in their responses. There were only 3 students whose responses fell under the code *Time Wasted/Chaos*. Similarly, there were only 3 student responses each in the codes *Structure* and *Feedback/Help*. There were also 2 students whose responses fell under the code *Efficient*.

Autonomy

- I learned a little more about how to arrange a piece during Little Liza Jane because I got to arrange one with my classmates (Class I, SC)
- In little liza jane the students lead the whole entire class and in Cindy Cindy Mr. Arnold told us what to do. I learned more when the students led it. We learned how to put an arrangement together. (Class I, SC)
- I learned more about arrangements during Goodbye Liza Jane since it was student led. (Class I, SC)
- …I learned more about arrangement with Liza Jane because we got to figure out how it all fit together along with the harmonies and rhythms that sounded best. (Class I, SC)
- In Goodbye Liza Jane I felt like we had the power to pick the arrangement….(Class II, N)
- I learned more about arrangements in the Liza Jane because it was way more hands on and we had to do it ourselves instead of being lead on, we made the mistakes and we learned form them, not perfectly by a teacher. Being able to search up music and the video for the music to see how it sounded like really helped in the learning process in my opinion. (Class II, SC)

- I feel like I learned about how music is put together with both equally. With Goodbye Liza Jane it was more open and anyone could do what they want but it was harder to do it as a group… (Class II, N)
- I would say I enjoyed Liza jane more than the other one because we got to figure out what we were going to do….(Class I, SC)

Creativity

- I learned more from the student led one as it allowed for us to explore options rather than be told of them (Class I, SC)
- I already knew a lot more in depth stuff about arranging then we went. I felt we went more creative with Liza Jane such as having a trio playing a fifth and a third above the pitch for a harmony. We didn't have that with Cindy Cindy. (Class I, SC)

Leadership

- …hearing what others had to say helped me be a better leader and to know what to do. (Class I, TC)
- …for example we had Jonathan explain examples of what we could do and so one then got to try it or come up with our own ideas and share them (Class I, SC)

Time Wasted/Chaos

- I learned more about music arrangements during Cindy Cindy. During Liza Jane there was more confusion with the arrangement due to it being student led. (Class I, TC)
- … and the arrangement that was organized by the teacher was already set in stone instead of spending days figuring out what to do. (Class II, TC)
- …and although i feel like we didn't do it as a class it was a good experience (Class I, SC)

Structure

- I think I learned more in the Cindy Cindy song that was guided by the teacher rather than by the students because I felt like it was more organized and easy to follow. (Class I, TC)
- I learned more in Cindy Cindy because it was a more organized piece. (Class I, TC)
- …and the arrangement that was organized by the teacher was already set in stone…(Class II, TC)

Feedback/Help

- …whereas Cindy Cindy it was easier to stay together since Mr. Arnold was there to guide us. (Class II, N)

Efficient

- I found that when learning Cindy Cindy by ear there was more time and energy able to be devoted to remembering the arrangement,…(Class II, TC)
- …With Cindy Cindy we were able to obtain much more knowledge due to being actually taught by our teacher. (Class II, TC)

Learning Outcomes

In the main category of *Learning Outcomes* for Question 2 there were no student responses within the *Faster* code. There were however, 3 responses that fell under the code *Ease*. Since Q2 addressed learning, it is not surprising that 23 students made comments under the code *Musical Concepts/Skills* in their responses including 3 who's responses were coded *Process* because they spoke about the arrangement process. Additionally, 6 students made comments under the code *Transfer* in their responses.

Ease

- I feel like it was easier to understand making an arrangement in Liza Jane than Cindy Cindy… (Class I, SC)
- Cindy Cindy was easier to make harmonies and arrangements out of it (Class II, TC)
- In learning liza jane I realized how much easier it is to learn something when you're told exactly how to do it (Class II, TC)

Concepts/Skills

- I learned that music can be put together with simple chords. (Class I, N)
- …In Liza Jane, I learned a lot about chord progressions and harmonies, (Class I, N)
- …but I learned how to play chords more consistently with Liza Jane (Class I, N)
- I learned more about arrangements in Cindy Cindy because I feel the teacher led lessons were more beneficial in teaching of arrangements and harmonies. (Class I, TC)
- We didnt actually learn anything in Cindy Cindy other than the notes we played. In Liza Jane we learned what notes were in the chords that corresponded to the part in music (Class I, SC)
- I learned more a how to put together music when the students got to put more of the day so in it because I had to think about that chords to use. (Class I, SC)
- …We learned how to break down a song into chunks to make it easier and how to work as a group and switch off on parts (Class I, TC)

- In Cindy Cindy I learned much more. I learned about harmonies and melodies but at the end of Cindy Cindy I wasn't completely confident with everything….(Class I, TC)
- With Cindy Cindy, I learned more about how harmonies fit together. With Liza Jane, I learned more about putting rhythms, and harmonies together….(Class I, SC).
- I think I learned more with Liza Jane because we discussed more about what makes an arrangement, organization, and making your own solo. With Cindy Cindy being told how to play made it easier but didnt allow for much long term learning. (Class I, SC)
- I learned about chords and harmonies and the basics of music arrangement with the first lesson…(Class I, SC)
- I learned concepts of arranging more in Liza' Jane due to the nature of learning things like chords and harmony - both of which are needed in the arrangement process. (Class I, SC)
- I learned more from Goodbye Liza Jane. We were required to think about music more and figure out music, chords, notes, etc. (Class II, SC)
- I learned equally the same in both as both featured great detail on how to form harmonies in relation to learning each melody…. (Class II, N)
- …meaning we needed to focus more to chord progressions… (Class II, TC)
- I learned more about music learning Cindy Cindy because we learned how to do more complicated accompaniments and we had shuffle rhythms and soloists as well. (Class II, TC)
- I learned more during Goodbye Liza Jane because we used more harmony parts than we did in Cindy Cindy. (Class II, SC)
- Both showed different aspects of arrangements. Equally as helpful in that sense. Goodbye Liza Jane helped a lot with the chords…. (Class II, N)
- I learned more about harmonies in Goodbye Liza Jane (student taught) versus Cindy Cindy where I learned more about music arrangement. In the student led song we had to break down chords and dissect more of what made a harmony. Cindy Cindy on the other hand was more or less worked around when (what order) to play each part. (Class II, N)
- I learned just about equal in both of them. I learned about chords and arpeggios in one and different way to play them in the other. (Class II, N)
- I learned more in Cindy Cindy because I feel there was more explanations about putting together melodies and harmonies. (Class II, TC)
- I learned more about how music together from Cindy Cindy because Mr. Arnold helped us with chords and explained the harmony…(Class II, TC)
- I learned more about music arrangements in Cindy Cindy because in Goodbye Liza jane we only had one rhythm and one note per measure we played in the harmony. In Cindy Cindy our teacher gave us multiple notes we could play and multiple rhythms we could play throughout the piece in the harmony part (Class II, TC)
- …For example we could use different harmonies to help go with sound. In Cindy Cindy I learned to listen more to my instructor (Class II, N)
- With that being said, in Goodbye, we used a arpeggio harmony technique that was pretty unique and something we probably never would have done with Arnold. (Class II, TC)

Process

- I learned about the same amount about putting together an arrangment since the process was similar. (Class I, N)
- In the process of learning Goodbye Liza Jane, I learned that one way to put music together is first finding a simple version of the tune. After practicing the melody, we found the harmonies and assigned certain notes to certain instruments at certain times. I did not learn very much in this process. When learning Cindy Cindy, I learned more about effective ways to quickly familiarize myself with the piece and get it down solid. We practiced the tune section by section and later added the harmonies, and lastly added new rhythms to the harmonies. (Class II, N)
- In both tunes I learned that it's put together in versus, rythyms, and increments. I feel like I learned about the same by learning both tunes. (Class II, N)

Transfer

- I felt like I learned a little bit more in Cindy Cindy where the teacher taught us the music techniques and we applied them in Liza Jane. (Class I, TC)
- …But once went in our own I began to use my own "brain" and was able to connect things which helped everything make more sense. Liza Jane was difficult to arrange at first because it was all very new but once the whole class combined our brains together it was easier…. (Class I, TC)
- …and dived further into those topics the second lesson. I learned more abt music arrangements in Goodbye Liza Jane than Cindy Cindy…(Class I, SC)
- …Hearing the different chords whenever some played the melody helped differentiate the changes. So it helped with the chopping of the chords in Cindy Cindy. (Class II, N)
- …in Eliza Jane we were more reliant on our prior experience and knowledge from classmates. (Class II, TC)
- I definitely learned more about arrangements in Cindy Cindy. With Goodbye Liza Jane being student led, we only used what our knowledge reached….(Class II, TC)

Effort

Two new categories emerged in Q2 of the End of Unit Reflection. One of these codes was labeled *Effort*. A student response was labeled *Effort* if a student mentioned how hard they had to work in the process of making the arrangement.

- I learned that it takes a lot of work and concentration for both pieces. (Class I, N)

- I think i learned more by Goodbye Liza Jane. Its just how the tune needed to be played (Class I, SC)
- I think they were both alike in some ways because we had to work to make everything come together. The repeats had to be on point and together so no one would fall behind or apart. (Class II, N)
- I mainly learned just how difficult it is to make an arrangement that sounds good. It surprised me because in music it sounds simple but when making on yourself, it's more difficult. (Class II, SC)

Experience Level

The second new category was named *Experience Level*. Student responses were coded *Experience Level* if the student responded that some they had some prior experience or their experience level changing.

- I learned that music is better organized when the person organizing it has more experience, and that each part sometimes isn't necessarily always different from each other. I didn't learn much about arranging music since I already knew about it. (Class II, TC)
- I didn't really learn a lot because I sort of knew how music was arranged because of this class (Class II, N)
- I would say I learned the same about both but was able to go more in depth with Cindy Cindy (Class II, TC)
- I learned more about music arrangements from Cindy Cindy. Though Mr. Arnold could have better explained WHY we are playing certain things, he definitely taught us more about how to make an arrangement than what we could figure out for ourselves. (Class II, TC)

Trends In Student Responses

Response trends for Q2 seemed to match some of the main trends that emerged in Q1. As with Q1, the data for overall preference indicates that the order in which students experienced teacher-centered and student-centered lessons influenced their perceived amount of learning in those two different types of environments. Students reported being more comfortable with student-centered lessons and feeling like they learned more from them when they had prior experience with the process of arranging a piece of music. Students who did not have experience

generally reported that they learned more from teacher-centered lessons. While some students expressed that there was more depth of learning in teacher-centered lessons, similar responses also occurred with students who reported more learning in the student-centered lessons.

Similar to responses in Q1, students were keenly aware of the different learning strategies used in student-centered lessons versus teacher-centered lessons. Just like Q1, students reported learning the tune by ear in teacher-centered lessons and learning the tune via sheet music in student-centered lessons. Similar to Q1 responses, several students felt it was important to discuss the level of autonomy they were afforded in student-centered lessons versus teacher-centered lessons. Student responses indicated that they had much more autonomy in student-centered lessons than they did in teacher-centered lessons.

Since Q2 addressed what students learned about arranging, *Musical Concepts/Skills* was by far the largest category of student responses in Q2. Students were very aware of the concepts and skills they were learning in both student-centered lessons and teacher-centered lessons. Students reported learning about chords, chord progressions, rhythms, harmonies, and chunking. Several students also provided a description of the two learning processes they encountered. It was interesting that despite reporting other differences such as levels of autonomy and learning strategies, students consistently reported that the learning process followed a similar sequence between the two different arranging experiences.

Not surprisingly, this question also prompted a few students to discuss how they applied previous knowledge to the current unit and information learned during earlier lessons to later lessons within the unit. A student in Class I, who experienced the teacher-centered lessons first, reported applying the knowledge acquired in teacher-centered lessons to the student-centered

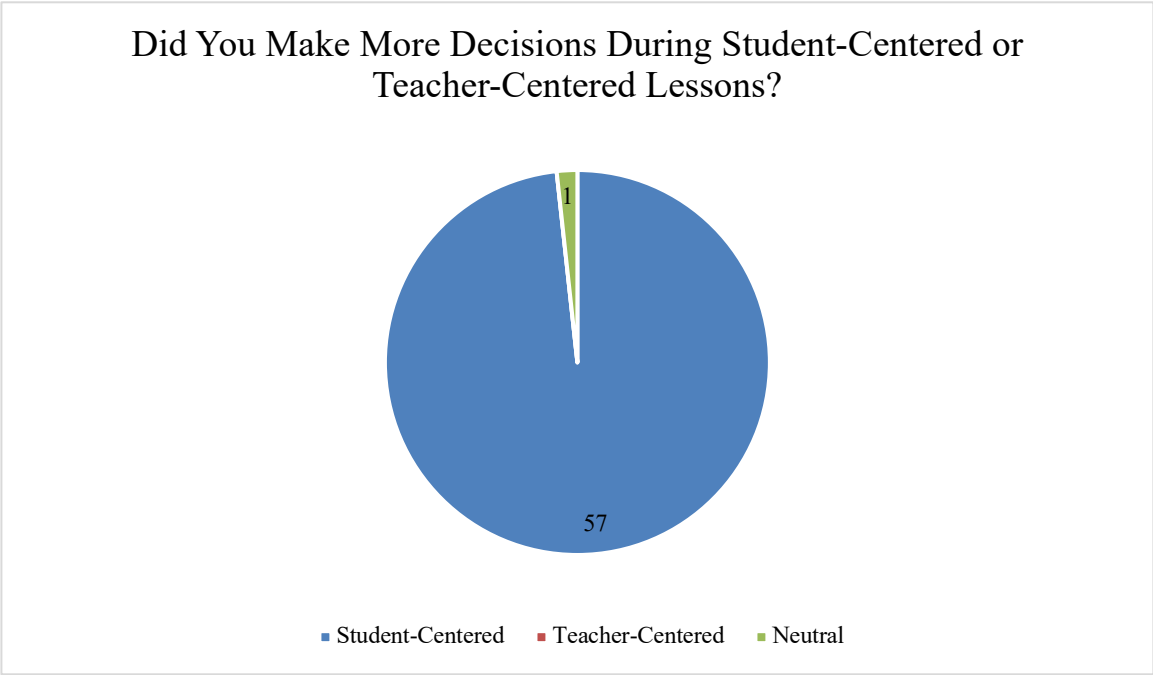
lessons later in the unit. The same thing happened in Class II, but since students in Class II had the student-centered lessons first, they had to use knowledge acquired prior to this unit to arrange "Goodbye Liza Jane" (SC).

Question 3: During which tune did you make more decisions?

Regardless of what students reported about their learning with the arrangement process, students were keenly aware of the number of decisions they made during student-centered lessons (CC) versus teacher-centered lessons (GLJ). The third question asked, "Did you and your classmates make more decisions in learning Goodbye Liza Jane or Cindy Cindy? Please explain any decisions you and or your classmates made while learning each tune." Students believed they made more decisions during the student-centered lessons. Figure 4.7 below shows a staggering 57 out of 58 respondents (98.28%) reported making more decisions in the process of learning "Goodbye Liza' Jane" (SC). One student remarked, "We definitely made more decisions with Lil' Liza Jane. Decisions like what chords to play, who would have a duet or solo, who was going to be the leader, and even what version of Liza Jane we wanted. We were in control of everything!" (Class I, N). Another student noted that, "I thought we had to make more decisions in Goodbye Liza Jane. We were able to pick the arrangement and come up with the harmonies. In Cindy Cindy it was all up to the conductor" (Class II, SC).

Figure 4.7

Student-Perceptions of Decision-Making in Student-Centered Lessons vs. Teacher-Centered Lessons



Even though students reported making more decisions during student-centered lessons (GLJ), 8 students directly mentioned making some decisions in the teacher-centered lessons (CC). One student noted, "We made more decisions in Liza' Jane simply due to the nature of it being student led. We literally had to make all the decisions there. Cindy Cindy did have some decisions made by students too however, but they were aimed more at how to learn the piece and play it more effectively rather than the creative process of how to play the piece." Responses in Q3 of the End of Unit Reflection mirrored responses in the first two questions, confirming that while students had to make most or all the decisions for their student-centered lessons, the teacher-centered lessons were not truly teacher-centered in terms of autonomy. Students retained some autonomy in teacher-centered lessons. One student noted "I preferred Cindy Cindy because

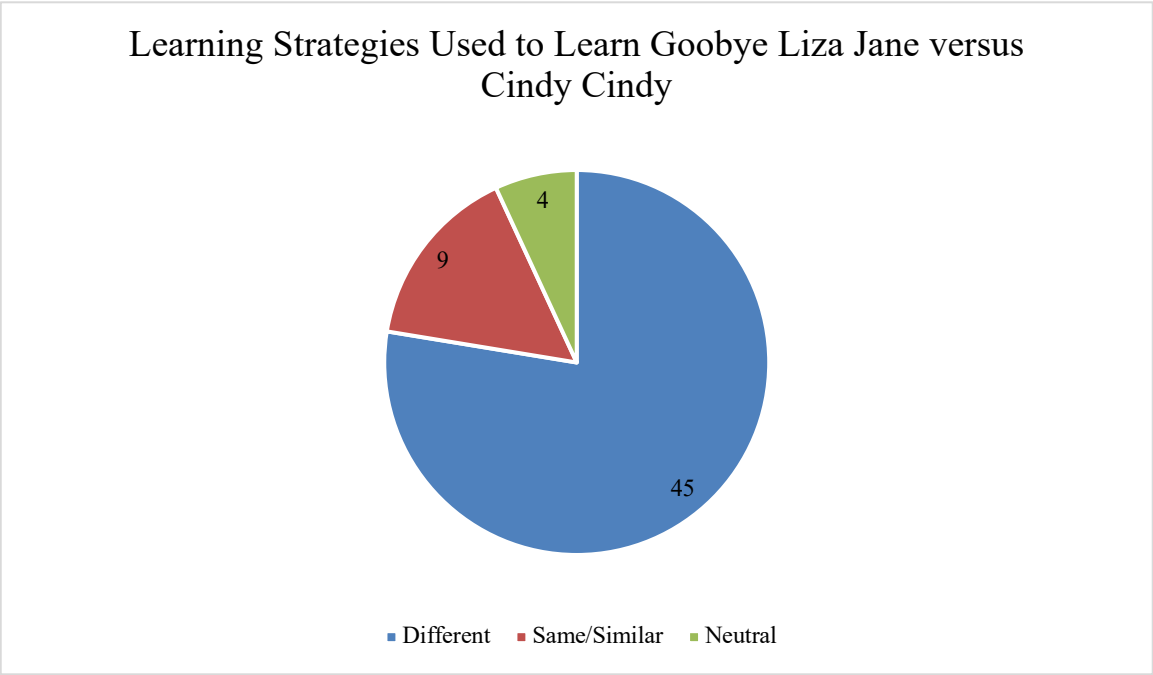
the teacher led instruction provided us with more structure and advice while still allowing students freedom to come up with solos and share ideas." (Class II, TC).

Question 4: Did you use different strategies to learn one tune than you did to learn the other?

Figure 4.8 below reports respondents using different strategies when learning "Goodbye Liza Jane" (SC) versus learning "Cindy Cindy" (TC). Overall, 45 out of 58 respondents (77.59%) in both classes reported using different learning strategies between student-centered lessons (GLJ) and teacher-centered lessons (CC). Out of both classes only 9 out of 58 respondents (15.52%) reported using the same or similar strategies for student-centered lessons (GLJ) and teacher-centered lessons (CC). In a similar fashion, only 4 out of 58 respondents (6.9%) did not specify or gave a neutral answer regarding learning strategies.

Figure 4.8

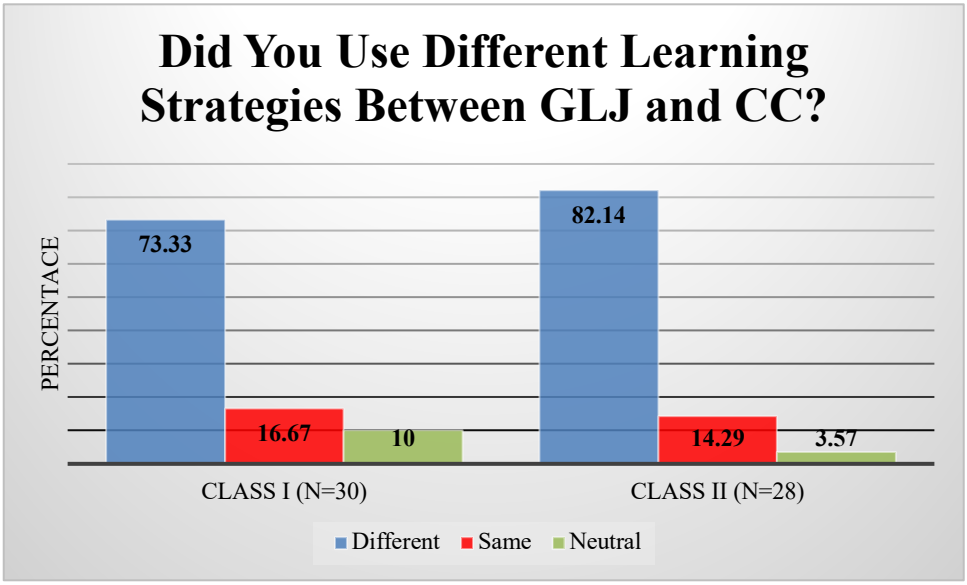
Student-Perceptions of Learning Strategies Used in Student-Centered Lessons vs. Teacher-Centered Lessons



In both Class I and Class II the vast majority of students reported using different learning strategies during student-centered lessons vs. teacher-centered lessons. Only a few students from each class reported using the same learning strategies for both or gave a neutral response. Figure 4.9 below shows the percentages of students who reported different learning strategies, the same learning strategy, or a neutral response for Q4 by class. The results for Class I and Class II were very similar with most students reporting using different learning strategies for student-centered lessons than they did for teacher-centered lessons.

Figure 4.9

Student Perceptions of Whether Students Used Different Leaning Strategies in Student-Centered Lessons vs. Teacher-Centered Lessons



Ear vs. Notation

During teacher-Centered Lessons (CC) the teacher taught students by ear, while in GLJ (SC) the students made the decision to use a sheet music reference in the learning process. This difference was well represented in student responses to the question, "Did you use different strategies to learn Goodbye Liza Jane than Cindy Cindy? I.e., notation, research, etc. Please explain the different strategies you used to learn each tune." Out of the students that reported using different learning strategies, 11 out of 22 Class I respondents (50%) mentioned learning by ear and or using sheet music in their descriptions of those different strategies. An even higher number of Class II students 17 out of 23 (73.91%) that reported different learning strategies between student-centered and teacher-centered methods mentioned learning by ear and or learning via sheet music in their descriptions. Between the two classes 28 out of 45 students

(62.22%) who reported using different learning strategies between student-centered lessons (GLJ) and teacher-centered lessons (CC) mentioned learning by ear and or learning via sheet music in their descriptions.

- In Liza Jane we used sheet music while Cindy Cindy was learned by ear. (Class I, SC)
- We learned completely by ear for Cindy Cindy, but we were able to use sheet music for Liza Jane, so we were able to focus more on our harmonies and arrangements with Liza Jane (Class I, TC)
- We learned it visually in LLJ rather than auditory (Class I, N)
- In Liza Jane we used sheet music while in Cindy Cindy we learned by ear. For liza jane we also had to find our own version of the song. (Class I, TC)
- Yes, Goodbye Liza Jane had to be transposed and Cindy Cindy was learned by ear (Class II, SC)
- Yes, in Cindy Cindy it was broken into smaller chunks and taught to us by ear while Liza Jane was printed and we worked on it as a whole (Class II, TC)
- Yes, like said above it was more by sheet music in Liza Jane due to easier understanding for all the classmates. Cindy Cindy could be taught by ear because our teacher already knew the piece. (Class II, SC)
- In Goodbye Liza Jane we had sheet music to play off of and we wrote the chords in the sheet music. In Cindy Cindy we learned it all by ear with no sheet music (Class II, TC)

Transfer

Further analysis of student responses revealed that students in Class I also applied what they learned in the teacher-centered lessons (CC) to their creation of an arrangement in the student-centered lessons. Four students directly addressed this transfer from one learning method to the other. This relationship was not present in the responses from Class II, which started with student-centered lessons (GLJ) and ended with the teacher-centered lessons (CC).

- …I felt we applied the things we learned in Cindy Cindy in Liza Jane. (Class I, SC)
- We learned Cindy Cindy by listening to our teacher who explained the process with us then when we learned Goodbye Liza Jane we had do this process ourselves. (Class I, SC)
- We did use different strategies but Mr. Arnold teaching us Cindy Cindy first helped our group know what to do when we got to Liza Jane. (Class I, SC)

Research/Arranging

A new code emerged in Q4 labeled *Research/Arranging* which was given when a student mentioned doing research, described the arrangement process, or described their participation in the arrangement process. Some 11 out of 30 respondents (36.67%) in Class I directly mentioned having to do more *Research/Arranging* in the student-centered lessons (GLJ) over the teacher-centered lessons (CC). Similarly, 9 of 28 respondents (32.14%) in Class II mentioned doing more *Research/Arranging* in the student-centered lessons (GLJ) than teacher-centered lessons (CC). By comparison, no respondent in either group mentioned doing more *Research/Arranging* in the teacher-centered lessons (CC) over the student-centered lessons (GLJ). As is evident in the quotes below, students in Class II hinted at a slightly more favorable view of the teacher-centered lessons.

- I would say we relatively used the same strategies probably because the strategies were taught to us in class before hand so we just had to connect the dots. The only difference I can think of in our strategies would be researching our own music and figuring out what harmonies to play. (Class I, N)
- Yes, Cindy Cindy was learned by observation focusing on notes while Liza Jane was learned by collaboration.We had the notes already but were learning to put it together. They both took a lot of thought and focus, but Liza Jane took more thought in regard to how arrangements work rather than notes and bowing. (Class I, SC)
- GLJ required more research and time to learn. There was also more markings that I had to make. It took more time to learn that one. But Cindy Cindy was fun and enjoyable and was learned in one day (Class II, TC)
- Goodbye Liza Jane started with finding a recording and listening to it and then finding an arrangement for it so there was more research involved in that. For Cindy Cindy it was learned by ear and gave more of an understanding to how certain harmonies and melodies would work together. (Class II, N)

Question 5: Other Details

The final question in the End of Unit Student Reflection stated, “Please share any other details you would like to share about the learning process for either song.” The responses to this

item were myriad, as the question invited, but one very prevalent theme emerged in student responses. There were 10 students whose responses fell under the code *Fun*. A few students just mentioned that it was fun in general without giving too much more detail:

- It was fun both ways (Class I, SC)
- so much fun!! (Class II, N)

A few students mentioned how fun it was to collaborate with peers:

- It was generally kinda fun to arrange and work through our own piece….(Class I, SC)
- It was fun seeing a lot of young minds who have heard orchestral arrangements and these grand pieces try to come up with our own melodies…(Class II, TC)

Class II respondents were more likely to mention teacher-centered lessons in their description of why they had fun. This makes sense, given that teacher-centered lessons had a substantial student-centered component and that Class II experienced teacher-centered lessons in the second half of the unit:

- Learning songs by ear seems to always be more fun (Class II, TC)
- Mr. Arnold was very helpful during Cindy Cindy and made it fun to learn :) (Class II, TC)

Responses in the *Fun* category also mirrored themes present in the other 4 questions of the end of unit reflection:

- They were both a lot of fun to learn and I enjoyed seeing the process for each one. I definitely learned a lot. (Class II, TC)
- The learning process (by ear, chunk by chunk) for Cindy Cindy for me personally was nothing new, as I have learned many pieces by ear due to the fact that I am in this schools Fiddle Group. Other than that, I had a good time learning both pieces. Thanks for choosing us! (Class II, TC)

Learning Outcomes

In addition to describing how the fun they had in the arranging process, there were quite a few students in Q5 that discussed or showed evidence of *Long-Term Learning*. The most obvious examples of *Long-Term Learning* fell under the category of *Transfer*.

Transfer

- The student led one was far more memorable (Class I, SC)
- Both songs improved my ability to rapidly learn and improve upon a piece. (Class I, SC)
- I liked how as a class we were able to put all this knowledge we had together. It shows us that the things we learn every day reside with us and we take it forward in a way. (Class I, N)

Students also showed evidence of *Long-Term Learning* when discussing the *Musical Concepts/Skills* that they learned.

Musical Concepts/Skills

- I really started understanding chords during liza jane (Class I, TC)
- chord changes and chord theory in general are very important in writing melodies and harmonies that mesh well together (Class II, SC)

Student responses in Questions 1- 4 indicated that students became more comfortable with the arrangement process as they gained experience. The following respondent from Class I stated in Q5:

- The processes used were difficult to begin with but became easier to master as time went on. (Class I, SC)

Similarly, students who had prior experience seemed to be quite comfortable throughout the process:

- It's was easy for me since I'm already in fiddlers and can learn pieces by ear really easily (Class II, N)

While student-centered lessons work for in person students, online learners such as this one, preferred direct teaching:

- Having a teacher to lead the Orchestra was a lot easier to follow as an online kid (Class I, N)

These lessons also seemed to inspire new learning and motivation for students:

- I want to try a hand at arranging music, but all the programs available cost money :^((Class I, SC)
- It was really cool to see everyone's thought process while we learned Goodbye Liza Jane, we've all been playing together all year but I learned so much about how everyone thinks during music. (Class II, SC)

While most responses were positive, a few students offered constructive criticism:

- I feel like student learning could work better in smaller groups. With so many students, it's harder for everyone to stay engaged as not everyone feels like contributions are needed. In a smaller setting, one is more inclined (and kind of also forced) to participate more in all the parts of learning. (Class II, SC)

One student even offered that the two styles of teaching and learning should be mixed:

- While it was fun to be creative with the class for Liza Jane, I honestly became a bit impatient at our slow speed, it took a lot longer to progress without a teacher. Ideally the lesson would be a mix of the two, allowing students to be creative and contribute while benefiting from the guidance of a teacher to help us move along and explain the music theory behind things. (Class II, TC)

Summary of Reported Strengths and Weaknesses for End of Unit Reflection

Table 4.13 below summarizes the perceived strengths and weaknesses of student-centered lessons for Q1-5 in the End of Unit Reflection. In general, students felt they were more actively involved in student-centered lessons than they were in teacher-centered lessons. Students noted using different learning strategies in student-centered lessons than teacher-centered lessons. They also noted that they did not like a complete lack of structure in the student-centered lessons.

Table 4.13

Student Perceptions of Strengths and Weaknesses of Student-Centered Lessons in the End of Unit Reflection

Strengths	Weaknesses
More enjoyment than TC when the student has some experience with a concept or task	Not enough structure
More autonomy/decision making	Chaotic at times
More creativity	Time wasted/time consuming
Use different learning strategies than TC	Does not work as well in large groups
More transfer/long-term learning	
More research/arranging completed by students	
More student involvement in the process	
More collaborative	

Likewise, Table 4.14 summarizes the perceived strengths and weaknesses of teacher-centered lessons in Q1-5 in the End of Unit Reflection. Students appreciated the structure and help of their teacher in the teacher-centered lessons, but also enjoyed having some autonomy and freedom afforded them in teacher-centered lessons.

Table 4.14

Student Perceptions of Strengths and Weaknesses of Teacher-Centered Lessons in the End of Unit Reflection

Strengths	Weaknesses
More enjoyment than SC when student has no experience with a concept or task	Not as much freedom/autonomy as SC
More structure	Not as much long-term learning/not as memorable
Less chaotic than SC	Less arranging by students and more copying
Use different learning strategies than SC	Less collaborative
Easier to follow teacher in large group setting	
Teacher is more experienced	
Easier to incorporate online learners	

Teacher Reflection

In addition to student responses, I asked the orchestra director to keep a journal of the learning process of his students and his own thoughts throughout all lessons. He organized his final document using these two prompts:

1. Please describe how each treatment played out. You may give a list of strengths and weaknesses for each treatment if that helps.
2. Please provide any other details about teaching in these two methods that might be helpful to researchers and colleagues in the music education field.

The teacher made a list of his perceptions of strengths and weaknesses in student-centered lessons within the experiment (Table 4.15). Then he made a list of his perceptions of strengths and weaknesses for teacher-centered lessons (Table 4.16. He also included a narrative of his own perceptions and synthesized that information with what he observed students perceived.

Additionally, he commented briefly on the outcomes of the different learning methods and made some general conclusions. The following is an unmodified version of his response (identifiable information redacted).

Table 4.15

Teacher Perceptions of Strengths and Weaknesses of Student-Centered Lessons in the Teacher Reflection

STRENGTHS	WEAKNESSES
Freedom to create Original Arrangement	Limited experience in harmonic understanding
Leadership opportunities	Unorganized approach to sequential learning
Promotes group building	Based on ability of the group, the final performance may not be as artistically prepared.
Pride and ownership of performance	Limited knowledge and experience in researching styles and performance practices of the tune.
Students get an opportunity to practice on their own and experience individual growth.	

Table 4.16

Teacher Perceptions of Strengths and Weaknesses of Teacher-Centered Lessons in the Teacher Reflection

STRENGTHS	WEAKNESSES
Arrangement is more artistically Organized	Students' creativity may be limited.
The pace of the classroom is fast and efficient	Less opportunity for students to practice concepts on their own.
Promotes group building	Creativity is limited to the comfort of the teacher.
Students are exposed to an efficient practice and learning model	Students are less likely to volunteer for help or volunteer for featured solos.
High Artistic performances	

Teacher Response and Conclusions

The teacher summarized the information in the following narrative:

Student-Centered and Teacher-Centered learning are important pedagogical practices that will benefit a variety of learning environments. I discovered through this process some contingencies that may affect the outcome of each of the models. First, the control group that experienced **Teacher-Centered Learning** first transferred some of the procedures and techniques of the teacher to their **Student-Centered** project. This helped them approach the beginning of their **Student-Centered** project with a better design. Second, the control group that started with the **Student-Centered** project felt a sense of relief once they started the **Teacher-Centered** project. They may have expressed that they enjoyed the **Teacher-Centered** project more because of the structure and outcome of their experience in the **Student-Centered** project. Third, both control groups have had experiences in **Student-Centered** learning. They have experienced independent learning alone, in small groups and in a large rehearsal setting. The students would have transferred some of those techniques to their experiences in this study.

The project was very beneficial for both the teacher and the students. As the teacher, it challenged me to allow my students more freedom in the learning process. It also gave me a keen understanding of the deficiencies they have as independent learners. The students were challenged to be more independent in their learning, more assertive in their leadership, and more creative in the final project.

All teachers create a **Teacher-Centered** environment. After this study, teachers will be able to glean that the most effective classrooms use a variety of teaching strategies that would be a mixture and balance of both **Teacher-Centered** and **Student-Centered** learning environments.

CHAPTER 5: DISCUSSION

Although educational philosophers and pedagogues have noted the advantages of a student-centered approach to instruction in their written philosophies and through anecdotal evidence, there is very limited research on student-centered learning. As far as I can discern through this review of literature, there are no formal studies conducted on student-centered learning in music.

This experiment sought to fill this gap and better understand:

1. How do students and teachers perceive their environment during student-centered lessons vs. teacher-centered lessons?
2. How do students and teachers perceive student learning in student-centered lessons vs. teacher-centered lessons?

Data was collected with a Student Reflection at the end of both sets of lessons. An End of Unit Reflection was completed by students at the end of the entire unit, and a Teacher Reflection was completed by the teacher. Demographic data was also taken, and the teacher kept a daily log of lesson activities during student-centered lessons.

Environment

In responses about environment, one main comparison emerged in both the student responses and that of the teacher. Students described in detail their ability to make decisions (autonomy) vs. when and how the teacher intervened during lessons. A second emergence was that students wrote extensively about their enjoyment and engagement in both the student-

centered lessons and the teacher-centered lessons. Despite noting time wasted/chaos in student-centered lessons in the End of Unit Reflection, student ratings for engagement were high for both student-centered and teacher-centered lessons in the Student Reflection. Third, while students reported helpful interactions consistently across the many comparisons made, who they interacted with changed depending on whether they were participating in student-centered lessons or teacher-centered lessons. Finally, in all the previously named environmental elements, both students and the teacher described ways in which they moved towards an environment that was a mix of the two methods being compared, regardless of whether they were participating in student-centered lessons or teacher-centered lessons. Students wrote about enjoying some combination of both autonomy and structure in the End of Unit Reflection.

Autonomy vs. Teacher Intervention

Out of all the data sets in this study, and out of the many comparisons drawn, the most surprising results occurred in the categories of autonomy and teacher in the Student Reflection. As explained in the results section, students rated their autonomy higher in the teacher-centered lessons than they did for student-centered lessons. Just as surprising was the fact that they rated the amount of teacher direction higher in the student-centered lessons than they did in the teacher-centered lessons. This seemed to contradict data obtained from Q3 in the End of Unit Reflection where every student but one (a virtual student) stated that they made more decisions in learning the student-centered tune (GLJ) than they did for the teacher-centered tune. But answers in the End of Unit reflection revealed students found leaders in the student-centered lessons and proceeded to rate their peer leaders as the teacher. Additionally, the evidence in the End of Unit Reflection and the Teacher Reflection indicates the teacher was able to allow the

autonomy designated by the experiment design in student-centered lessons. Despite the autonomy afforded them, students moved towards a more comfortable equilibrium where they allowed the presence of a more experienced peer leader which they could see as a teacher. The opposite happened in the teacher-centered lessons, where the teacher relinquished some of his authority and allowed the students to create their own solos. Their teacher acknowledged within the Teacher Reflection that, "…both control groups have had experiences in **Student-Centered** learning." Since the teacher himself was accustomed to creating a student-centered learning environment, it might have been difficult for him to adhere to a purely teacher-centered structure in the teacher-centered lessons. This was also evident in some student responses from the End of Unit Reflection, which indicated a mix of student-centered and teacher-centered environments allowed for some autonomy during the teacher-centered lessons. One student in Q1 of the End of Unit Reflection even indicated they were afforded more autonomy in the teacher-centered lessons (CC) than the student-centered lessons (GLJ). The student noted, "I preferred playing Cindy Cindy because I had more freedom to mess around with a solo, but I enjoyed leading Goodbye Liza" (Class I, CC). On the other end of the spectrum, it was interesting the teacher found it difficult to completely control the learning taking place in the teacher-centered lessons without affording some autonomy. Gordon would have also agreed with a balance of more formal guidance mixed with informal guidance (Gordon, 2012). Piaget, Dewey, Vygotsky, and Rousseau all opined similarly and wrote about this balance in their own way (Dewey, 2015; Page, 1990; Piaget, 1964; Rousseau, 1899; Vygotsky, 1978; Wiggins, 2001). And while each individual in a class is different and brings their own experiences to the table when collectively solving a problem, the data sets and anecdotal evidence in this experiment indicate that both the

teacher and the students were neither used to a completely teacher-centered environment nor a completely student-centered environment. Rather, students and the teacher were more comfortable and used to a mix of the two based upon their past experiences. On a further note, students were more comfortable with a student-centered environment when they had a base of experience for a particular task, which in this case, was creating an arrangement of a fiddle tune.

Engagement

Responses in the Student Reflection indicated high engagement compared to the other 7 categories. Students perceived high engagement in both student-centered lessons and teacher-centered lessons with engagement means being slightly higher in teacher-centered lessons. Even though engagement was high, some students thought student-centered lessons were unorganized and lacked a logical sequence. One student noted, "I enjoyed learning Cindy Cindy better because it was more engaging, and there wasn't a time where I was sitting around not doing anything." (Class II, TC). In addition to students reporting time-wasted and chaos in the End of Unit Reflection, the teacher noted that in a purely student-centered learning environment, students may have an "unorganized approach to sequential learning." Any lack of organization (chaos) or time-wasted, can definitely influence engagement levels. At first glance the finding that reported engagement was higher in the teacher-centered lessons of this study may seem at odds with other research in the field such as Ribeiro (2011) that reported higher levels of enjoyment and engagement in a student-centered learning environment. But there are marked differences between that case study and this experiment. The Ribeiro (2011) case study does not compare two roughly equivalent measures, it only contrasts a case study group with students' past experiences, which are unique to every student. Secondly, the project in the case study

presented in Ribeiro (2011) did not fall completely on the bottom end of the student-centered portion of the spectrum in Rogers & Frieburg (1994). The professor regularly gave feedback to students throughout the process. Ribeiro (2011) was by its description, somewhere in the middle of the continuum between a completely autonomous environment and a completely controlled environment. As already mentioned, students in this study were also more comfortable with a mix that lies somewhere in the middle of the continuum presented in Rogers & Freiburg (1994).

Additionally, students became comfortable with a more student-centered environment after having had exposure to the arrangement creation process. Thus, the amount of autonomy that was required of students in their first set of lessons in this study could logically affect perceived student engagement. This is evidenced by the fact that while there was mention of time-wasted/chaos for the student-centered treatments in Q1 of the End of Unit Reflection, all comments with this code were from students in Class II, the class who began with the student-centered lessons. The teacher gave some insight into why time-wasted/chaos ratings only occurred in Class II, noting that Class I had the benefit of experiencing the more structured teacher-centered lessons first and was able to transfer that experience to their student-centered lessons. Class II who "…started with the **Student-Centered** project felt a sense of relief once they started the **Teacher-Centered** project." The input provided by the teacher reflects the concepts of scaffolding and the Zone of Proximal Development termed by Vygotsky (Verenikina, 2003; Vygotsky, 1978; Wiggins, 2001). Class II who experienced the student-centered lessons first, would have needed more scaffolding for the experience to remain within their collective Zone of Proximal Development. Class I, who already had an experience that was directed by the teacher, had more students operating within their Zone of Proximal Development

when they got to the student-centered lessons. There would have been much less need for Class I to operate with a large amount of scaffolding because of their prior experience with the teacher-centered lessons.

A second possible explanation for why the means of reported engagement levels among students were slightly higher in the teacher-centered lessons of this study is that the teacher-centered lessons of the unit contained some student-centered elements. One student in Q1 of the End of Unit Reflection reported, "…we got the best of both worlds with Cindy Cindy because Mr. Arnold let us use our knowledge we had gained from him and our previous knowledge to make some of our own decisions about how and what to play in the arrangement." (Class II, TC). This student indicated in their response that the teacher allowed some autonomy in teacher-centered lessons. The teacher also indicated that students participating in the study were accustomed to a student-centered learning environment and "would have transferred some of those techniques to their experiences in this study." Given that the student-centered lessons, and even the teacher-centered lessons contained some student-centered elements, it is not surprising that students rated their engagement high in both. The data indicate that students were in at minimum a somewhat active learning environment for both treatments, which by its very definition, requires engagement (Dewey, 2015; Green, 2016; Page, 1990; Piaget, 1964; Wiggins, 2001).

Enjoyment

Out of all 8 categories of questions in the Student Reflection, enjoyment was rated the lowest in the combined responses. Even though responses in the End of Unit Reflection and Teacher Reflection indicated some lack of organization, and chaotic learning environment in

student-centered lessons, students still rated their enjoyment levels significantly higher during student-centered lessons than they did for teacher-centered lessons in the Student Reflection. This difference was noted in student responses in the End of Unit Reflection, such as this student who noted, “I enjoyed Liza Jane more because students had more freedom to design the arrangement.” (Class II, SC). Many student responses agree with previous studies that highlight student enjoyment during student-centered experiments (Gundala et al., 2018; Ribeiro, 2011; Vernon, 1995).

While students rated their enjoyment higher in the student-centered lessons than they did in the teacher-centered lessons, the End of Unit Reflection responses indicate there was more overall preference for learning the teacher-centered tune over the student-centered tune. There are several factors that may have played a role in this response of overall preference. Students reported that the tunes themselves played a role in their overall learning preference for the tunes. For example, only four students in Q1 of the End of Unit Reflection reported liking the student-centered tune (GLJ) more than the teacher-centered tune (CC). In contrast, seven students reported liking the teacher-centered tune (CC) more than the student-centered tune (GLJ). Secondly, as highlighted in the engagement and autonomy vs. teacher analyses, students, and their teacher reported some lack of organization while learning the student-centered tune. As with engagement, the order of learning might also have played a role in overall enjoyment. In Q1 of the End of Unit Reflection more students in Class I indicated a preference for the learning process in the student-centered tune (GLJ) than did for the teacher-centered tune (CC). This finding contrasts with Class II where less students indicated a preference for the student-centered learning process than did for the teacher-centered learning process. Student data for learning

preference agrees with the teacher who indicated in the Teacher Reflection that enjoyment levels were affected by the order in which students participated in the two types of lessons. Class I received the teacher-centered instruction first which, "…helped them approach the beginning of their **Student-Centered** project with a better design." The opposite was true with class two, where the lack of organization in the student-centered lesson was quite pronounced in student responses. This student in Class II captured that relationship well when stating, "I enjoyed learning Cindy Cindy better because it was more engaging, and there wasn't a time where I was sitting around not doing anything." (Class II, TC). Once students had an experience with the fiddle tune arranging process, lack of organization was no longer a problem. In fact, there were seven students in Class II who mentioned time wasted/chaos in their responses to overall preference in Q1 of the End of Unit Reflection, but there was not a single student whose response was coded for time wasted/chaos in Class I, where students experienced the teacher-centered lessons before student-centered lessons.

Although enjoyment levels were rated numerically low in the Student Reflection, this might have had somewhat to do with the way the question was worded. The question asked whether "I enjoyed learning this tune," which in hindsight may have led some respondents to rate how much they liked the tune rather than their overall enjoyment of the process. Enjoyment ratings may also have been impacted by environmental factors outside of the classroom. This experiment took place in the spring of 2021, a time of global unrest amid a devastating pandemic. Around the world students and teachers were operating under a veil of uncertainty and worry. This uncertainty was quite apparent in attendance data for the study which indicates that on any given day, different participants were in the classroom. Some students stayed home for

the majority or a large portion of the study and entered the class via zoom. Only a portion of the students were present in-person on any given day for each lesson. The COVID-19 pandemic more likely than not, had a negative effect on enjoyment ratings in the Student Reflection. Even given this, students described their enjoyment in detail with their responses to the End of Unit Reflection.

Interactions

In comparison to other categories within the Student Reflection, there was a significant positive correlation between the category of interactions for almost every category except for the engagement and teacher categories. As the ratings for interactions were higher, so were the ratings for enjoyment, specific learning outcomes, arranging outcomes, autonomy, and perceived overall learning. This held true also for the correlations of student-centered responses, and for the correlations of teacher-centered responses as they were analyzed. The data very strongly points to the fact that the interactions was consistently correlated to 5 of the other categories regardless of whether the comparison involved student-centered responses (Table 4.3), teacher-centered responses (Table 4.4) or all responses (Table 4.2). Additionally, there were no statistically significant differences in comparisons of the Interaction means in student-centered vs. teacher-centered responses, in Class I vs. Class II responses, in Class I SC vs Class II SC responses, in Class I TC vs. Class II TC responses, in Class I SC vs. Class I TC responses, or in Class II SC vs. Class II TC responses. Regardless of the comparison made, students rated their interactions consistently when measured across all three questions about interaction. Perhaps there is a good reason for the seeming lack of a measurable variance in perceived interactions in student-centered vs. teacher-centered lessons and other comparisons. One explanation is that a similar

amount of interaction is required to create an arrangement regardless of whether a student has more interaction with their teacher or with their peers. It would be difficult to analyze whether this was the case without directly asking this of students. As the data in this experiment suggest, students may have viewed their peer as the teacher in questions regarding autonomy. As explained in the autonomy vs. teacher portion of the discussion, teacher ratings were much higher for student-centered lessons than they were for teacher-centered lessons. One student in Q1 of the End of Unit Reflection mentioned, "I enjoyed Goodbye Liza Jane more because it was more led by students than the instructor" (Class II, SC). Conversely, autonomy ratings were actually lower for the student-centered lessons than they were for the teacher-centered lessons in the Student Reflection. However, the data in the End of Unit Reflection paint a different picture than seems to be the case looking solely at the numbers in the Student Reflection. In the End of Unit Reflection, there are many more mentions of autonomy and creativity in student responses for those who mentioned a preference for the student-centered process over the teacher-centered process. One student mentioned "I enjoyed Liza Jane more because students had more freedom to design the arrangement" (Class II SC).

Since this study was meant to test the strengths and weaknesses of a strongly student-centered set of lessons vs. a strongly teacher-centered set of lessons, it is not at all surprising that interactions ratings in the Student Reflection are seemingly flat. One might expect more polarized, and possibly higher interaction ratings between the individual (self), the teacher, and peers in a setting that was intentionally a mix containing student-centered elements and guidance from the teacher. Rousseau, Piaget, Dewey, Vygotsky, Gordon, and others would agree that a good balance between autonomy and some guidance from the teacher would be necessary to

create an ideal learning environment (Dewey, 2015; Gordon, 2012; Page, 1990; Piaget, 1964; Rousseau, 1899; Vygotsky, 1978; Wiggins, 2001). The fact that interaction ratings were very steady throughout different comparisons of student groups made within the Student Reflection undoubtedly points to the possibility that students and the teacher sought equilibrium in both student-centered and teacher-centered lessons. The teacher couldn't help but allow students to form their own solos in the teacher-centered lessons, and the students elected peer leaders for the student-centered lessons. As the teacher noted in the Teacher Reflection, students transferred their knowledge to seek out the best possible way to approach their learning tasks. This was also evident in End of Unit Reflection responses such as this student who stated, "I enjoyed both equally. Cindy Cindy allowed me to learn things from the teacher and with those things I learned I was able to use that knowledge and become a class leader. Without Cindy Cindy I wouldn't have learned Liza Jane as easily" (Class I, N). As stated previously the teacher himself made some transfer from previous experience in that he allowed students to create solos in the teacher-centered lessons.

Students seemed to rate their interactions in a consistent manner, whether they were participating in student-centered lessons or teacher-centered lessons. One explanation is that students needed to interact regardless of whether more of their interactions took place with the teacher or with their peers. And the fact that both students and the teacher were seeking a middle ground with autonomy, regardless of whether they were in student-centered lessons or teacher-centered lessons would have affected the interaction ratings by moderating them in the same way.

Implications for Environment

In principle, the findings of this study match philosophical writings indicating students need some teacher guidance in their learning processes while also retaining some level of autonomy (Dewey, 2015; Green, 2016; Green, 2017; Page, 1990; Piaget, 1964; Rousseau, 1899; Vygotsky, 1978; Wiggins, 2001). The autonomy and teacher ratings along with the student responses in the End of Unit Reflection and the Teacher Response certainly point to a discomfort on both the part of the teacher and the students with either a completely autonomous environment, or an environment that is completely controlled by the teacher. To achieve as much balance as possible, students elected peer leaders in the student-centered lessons, and the teacher relinquished some autonomy to students in the teacher-centered lessons of this study. And although the data within this study surrounding autonomy vs. teacher intervention do not pinpoint a perfect answer of how much autonomy and how much teacher intervention are appropriate in each educational situation, they do support some fundamental arguments in literature:

1. Ideally, environments should contain a mix of autonomy and teacher guidance/intervention
2. The optimal level of autonomy afforded each student at any moment during a learning process depends on their experience level with similar or relatable problems.
3. As students gain more experience with solving a particular type of problem, students should retain more and more autonomy wherever possible without creating an environment that is chaotic. In this environment, teachers will help students sequence their learning rather than completely controlling the curriculum (what is learned).

The data from this experiment surrounding engagement and enjoyment serve to bolster the implications of the data surrounding student autonomy and teacher intervention. Engagement

was the highest rated category for both student-centered and teacher-centered lessons. This makes perfect sense, because creating an arrangement, regardless of whether one looks through the lens of the student or the teacher, may be a less common musical activity (Gordon, 2012; Green, 2016; Green et al., 2017; Page, 1990). This confirmation that novel activities produce high levels of engagement in students bolsters the argument that creation activities such as forming an arrangement should be a more common experience in music education classrooms.

Additionally, data indicate both students and the teacher sought an equilibrium and balance in the environment throughout the arrangement creation process, regardless of whether they were participating in student-centered lessons or teacher-centered lessons. And perhaps this is partially due the fact that students and the teacher were used to a somewhat student-centered environment already, although there is no specific data on exactly where on the continuum their collective experience lies. This certainly underscores the importance of creating an environment in which students may regularly give input throughout the process of learning. If educators give their students enough choice in the way they learn a given concept, students will find efficient ways to learn. As much as educators try to understand exactly what a student knows, the only person who truly knows what they need to learn next to solve a problem is the student themselves. Students will naturally seek the information needed to fill in their own learning gaps (Green, 2016; Green, et al., 2017; Wiggins, 2001). Educators should also be open to fluidity in their plans. If a student finds they need to learn one concept to attack a problem, teachers should allow students them the freedom to learn whatever information they are missing to solve the next task.

Allowing choice in the learning process is undoubtedly helpful to both students and the teacher, but teachers should also be careful not to give too much autonomy to students when they are solving a completely new problem or trying a novel task. Teachers should carefully guide instructional sequencing so that students don't get frustrated or stuck for too long trying to complete one task. This error became clear with students in Class II who experienced student-centered lessons first in the study. Students in Class II noted an uneasy feeling and described their discomfort in student-centered lessons. But students in Class I did not have that same discomfort in their student-centered lessons. Students in Class I and Class II were afforded the same level of autonomy for their respective sets of student-centered lessons. The only difference was the order in which they experienced them. As students become more experienced problem solvers with a given concept, the teacher can and should allow more autonomy. Verenikina (2003) would agree with this assessment. The amount of structure a teacher provides should fit within the range of each child's Zone of Proximal Development. However, it is possible that teachers hold on to too much structure for too long (Dewey, 2015; Page, 1990; Rousseau, 1899; Verenikina, 2003; Vygotsky, 1978; Wiggins, 2001) As the concept of the Zone of Proximal Development suggests, allowing as much autonomy as possible based on student experience levels will optimize student engagement, meaningful interactions, and most importantly enjoyment throughout each learning process without compromising good sequencing in students' learning (Verenikina, 2003; Vygotsky, 1978).

Learning Outcomes

In the Student Reflection, the End of Unit Reflection, and the Teacher Reflection, students vividly described what they learned in both student-centered lessons and teacher-

centered lessons. Similar to implications of the educational environment, student ratings and writings about learning outcomes reflect the fact that both types of lessons in the reality of their implementation were a mix of student-centered and teacher-centered methods. The fact that each type of lesson was a mix, probably muted the effects that the two different methods had on ratings, which were consistent between specific learning outcomes, arranging outcomes, and perceived overall learning (and all positively strongly correlated). The consistency in learning ratings between student-centered and teacher-centered respondents would have been surprising if there had been a stark difference between the two methods in their implementation. And while it is difficult to tell exactly how much of an effect this mixing of methods had on student learning in this study, it is clear that both sets of lessons were mixed. Students wrote in the End of Unit Reflection about having peer leaders in student-centered lessons that they rated as teachers in the Student Reflection. They also appreciated the freedom they retained in teacher-centered lessons where they referred to their actual teacher as a guide in many instances. Several student descriptions of their teacher-centered experiences sound more like descriptions of student-centered environments than a strictly teacher-centered environment. One student stated, “I preferred Cindy Cindy because the teacher led instruction provided us with more structure and advice while still allowing students freedom to come up with solos and share ideas” (Class II, TC). The teacher, and the students both acknowledged the difficulties and limitations student leaders encountered during student-centered lessons. One student leader noted, “It was hard to lead the class when I already had a background in fiddle music to slow down and explain what I wanted for Little Liza” (Class I, TC). Even though students chose more experienced peers to lead during student-centered lessons, those leaders probably would have been somewhat limited by

their arranging and teaching abilities. One student noted these limitations very well in Q2 of the End of Unit Reflection by saying, "I learned more about how music is put together from Cindy Cindy because our teacher helped us with chords and explained the harmony, in Liza Jane we were more reliant on our prior experience and knowledge from classmates" (Class II, TC). Students also noted that their teacher's sequencing was an important part in their learning process. One student commented that, "Cindy Cindy was more enjoyable to learn because our teacher took it step by step with us…" (Class II, TC). Comments from the Teacher Reflection mirrored student sentiments. Just like responses in the End of Unit Reflection, the teacher noted that without enough guidance, students would have an "unorganized approach to sequential learning." He also noted that, "based on ability of the group, the final performance may not be as artistically prepared." This thought brings levity to the argument that student learning may sometimes be limited by the knowledge of the teacher, and that teachers themselves are just a more experienced learner (Gordon 2012; Page, 1990, Dewey, 2015). Student comments are harmonious with those of their teacher. They were aware that he was a more experienced guide than their peer teachers. One student noted, "…his experience in teaching and music proved very valuable compared to us learning the piece amongst ourselves" (Class II, TC). Both the teacher and the students noted that they were able to apply their knowledge from the teacher-centered lessons to the student-centered lessons. One student noted, "I felt like I learned a little bit more in Cindy Cindy where the teacher taught us the music techniques and we applied them in Liza Jane" (Class I, TC).

While the magnitude of the effect that mixing student-centered and teacher-centered methods had on learning outcomes was difficult to measure exactly, the effect that novelty had

on student learning was clearly present. Just like with environment ratings, students rated their learning higher in the set of lessons that occurred chronologically first, regardless of whether they were participating in student-centered or teacher-centered lessons in their first set of lessons. Students also rated specific learning outcomes, arranging outcomes, and perceived overall learning significantly higher in Class II student-centered responses (Lesson I) than they did for Class I student-centered responses (Lesson II). Even though some students in Class II felt their student-centered lessons were chaotic, they still rated their learning higher overall than students in Class I who participated in student-centered lessons after their teacher-centered lessons. Responses in the End of Unit reflection indicate roughly the same proportion of students felt they learned more about arranging in their first set of lessons. This result brings even more levity to the argument that despite some difficulties in the learning process, students learn a lot when they attempt to solve a new problem. Although not statistically significant, the means for learning outcomes were slightly higher for student-centered responses than they were for teacher-centered responses and higher in Lesson I responses than they were in Lesson II responses. The ratings evidence and responses in the End of Unit Reflection suggest that whether students had experience with arranging played a large role in their perceived learning. Dewey (2015) wrote extensively about the fact that each experience a person goes through in their lives shapes all subsequent experiences, especially if a past experience is like the present experience. Vygotsky (1978) also wrote heavily about how experience shapes future actions. Vygotsky believed recalling experiences shapes the way a child thinks.

An important consideration regarding the effect of experience on student ratings is that most of the students in Class II who participated in the student-centered lessons first were

probably operating outside of their Zone of Proximal Development (Verenikina, 2003). Their teacher noted in the teacher reflection that students in Class II, "felt a sense of relief once they started the Teacher-Centered project." The teacher also stated that operating outside their Zone of Proximal Development probably had a negative effect on student enjoyment for Class II. One student in Class II who preferred the teacher-centered lessons noted that in, "Goodbye Liza Jane we used sheet music and someone's vague understanding of music theory and Cindy Cindy we learned by ear and had someone who understands music theory/an experienced fiddler guide us in the harmonies" (Class II, TC). Once students in Class II got to the teacher-centered lessons, many of them noticed how much they were able to accomplish when their teacher led the lessons. One student noted, "I learned more about music learning in Cindy Cindy because we learned how to do more complicated accompaniments and we had shuffle rhythms and soloists as well" (Class II, TC).

The opposite effect probably took place with Class I that experienced the more structured teacher-centered lessons first and then moved to the less structured student-centered lessons. Their teacher acknowledged this advantage in the Teacher Reflection stating that the "group that experienced Teacher-Centered Learning transferred some of the procedures and techniques of the teacher to their Student-Centered project. This helped them approach the beginning of their Student-Centered project with a better design." Vygotsky (1978) stressed that memory shapes thought. It seems quite logical along that line of reasoning, the memory of a well-planned and thought-out example of arranging in the immediate past helped students as they tried to create an arrangement on their own. Students in Class I seemed to agree that this sequence was helpful. One student noted that "Mr. Arnold teaching us Cindy Cindy first helped our group know what

to do when we got to Liza Jane" (Class I, SC). Going from teacher-centered lessons to student-centered lessons was a definite advantage for Class I over Class II students who experienced student-centered lessons first. And although each student brings a different level of experience to their group, both students and the teacher agreed that moving from more structure in the arrangement process was helpful. Vygotsky would agree that more scaffolding in the first experience and less scaffolding in the second experience would place more students in the range of their Zone of Proximal Development (Verenikina, 2003). By the time they reached the student-centered lessons, many students in Class I had enough prior knowledge to be able to solve the arranging task at hand.

Learning Strategies

The most common difference in strategies students spoke about was using sheet music to learn their tune in the student-centered lessons (GLJ), and learning the tune by ear from the teacher in the teacher-centered lessons. This was true for both Class I and Class II. Given that there was a mix between student-centered and teacher-centered methods in both sets of lessons, the students' choice to use sheet music during student-centered lessons to learn the tune is not particularly surprising. One reason may be students are most accustomed to learning new music through notation and not by ear in an orchestra class. Gordon (2012), Green (2016) & Green et al. (2017) agree learning by notation is the most widely used strategy for learning music in instrumental classes. And while there were students who had experience with learning tunes by ear because of their participation in fiddle group or similar informal learning situations such as being in a band, not all students would have had much outside experience with learning tunes by ear. Another possible factor is learning the tune by ear would take up some valuable working

memory students need to make decisions about their arrangement. Using sheet music, at least in the beginning, allows them the freedom to start thinking about how the arrangement would go more quickly. One student noted, "We learned completely by ear for Cindy Cindy, but we were able to use sheet music for Liza Jane, so we were able to focus more on our harmonies and arrangements with Liza Jane" (Class I, TC). Most probably, their decision to use sheet music in both classes and to look for different versions of the melody to use was also a decision made based upon the size of the group. An entire class would have found it difficult to learn the tune by ear without a sheet music reference to ensure consistency, especially given that as far as the data reveals, none of the students participating knew either of these tunes prior to the experiment. While they were taught a version of the tune in their teacher-centered lessons, students had to come up with their own version in the student-centered lessons, and writing it out would have helped them accomplish this task with more facility. Students acknowledged an additional strategy they used to compare versions. One student wrote, "…we looked at videos and compared those to the arrangement we picked. We played through the piece and made decisions for what to play" (Class I, N). Green et al. (2017) noted that self-directed musicians tend to use recordings when learning a new tune. In the case of teacher-centered lessons, the teacher was the aural reference to which Green et al. (2017) referred. One student acknowledged, "we learned Cindy Cindy by listening to our teacher who explained the process with us. Then when we learned Goodbye Liza Jane, we had to do this process ourselves" (Class I, SC).

Students gave insight into how much more of the process they had to complete on their own in student-centered lessons. One student noted that, "for Liza Jane I wrote bass, cello, and viola parts and we looked off of music while in Cindy Cindy we learned by ear" (Class I, TC).

And while the previous statement sheds light on the leadership that one student took during the process, it also reveals a possible weakness in the design of the study. If only one or two more experienced peers are doing a lot of the work, it means that many of the students in the class may be taking on similar roles in the learning process as they did when their normal teacher was in charge. Furthermore, some students felt there was some time wasted in student-centered lessons, or that teacher-centered lessons were more efficient or organized. One student even acknowledged that "both times felt like I was just along for the ride. I wasn't really doing anything other than just doing what I was told" (Class I, SC).

Implications for Learning Outcomes

Data for learning outcomes seem to support the same main findings that occurred in data surrounding the learning environment. Just as with engagement ratings, results on learning outcomes indicate students tend to rate their learning higher in their first few experiences solving a new type of problem, whether they have help from an experienced guide or not. Results also indicate students perceived the guidance of their teacher to be helpful in the learning process. While students linked learning outcomes with the ability to make decisions and be creative, they believed that a total lack of guidance from the teacher limited their learning potential. Furthermore, when students were participating in student-centered lessons, they used different strategies to attack creating an arrangement, such as using sheet music vs. learning by ear when the teacher was teaching them the arrangement.

Perhaps one of the most important things the field of education, and music education can glean from this study, is the first experience in solving a given problem may produce the most learning. And while educators cannot control students' past experiences, they can attempt to

present a variety of different problems for students to solve. This study sheds light on the fact that creation activities such as creating an arrangement of a fiddle tune, were particularly novel, even in an orchestra program where the teacher reported students were used to student-centered experiences. Music educators can and should implement more creation activities into music education curricula (Gordon, 2012; Green, 2016; Green et al., 2017; Wiggins, 2001). The same would apply to creation activities in other disciplines outside of music (Dewey, 2015, Page, 1990; Piaget, 1964; Rousseau, 1899; Verenikina, 2003; Vygotsky, 1978). Finally, this study confirms the thoughts of Vygotsky that the proper amount of guidance and structure in a learning environment should decrease as students gain confidence and experience in solving a given problem. Specifically, teachers should provide only as much structure at any given moment in the learning process as will allow students to experience problem solving in a sequential manner. Although this strategy may require more planning on the part of the teacher and be outside their comfort zone, teachers can and should provide as many opportunities as possible for students to have music experiences in which they make their own decisions.

A secondary finding that occurred in the analysis of learning strategies relates to both the environment and learning outcomes. The teacher in this study and some student responses all indicate small group work really forces students to be accountable in the learning process and take responsibility for solving part of a group problem. The results of this study seem to bolster the argument for small group work. Just as research suggests, educators can and should utilize small group work to their advantage to optimize student participation in a student-centered environment (Green, 2016; Green et al., 2017; Wiggins, 2001; Gundala et al., 2018; O'Hara & Shaffer, 1995; Parsons, 2009; Ribeiro, 2011).

Limitations and Suggestions for Further Research

Undoubtedly, the most important outside factor that affected the outcome of this study was the global COVID-19 pandemic. This study was conducted during the Spring of 2021, a time of heightened caution during the COVID-19 pandemic. The COVID-19 protocols meant students were unable to have close contact, and they had to maintain an assigned seat for contact tracing purposes. These challenges alone were a difficult barrier to the study, but on top of that, many students were switching back and forth between in-person participation and virtual participation on a daily basis. Although the total impact the pandemic had on the students, the teacher, and the implementation of the study cannot be known, the fact that it made an impact on the outcome of this study is undeniable. The uncertainty and fear created by the ongoing pandemic, definitely had an impact on enjoyment levels. Engagement levels were probably affected greatly by the fact that on any given day, some students were switching back and forth between participating online and in person. To more clearly see the effects of the two instructional methods on student perceptions of their environment and learning, this study should be replicated when students are not switching back and forth between learning virtually and learning in person.

Another problem the teacher and the researcher encountered is the physical limitations presented by COVID-19 protocols made it impossible for this study to be implemented in small groups, as was originally designed. One of the students in this experiment agreed and offered this suggestion, “I feel like student learning could work better in smaller groups. With so many students, it’s harder for everyone to stay engaged as not everyone feels like contributions are needed. In a smaller setting, one is more inclined (and kind of also forced) to participate more in

all the parts of learning" (Class II, SC). Green et al. (2017) also noted the tendency of self-directed musicians to play in small groups and suggested this type of setting could be very helpful in a formal music classroom. This same small group approach was also used in related student-centered experiments (Gundala, 2018; O'Hara & Shaffer, 1995; Parsons, 2009; Ribeiro, 2011). As the student noted, each person in a small group really must contribute in order to have a successful musical experience. Consistency in any type of small group situation would have been impossible due to the constraints of the pandemic. More research testing the amount active participation in small group settings is needed to determine whether students tend to be more involved or less involved in learning processes in small group settings. This could also be tested with different amounts of guidance and teacher intervention to determine what level of guidance by the teacher is most beneficial in small group work.

The large group sizes negatively affected every aspect of environment ratings and learning outcome ratings. Since students were in such a large group trying to create one arrangement in the student-centered lessons, students reported in their End of Unit Reflections that the majority of arranging tasks were completed by a small number of students. This imbalance in tasks in turn affected student perceptions of efficiency, and the amount of time each student spent actively creating an arrangement, undoubtedly affecting responses in the End of Unit Reflection and in the Student Reflection. Partly because of the large group size in student-centered lessons, students noted a lack of efficiency in student-centered lessons as one of the reasons for preferring the teacher-centered process in Q1 of the End of Unit Reflection. Small group work is more closely aligned with the student-centered model of learning and not the teacher-centered model (Gundala et al., 2018; O'Hara & Shaffer, 1995; Parsons, 2009; Ribeiro,

2011). Therefore, using large groups for the study probably created a ratings advantage for teacher-centered lessons. It would be helpful to repeat this study utilizing a large group setting for the teacher-centered lessons and a small group setting for the student-centered lessons. If possible, researchers could also test using a small group setting in teacher-centered lessons to view the effect of small groups in that method of learning.

Because student interactions were affected where only a few students were in leadership roles to complete most arranging tasks, perceived teacher intervention by their peer leaders was rated higher. The fact that students have rated their peers as the teacher in the first place, is an indication that students always seek some level of guidance in their learning processes. Seeking the direction of more experienced peers is a normal part of the learning process for self-directed musicians (Green, 2016; Green et al., 2017). But to differentiate between peer leaders and the teacher, some modifications could be made in future replications of this research to a few of the questions presented in this experiment that would allow results to delineate between peer leaders and the students' teacher.

Another limitation to effectively measuring the student-centered learning vs teacher-centered learning in this study was the effect that gained experience had on ratings in the first set of lessons vs. the second set of lessons that students experienced. Since the order in which students experienced the two different methods also affected student responses, it would be great to compare two different class results where the first class moved from a more structured set of arrangement lessons to a second set of lessons where the teacher was allowed to optimally guide students in their process as needed. Both experiences would be intentionally mixed between structure and autonomy for the first group and follow the guidelines outlined in the implications

section of this dissertation as well as guidelines for the Zone of Proximal Development (Verenikina, 2003). That group could then be compared to a second class that received two completely structured sets of lessons where the teacher was in charge of every aspect of the curriculum and learning for both lessons. The above design might help researchers understand the effect that order has on outcomes and compare the ideal student-centered experience against a rigidly teacher-centered experience. There are many other possibilities for such a comparison. One possibility would be to have three different treatments for one class and three different treatments for a second class. The first class could start with an arrangement making process that contained more guidance from the teacher in each lesson. Then a second set of arrangement lessons could utilize less guidance from the teacher, and a third set of arrangement lessons could contain almost no guidance from the teacher. Student perceptions of these three sets of lessons could then be compared three arranging tasks where the teacher made all the decisions for all three sets of arranging lessons.

Another difficulty in measuring the effects of student-centered lessons vs. teacher-centered lessons is the fact some students had similar experiences prior to starting this experiment. Therefore, the lack of novelty that the arranging task presented for some students in both classes would have muted the difference in scores between student-centered lessons and teacher-centered lessons. Their teacher acknowledged this in the Teacher-Reflection, noting that both "…groups have had experiences in Student-Centered learning. They have experienced independent learning alone, in small groups and in a large rehearsal setting. The students would have transferred some of those techniques to their experiences in this study." Students also noted these experiences in their End of Unit Reflection responses. One student stated that their prior

knowledge meant that their learning in this study was limited. They wrote, “I didn’t really learn a lot because I sort of knew how music was arranged because of this class” (Class II, TC). It would also be interesting if this study was repeated with a set of classes that are accustomed to a mostly teacher-centered environment to see how they react to a student-centered experience.

Another important set of limitations had to do with the required de-identification of data. The IRB process required the teacher implementing this study to de-identify data in such a way that he himself would not be able to identify the responses of his own students. Therefore, I was unable to link student responses in the End of Unit Reflection to the same participant in the Student Reflection. Data could only be analyzed in terms of all responses or groups of responses (by lesson, by class, or by student-centered lessons vs. teacher-centered lessons). It could not be analyzed individually to see if each student was consistent in their responses between the Student Reflection and the End of Unit Reflection. It would be helpful to repeat this study with a simplified de-identification process linking participants between their responses for each data set. This would allow analysis of information about individual students and not just groups of students.

Another consideration that might have affected the outcome of this study is the fact that one of the students in Class II was also enrolled in Class I for the school year the study was completed. This double enrollment probably had some effect on the outcomes for both classes, including the structure of how student-centered lessons and teacher-centered lessons were carried out in each class. It would be ideal if any repeats of this study involved classes with a completely different set of students to keep the integrity of the data intact between classes.

One more consideration that might have affected the outcomes of this study is Class II participants had more playing experience than Class I participants. Although the classes had the closest ability levels among orchestras at the school where the experiment was conducted, it would be ideal if researchers were able to use two different classes of the exact same ability levels that met at different times.

One more inherent limitation in comparing the student-centered lessons with teacher-centered lessons is the teacher taught "Cindy Cindy" by ear for teacher-centered lessons, while students chose to use both sheet music and recordings as a guide in the process of creating an arrangement of "Goodbye Liza Jane." Even though students used sheet music as an aide in creating an arrangement, they did not copy a completely written arrangement of a fiddle tune. It would be worth it to try a teacher-centered set of lessons where the teacher shows students how they researched different versions of the melody of a tune and uses a written version of all the materials that go into the arrangement they teach students and then compare to a student-centered approach to the arrangement process like the one in this dissertation. Another possible comparison would be to teach a completely written out arrangement for teacher-centered lessons and compare it to a student-centered approach like the one in this dissertation.

Yet another comparison could be done where a pre-written arrangement could be taught using student-centered methods as much as possible. The teacher could allow students to break up into small groups, do their own research on how to execute the written rhythms, create their own interpretations of dynamics and articulations etc. and then present their interpretations to the class in a performance. The other group would be taught using completely teacher-centered methods where the teacher directly teaches all the rhythms and articulations and tells students

exactly how the dynamics will be interpreted. Student perceptions in the student-centered group could then be compared to the completely teacher-centered group who learned the same music.

All of the suggested comparison combinations above could also be attempted using different styles of music and comparing the results of those styles. For example, a researcher could compare perceptions of student-centered vs. teacher-centered lessons in learning two different classical pieces. This could be replicated with jazz, bluegrass, pop, or any other style of music. One could also compare different genres against each other using the student-centered methods for both, or comparing teacher-centered methods against student-centered methods. For example, the researcher could implement teacher-centered lessons with a classical piece, and then use student-centered methods to teach a fiddle tune.

Another important consideration was the limitation of not being able to record student performances of arrangements for the two teaching methods during the implementation of this study. It was unrealistic to obtain all the proper permissions for video recording necessary to analyze the student performances of the teacher-centered arrangement of "Cindy Cindy" vs. the student-centered arrangement of "Goodbye Liza Jane." If time constraints and protection of human subjects were not an issue, each one of the above research possibilities could also be recorded. Those recordings could then be rated by a panel of independent judges. Other analyses could also be completed with recordings such as gaining student perceptions and teacher perceptions of their recorded performances for student-centered performances vs. teacher-centered performances.

The above list of limitations provoked thought on a good number of possibilities for further research. Even so, there are nearly unlimited further possibilities for testing student-

centered methods of instruction in the field of music education. And while there needs to be more research in the area of student-centered learning in general, more research studying student-centered learning in music would definitely help the field of music education and other disciplines outside of music.

Final Thoughts

As is often the case with research, completing a study in the area of student-centered learning has caused me to ponder a new question. Are students drawn to learn in a way that mimics the structure of past learning experiences? Or, do they naturally seek a balance of autonomy and structure in their search for knowledge? In reality, both phenomena likely occur in the learning process. The idea that students' creative abilities are affected by both their natural propensity for creativity and their past creative experiences is much like the arguments made by Gordon (2012) who noted that musical abilities are some combination of the natural (genetic) abilities that a person possesses and how much these are nurtured. In the question of creativity, the optimal level of autonomy in creative tasks should be partly based on a child's genetic propensity for creativity. For example, I have had several students in my teaching career who seem to naturally lean towards wanting more structure in their learning, regardless of the creative opportunities they are presented with. I've often been given a statement such as, "Just tell me how it goes." And yet other students, solicited or not, have made statements such as, "I changed the ending to this piece we are working on because I didn't like how Mozart wrote it." And although an analysis of the natural occurrence of creativity in humans is outside the scope of this dissertation, data in the Student Reflection, End of Unit Reflection, and Teacher Reflection seem to be in agreement with Dewey, Piaget, Rousseau, Vygotsky, Gordon, and many others, that each

experience shapes the way we view subsequent experiences (Dewey, 2015; Gordon, 2012; Page, 1990; Piaget, 1964; Rousseau, 1899; Vygotsky, 1978). Exposing students to a wide variety of experiences through solving musical problems broadens student's abilities to solve different types of problems. Every problem that humans face in life, whether simple or complex, requires some manner of creativity in its solving. And regarding nurturing this creativity, results of this study indicate that engaging in creative activities such as creating an arrangement for a fiddle tune push the limits of student knowledge. Their teacher also acknowledged that he learned a lot from the experiences in this study. Creative experiences can and should be implemented more by both music educators and educators in disciplines outside of music.

Along those lines of reasoning this study has identified three main concepts that may help teachers decide their most optimal level of involvement as they guide students in creative learning processes. First, creative experiences cannot exist without some level of autonomy. In other words, the natural curiosity of a human cannot be nurtured in a class setting where the teacher retains all or almost all decision making in the learning process. Any classroom where this occurs will favor the learning of information, and neglect to nurture students' problem-solving abilities (Dewey, 2015; Piaget, 1964; Rousseau, 1899; Vygotsky, 1978). Nor can students attempt to solve new problems efficiently without the guidance of their teacher (Dewey, 2015; Gordon, 2012; Piaget, 1964; Rousseau, 1899; Vygotsky, 1978). Therefore, an optimal environment for learning should contain some level of teacher guidance while still allowing students to retain decision making power in their learning pursuits. Second, this optimal level of guidance balanced with autonomy for each student at any given moment in a learning process should depend on current experience level with similar or relatable problems. Third, as students

gain more experience in solving a particular problem such as creating an arrangement of a fiddle tune, they should retain more and more autonomy in their processes (Dewey, 2015; Piaget, 1964; Verenikina, 2003; Vygotsky, 1978). As Dewey (2015) cautioned, teachers often err on the side of retaining way too much autonomy and squashing student's natural creative problem-solving skills, rather than nurturing them. The best encouragement I can give to any teacher reading this document is to err on the side of giving too much decision-making ability to students in their learning processes. As students express the need for help, guide them in a way allows them to implement good sequencing in their learning. Embrace learning units that lend themselves to creativity such as creating an arrangement of a fiddle tune. Allow students to make as many decisions as possible throughout the process while maintaining good instructional sequencing. At the very least, a student-centered learning experience will provide students with the opportunity to experience learning in a different way. I can summarize the difference between student-centered and teacher-centered learning in no better way than to offer this student response from Q4 of the End of Unit Reflection. When comparing the student-centered lessons to teacher-centered lessons this student wrote:

> Wildly different strategies were in use for both pieces. Liza' Jane was student-led and focused on rearranging a piece and creative liberty, so the creative process was more at use. We learned matching chords and certain techniques that would make the overall performance more entertaining, as well as enjoyable to play. Cindy Cindy focused more on learning a piece in an efficient and effective manner, so it was more about the learning process as well as listening to the instructor in order to learn techniques that would make sound more consistent and beautiful. Think of it this way: Liza' Jane taught techniques

> aimed at the creative process and making the piece enjoyable for all that listened and even those who played, while Cindy Cindy taught techniques aimed at simply learning the piece in a professional and even competitive fashion. One is for fun, and the other for winning state finals. (Class I, SC)

As Dewey, Piaget, Rousseau, Vygotsky, Gordon, and others would agree, the goal in any learning situation is not just to learn information, but to become better at solving problems (Dewey, 2015; Gordon, 2012; Piaget, 1964; Rousseau, 1899; Vygotsky, 1978). I personally want my own students to become good at solving musical problems, so they can eventually solve any musical problem presented to them on their own. The only way any learner can achieve this goal in music, or any discipline for that matter, is by practicing the problem-solving process. And even if the results are sometimes different than the teacher may have intended, the only way any student may practice solving problems is by making their own decisions while they learn.

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Appendix A: Explanation of Teacher-Centered Environment vs. Student-Centered Environment

Teacher-Centered (TC) Environment

The goal for the TC treatment is for the teacher to be the authority on artistic direction as well as pedagogy of the fundamentals such as notes, rhythms etc. The teacher shall not allow any classroom discussion amongst students and all student questions must be directed solely to the teacher. While the students will be engaged in the act of playing their instruments, they will have no input on what and how to play other than the direction given by the teacher.

Student-Centered (SC) Environment

The goal for the student-centered portion of instruction is to have students actively engaged through the entire process. Even when students are obtaining the necessary knowledge base required to create their own arrangement, the teacher should constantly challenge students to work together and arrive at their own conclusions. The activities for this portion of instruction are set up such that students are exposed to an active learning environment throughout the learning process.

Appendix B: Research Cheat Sheet for Teacher

General Design

Weeks 1-2
There will be a Student-Centered group for Goodbye Liza Jane and a Teacher-Centered group for "Cindy Cindy"

Weeks 3-4
There will be a Student-Centered group for Cindy Cindy and a Teacher-Centered group for Goodbye Liza Jane.

Student-Centered Group Daily Objectives
(Weeks 1-2 Goodbye Liza Jane) (Weeks 3-4 Cindy Cindy)
Students will…

1. Agree upon a melody to use for their upcoming project.
2. Agree upon a bassline (chord structure) for their arrangement and research possible harmonies to use.
3. Find/create a harmony to go along with the chosen melody and chord structure.
4. Continue the work from Lesson 3 and verify the harmony against the melody and chord structure.
5. Learn about the arrangement writing process (note this begins to blend with the subsequent lessons and some objectives may be accomplished simultaneously from this point forward especially)
6. Assign tasks and create a working rough draft (no specific notation style) for their arrangement based upon their ideas for an arrangement structure.
7. Begin to share and refine the ideas they work on with their small groups
8. Finalize their arrangement to share with the class.

Teacher-Centered Group Daily Objectives
(Weeks 1-2 Cindy Cindy) (Weeks 3-4 Goodbye Liza Jane)
Students will…

1. Learn the melody of the tune from the instructor
2. Learn the chords of the tune from the instructor
3. Learn how a simple harmony is created given the melody and accompanying chords they learned from the instructor
4. Learn the specific harmonies the instructor wants to use for the fiddle arrangement and how they will be put together
5. Learn about the arrangement writing process as the instructor discusses the decisions he made to create the arrangement he is teaching them.
6. Review the arrangement that the instructor created.
7. Continue rehearsing the arrangement as the instructor directs and make any changes the instructor deems necessary

8. Fix any remaining mistakes at the direction of the teacher and get the arrangement ready to perform

Teacher Daily Checklist:

1. At the end of each instructional day give students a ticket out the door (paper or google link?)
2. After each class write a brief daily log of activities describing what happened and any details about how the lessons unfolded that you deem important

After Each Tune (Every 2 Weeks)

1. Students perform for their classmates
2. Give students the Perceptions Survey (Would you prefer I give you paper copies or make an online version?)

After The Entire Unit (4 Weeks)

1. Give students the free response questions (Would you prefer I give you paper copies or make an online version?)
2. Informal interview this is between you and me and will give you the opportunity to provide your perceptions of the experience with two different teaching methods and your thoughts on the student experience throughout this process

Teacher-Centered Teaching Actions

1. Lecture
2. Recitation
3. Drill and Practice
4. Demonstration
5. Discussion (If students have a question the teacher may answer the question but may not guide the student to the answer)

Student-Centered Teaching Actions

1. Cooperative Group (Teacher helps students form groups and facilitates activities/learning)
2. Guided Discovery (The lesson plan is based off of a guided discovery of learning in which you help students sequence their learning but they are also somewhat responsible for the process and product)
3. Contracts (Could use this if you wish)
4. Role Play (The whole process is role play)
5. Projects (The unit is a project)
6. Inquiry (You will rely on this heavily. When students ask questions you can ask a leading question in return. You may start a lesson with a series of questions that students have to answer etc.)
7. Self-assessment (This is also built into the project)

Appendix C: Goodbye Liza Jane Melody

Appendix D: Goodbye Liza Jane Chords

© 2014

Appendix E: Goodbye Liza Jane Lyrics

Goodbye Liza Jane

Scrapin' up the sand from the bottom of the sea
Goodbye, Goodbye
Scrapin' up the sand from the bottom of the sea
Goodbye Liza Jane
Scrapin' up the sand from the bottom of the sea
Goodbye, Goodbye
Scrapin' up the sand from the bottom of the sea
Goodbye Liza Jane

Oh how I'll miss her, oh what a shame
Oh how I'll miss her, Goodbye Liza Jane
Oh how I'll miss her, oh what a shame
Oh how I'll miss her, Goodbye Liza Jane

Black my boots and mak'em shine
Goodbye, Goodbye
Black my boots and mak'em shine
Goodbye Liza Jane
Black my boots and mak'em shine
Goodbye, Goodbye
Black my boots and mak'em shine
Goodbye Liza Jane

Oh how I'll miss her, oh what a shame
Oh how I'll miss her, Goodbye Liza Jane
Oh how I'll miss her, oh what a shame
Oh how I'll miss her, Goodbye Liza Jane

Appendix F: Cindy Cindy Melody

©2021

Appendix G: Cindy Cindy Chords

©2021

Appendix H: Cindy Cindy Lyrics

Cindy Cindy

You oughta see my Cindy, she's from way down South
She's so sweet the honeybees swarm around her mouth

Get along home Cindy Cindy get along home
Hey get along home Cindy Cindy, I'll marry you someday

First time I met Cindy she was standin' in the door
Shoes and stockin's in her hands and her feet all over the floor

Get along home Cindy Cindy get along home
Hey get along home Cindy Cindy, I'll marry you someday

Wished I was an apple a hangin' from the tree
And every time that Cindy walked by, she'd take a bite a' me

Get along home Cindy Cindy get along home
Hey get along home Cindy Cindy, I'll marry you someday

Now if I had a needle and thread, the finest I could sew
I'd sew that pretty gal to my side and down the road we'd go

Get along home Cindy Cindy get along home
Hey get along home Cindy Cindy, I'll marry you someday
Get along home Cindy Cindy get along home
Hey get along home Cindy Cindy, I'll marry you someday

Appendix I: Final Version of the Student Reflection

Student Reflection

Please select the rating from 1-5 that best represents your agreement or disagreement or how often an event occurred. The five rating options include:

1) Strongly Disagree, 2) Disagree, 3) Neutral, 4) Agree, 5) Strongly Agree
Questions 1* and 21*: 1) Never, 2) Rarely, 3) Some of the time, 4) Most of the time, 5) The whole time

1. I felt engaged while learning this tune*
2. I had helpful discussions with the teacher while learning this tune
3. I had helpful discussions with my peers while learning this tune
4. I enjoyed learning this tune
5. I learned new things about music while learning this tune
6. After learning this tune I know more about chords
7. Learning this tune improved my knowledge about harmony
8. After learning this tune I could create my own arrangement of a tune
9. My ability to learn melodies by ear has improved from learning this tune
10. My ability to work as part of a team improved while learning this tune
11. I learned how to arrange a piece of music while learning this tune
12. I learned new music skills and improved existing ones while learning this tune
13. I was allowed to make decisions about how to play this tune
14. The teacher made the decisions about how to play this tune
15. My classmates contributed ideas to the arrangement of this tune
16. I contributed ideas to the arrangement of this tune
17. I was responsible for learning this tune and learning how to play it
18. The teacher told us exactly how and what to play in the tune we learned
19. The teacher guided our learning and allowed us to choose how and what to play in the tune we learned
20. I learned everything in this arrangement directly from the teacher
21. I felt interested, active, and engaged while learning this tune*
22. My confidence as an independent musician increased over the course of the learning process
23. Learning this tune helped me to understand how to form an arrangement
24. After learning this tune I want to try arranging more music
25. After learning this tune I have enough knowledge to attempt arranging my own tunes in the future

Appendix J: Likert Examples

Below are some examples of Likert surveys for student-centered learning projects. Many of the questions for the Likert survey I created were adapted from the first Likert which I deemed to be the most relevant to my project design (Gundala et al., 2018).

Item	M	SD
Student Motivation to Learn		
This project enhanced my engagement with the course content.	4.33	0.96
This project made discussions in class more enjoyable.	4.32	0.90
This project was worth the time spent on it.	4.33	0.92
Project as Learning Device		
This project made the subject matter realistic.	4.56	0.87
This project integrated concepts in the course.	4.40	0.87
This project illustrated concepts in the course.	4.28	0.84
This project will help me remember the material better.	4.48	0.92
Skills and Personal Benefits		
This project helped me develop my teamwork skills.	3.83	0.96
This project helped my report preparation skills.	4.00	0.91
My understanding of how to obtain information from the library and online databases or websites improved.	3.52	1.01
My understanding of how to write a business report of my findings improved.	3.96	0.79
My understanding of how to conduct a SWOT analysis improved.	4.04	1.02
My understanding of how to analyze the overall dynamics in a product category improved.	4.21	0.72
My understanding of how to analyze the competition in a category improved.	4.17	0.87
Overall 'Real Company Project' Assessment		
This project made the overall course more engaging.	4.48	0.87
This project provided me with the confidence and ability to solve the real-world issue.	4.20	1.04
This project was and will enhance my job performance.	3.92	1.12
This project was and will be helpful in my other business courses.	4.20	0.87
I would recommend that this course continues to require this project.	4.40	0.87

(Gundala et al., 2018)

Table 3
Dimensions and items of the APA-TBL instrument (São Paulo, 2016).

Dimensions	Dimension Title	Items
Dimension 1	Influence of the team on individual performance	6 - Group testing helped me develop teamwork skills. 8 - Taking the team test improved my understanding of the subject. 12 - The dialogue and discussion on my team helped me learn about decision making. 13 - Dialogue and discussion with other teams helped me learn about decision making. 14 - The dialogue and discussion with the other teams helped me to become deeply involved with the presented content. 15 - The team activities enabled me to apply the theoretical concepts to resolve the clinical case. 18 - The discussion of the clinical case promoted my learning and development. 19 - The discussion of the clinical case made me realize how important teamwork is for solving real problems. 20 - Discussing the clinical case with my team helped me realize my strengths and weaknesses as a team member. 23 - Team activities made it possible to solve problems that will be faced in professional practice. 24 - The team learning experience will help my professional future.
Dimension 2	Teacher performance/role in the method's application	2 - The amount of content available for the individual preparation was adequate. 3 - The quality of the content provided was in line with the proposed objectives. 21 - In the discussion of the clinical case, I noticed the role of the teacher as learning facilitator. 22 - The activities met my expectations regarding the TBL method of teaching and learning.
Dimension 3	Student commitment	1 - I read the content before class. 4 - The before-class reading promoted my learning. 5 - My individual performance depended on how well prepared I was. 11 - I prepared and contributed as much as I could to make my team successful.
Dimension 4	Team responsibility and performance	7 – The team's success depended on how much I was able to collaborate with the group. 9 - Team activities increased my responsibility regarding my studies. 10 - The good performance of the team depended on how much I collaborated as a team member in the resolution of the case. 16 - Team members were appropriately selected to maintain homogeneity between groups. 17 - The immediate feedback favored the interaction between the teams.

(Cunha, 2018, p.146)

Appendix
Scale Reliabilities (α) and Rotated Component Matrix

	Component			
Scale	1	2	3	4
Student Motivation to Learn (α = .83)				
I preferred the project to an all lecture course.	.788	.073	.087	.089
I preferred the project to analyzing cases.	.786	.023	.043	.052
The project increased my interest in the course.	.793	.316	.113	.117
The project made discussions in class more enjoyable.	.789	.206	.086	.195
The project was worth the time spent on it.	.485	.278	.234	.322
Project as Learning Device (α = .77)				
The project made the subject matter realistic.	.329	.664	.274	−.048
The project integrated the material in the course.	.124	.847	.074	.140
The project illustrated concepts in the course.	.047	.803	.059	.302
The project will help me remember the material better.	.280	.619	.290	.161
Contribution to Marketing and Marketing Research Knowledge (α = .72)				
The project illustrated practical problems with doing marketing research.	.110	.297	.674	.076
The project illustrated “quality” in marketing research.	.128	.164	.681	.034
The project helped me understand consumer response to marketing.	.123	.020	.771	.164
The project will help me to evaluate market research done by outside professional suppliers.	−.005	.053	.759	.157
Skills and Personal Benefits (α = .74)				
The project helped me develop my teamwork skills.	.164	.185	.095	.753
The project helped my report preparation skills.	.183	.143	.084	.820
The project helped me develop my interpersonal skills.	.065	.077	.194	.729

(Parsons, 2009, p.158)

Item	Mean[a]	Standard Deviation
When I first heard about this exercise at the start of the semester...		
I thought this was going to be a lot of work.	4.31	1.04
I questioned whether this exercise would be worthwhile.[b]	3.25	1.18
I doubted that I could do a good job.[b]	2.92	1.18
With regard to getting ready for my encounter...		
I had to start working on this project long before the actual encounter.	3.64	1.15
It was necessary to gather a lot of information from the library.	3.78	1.17
It was necessary to gather a lot of information from company sources.	4.39	.96
I had to practice what I was going to say.	3.56	1.05
The class speakers proved to be helpful.	4.03	1.06
Reviewing previous encounter videotapes was helpful.	4.25	.94
The lecture material proved helpful.	4.44	.65
Class discussions were helpful.	4.50	.51
Holding joint sessions with the other class was helpful.	3.94	.98
Concerning the actual encounter...		
I feel that the other parties asked realistic questions.	4.28	.74
Follow-up visits with the other party were realistic.	4.00	1.01
Doing two encounters, as opposed to one, was a good idea.	4.06	1.29
The ability to watch myself on tape helped me for the second encounter.	4.19	1.04
The discussion with *XXX* at the end helped me for the second encounter.	4.53	.77
I felt better prepared for the second encounter.	4.39	.80
As a result of doing this exercise...		
I have a better feel for how buyers operate.	4.39	.69
I have a better feel for how sellers operate.	4.36	.76
I made some business contacts.	2.58	1.27
In retrospect...		
This was a lot of work.	4.56	.69
This exercise was worthwhile.	4.53	.70
I did a good job.	4.17	.70
If I had the chance to, I would do this encounter again.	3.56	1.25
I would recommend that others participate in this buyer/seller encounter.	4.19	.95

(O'Hara, 1995, p.6)

Appendix K: Teacher Notes for Student-Centered Lessons (Class I)

Lesson I

- Students pulled up Liza Jane on YouTube
- Discovered an option on The Session
- Found 3rd Version Illinois.edu, chose Illinois
- Chose Leaders for Each
- Students made a copy of the violin parts.

Lesson II

- Student took the violin part home and created viola + cello parts for all of the students
- A small group of students demonstrated the tune together 1vln, 1vla, 1cello, 1bass
- Students discussed whether they wanted to play from the music or memorize. Decided they would go deeper using the music
- Practiced getting the melody clean, and adding a Bass-Line
- Student Leader Introduced A Shuffle Stroke to make it "Spicy"
- Students came up with ideas to make the melody more
- Last time through add weird stuff

Lesson III

- Review the melody with the basses playing a Bass & Guitar line.
- Student leaders explained the chords + triads. He wrote the chords out and projected a google doc on the Big Screen for everyone to see. Practiced the chords as a class
- Student Leaders are Vln/Vla/Cello
- Practiced the chop
- Listened to melody and tried to make the harmony line up to the melody
- Students were struggling with chords with the melody
- Rehearsed just chords. Then practiced the chords by counting chords. 7 a's 4 d's etc.
- Put the chords + melody together and rehearsed each half
- Practiced half on melody, half on harmony then switched parts

Lesson IV

- Reviewed melody
- Reviewed chords + rhythms
- Divided group-1/2 group played melody 1st time, harmony 2nd time, and reverse.

- Students discussed the challenges of an accompaniment with a melody. Open discussion Talking about an arrangement:

  Student said a solo is like a room. You have the structure always, but you can change the

  colors by painting the room, change the solo by adding different colors.

Lesson V

- Review of Melody + Harmony
- Students asked if there were volunteers for solos.
- Student leader began to map out the arrangement and gave examples of variations.
- Students played Mroy's Arrangement and experimented with variations (Noodled Around) to brainstorm ideas for the arrangement
- Mapped out the arrangement together and leader explained the ideas that the group shared.
- Students marked their music to indicate the arrangement

Lesson VI +Dress Rehearsal

- Students reviewed the formula for the arrangement
- Students practiced the arrangement
- A student who was in a duet was absent for the recording. The students problem solved and created another variation with a new member of the duet.
- Practiced 2nd time with metronome to help tempo.
- Practiced additional time without metronome.

Appendix L: Teacher Notes for Student-Centered Lessons (Class II)

Lesson I

- Students researched melody on: Youtube, The Session, Free scores.com
- Chose a violin part with chords
- Chose a cellist + violist to transcribe

Lesson II

- Began by a violinist demonstrating
- Students chose to play scale of G Major to warm up + get the style of the scale.
- Call-response with music in front of the players.
- Players were helping each other learn the fingerings, violins helping cellos etc.
- Rhythm on open string and then added notes
- Played through arrangement slowed down tricky parts.

- Students wrote out melody for cello + viola + distributed.
- Warmed up on D Major Scale with rhythms
- Reviewed tune with Bass Line
- Student led tune from instrument and metronome.
- Slowed down

Lesson IV

- Open with review and a scale
- Rehearsed the closing passage
- Used the metronome @ a slow tempo. Straight notes
- Rehearsed passage with swing notes
- Last line rehearsed
- Put the last three lines together
- Worked through harmonies and assigned harmony parts.

Lesson V

- Start with scale review
- Assigned arpeggios to each section to play along with the melody.
- Discussion of Arrangement.
- Work through the new part.
- Review Entire Piece Verse 1
- Verse 2 add harmonies
- Lesson and engagement slows way down when students started working on harmonies

- Begin to develop an arrangement

Lesson VI

- Reviewed Melody
- Discussed harmony options for C-End.
- Worked through a Call Response of the Melody @ Letter C.
- Two leaders split the class and explained the two harmony parts
- Small group worked through the pattern, large group became less engaged

Lesson VII Dress Rehearsal

- Scale warmups
- Run through twice
- Leader listened first time
- Rehearsed the arrangement
- Rehearsed spots that needed attention.

Appendix M: UGA IRB Approval

UNIVERSITY OF GEORGIA

Tucker Hall, Room 212
310 E. Campus Rd.
Athens, Georgia 30602
TEL 706-542-3199 | FAX 706-542-5638
IRB@uga.edu
http://research.uga.edu/hso/irb/

Human Research Protection Program

EXEMPT DETERMINATION

May 5, 2021

Dear Rebecca Atkins:

On 4/21/2021, the Human Subjects Office reviewed the following submission:

Title of Study:	Perceptions of Student-Centered Learning in Music
Investigator:	Rebecca Atkins
Co-Investigator:	Daniel Bermel
IRB ID:	PROJECT00003246
Funding:	None
Review Category:	DHHS – Exempt 1 (External Site Authorization

We have determined that the proposed research is Exempt. The research activities may now begin. Since this study was determined to be Exempt, please be aware that not all future modifications will require review by the IRB. For more information, please see Appendix C of the Exempt Research Policy. As noted in Section C.2, you can simply notify us of modifications that will not require review via the "Add Public Comment" activity.

A progress report will be requested prior to 5/5/2026. Before or within 30 days of the progress report due date, please submit a progress report or study closure request. Submit a progress report by navigating to the active study and selecting Progress Report. The study may be closed by selecting Create Version and choosing Close Study as the submission purpose.

In conducting this study, you are required to follow the requirements listed in the Investigator Manual (HRP-103).

Sincerely,

Benilda P. Pooser, Ph.D., CIM
Director, Clinical Research Compliance

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Appendix N: County IRB Approval

April 28, 2021

Daniel Jeffrey Bermel

SENT VIA EMAIL

Dear Mr. Bermel:

Your research project titled, Student Perceptions of Student-Centered Learning In Music, has been approved. Listed below is the school where approval to conduct the research is complete. Please work with the school administrator to schedule administration of instruments or conduct interviews.

School

Should modifications or changes in research procedures become necessary during the research project, changes must be submitted in writing to the department of Accountability, Research & Grants prior to implementation. At the conclusion of your research project, you are expected to submit a copy of your results to this office. Results cannot reference the School District or any District schools or departments.

Research files are not considered complete until results are received. If you have any questions regarding the process, contact my office at

Sincerely,

Grants & Research Manager
Accountability, Research & Grants

BOARD OF EDUCATION

SUPERINTENDENT